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File Code: 1950

Date: July 7, 2005

Dear Reviewer:

Enclosed for your review and comment is a copy of the Draft Environmental Impact Statement (DEIS), for the Middle Fork John Day Range Planning Project.

The DEIS examines a No Action alternative (no grazing) and two Action alternatives for managing the Middle Fork John Day area. Alternative 3 has been identified as the preferred alternative. This alternative also includes one Forest Plan Amendment to convert a 230-acre portion of the Bear Allotment from MA 19 (Administrative Area) to MA 2 (Rangeland).

Reviewers should provide the Forest Service with their comments during the review period that ends on September 6, 2005. This enables the agency to analyze and respond to comments at one time and use the information in preparing the Final Environmental Impact Statement (FEIS).

Copies of the DEIS are available for review at the Malheur National Forest Offices in John Day, Oregon. The DEIS is also available on the Internet at www.fs.fed.us/r6/malheur.

I want to encourage you to review and comment on this DEIS. Your interest in the management of the Malheur National Forest is appreciated. If you have questions regarding this project, please contact Mike Montgomery, District Ranger or Linda Batten, Middle Fork John Day Range Planning Project Interdisciplinary Team Leader, at 541-575-3000.

Sincerely,

/S/ ROGER W. WILLIAMS
Forest Supervisor

Enclosure

United States
Department of
Agriculture

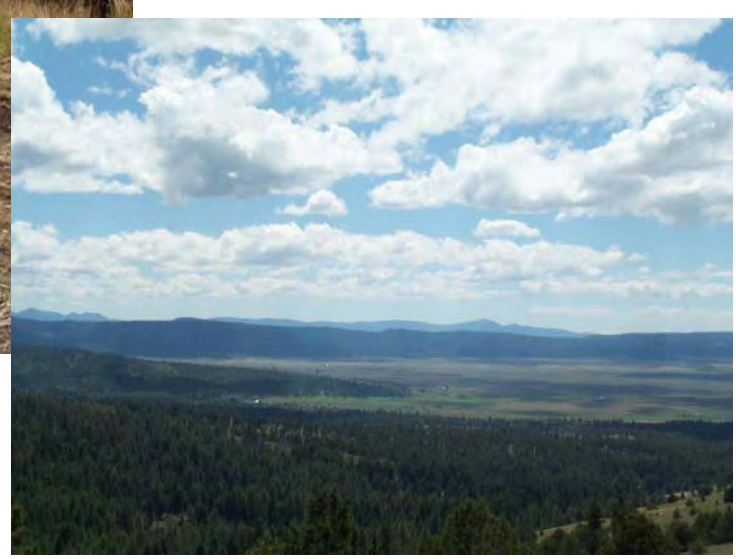
Forest
Service

June 2005

Draft Environmental Impact Statement
and Proposed Forest Plan Amendment

Middle Fork John Day Range Planning Project

Blue Mountain Ranger District and Prairie City Ranger District
Malheur National Forest
Grant County, Oregon
R6-MAL-05-002



Middle Fork John Day Range Planning Project EIS - Key Acronyms

AMP	Allotment Management Plan
AOI	Annual Operating Instructions
AUM	Animal-Unit-Month
BA	Biological Assessment
BMP	Best Management Practices
CEQ	Council on Environmental Quality
C/T	Condition and Trend (survey/plots/data)-Vegetation condition ratings
DMA	Designated Monitoring Area
EA	Environmental Assessment
EIS (DEIS or FEIS)	Environmental Impact Statement (Draft or Final)
IDT	Interdisciplinary Team
IIT	Interagency Implementation Team
MA	Management Area
MIS	Management Indicator Species
NEPA	National Environmental Policy Act of 1969
NFMA	National Forest Management Act of 1976
PACFISH -	"Interim strategies for managing anadromous fish-producing watersheds in Eastern Oregon and Washington, Idaho, and Portions of California," Decision Notice dated February 24 1995
PAG	Plant Association Group
RHCA	Riparian Habitat Conservation Area
RMO	Riparian Management Objective
ROS	Recreation Opportunity Spectrum
SHPO	State Historic Preservation Office
TES	Threatened, Endangered, or Sensitive species

Middle Fork John Day Range Planning Project
Draft Environmental Impact Statement
Blue Mountain Ranger District and Prairie City Ranger District
Malheur National Forest
Grant County, Oregon

Lead Agency:	**USDA Forest Service**
Responsible Official:	**Roger W. Williams** **Forest Supervisor** **Malheur National Forest** **431 Patterson Bridge Road** **P.O. Box 909** **John Day, OR 97845**
For Information Contact:	**Linda Batten** **IDT Leader** **Blue Mountain Ranger District** **431 Patterson Bridge Road** **P.O. Box 909** **John Day, OR 97845** **541-575-3000** **comments-pacificnorthwest-malheur@fs.fed.us**

Abstract: This Draft Environmental Impact Statement documents the analysis of three alternatives, including a no-grazing alternative, for the Middle Fork John Day Range Planning Project on the Blue Mountain and Prairie City Ranger Districts of the Malheur National Forest. Alternative 1 is the No-Grazing Alternative. Alternative 2 was designed to continue current grazing practices and meet Forest Plan direction with no changes to the range management infrastucture. Alternative 3 is the Proposed Action; it was designed to continue grazing and meet Forest Plan Direction with additional water developments and fences as well as changes in allotment configuration.

Send Comments to: Comments on this DEIS should be sent to Linda Batten, IDT Leader at the address provided above and will be due 45 days after the notice of availability is published in the Federal register.

Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decision making process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, l986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

Summary of the
Middle Fork John Day Range Planning Project
Draft Environmental Impact Statement

CHAPTER 1. INTRODUCTION

Background

National and Forest Direction

Prior to 1995, controversy existed over whether there was any need to consider a grazing permit as a Federal action requiring review under the National Environmental Policy Act as well as the adequacy of the progress toward getting allotment NEPA decisions completed. To resolve the issue, Congress included language in the Rescission Act of FY05 (Public Law 104-19, Section 504) which requires the Forest Service to identify all allotments on which NEPA analysis is needed, and to prepare and adhere to a schedule for conducting an assessment of grazing actions under NEPA.

The Malheur National Forest Land and Resource Management Plan ("Forest Plan", USDA Forest Service 1990) directs the Forest Service to update or develop new Allotment Management Plans (AMPs). AMPs are updated by conducting an environmental analysis of the impacts of grazing and associated activities. The Forest Plan originally scheduled AMPs for these allotments to be completed between 1996 and 2001 (USDA Forest Service 1990). Section 504(b) and (c) allows the Forest Service to issue expired and waived permits on allotments listed on the schedule, but have not gone through a NEPA analysis, as long as the terms and conditions of the permit are not changed. In a reply to Congress, the Forest Service established a fifteen year schedule for completion of this work.

Grazing actions on public land must be viewed as an on-going action. To understand the context of grazing activity today, one must have an appreciation of the history of grazing in the West. Prior to the 1930s, grazing on public land was unregulated until Congress enacted laws which required grazers to own a local home ranch to qualify for a permit to graze. The Granger-Thye Act of 1950: P.L. 81-478 (April 24, 1950) established the direction for National Forest System allotment management, including the authorization to issue grazing permits for terms up to 10 years; authorization to use grazing fee receipts for rangeland improvement; and the establishment of grazing advisory boards. Also, requirements, including base property and commensurability, were also designated by statute to ensure economic stability to local communities, but also to foster stewardship toward the public land resources and to manage the rangelands for sustainability. This period of unregulated grazing resulted in adverse environmental consequences such as soil loss and watershed modifications that created many of the permanent and semi-permanent impacts seen today in the Planning Area (Johnson 1995) and other parts of the West. Some of these impacts, such as the incapacity of sites to naturally restore native vegetation communities, must be clearly recognized and understood to ensure that unrealistic expectations for management are not part of the action alternatives.

This assessment of vegetation and watershed conditions takes into account the historic level of use that occurred on these allotments prior to the establishment of management and control of livestock numbers with the enactment of the Granger-Thye Act of 1950. The purpose of both the Granger-Thye Act for USFS and Taylor Grazing Act for BLM was to establish controls and stewardship toward the public land grazing resource, with the core of that stewardship creating a linkage of the use of public land to an established private landowner who would bring stability to the community and bring these lands into a sustainable level of production for both forage and wildlife habitat.

Planning area

The Middle Fork John Day (MFJD) Range Planning Area is comprised of eight (8) livestock grazing allotments and three (3) administrative use pastures, and is located approximately 18 miles northeast of John Day, Oregon (see Figure 1, Map Section). The eight allotments, Austin, Bear, Blue Mountain, Camp Creek, Elk, Lower Middle Fork, Upper Middle Fork, and Sullens, encompass approximately 186,500 acres of mainly National Forest lands, including about 80 acres of BLM managed land. About 2,800 acres of private land is included in the Planning Area (see also Chapter 1, Management Areas and Objectives and Figure 9, Map Section). Five of the allotments have active permits, while three of the allotments (Austin, Elk, and Sullens) are currently vacant. The three administrative use pastures, Bear, Blue Mountain, and Sunshine, total approximately 490 acres (see Figure 1, Map Section. The allotments and administrative pastures are primarily contained in the Upper Middle Fork John Day, Galena, and Camp Creek Watersheds. The Middle Fork John Day (MFJD) River, which provides habitat for threatened steelhead trout and bull trout and for Chinook salmon, a sensitive species, lies within the planning area and runs through several of the allotments; more than 20 perennial tributary streams lie in the planning area (see Figure 10, Map Section). Elevations range from 7,100 feet at Vinegar Hill to 3,400 feet where the MFJD River leaves the Forest. Precipitation ranges from 40 inches, mostly as snow, in the higher elevations to 20 inches at lower elevations along the River.

Livestock grazing has been a part of the landscape of the Malheur National Forest since the 1860's when the first miners and homesteaders entered this area. Although livestock grazing on National Forest lands has decreased since the early 1900s, the ranching industry remains an important part of the Grant County economy.

The allotments within the planning area, like many areas in the Western United States, have a legacy of livestock overuse that started in the late 1800s and continued into the mid 1930s. These allotments were historically grazed by domestic livestock, with thousands of sheep grazing in the late 1860s until the 1940s. From the 1940s until the present day, domestic livestock grazing in the area has been dominated by cattle. Early grazing was essentially unregulated and resulted in significant impacts including loss of vegetation and soil erosion, some of which are still observable today in areas such as Vinegar Hill/Indian Rock (Johnson 1995). Livestock utilized available forage in a continuous season grazing regime. During the middle part of the 1900s the Forest Service took significant action to regulate numbers and seasons, and to establish workable grazing seasons and allotments. This action continued into the latter half of the 1900s when emphasis shifted to development of management systems and regulation of effects on specific resources.

Improved grazing systems and pasture designs were implemented to accelerate riparian area recovery in the late 1970s and throughout the 1980s with a reduction in allowable use in the 1970s. Implementation of the Malheur National Forest Land and Resource Management Plan in the early 1990s again reduced the amount of allowable use by livestock grazing to accelerate the rate of recovery in riparian areas, and limited utilization of shrubs. In the mid to late 1990s other mitigations associated with the Endangered Species Act and PACFISH (which amended the Malheur National Forest Plan) were implemented in an effort to further protect riparian areas and associated aquatic species.

Allotments within the planning area at one time had deferred or rest rotation grazing systems in place. In recent years, deferred/rest rotations have been changed (and resulted in livestock use in the same area at the same time of year every year) for a variety of reasons: to avoid spawning fish, to allow use of the pastures without late season water (pastures would get used each year in the spring/early summer), and to reduce shrub use (by grazing early every year). When livestock use in the same area at the same time of year every year, plants in some pastures do not mature and develop seed heads periodically, resulting in a loss of plant health and vigor over time.

Informal observations have highlighted competition for browse (shrubs) and forage between livestock and big game (elk/deer) in parts of some of the allotments. After the Summit Fire in Lower Middle Fork Allotment, and in other situations and locations, informal observations have shown shrubs to be browsed at moderate levels by big game when these areas were rested from livestock use. Data and information on competition between livestock and big game in the Planning Area is limited.

In most places in the planning area, vegetation and other resource conditions are consistent with the Malheur National Forest Land and Resource Management Plan (Forest Plan), and livestock distribution and utilization are contributing to desired conditions at this time. Previous actions, enacted under the existing permits, have addressed many of the areas of past concern on the allotments within this range planning area. Many of the actions that might have been included and evaluated in this range planning EIS have already been implemented through past separate incremental management decisions. This has resulted in allotments with relatively few ongoing resource concerns or conflicts associated with permitted livestock use. However, some areas of concern related to livestock grazing still remain in the allotments. The existing condition descriptions in Chapter 3 show that in some years it has been difficult to meet standards or to reach desired conditions in areas of concern with the range developments that currently exist on the allotments.

Allotment conditions are mainly in an improving trend. A few areas are in a static or downward trend, and current livestock grazing is, in some cases, not contributing to that trend, or is only partially contributing to that trend. There are places where livestock management changes could initiate or accelerate the improving trend, particularly on sensitive portions of streams (see Purpose and Need, below, and Chapter 6, Glossary and Sensitive Stream Reach Figure 10, Map Section). In places that adjustments to livestock management could initiate or could accelerate an improving trend, actions to improve conditions are proposed. In areas where existing condition meets desired condition, no need for change was identified and so no proposed changes to current management are suggested.

This Environmental Impact Statement (EIS) focuses on resolving current areas of resource concern that may be contributing to undesired resource conditions in specific locations and situations. This EIS documents the environmental analysis of effects of livestock grazing in the Middle Fork John Day Range Planning Area and will be used to develop new Allotment Management Plans (AMPs) for each of the proposed allotments.

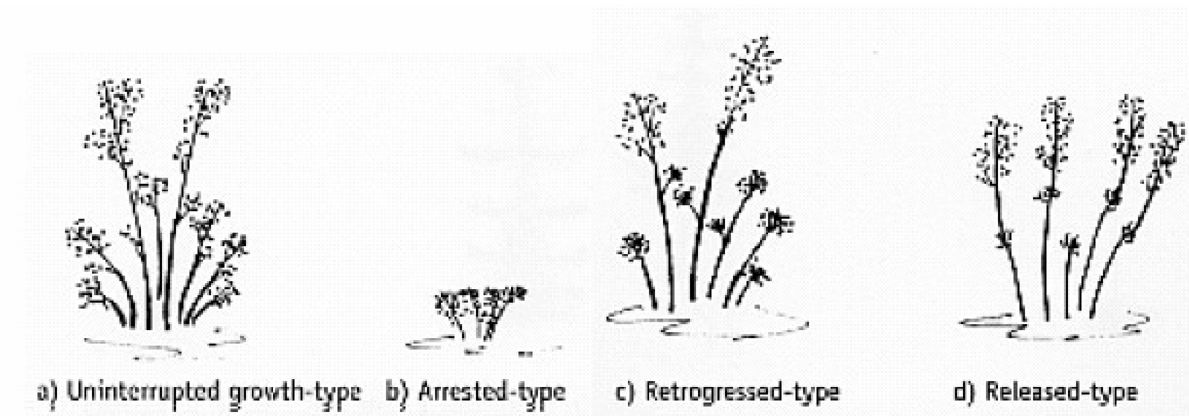
Purpose of and Need for Action

The purpose of this proposal is to authorize livestock grazing in a manner that is consistent with the Malheur Forest Plan. Authorization is needed on these allotments because:

- Where consistent with other multiple use goals and objectives, there is Congressional intent to allow grazing on suitable lands. (Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resource Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976, FSM 2202.1).
- The allotments contain lands identified as suitable for domestic livestock grazing in the Malheur National Forest Plan and continued domestic livestock grazing is consistent with the goals, objectives, standards, and guidelines of the forest plan (Forest Plan Chapter IV).
- It is Forest Service policy to make forage available to qualified livestock permittees, from lands suitable for grazing, consistent with management plans (FSM 2202.1);
- By regulation, forage producing lands will be managed for grazing where consistent with land management plans (36 CFR 222.2(c)).
- It is Forest Service policy to continue contributing to the economic and social well being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood (FSM 2202.1(4)).
- The Malheur National Forest Plan permits livestock use on suitable range when the permittee manages livestock using prescribed practices (Forest Plan IV-2).

To meet this purpose, there is a need for change from current management strategies on the eight allotments in the MFJD Range Planning Area (see Figures 2-8, Map section) because parts of the allotments have been documented to not be moving toward desired conditions as identified in the Forest Plan. Direction from the Forest Plan as amended by PACFISH, and the presence of Endangered Species Act listed fish in the Planning Area has elevated the importance of riparian management. In some areas on the allotments riparian shrubs have been documented to display arrested or retrogressed architecture (see Figure 12, Chapter 3, Vegetation and Rangeland Resources, Chapter 6, Glossary and Figures 2-8, Map Section), and lack of abundant age classes and regeneration (from seed, sprouts, etc.). Also, recent monitoring data within the planning area has shown forage and shrub utilization in excess of Forest Plan standards in some areas that livestock tend to prefer. These are mainly isolated areas where cattle congregate along streams, not necessarily caused by overall shortages of forage or overstocked range.

Figure 12: Architectures exhibited by shrubs (from Keigley and Frisina. 1998. Browse Evaluation by analysis of growth form-see Chapter 6 of this EIS for definitions/descriptions)



The following paragraphs identify specific needs and the existing conditions within each allotment. Existing conditions are further described in Chapter 3 of this EIS. Generally the allotments have relatively few ongoing resource concerns or conflicts associated with permitted livestock use. Only those pastures or areas where needs were identified are discussed below:

Austin Allotment

Private lands within this allotment have been fenced separately from Forest lands, the associated on/off grazing permit is no longer in use and the allotment is vacant (see Figure 2, Map Section). The pastures within the Austin Allotment are small (about 40 acres each) and are adjacent to Upper Middle Fork and Blue Mountain Allotments. From a range management stand point it would be logical to manage these units with the adjacent allotments to facilitate management of resources.

Damage to the ditch banks has been caused by the concentration of unauthorized livestock near the private land fence in the Austin Allotment. There is a need for maintaining livestock distribution that avoids trampling of an irrigation ditch in the Bates Pasture of the Austin Allotment to maintain the function of that ditch.

Bear Allotment

The riparian areas of the Middle Fork of the John Day River in the C1 & C2 pastures are in early seral ecological stage (see Chapter 6, Glossary – Seral), riparian shrub conditions are recovering but riparian areas along the river are currently lacking a diversity of shrub species and age classes (see Figure 3, Map Section). Early season use has improved shrub conditions in Pastures C1 and C2, but has led to livestock using these pastures at the same time each year generally not allowing for periodic seed set. In addition, observations of soils in the C1 and C2 pastures show soil impacts for compaction. There is a need for deferred and/or rest rotational grazing practices using more pastures, and when possible, early season grazing along the Middle Fork John Day River in pastures C1 and C2 to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture in this area (see Figure 12 for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998) and to reduce impacts on soils.

Blue Mountain Allotment

Current riparian shrubs on sensitive sections of Idaho, Crawford, and Summit Creeks and the Middle Fork John Day River within the Crawford, Idaho, West Summit and East Summit pastures display arrested or retrogressed architecture, lack of abundant age classes and regeneration (from seed, sprouts, etc.) (see Chapter 6, Glossary and Figure 4, Map Section). There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing along sensitive reaches of Idaho, Crawford, and Summit Creeks and the Middle Fork John Day River to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture in this area (see Figure 12 for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998).

Riparian vegetation in most of the perennial (wet year-round) parts of Crawford Creek were determined to be in early seral stage (see Chapter 6, Glossary – Seral). There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing on the perennial parts of Crawford Creek (Crawford Pasture) to move riparian vegetation toward mid/late seral stages.

Crawford pasture does not have sufficient late-season water sources for livestock because the water sources (ponds, spring developments, and intermittent creeks) are dry or provide inadequate water during much of the summer. The Pie Meadow water development has exceeded its life expectancy; there is minimal flow to provide water for livestock and trampling damage is occurring at the spring. Several existing ponds are not filling up or are not holding water in the Crawford Pasture. There is a need for improved livestock distribution through increased water storage capacity and reliable late season water for livestock, and for modifications to springs so that springs have dense herbaceous riparian vegetation, a high water table, saturated soils closer to potential natural conditions, and maintained downslope vegetation and water conditions in the Crawford pasture.

Water sources in the upper elevations of the Idaho pasture are limited. The north and northeast portion of the pasture receives little use while the southern portion of the pasture is used routinely. Riparian shrubs along the middle-part of Idaho Creek are severely hedged with arrested architecture and are often only about one foot tall. Observations indicate both cattle and big game have affected these shrubs. There is a need for better livestock distribution and more available water for livestock in the upper elevations of the Idaho Pasture.

The MFJD River, Summit Creek and Squaw Creek channels were downcut four to six feet by a flood in the Upper Phipps Meadow and East Summit Pastures in 1997. While riparian vegetation conditions are improving, the downcut channel has affected the valley bottom vegetation by lowering the water table. Stream banks are unstable and the channel continues to widen as a natural consequence of the downcutting; natural development of the floodplain is occurring. There is a need for continuation of rest from livestock management to continue to move riparian vegetation toward mid/late seral stages and for a functioning channel and hydrologic condition on the downcut streams in the Upper Phipps Meadow and East Summit Pastures (MFJD River, Summit Creek and Squaw Creek).

Camp Creek

Currently livestock trailing between the fenceline and the MFJD River in the Middle Pasture is degrading streambanks in approximately three small segments of the river where the fence lies within a few feet of the river (see Figure 5, Map Section). Though herbaceous vegetation is in late seral stage on the MFJD River in the Middle Pasture (see Chapter 6, Glossary – Seral), shrub regeneration and diverse age classes and species are lacking. There is a need for modified grazing developments and better livestock distribution, as well as for deferred and/or rest rotational grazing practices, and when possible, early season grazing, to increase streambank stability and to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture along the MFJD River in the Middle Pasture (see Figure 12 for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998).

Gibbs and North pastures do not have sufficient late-season water sources for livestock because the water sources are dry during much or all of the summer; intermittent creeks in both pastures and a pond in North pasture dry up, and an irrigation ditch in Gibbs pasture no longer runs water because of problems at the diversion. There is a need for reliable late season water source(s) in the Gibbs and North pastures.

Riparian vegetation on Camp Creek (Lower Camp Pasture) was surveyed and determined to be in early seral stage; shrub condition is variable (some shrubs exhibit arrested and retrogressed growth types) but improving as there are many young shrubs with uninterrupted architecture (see Figure 12 for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998). There is a need for mid/late seral riparian vegetation on Camp Creek. There is a need for more diverse and abundant riparian shrubs in uninterrupted or released architecture along Camp Creek in the Lower Camp Pasture. There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing on Camp Creek to move toward mid/late seral riparian vegetation and to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture along

Camp Creek in the Lower Camp Pasture.

Elk Allotments

Private lands within this allotment have been fenced separately from Forest lands, the associated on/off grazing permit is no longer in use and the allotment is vacant (see Figure 7, Map Section). The allotment is surrounded by the Sullens Allotment. From a range management stand point it would be logical to combine Elk Allotment with Sullens Allotment to facilitate management of resources.

Lower Middle Fork

Present shrub architecture (hedged and arrested), lack of diverse age class representation and the lack of an apparent improving trend are cause for concern on sensitive stream reaches within in the Balance and Sunshine Pastures (see Figure 6, Map Section). It is felt these two pastures may have been using a disproportionate share of permitted animal months in the Lower Middle Fork allotment (the two pastures make up about 12% of the allotment land base but receive about 20% of the livestock use). There is a need for continuation of planned livestock management including deferred and/or rest rotational grazing practices in 9 pastures, and when possible, early season grazing to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture (see Figure 12 for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998) in the Balance and Sunshine Pastures.

Pizer Meadow (Pizer Pasture) has been and continues to be an area of livestock concentration with heavy use of forage; the undeveloped spring at Pizer Meadow is not fenced and gets used and trampled by livestock. There is a need for dense herbaceous riparian vegetation, a saturated soils area closer to potential natural conditions, and a high water table at Pizer Spring that maintain downslope vegetation and water conditions in Pizer Meadow. There is a need for better livestock distribution in the Pizer pasture and modifications of grazing developments in the Pizer Meadow area so that springs have dense herbaceous riparian vegetation, a high water table, saturated soils closer to potential natural conditions, and maintained downslope vegetation and water conditions.

As a result of the Summit Fire in 1996, riparian vegetation (both herbaceous and shrubs) in many areas throughout the Big Boulder, Coyote, Deadwood, Susanville, Pizer Pastures is in early seral stage (see Chapter 6, Glossary – Seral). There is a need for continuation of better livestock distribution, deferred and/or rest rotational grazing practices, and when possible, early season grazing to continue to move toward mid/late seral riparian vegetation and to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture along creeks burned by the Summit Fire throughout the Big Boulder, Coyote, Deadwood, Susanville, and Pizer Pastures.

Sullens

Riparian vegetation on parts of Dry Fork Clear Creek and Squaw Creeks in the Bridge Creek, Savage and Highway Pastures are in early seral stage (see Chapter 6, Glossary – Seral, and Figure 7, Map Section). There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing to continue to move toward mid/late seral riparian vegetation on Dry Fork Clear Creek and Squaw Creeks in the Bridge Creek, Savage and Highway Pastures.

Trampling impacts from livestock have occurred at Looney and Wigwam Springs in Bridge Creek Pasture. The exclosure around the Looney Spring source is not large enough and troughs are too close to the spring source. There is a need for better distribution of livestock in the pasture and modifications of grazing developments in the Looney and Wigwam Springs areas (in Bridge Creek Pasture) so that springs have dense herbaceous riparian vegetation, a high water table, saturated soils areas closer to potential natural conditions, and maintained downslope vegetation and water conditions.

Squaw Meadow Pasture has been used for livestock holding/gathering. When in this pasture, livestock generally concentrate along and get their water from Squaw Creek. The healing stream banks along Squaw Creek are very sensitive to concentrated disturbance and the area is used by steelhead for spawning. There is a need for better distribution of livestock in the pasture through the use of off-site (off Squaw Creek) water in Squaw Meadow Pasture.

Riparian vegetation in Noxage Meadow and flowing portion of Phipps Creek have been over utilized by both cattle and big game. In early 1980s, livestock concentrated season-long along Noxage Meadow, Phipps Creek and other streams resulting in over use of riparian vegetation and bank alteration. There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing to continue to move toward mid/late seral riparian vegetation and a functioning channel and hydrologic condition on the downcut portion of Phipps Creek in Noxage Meadow within the Highway Pasture.

Upper Middle Fork

Lower Vinegar Creek (in Lower and Upper Vinegar pastures), Vincent Creek (in Lower and Upper Vinegar pastures) and Tincup and Windlass Creeks (in Caribou pasture) are in or are estimated to be in early seral or early to mid-seral stage in many areas (see Chapter 6, Glossary – Seral, and Figure 8, Map Section). On sensitive portions of Vinegar and Vincent Creeks (see Figure 10, Map Section), riparian shrubs are present but have been heavily browsed, and most are either mature or have been recently planted. On Tincup and Windlass Creeks, shrubs are sparse or not present. The combination of effects from historic activities with recent livestock use is likely the cause for the early seral stages in these creeks. Season-long use in Caribou Pasture and unauthorized use by an adjacent permittee in Upper and Lower Vinegar Pastures have contributed to current conditions. The lower section of Davis Creek (Deerhorn Pasture) had no hardwood cover with no riparian shrubs taller than 2 feet; this condition was partially influenced by recent livestock use as well as historic activities (Edwards 2001-Stream Survey). There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing in the Upper Middle Fork Allotment to move toward mid/late seral stages of riparian vegetation on Lower Vinegar, Upper Vinegar and Caribou pastures and to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture (see Figure 12 under Desired Condition, this chapter for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998) along sensitive stream reaches in the Lower Vinegar, Upper Vinegar, Caribou, and Deerhorn Pastures.

The Blackeye pasture was separated from the Caribou pasture by a fence for a range evaluation project over 20 years ago. The division fence has not been maintained and its current condition is unknown. The Blackeye pasture is no longer needed for its intended purpose. From a range management stand point it would be logical to manage these pastures as one pasture to facilitate management of resources.

Planning Area

Throughout the allotments, possible cattle grazing impacts has been reported at 42 eligible or unevaluated (but managed as eligible) cultural property sites. There is a need for protection of eligible heritage resources in the planning area.

The Blue Mountain and Sunshine administrative areas, areas with little or no concerns, would need no change from current conditions or management.

Proposed Action

A "proposed action" is defined early in the project-level planning process. This serves as a starting point for the interdisciplinary team, and gives the public and other agencies specific information on which to focus comments. Using these comments (see discussion of Significant Issues later in this chapter), and information from preliminary analysis, the interdisciplinary team then develops alternatives as needed to the proposed action. Alternative 3 is the proposed action. Alternative 3 includes Elements Common to all Grazing Alternatives within the Planning Area. Alternative 3 is briefly described below and described in further detail in Chapter 2 under Alternatives Considered in Detail.

Purpose and Design:

The purpose of this alternative (Alternative 3) is to provide grazing while assuring that livestock management is consistent with the Malheur National Forest Plan and/or moves toward meeting aquatic and other resource Forest Plan standards, as amended, including PACFISH Riparian Management Objectives (RMOs) at a near natural rate of recovery. Areas of concern would be dealt with through adaptive management and administrative changes; however, Alternative 3 also utilizes physical changes to improve allotment management (such as new water developments, new fence construction, and changes in allotment/pasture configuration).

The proposed action is designed to achieve the near natural rate of recovery which would be similar to the rate of recovery that would occur without livestock grazing. The near natural rate of recovery is intended to not have carryover effects from one year to the next. However, due to the nature of grazing and complexities and uncertainties of having livestock move throughout an allotment, some effects would occur, which would be allowable under PACFISH. The Forest acknowledges that standards would not be met in some years in some locations; however, the Forest would use the adaptive management strategy to respond to those concerns. The Malheur National Forest Riparian Monitoring Strategy (Appendix D) provides a starting point for acceptable level of effects or condition thresholds (end-point indicators-see Chapter 6, Glossary). The intent of PACFISH is that no negative cumulative effects that would retard attainment of riparian management objectives (RMOs) would occur as a result of the project. The proposed action would have an improving cumulative trend on riparian conditions over the life of the EIS.

Alternative 3 uses adaptive management to help achieve PACFISH and other Forest direction. Alternative 3 provides management tools in the form of new improvements and other specific actions to increase management flexibility and achieve better distribution of livestock. Generally, less intensive management (by both the permittees and Forest Service) should be required to meet PACFISH and Forest direction with the use of these tools, and by providing upland water, additional upland forage is made accessible.

Proposed Action Description:

The Blue Mountain and Prairie City Ranger Districts, Malheur National Forest propose to combine 8 allotments into 6 and to continue authorization of livestock grazing on these six grazing allotments and three administrative pastures. Alternative 3 utilizes all “Elements Common to all Grazing Alternatives within the Planning Area,” described in Chapter 2, plus additional proposed actions specific to this alternative. These elements include: implementing deferred or rest rotational grazing, minimize duration of hot-season grazing, meeting or moving toward Forest Plan standards, as amended, adjusting grazing based on monitoring, maintaining allotment facilities, use of administrative action, continuation of currently planned range improvements and practices, and the continuation of current management activities unrelated to livestock management (such as recreational use and fire protection). The proposed action establishes a maximum number of Animal Unit Months (AUMs) which allows for a range of permitted animal numbers and season of use for each allotment. AUMs may range from zero to the maximum. Permits display the “average” number of livestock for the “average” season of use so those numbers have been displayed below. See “Elements Common to all Grazing Alternatives within the Planning Area” displayed in Chapter 2 for further descriptions.

Allotment Specific Actions:

Most of the needs described in Purpose and Need can be resolved through deferred rotational grazing (or rest rotation depending on the allotment configuration) and adaptive management as described above. The following tables list additional actions necessary to more effectively implement deferred (or rest) rotational grazing or to further control timing, intensity, frequency, or duration. Maps showing the proposed changes are in the Map Section (Figures 2-8). Cattle would be the permitted livestock on all allotments. Implementation of the allotment management plans that emerge from this analysis is anticipated to be implemented in spring 2006.

Austin Allotment

FS Acres	Average Season of Use	Permit/Average Number	Maximum AUMs
0 ac.	**N/A**	**N/A**	**N/A**

- Eliminate allotment status because the allotment is vacant and from a range management stand point it would be logical to manage these units with the adjacent allotments to facilitate management of resources.
- Incorporate Bates and western-most pasture (about 80 acres) into Upper Middle Fork allotment.
- Incorporate two eastern Austin Allotment pastures (about 80 acres) into Blue Mountain allotment.

Bear Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
1,710 ac. (incl. Bird Pasture)	**6/1 – 10/15** (5/1-10/15)	**84 Cow/calf pair**	**496 AUMs**

- Add 230-acre Bear administrative pasture to Bear Allotment as new (Bird) pasture. Adding the Bird Pasture to the Bear Allotment will allow for rotational grazing (deferred or rest) and accelerate riparian shrub development on the MFJD River.

Blue Mountain Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
22,480 ac.	**6/16-10/9** (5/15-10/9)	**163 Cow/calf pair**	**817 AUMs**

- Officially incorporate two eastern Austin Allotment pastures (about 80 acres) into Blue Mountain allotment.
- Reconstruct/improve 1 livestock water development at Pie Meadow. Reconstruction is intended to improve flow and increase water storage capacity for livestock thus reducing livestock impact to spring, reducing pressure in areas of Crawford Creek, and increasing saturated soil areas, herbaceous riparian vegetation, and raising/maintaining a high water table to maintain downslope vegetation and water conditions.
- Construct 2 new water developments in Idaho pasture to better distribute cattle to lightly used areas.
- Rest Upper Phipps Meadow Riparian pasture for the life of this AMP (at least 10 years) to allow for riparian vegetation recovery and to improve channel function in the downcut portions of the MFJD River, Squaw Creek, and Summit Creek.

Camp Creek Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
600 ac.	**6/1-10/30** (5/1-10/30)	**50 Cow/calf pair**	**327 AUMs**

- Create watergap on Middle Fork John Day river for Gibbs Pasture to allow for deferred rotational and late-season use of this non-riparian pasture, thus accelerating riparian shrub development on the MFJD River through lessened use of riparian pasture.
- Build structures to deflect livestock trailing on riverbanks in Middle Pasture to improve bank stability on the south side of the MFJD River.

Elk Allotment

FS Acres	Average Season of Use	Permit/Average Number	Maximum AUMs
0 ac.	**N/A**	**N/A**	**N/A**

- Eliminate allotment status because the allotment is vacant and from a range management stand point it would be logical to combine Elk Allotment with Sullens Allotment to facilitate management of resources.
- Incorporate Forest lands into Sullens (about 70 acres) allotment.

Lower Middle Fork Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
54,500 ac.	**6/1 – 10/31** (5/1-10/31)	**549 Cow/calf pairs**	**3,623 AUMs**

- Fence spring source at Pizer Meadow to prevent livestock trampling impact to spring and increase saturated soil areas, herbaceous riparian vegetation, and a high water table to maintain downslope vegetation and water conditions; construct water source ¼ mile west of Pizer to better distribute livestock use.

Sullens Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
45,070 ac. (incl. Elk acres)	**6/16-10/15** (5/15-10/15)	**241 Cattle**	**1266 AUMs**

- Officially incorporate Elk allotment (about 70 acres) into Highway pasture of Sullens allotment.
- Construct water development at Wigwam Spring to improve livestock grazing distribution in the allotment and reduce livestock impact to spring and increase saturated soil areas, herbaceous riparian vegetation, and a high water table to maintain downslope vegetation and water conditions.
- Reconstruct Looney Spring water development, expanding exclosure and moving troughs to reduce livestock trampling impact to spring and improve spring conditions as described under Wigwam Spring.
- Construct water development at Squaw Meadows spring to provide off-stream water source to reduce livestock impacts to banks from concentrated use.
- Increase # of pastures from 5 to 6. Create North Squaw pasture by subdividing and fencing Savage Pasture into 2 pastures providing for deferred rotational grazing; install 2 cattleguards at road crossings.

Upper Middle Fork Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
54,080 ac. (incl. Austin acres)	**6/1 – 10/15** (5/1-10/15)	**485 Cow/calf pair**	**2868 AUMs**

- Combine Blackeye and Caribou pastures into one pasture called Caribou.
- Incorporate Bates Pasture of the Austin allotment (about 80 acres) into Upper Middle Fork allotment to use as a holding pasture; officially incorporate the western-most pasture of the Austin allotment into the Lower Vinegar Pasture of the Upper Middle Fork allotment.

Administrative Pastures

Area and FS Acres	Season of Use	Average Number	Maximum AUM/AMs
Bear Administrative Pasture Appx. 250 ac.	**See Bear Allotment**	**See Bear Allotment**	**See Bear Allotment**
▪ Bear Administrative Pasture – Add 230-acre pasture to Bear Allotment, naming it “Bird” Pasture- refer to the Bear Allotment. Fenced section along MFJD River will not be used for grazing.			

A Project Schedule for the proposed action is found in Chapter 2 under Project Schedule.
Forest Plan Amendments

A non-significant Forest Plan amendment would be required to implement Alternative 3. Alternative 3 was designed, in part, to reduce impacts to riparian areas. Selecting Alternative 3 would include a site-specific, non-significant amendment to the Malheur National Forest Plan, as amended. The amendment would convert a 230-acre portion of the Bear Administrative Pasture from MA19 (Administrative Area) to MA2 (Rangeland) since this area would be added to the Bear Allotment as the Bird Pasture.

Selection of this alternative would be consistent with the Forest Plan, as amended (36 CFR 219.10 (c)). See also Chapter 2, Alternative 3 for a description of this alternative.

Management Areas and Objectives

Relationship to the Forest Plan

National forest planning takes place at several levels: national, regional, forest, and project. This EIS is a project-level analysis; its scope is confined to addressing the significant issues and possible environmental consequences of the project. It does not attempt to re-address decisions made at higher levels. It does, however, implement direction provided at those higher levels. The Forest Plan embodies the provisions of the National Forest Management Act, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Malheur National Forest. Where appropriate, the EIS tiers to the Forest Plan FEIS, as encouraged by 40 CFR 1502.20.
Forest Plan Management Areas. The goals, objectives, desired future conditions, locations, and management direction for these management areas were analyzed in the Final Environmental Impact Statement (FEIS) for the Malheur National Forest Land and Resource Management Plan. This EIS does not address these issues, but tiers to the analysis described in the FEIS and the decision as documented in the Forest Plan and its Record of Decision.

The Forest Plan was amended in 1995 by PACFISH (Interim Strategies for Managing Anadromous Fish Producing Watersheds on Federal Lands in Eastern Oregon and Washington, Idaho, Western Montana and Portions of California, Decision Notice 2/24/1995) to provide direction to maintain management options for anadromous fish habitat while the Forest Service developed long-term management strategies. PACFISH identified Riparian Management Objectives (RMOs), which set criteria for desired pool frequency, large woody debris, bank stability, lower bank angle, and width/depth ratios associated with streams where the Forest Plan did not address RMOs sufficiently. A key assumption of

PACFISH (Enclosure B) is that influences of livestock grazing must result in riparian restoration at a minimum of "near natural" rates. The Malheur Forest Plan has some more stringent objectives, which remain in place (see Amendment 29 to Forest Plan, 8/18/94). Those analyses are documented in the Final EIS and Record of Decision for the Forest Plan, and the environmental assessments for PACFISH and other related documents. These documents are incorporated by reference, as appropriate, throughout this EIS.

Management Areas

Table 1-1: Acres of Malheur National Forest Management Area (MA) and other Ownership by Allotment

Management Area (MA)	Acres per Allotment								MA Total Acres	Percent of Planning Area*
	Austin	Bear	Camp Creek	Lower M.Fork	Elk	Blue Mtn.	Upper M.Fork	Sullens		
1-2 Forest and Rangeland	13	54	84	10,214	14	5,441	22,567	25,991	64,378	36%
RHCA & 3B Riparian Areas	38	212	155	8,813	7	2,921	8,817	4,948	25,911	14%
4A Big Game Winter Range	0	917	171	21,547	0	0	6,493	0	29,128	16%
7 Scenic Area	0	0	0	8,592	0	0	1,520	0	10,112	6%
9 Research Natural Area	0	0	0	0	0	0	60	0	60	>1%
12 Dev. Rec. Sites	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
13 Old Growth	0	0	0	1,282	0	2,011	1,588	4,148	9,029	5%
14F Visual Corridor	21	295	185	1,208	50	1,907	2,055	2,614	8,335	5%
14M Visual Corridor (and MA 1-2)	85	0	0	0	1	10,125	7,768	8,730	26,709	15%
16 Min Level Mgmt	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
19 Admin. Sites	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
21 Wildlife Emphasis Area	0	0	0	2,888	0	0	3,105	0	5,993	3%
Total Malheur NF	157	1478	595	54,544	72	22,405	53,973	46,431	179,655	100%
Private Land	513	12	0	1541	138	33	531	44	2,812	
BLM	0	40	0	0	0	0	0	40	80	
Other National Forest	0	0	0	2876	0	177	394	80	3,527	

* Malheur National Forest Only
N/M-"Not Mapped" - these areas are Management Areas, but they are not in the Forest Plan Management Area GIS layer because the Forest Plan did not map these MAs.

The Forest Plan uses management areas to guide management of the National Forest System lands within the Malheur National Forest. The Forest Plan, as amended, contains both Forest-Wide Standards and Guidelines as well as Standards and Guidelines for specific management areas. Each management area provides for a unique combination of activities, practices and uses. The 186,500 acre Middle Fork John Day (MFJD) Range Planning Area includes approximately 180,000 acres of National Forest lands that are allocated by the Forest Plan, as amended, to management areas (see Figure 9, Map Section). Management area designations overlap; when a specific segment of land falls under the goals or standards of two or more management areas, acres are assigned to the higher priority management area (see Table 1-1). The Management Area acres and map used in this analysis are based on computer calculations and data in Geographical Information System (GIS).

Private Land

Two allotments (Austin and Elk) are “On-Off” Allotments which include private land in the term grazing permit; in these allotments, private land was managed as part of the allotment. Currently, the private land in Austin and Elk Allotments is excluded from Forest Service land and is no longer included in or managed as part of these allotments. Private land inholdings occur within the remaining allotments and in the overall Planning Area; private land in these areas is not included in the term grazing permit, nor is it managed as part of the allotment. Approximately 2,800 acres within the Planning Area are private property (see Table 1-1 and Figures 2-8 and 9, Map Section). Conditions and actions on private lands are considered for cumulative effects (see Chapter 3 and Appendix A, Cumulative Effects).

Bureau of Land Management (BLM) and Other Forest Service System Lands

BLM land is an inholding surrounded by Forest Service land. BLM land is very likely not fenced though it lies within the borders of Forest Service lands and allotments (Pers. Com. Ken Primrose, BLM 2004, see Figures 3, 7 and 9). Officially grazing is not authorized on BLM land because there are no permits for livestock use. It is likely that Forest Service permitted livestock are grazing on BLM land, but the BLM and Forest Service do not allocate additional AUMs to the parcels (Pers. Com. Ken Primrose, BLM 2004). Any use of BLM by Forest Service permitted livestock would reduce overall use of Forest lands.

Approximately 3,500 acres of the allotments fall within the Wallowa-Whitman and Umatilla National Forests (see Table 1-1). Currently the Malheur National Forest manages these areas for livestock through informal agreement with the other Forests. In the Umatilla National Forest, most of the acreage is within Management Area A8 – Scenic Area (2,300 ac.) or labeled as Private (likely patented mining claims – 700 ac.); about 10 acres are MA B2 – Wilderness, and about 250 acres are MA D2 – Proposed Research Natural Area. In the Wallowa-Whitman National Forest about 150 acres are MA 1 – Timber emphasis, 90 acres are MA 15 – Old Growth, and less than 10 acres are MA 17 – Utility Corridors. These acres occur along the outer edges of the planning area and allotment boundaries where Forest boundaries follow U.S. Public Land Survey lines (usually section lines) and allotments follow ridgetops or other geographic boundaries. Some of these acres are high elevation with little livestock use, and some may be included due to mapping/fence location errors. Known localized concerns in these areas are discussed in this analysis.

Key Issues

Significant issues, otherwise known as key issues, for the Middle Fork John Day Range Planning Project came from the tribes, the public, the livestock grazing permittees, other agencies, organizations and businesses, and Forest Service resource specialists in response to the Proposed Action. Issues are defined as a point of discussion, debate, or dispute about environmental effects. Key issues are used to formulate alternatives, prescribe mitigation measures, and analyze environmental effects. Issues are "significant" because of the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflict (40 CFR 1508.27). Three key issues were identified through internal and external scoping. The key issues were approved by the Responsible Official.

In addition to the key issues, there are "other analysis" issues addressed in the effects analysis and often used to compare alternatives. These are discussed in Chapter 1.

The environmental consequences of the proposal are disclosed in Chapter 3 for each resource affected by the significant or key issues.

Key Issue #1 –Changes in management and use may have financial impacts on local permittees and the Forest Service

The MFJD Range Planning Area livestock grazing resource is a component of the social and economic conditions of the surrounding communities and people. The Forest Plan states that big game and livestock numbers should be managed at a level which utilizes available forage while maintaining plant vigor, composition and density (Forest Plan p. 4-34). Changes in management or restrictions of use on the affected allotments can impact the local permittees and communities. The amount of forage available to livestock and the timing of use of that forage can affect ranch employment and wages. Ranch purchases for goods and services from other businesses in the communities are indirect effects. The federal government also makes purchases locally associated with the range management program, and returns a portion of its grazing receipts to counties. Changes in livestock grazing on these allotments can impact many social and cultural conditions such as the traditional lifestyle of permittee ranching families.

Changes in allotment management and administration can affect the financial efficiency of allotment management and overall ranching operational feasibility. Permittees, government (taxpayers), and others incur costs, and benefits from grazing are distributed to these entities. Recent Forest Service range management budgets have required more involvement on the part of the permittees in the form of monitoring and cost-share improvement projects. The future of livestock grazing on these allotments will depend on the economic feasibility of livestock management, including monitoring and development maintenance.

Key Issue #2 - Livestock grazing may impact aquatic resources

The Middle Fork John Day Range Planning Area contains a number of important stream habitats. These habitats are affected by many uses and resources. Several of the riparian areas in the planning area are in earlier ecological stage than prescribed as desired condition. Some of the factors which reflect the health of riparian/aquatic systems include vegetative diversity, water quality, streambank condition and fish habitat. Direct solar radiation is a key factor that increases water temperature. Stream width and riparian shade control the amount of direct solar radiation that accesses streams. High wetted width to depth ratios also reduce the quality and quantity of fish habitat during low flow periods. Stream banks that are functioning provide overhang and hiding cover. Historic livestock grazing has contributed to high wetted width to depth ratios compared to Riparian Management Objectives (RMOs) listed in PACFISH (1995). Livestock grazing can affect streambank vegetation, integrity and recovery, thus affecting narrowing of streambanks and wetted width to depth ratios.

Key Issue #3—Livestock grazing during spawning periods may cause an adverse direct effect to Endangered Species Act-listed fish by trampling redds and disturbing spawning adults.

The Middle Fork John Day Range Planning area contains streams that provide spawning habitat and potential spawning habitat for steelhead and bull trout, which are listed as Threatened under the Endangered Species Act. It has been identified through consultation that grazing activities during spawning periods, prior to July 15 for steelhead and after August 15 for bull trout, would result in a Likely to Adversely Affect determination for listed fish. Timing and location of livestock grazing may affect listed fish species.

Decision Framework (Ref. FSH 2209.13 Sec. 92.21)

Based on the interdisciplinary analysis presented in the Final Environmental Impact Statement (EIS), the Malheur National Forest Supervisor is the responsible official who will decide whether or not to continue authorization of grazing on the allotments in the Middle Fork John Day Range Planning Area. If the decision is to continue to authorize grazing, it will also include deciding the kind, class and number of livestock, approximate season of use, and management prescriptions (including standards, guidelines, mitigation measures intended to mitigate any environmental effects, and monitoring). If a decision is made to construct or reconstruct developments described in the proposed action, this environmental assessment will serve as the site-specific analysis to support that decision.

The Proposed Action (Alternative 3) will require a non-significant Forest Plan amendment related to management Area designation (see Proposed Action, above). The Responsible Official will also determine if the selected alternative is consistent with the Forest Plan, as amended.

After completion of the Draft EIS, there will be a 45-day public comment period. Based on response to this Draft EIS and the analysis disclosed in the Final EIS, the Responsible Official will make a decision and document it in a Record of Decision (ROD) which will accompany the Final EIS.

CHAPTER 2. ALTERNATIVES

Alternative Development Process

This chapter of the FEIS describes in detail three alternative ways to manage land and resources in the Middle Fork John Day Range Planning Area, Alternative 1 (No Grazing), Alternative 2 (Current Management), and Alternative 3 (Proposed Action). The Proposed Action was developed using the District Ranger's specific direction in the Project Initiation Letter. Public participation to review and comment on proposed activities in the Middle Fork John Day Range Planning Area began in February 1999 and continues with this DEIS. Forest Service resource specialists were part of an interdisciplinary team (IDT) that worked on development of action alternatives. Based on comments received from the public and other agencies, direction given by Forest leadership, and through incorporating Forest Plan amendments, existing State and Federal laws, and Forest Service interim direction, the range of alternatives considered in detail is limited. The alternatives were designed to stay within a framework of ecological stewardship and the Malheur Forest Plan (USDA Forest Service 1990).

One assumption the IDT used in creating the alternatives is that permitted use (as measured in Animal Unit Months, see the tables by allotment in Alternatives 2 and 3, Alternatives Considered in Detail) is the upper limit of use for the life of this analysis. Reductions in permitted use are supported by the Malheur Forest Plan (USDA Forest Service 1990) and other Forest Service decision documents. The Malheur Forest Plan does not establish an absolute level of livestock grazing; instead, annual forage utilization requirements are established in allotment management plans as a tool to achieve or maintain the desired condition (IV-18). Additionally, the Chief of the Forest Service determined in a 9/10/84 appeal decision for the San Juan and Grand Mesa, Uncompahgre and Gunnison National Forests that there is no assurance the projected outputs (from forest plans) will occur. Both grazing alternatives were designed to use adaptive management to move toward desired conditions; adaptive management allows for the upper limit as well as for reductions in permitted use.

In creating the alternatives, the IDT assumed that livestock management is economically feasible in all of the allotments (see Chapter 3, Social and Economic). Additionally, the existing condition identified some range developments such as spring developments, ponds and fences as being in need of maintenance, repair, or reconstruction. Some maintenance, repair, and reconstruction is ongoing under the grazing permits; major work will be analyzed under other NEPA documents (see Appendix A). These projects will improve range conditions and have been discussed in Chapter 3 of this document under Cumulative Effects.

Other assumptions used in designing action alternatives and assessing effects are described under Elements Common to All Grazing Alternatives (Chapter 2).

Each action alternative analyzed in detail discloses environmental effects associated with its implementation, thereby facilitating a comparison of alternatives. This comparison of effects along with projected environmental consequences detailed in Chapter 3 provides the

Responsible Official with information needed to make an informed choice between alternatives.

The IDT and Responsible Official felt the alternatives to be analyzed in detail represented a range of reasonable alternatives (40 CFR 1502.14 (a)) and that they address the Purpose and Need. The "No Action" alternative is required by NEPA. Consideration of the no grazing alternative (Alternative 1) meets the intent of the "No Action" alternative as required by NEPA.

Alternatives Considered in Detail

The following three alternatives are considered in detail in the EIS; these three alternatives are described in Chapter 2. Ten alternatives were also considered but eliminated from detailed study for the reasons described in Chapter 2

Alternative 1 (No Grazing/No Action)

Purpose and Design:

Alternative 1 represents the 'no grazing' alternative. Under this alternative, all Term Grazing Permits would be canceled. No permits would be issued for the eight affected allotments until and unless a subsequent NEPA decision to re-authorize grazing on any or all of the allotments was made. The purpose of the no-grazing alternative is to describe the effects of cancellation of grazing permits.

Other management activities taking place in the area would continue if Alternative 1 were selected, but no livestock management activities would take place. Activities such as motorized access travel management, road maintenance, dispersed recreation, noxious weed management, and fire protection would be allowed to continue as they currently take place in the Planning Area.

Elements Common to all Grazing Alternatives within the Planning Area:

This section displays assumptions, background information, and design elements common to the grazing alternatives, Alternatives 2 and 3. The IDT assumed that, if the following elements are followed, then effects from livestock use will be acceptable.

- Deferred and/or rest rotations will be emphasized and implemented
- Minimize duration of hot-season grazing
- Forest Plan standards and guidelines as amended by PACFISH will be met
- Adaptive management will be used on all active allotments to move toward desired conditions
- Animal Unit Months (AUMs), average animal use, and cow/calf pairs
- Endangered Species Act consultation requirements will be followed

- Allotment facilities are maintained
- Appropriate administrative actions will occur
- Currently planned range improvements and practices will be implemented
- Current management activities unrelated to livestock management would continue
- Noxious weed strategy

Alternative 2 (No Change)

Purpose and Design:

The purpose of this alternative (Alternative 2) is to provide grazing while assuring that livestock management is consistent with the Malheur National Forest Plan and/or moves toward meeting aquatic and other resource Forest Plan standards, as amended, including PACFISH Riparian Management Objectives (RMOs) at a near natural rate of recovery. Areas of concern would be dealt with through adaptive management and administrative changes. Alternative 2 is designed to provide continued grazing and meet PACFISH and other Forest direction with minimal changes to the range management improvements (such as fences and water developments).

Alternative 2 is designed to meet PACFISH and other Forest direction, mainly through intensive range management. This alternative uses existing fences, existing water developments and other existing range improvements to control livestock distribution and use. It does not add new improvements, which are included in Alternative 3. The effects of using the existing improvements are included in Chapter 3 of this document, and it is expected that intensive management (by both the permittees and Forest Service) will be required to meet PACFISH and Forest Direction.

Alternative 2 is designed to achieve the near natural rate of recover which would be similar to the rate of recovery that would occur without livestock grazing. The near natural rate of recovery is intended to not have carryover effects from one year to the next. However, due to the nature of grazing and complexities and uncertainties of having livestock move throughout an allotment, some effects would occur, which would be allowable under PACFISH. The Malheur National Forest Riparian Monitoring Strategy (Appendix D) provides a starting point for acceptable level of effects or condition thresholds (endpoint indicators). The intent of PACFISH is that no negative cumulative effects that would retard attainment of riparian management objectives (RMOs) would occur as a result of the project. Alternative 2 would have an improving cumulative trend over the life of the EIS.

Alternative 2 Allotment Specific Actions:

Alternative 2 proposes no physical changes to current management of the eight allotments. This alternative would manage the allotments as they are currently described in their permits and as adjusted (adjustments are documented in permittee’s Annual Operating Instructions (AOIs)). Areas of concern would be dealt with through adaptive management and administrative changes (such as change or reduction in timing, intensity, frequency, and duration of use); no physical changes (such as water developments or fence construction), except those already being considered under Categorical Exclusions (CEs), would be implemented. This alternative proposes current livestock management strategies. Alternative 2 utilizes all "Elements Common to all Grazing Alternatives within the Planning Area," described above. Implementation of the allotment management plans that emerge from this analysis are anticipated to be implemented in spring 2006. Maps showing the existing condition (as well as the proposed changes that would be implemented through Alternative 3) are in the Map Section (Figures 2-8). Cattle would be the permitted livestock on all allotments. The Austin, Elk, and Sullens allotments would be left vacant.

Alternative 3 (Proposed Action)

The proposed action is an alternative developed early in the NEPA planning process to accomplish stated purposes, needs, and goals based on the best information available at the time. It is the first alternative brought to the public and is used to identify issues and develop other alternatives for further study. Alternative 3 is the proposed action.

Purpose and Design:

Like Alternative 2, the purpose of this alternative is to provide grazing while assuring that livestock management is consistent with the Malheur National Forest Plan and/or moves toward meeting aquatic and other resource Forest Plan standards, as amended, including PACFISH Riparian Management Objectives (RMOs) at a near natural rate of recovery. As in Alternative 2, areas of concern would be dealt with through adaptive management and administrative changes; however, Alternative 3 also utilizes physical changes (such as new water developments, new fence construction, and changes in allotment/pasture configuration) to improve allotment management.

The proposed action is designed to achieve the near natural rate of recover which would be similar to the rate of recovery that would occur without livestock grazing. The near natural rate of recovery is intended to not have carryover effects from one year to the next. However, due to the nature of grazing and complexities and uncertainties of having livestock move throughout an allotment, some effects would occur, which would be allowable under PACFISH. The Malheur National Forest Riparian Monitoring Strategy (Appendix D) provides a starting point for acceptable level of effects or condition thresholds (endpoint indicators). The intent of PACFISH is that no negative cumulative effects that would retard attainment of riparian management objectives (RMOs) would occur as a result of the project. The proposed action would have an improving cumulative trend over the life of the EIS.

Alternative 3 uses adaptive management to help achieve PACFISH and other Forest direction and provides the same AUMS as Alternative 2. The primary difference between the action alternatives is that Alternative 3 provides management tools in the form of new improvements and other specific actions to increase management flexibility and achieve better distribution of livestock. Generally, less intensive management (by both the permittees and Forest Service) should be required to meet PACFISH and Forest direction with the use of these tools, and by providing upland water, additional upland forage is made accessible.

Proposed Action:

The Forest Supervisor of the Malheur National Forest proposes to continue authorized domestic livestock grazing on six grazing allotments (portions of the original eight allotments would be combined into six allotments) and three administrative pastures within the Upper Middle Fork John Day, Galena, and Camp Creek Watersheds on the Blue Mountain and Prairie City Ranger Districts.

Alternative 3 utilizes all "Elements Common to all Grazing Alternatives within the Planning Area," described above, plus additional proposed actions specific to this alternative. Implementation of the allotment management plans that emerge from this analysis is anticipated to be in spring 2006.

Alternative 3 Allotment Specific Actions:

Most of the needs described in Purpose and Need can be resolved through deferred rotational grazing (or rest rotation depending on the allotment configuration) and adaptive management as described above. The tables displayed above list additional actions necessary to more effectively implement deferred or rest rotational grazing or to further control timing, intensity, frequency, or duration. Maps showing the proposed changes are in the Map Section (Figures 2-8). Cattle would be the permitted livestock on all allotments.

Forest Plan Amendment

Only Alternative 3 would require a non-significant Forest Plan amendment.

A non-significant Forest Plan amendment would be required to implement Alternative 3. Alternative 3 was designed, in part, to reduce impacts to riparian areas. Selecting Alternative 3 would include a site-specific, non-significant amendment to the Malheur National Forest Plan, as amended. The amendment would convert a 230-acre portion of the Bear Administrative Pasture from MA19 (Administrative Area) to MA2 (Rangeland) since this area would be added to the Bear Allotment as the Bird Pasture.

Selection of this alternative would be consistent with the Forest Plan, as amended (36 CFR 219.10 (c)).

Mitigation Measures

The section of the EIS on mitigation measures is small because design elements (Elements Common to all Grazing Alternatives within the Planning Area, Chapter 2) are expected to reduce or mitigate most negative effects of livestock grazing, and other actions needed to reduce or mitigate effects of livestock grazing will occur through the adaptive management process. The Forest Service developed additional mitigation measures to be used as part of the action alternatives. Those mitigation measures can be found in Chapter 2

CHAPTER 3. EXISTING CONDITION AND ENVIRONMENTAL CONSEQUENCES

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. See Chapter 3 of the EIS for all existing conditions and effects.

Table 2-1: Comparison of Alternatives by Activity

Activity	Unit of Measure	Alt. 1 (No Grazing)	Alt. 2 (No Change)	Alt. 3 (PA)
Permitted Animal Unit Months				
Austin	AUMs	0	0*	0
Bear	AUMs	0	496	496
Blue Mountain	AUMs	0	817	817
Camp Creek	AUMs	0	327	327
Elk	AUMs	0	0*	0
Lower Middle Fork	AUMs	0	3,623	3,623
Sullens	AUMs	0	0	1,266
Upper Middle Fork	AUMs	0	2,868	2,868
Acres per allotment				
Austin	Acres	0	0*	0
Bear	Acres	0	1,480	1,710
Blue Mountain	Acres	0	22,400	22,480
Camp Creek	Acres	0	600	600
Elk	Acres	0	0*	0
Lower Middle Fork	Acres	0	54,500	54,500
Sullens	Acres	0	45,000	45,070
Upper Middle Fork	Acres	0	54,000	54,080
Number of new or improved range development structures (including new fences, new water developments, reconstructed water developments)				
Austin	Total #	0	0	0
Bear	Total #	0	0	0
Blue Mountain	Total #	0	0	3
Camp Creek	Total #	0	0	2
Elk	Total #	0	0	0
Lower Middle Fork	Total #	0	0	1
Sullens	Total #	0	0	4
Upper Middle Fork	Total #	0	0	0
Economics				
Permits issued	# of permits	0	5	up to 6

Permitted AUMs	# AUMs	0	8,131	9,397

*These existing but vacant allotments contain about 160 acres (Austin) and 70 acres (Elk) that would remain vacant with no permitted AUMs.

Table 2-2: Comparison of Alternatives by Measurement – Key Issue #1 – Financial Impacts

Measurement	Alt. 1 (NA)	Alt. 2	Alt. 3 (PA)
Permitted AUMs	-	0	0
Operations Cost	+	0	0
Implementation/Improvement Cost	+	0	+
Grazing Receipts to County	0	$25,000	$25,000

Alternative 2 will be used as the baseline for comparison purposes. The table uses "0" as the baseline, - (minus) to reflect a decrease to the permittee, and + (plus) to reflect an increase to the permittee

Table 2-3: Comparison of Alternatives by Measurement – Key Issue #2 – Aquatic Resources

Measurement	Unit of Measure	Existing Condition	Alt. 1 (NA)	Alt. 2	Alt. 3 (PA)
Percentage of monitored DMAs (or Sensitive Stream Reaches) in late riparian ecological status (or "potential natural condition) including shrub abundance, growth form and age class	%	60%	Increase	Increase	Increase

Table 2-4: Comparison of Alternatives by Measurement – Key Issue #3 – Endangered Species Act Fish

Measurement	Unit of Measure	Alt. 1 (NA)	Alt. 2	Alt. 3 (PA)
Pastures where spawning habitat or potential spawning habitat exists and cattle may graze during spawning periods	Number of pastures where Domestic livestock grazing could trample Redds or egg masses	0	50	50

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Map Section

All Maps are located in the Map Section after the Glossary.

Appendices

CHAPTER 1. INTRODUCTION

Document Structure

The Forest Service has prepared this Environmental Impact Statement (EIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Impact Statement discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into six chapters:

- *Chapter 1. Introduction:* This chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Chapter 2. Comparison of Alternatives, including the Proposed Action:* This chapter provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised internally, and by the public and other agencies. This discussion also includes mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Chapter 3. Affected Environment and Environmental Consequences*: This chapter describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area, with resources with significant issues towards the beginning of Chapter 3. Within each section, the affected environment is described first, followed by the effects of the No Grazing Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- *Chapter 4. Consultation, Coordination, and Public Involvement:* This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement, and a summary of public involvement.
- *Chapter 5. Bibliography:* This chapter lists literature cited during the development of the environmental impact statement.
- *Chapter 6. Glossary:* This chapter is a glossary of terms used in this environmental impact statement.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the Environmental Impact Statement.
- *Index:* The index provides page numbers by document topic.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Blue Mountain Ranger District Office in John Day, Oregon.

Background

National and Forest Direction

Prior to 1995, controversy existed over whether there was any need to consider a grazing permit as a Federal action requiring review under the National Environmental Policy Act as well as the adequacy of the progress toward getting allotment NEPA decisions completed. To resolve the issue, Congress included language in the Rescission Act of FY05 (Public Law 104-19, Section 504) which requires the Forest Service to identify all allotments on which NEPA analysis is needed, and to prepare and adhere to a schedule for conducting an assessment of grazing actions under NEPA.

The Malheur National Forest Land and Resource Management Plan ("Forest Plan", USDA Forest Service 1990) directs the Forest Service to update or develop new Allotment Management Plans (AMPs). AMPs are updated by conducting an environmental analysis of the impacts of grazing and associated activities. The Forest Plan originally scheduled AMPs for these allotments to be completed between 1996 and 2001 (USDA Forest Service 1990). Section 504(b) and (c) allows the Forest Service to issue expired and waived permits on allotments listed on the schedule, but have not gone through a NEPA analysis, as long as the terms and conditions of the permit are not changed. In a reply to Congress, the Forest Service established a fifteen year schedule for completion of this work.

Grazing actions on public land must be viewed as an on-going action. To understand the context of grazing activity today, one must have an appreciation of the history of grazing in the West. Prior to the 1930s, grazing on public land was unregulated until Congress enacted laws which required grazers to own a local home ranch to qualify for a permit to graze. The Granger-Thye Act of 1950: P.L. 81-478 (April 24, 1950) established the direction for National Forest System allotment management, including the authorization to issue grazing permits for terms up to 10 years; authorization to use grazing fee receipts for rangeland improvement; and the establishment of grazing advisory boards. Also, requirements, including base property and commensurability, were also designated by statute to ensure economic stability to local communities, but also to foster stewardship toward the public land resources and to manage the rangelands for sustainability. This period of unregulated grazing resulted in adverse environmental consequences such as soil loss and watershed modifications that created many of the permanent and semi-permanent impacts seen today in the Planning Area (Johnson 1995) and other parts of the West. Some of these impacts, such as the incapacity of sites to naturally restore native vegetation communities, must be clearly recognized and understood to ensure that unrealistic expectations for management are not part of the action alternatives.

This assessment of vegetation and watershed conditions takes into account the historic level of use that occurred on these allotments prior to the establishment of management and control of livestock numbers with the enactment of the Granger-Thye Act of 1950. The purpose of both the Granger-Thye Act for USFS and Taylor Grazing Act for BLM was to establish controls and stewardship toward the public land grazing resource, with the core of that stewardship creating a linkage of the use of public land to an established private landowner who would bring stability to the community and bring these lands into a sustainable level of production for both forage and wildlife habitat.

Planning area

The Middle Fork John Day (MFJD) Range Planning Area is comprised of eight (8) livestock grazing allotments and three (3) administrative use pastures, and is located approximately 18 miles northeast of John Day, Oregon (see Figure 1, Map Section). The eight allotments, Austin, Bear, Blue Mountain, Camp Creek, Elk, Lower Middle Fork, Upper Middle Fork, and Sullens, encompass approximately 186,500 acres of mainly National Forest lands, including about 80 acres of BLM managed land. About 2,800 acres of private land is included in the Planning Area (see also Chapter 1, Management Areas and Objectives and Figure 9, Map Section). Five of the allotments have active permits, while three of the allotments (Austin, Elk, and Sullens) are currently vacant. The three administrative use pastures, Bear, Blue Mountain, and Sunshine, total approximately 490 acres (see Figure 1, Map Section. The allotments and administrative pastures are primarily contained in the Upper Middle Fork John Day, Galena, and Camp Creek Watersheds. The Middle Fork John Day (MFJD) River, which provides habitat for threatened steelhead trout and bull trout and for Chinook salmon, a sensitive species, lies within the planning area and runs through several of the allotments; more than 20 perennial tributary streams lie in the planning area (see Figure 10, Map Section). Elevations range from 7,100 feet at Vinegar Hill to 3,400 feet where the MFJD River leaves the Forest. Precipitation ranges from 40 inches, mostly as snow, in the higher elevations to 20 inches at lower elevations along the River.

Livestock grazing has been a part of the landscape of the Malheur National Forest since the 1860's when the first miners and homesteaders entered this area. Although livestock grazing on National Forest lands has decreased since the early 1900s, the ranching industry remains an important part of the Grant County economy.

The allotments within the planning area, like many areas in the Western United States, have a legacy of livestock overuse that started in the late 1800s and continued into the mid 1930s. These allotments were historically grazed by domestic livestock, with thousands of sheep grazing in the late 1860s until the 1940s. From the 1940s until the present day, domestic livestock grazing in the area has been dominated by cattle. Early grazing was essentially unregulated and resulted in significant impacts including loss of vegetation and soil erosion, some of which are still observable today in areas such as Vinegar Hill/Indian Rock (Johnson 1995). Livestock utilized available forage in a continuous season grazing regime. During the middle part of the 1900s the Forest Service took significant action to regulate numbers and seasons, and to establish workable grazing seasons and allotments. This action continued into the latter half of the 1900s when emphasis shifted to development of management systems and regulation of effects on specific resources.

Improved grazing systems and pasture designs were implemented to accelerate riparian area recovery in the late 1970s and throughout the 1980s with a reduction in allowable use in the 1970s. Implementation of the Malheur National Forest Land and Resource Management Plan in the early 1990s again reduced the amount of allowable use by livestock grazing to accelerate the rate of recovery in riparian areas, and limited utilization of shrubs. In the mid to late 1990s other mitigations associated with the Endangered Species Act and PACFISH (which amended the Malheur National Forest Plan) were implemented in an effort to further protect riparian areas and associated aquatic species.

Allotments within the planning area at one time had deferred or rest rotation grazing systems in place. In recent years, deferred/rest rotations have been changed (and resulted in livestock use in the same area at the same time of year every year) for a variety of reasons: to avoid spawning fish, to allow use of the pastures without late season water (pastures would get used each year in the spring/early summer), and to reduce shrub use (by grazing early every year). When livestock use in the same area at the same time of year every year, plants in some pastures do not mature and develop seed heads periodically, resulting in a loss of plant health and vigor over time.

Informal observations have highlighted competition for browse (shrubs) and forage between livestock and big game (elk/deer) in parts of some of the allotments. After the Summit Fire in Lower Middle Fork Allotment, and in other situations and locations, informal observations have shown shrubs to be browsed at moderate levels by big game when these areas were rested from livestock use. Data and information on competition between livestock and big game in the Planning Area is limited.

In most places in the planning area, vegetation and other resource conditions are consistent with the Malheur National Forest Land and Resource Management Plan (Forest Plan), and livestock distribution and utilization are contributing to desired conditions at this time. Previous actions, enacted under the existing permits, have addressed many of the areas of past concern on the allotments within this range planning area. Many of the actions that might have been included and evaluated in this range planning EIS have already been implemented through past separate incremental management decisions. This has resulted in allotments with relatively few ongoing resource concerns or conflicts associated with permitted livestock use. However, some areas of concern related to livestock grazing still remain in the allotments. The existing condition descriptions in Chapter 3 show that in some years it has been difficult to meet standards or to reach desired conditions in areas of concern with the range developments that currently exist on the allotments.

Allotment conditions are mainly in an improving trend. A few areas are in a static or downward trend, and current livestock grazing is, in some cases, not contributing to that trend, or is only partially contributing to that trend. There are places where livestock management changes could initiate or accelerate the improving trend, particularly on sensitive portions of streams (see Purpose and Need, below, and Chapter 6, Glossary and Sensitive Stream Reach Figure 10, Map Section). In places that adjustments to livestock management could initiate or could accelerate an improving trend, actions to improve conditions are proposed. In areas where existing condition meets desired condition, no need for change was identified and so no proposed changes to current management are suggested.

This Environmental Impact Statement (EIS) focuses on resolving current areas of resource concern that may be contributing to undesired resource conditions in specific locations and situations. This EIS documents the environmental analysis of effects of livestock grazing in the Middle Fork John Day Range Planning Area and will be used to develop new Allotment Management Plans (AMPs) for each of the proposed allotments.

Purpose of and Need for Action

The purpose of this proposal is to authorize livestock grazing in a manner that is consistent with the Malheur Forest Plan. Authorization is needed on these allotments because:

- Where consistent with other multiple use goals and objectives, there is Congressional intent to allow grazing on suitable lands. (Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resource Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976, FSM 2202.1).
- The allotments contain lands identified as suitable for domestic livestock grazing in the Malheur National Forest Plan and continued domestic livestock grazing is consistent with the goals, objectives, standards, and guidelines of the forest plan (Forest Plan Chapter IV).
- It is Forest Service policy to make forage available to qualified livestock permittees, from lands suitable for grazing, consistent with management plans (FSM 2202.1);
- By regulation, forage producing lands will be managed for grazing where consistent with land management plans (36 CFR 222.2(c)).
- It is Forest Service policy to continue contributing to the economic and social well being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood (FSM 2202.1(4)).
- The Malheur National Forest Plan permits livestock use on suitable range when the permittee manages livestock using prescribed practices (Forest Plan IV-2).

To meet this purpose, there is a need for change from current management strategies on the eight allotments in the MFJD Range Planning Area (see Figures 2-8, Map section) because parts of the allotments have been documented to not be moving toward desired conditions as identified in the Forest Plan. Direction from the Forest Plan as amended by PACFISH, and the presence of Endangered Species Act listed fish in the Planning Area has elevated the importance of riparian management. In some areas on the allotments (see Chapter 3, Vegetation and Rangeland Resources and Figures 2-8, Map Section) riparian shrubs have been documented to display arrested or retrogressed architecture (see Figure 12 under Desired Condition, this chapter for a drawing of shrub architecture, Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998), and lack of abundant age classes and regeneration (from seed, sprouts, etc.). Also, recent monitoring data within the planning area has shown forage and shrub utilization in excess of Forest Plan standards in some areas that livestock tend to prefer. These are mainly isolated areas where cattle congregate along streams, not necessarily caused by overall shortages of forage or overstocked range.

The following paragraphs identify specific needs and the existing conditions within each allotment. Existing conditions are further described in Chapter 3 of this EIS. Generally the allotments have relatively few ongoing resource concerns or conflicts associated with permitted livestock use. Only those pastures or areas where needs were identified are discussed below:

Austin Allotment

Private lands within this allotment have been fenced separately from Forest lands, the associated on/off grazing permit is no longer in use and the allotment is vacant (see Figure 2, Map Section). The pastures within the Austin Allotment are small (about 40 acres each) and are adjacent to Upper Middle Fork and Blue Mountain Allotments. From a range management stand point it would be logical to manage these units with the adjacent allotments to facilitate management of resources.

Damage to the ditch banks has been caused by the concentration of unauthorized livestock near the private land fence in the Austin Allotment. There is a need for maintaining livestock distribution that avoids trampling of an irrigation ditch in the Bates Pasture of the Austin Allotment to maintain the function of that ditch.

Bear Allotment

The riparian areas of the Middle Fork of the John Day River in the C1 & C2 pastures are in early seral ecological stage (see Chapter 6, Glossary – Seral), riparian shrub conditions are recovering but riparian areas along the river are currently lacking a diversity of shrub species and age classes (see Figure 3, Map Section). Early season use has improved shrub conditions in Pastures C1 and C2, but has led to livestock using these pastures at the same time each year generally not allowing for periodic seed set. In addition, observations of soils in the C1 and C2 pastures show soil impacts for compaction. There is a need for deferred and/or rest rotational grazing practices using more pastures, and when possible, early season grazing along the Middle Fork John Day River in pastures C1 and C2 to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture in this area (see Figure 12 under Desired Condition, this chapter for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998) and to reduce impacts on soils.

Blue Mountain Allotment

Current riparian shrubs on sensitive sections of Idaho, Crawford, and Summit Creeks and the Middle Fork John Day River within the Crawford, Idaho, West Summit and East Summit pastures display arrested or retrogressed architecture, lack of abundant age classes and regeneration (from seed, sprouts, etc.) (see Chapter 6, Glossary and Figure 4, Map Section). There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing along sensitive reaches of Idaho, Crawford, and Summit Creeks and the Middle Fork John Day River to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture in this area (see Figure 12 under Desired Condition, this chapter for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998).

Riparian vegetation in most of the perennial (wet year-round) parts of Crawford Creek were determined to be in early seral stage (see Chapter 6, Glossary – Seral). There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing on the perennial parts of Crawford Creek (Crawford Pasture) to move riparian vegetation toward mid/late seral stages.

Crawford pasture does not have sufficient late-season water sources for livestock because the water sources (ponds, spring developments, and intermittent creeks) are dry or provide inadequate water during much of the summer. The Pie Meadow water development has exceeded its life expectancy; there is minimal flow to provide water for livestock and trampling damage is occurring at the spring. Several existing ponds are not filling up or are not holding water in the Crawford Pasture. There is a need for improved livestock distribution through increased water storage capacity and reliable late season water for livestock, and for modifications to springs so that springs have dense herbaceous riparian vegetation, a high water table, saturated soils closer to potential natural conditions, and maintained downslope vegetation and water conditions in the Crawford pasture.

Water sources in the upper elevations of the Idaho pasture are limited. The north and northeast portion of the pasture receives little use while the southern portion of the pasture is used routinely. Riparian shrubs along the middle-part of Idaho Creek are severely hedged with arrested architecture and are often only about one foot tall. Observations indicate both cattle and big game have affected these shrubs. There is a need for better livestock distribution and more available water for livestock in the upper elevations of the Idaho Pasture.

The MFJD River, Summit Creek and Squaw Creek channels were downcut four to six feet by a flood in the Upper Phipps Meadow and East Summit Pastures in 1997. While riparian vegetation conditions are improving, the downcut channel has affected the valley bottom vegetation by lowering the water table. Stream banks are unstable and the channel continues to widen as a natural consequence of the downcutting; natural development of the floodplain is occurring. There is a need for continuation of rest from livestock management to continue to move riparian vegetation toward mid/late seral stages and for a functioning channel and hydrologic condition on the downcut streams in the Upper Phipps Meadow and East Summit Pastures (MFJD River, Summit Creek and Squaw Creek).

Camp Creek Allotment

Currently livestock trailing between the fenceline and the MFJD River in the Middle Pasture is degrading streambanks in approximately three small segments of the river where the fence lies within a few feet of the river (see Figure 5, Map Section). Though herbaceous vegetation is in late seral stage on the MFJD River in the Middle Pasture (see Chapter 6, Glossary – Seral), shrub regeneration and diverse age classes and species are lacking. There is a need for modified grazing developments and better livestock distribution, as well as for deferred and/or rest rotational grazing practices, and when possible, early season grazing, to increase streambank stability and to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture along the MFJD River in the Middle Pasture (see Figure 12 under Desired Condition, this chapter for a drawing of shrub architecture and

Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998).

Gibbs and North pastures do not have sufficient late-season water sources for livestock because the water sources are dry during much or all of the summer; intermittent creeks in both pastures and a pond in North pasture dry up, and an irrigation ditch in Gibbs pasture no longer runs water because of problems at the diversion. There is a need for reliable late season water source(s) in the Gibbs and North pastures.

Riparian vegetation on Camp Creek (Lower Camp Pasture) was surveyed and determined to be in early seral stage; shrub condition is variable (some shrubs exhibit arrested and retrogressed growth types) but improving as there are many young shrubs with uninterrupted architecture (see Figure 12 under Desired Condition, this chapter for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998). There is a need for mid/late seral riparian vegetation on Camp Creek. There is a need for more diverse and abundant riparian shrubs in uninterrupted or released architecture along Camp Creek in the Lower Camp Pasture. There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing on Camp Creek to move toward mid/late seral riparian vegetation and to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture along Camp Creek in the Lower Camp Pasture.

Elk Allotment

Private lands within this allotment have been fenced separately from Forest lands, the associated on/off grazing permit is no longer in use and the allotment is vacant (see Figure 7, Map Section). The allotment is surrounded by the Sullens Allotment. From a range management stand point it would be logical to combine Elk Allotment with Sullens Allotment to facilitate management of resources.

Lower Middle Fork Allotment

Present shrub architecture (hedged and arrested), lack of diverse age class representation and the lack of an apparent improving trend are cause for concern on sensitive stream reaches within in the Balance and Sunshine Pastures (see Figure 6, Map Section). It is felt these two pastures may have been using a disproportionate share of permitted animal months in the Lower Middle Fork allotment (the two pastures make up about 12% of the allotment land base but receive about 20% of the livestock use). There is a need for continuation of planned livestock management including deferred and/or rest rotational grazing practices in 9 pastures, and when possible, early season grazing to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture (see Figure 12 under Desired Condition, this chapter for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998) in the Balance and Sunshine Pastures.

Pizer Meadow (Pizer Pasture) has been and continues to be an area of livestock concentration with heavy use of forage; the undeveloped spring at Pizer Meadow is not fenced and gets used and trampled by livestock. There is a need for dense herbaceous riparian vegetation, a saturated soils area closer to potential natural conditions, and a high water table at Pizer

Spring that maintain downslope vegetation and water conditions in Pizer Meadow. There is a need for better livestock distribution in the Pizer pasture and modifications of grazing developments in the Pizer Meadow area so that springs have dense herbaceous riparian vegetation, a high water table, saturated soils closer to potential natural conditions, and maintained downslope vegetation and water conditions.

As a result of the Summit Fire in 1996, riparian vegetation (both herbaceous and shrubs) in many areas throughout the Big Boulder, Coyote, Deadwood, Susanville, Pizer Pastures is in early seral stage (see Chapter 6, Glossary – Seral). There is a need for continuation of better livestock distribution, deferred and/or rest rotational grazing practices, and when possible, early season grazing to continue to move toward mid/late seral riparian vegetation and to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture along creeks burned by the Summit Fire throughout the Big Boulder, Coyote, Deadwood, Susanville, and Pizer Pastures.

Sullens Allotment

Riparian vegetation on parts of Dry Fork Clear Creek and Squaw Creeks in the Bridge Creek, Savage and Highway Pastures are in early seral stage (see Chapter 6, Glossary – Seral, and Figure 7, Map Section). There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing to continue to move toward mid/late seral riparian vegetation on Dry Fork Clear Creek and Squaw Creeks in the Bridge Creek, Savage and Highway Pastures.

Trampling impacts from livestock have occurred at Looney and Wigwam Springs in Bridge Creek Pasture. The exclosure around the Looney Spring source is not large enough and troughs are too close to the spring source. There is a need for better distribution of livestock in the pasture and modifications of grazing developments in the Looney and Wigwam Springs areas (in Bridge Creek Pasture) so that springs have dense herbaceous riparian vegetation, a high water table, saturated soils areas closer to potential natural conditions, and maintained downslope vegetation and water conditions.

Squaw Meadow Pasture has been used for livestock holding/gathering. When in this pasture, livestock generally concentrate along and get their water from Squaw Creek. The healing stream banks along Squaw Creek are very sensitive to concentrated disturbance and the area is used by steelhead for spawning. There is a need for better distribution of livestock in the pasture through the use of off-site (off Squaw Creek) water in Squaw Meadow Pasture.

Riparian vegetation in Noxage Meadow and flowing portion of Phipps Creek have been over utilized by both cattle and big game. In early 1980s, livestock concentrated season-long along Noxage Meadow, Phipps Creek and other streams resulting in over use of riparian vegetation and bank alteration. There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing to continue to move toward mid/late seral riparian vegetation and a functioning channel and hydrologic condition on the downcut portion of Phipps Creek in Noxage Meadow within the Highway Pasture.

Upper Middle Fork Allotment

Lower Vinegar Creek (in Lower and Upper Vinegar pastures), Vincent Creek (in Lower and Upper Vinegar pastures) and Tincup and Windlass Creeks (in Caribou pasture) are in or are estimated to be in early seral or early to mid-seral stage in many areas (see Chapter 6, Glossary – Seral, and Figure 8, Map Section). On sensitive portions of Vinegar and Vincent Creeks (see Figure 10, Map Section), riparian shrubs are present but have been heavily browsed, and most are either mature or have been recently planted. On Tincup and Windlass Creeks, shrubs are sparse or not present. The combination of effects from historic activities with recent livestock use is likely the cause for the early seral stages in these creeks. Season-long use in Caribou Pasture and unauthorized use by an adjacent permittee in Upper and Lower Vinegar Pastures have contributed to current conditions. The lower section of Davis Creek (Deerhorn Pasture) had no hardwood cover with no riparian shrubs taller than 2 feet; this condition was partially influenced by recent livestock use as well as historic activities (Edwards 2001-Stream Survey). There is a need for deferred and/or rest rotational grazing practices, and when possible, early season grazing in the Upper Middle Fork Allotment to move toward mid/late seral stages of riparian vegetation on Lower Vinegar, Upper Vinegar and Caribou pastures and to increase diversity and abundance of riparian shrubs in uninterrupted or released architecture (see Figure 12 under Desired Condition, this chapter for a drawing of shrub architecture and Chapter 6, Glossary-Architecture, and Keigley and Frisina 1998) along sensitive stream reaches in the Lower Vinegar, Upper Vinegar, Caribou, and Deerhorn Pastures.

The Blackeye pasture was separated from the Caribou pasture by a fence for a range evaluation project over 20 years ago. The division fence has not been maintained and its current condition is unknown. The Blackeye pasture is no longer needed for its intended purpose. From a range management stand point it would be logical to manage these pastures as one pasture to facilitate management of resources.

Planning Area

Throughout the allotments, possible cattle grazing impacts has been reported at 42 eligible or unevaluated (but managed as eligible) cultural property sites. There is a need for protection of eligible heritage resources in the planning area.

The Blue Mountain and Sunshine administrative areas, areas with little or no concerns, would need no change from current conditions or management.

Proposed Action

A "proposed action" is defined early in the project-level planning process. This serves as a starting point for the interdisciplinary team, and gives the public and other agencies specific information on which to focus comments. Using these comments (see discussion of Significant Issues later in this chapter), and information from preliminary analysis, the interdisciplinary team then develops alternatives as needed to the proposed action. Alternative 3 is the proposed action. Alternative 3 includes Elements Common to all

Grazing Alternatives within the Planning Area. Alternative 3 is briefly described below and described in further detail in Chapter 2 under Alternatives Considered in Detail.

Purpose and Design:

The purpose of this alternative (Alternative 3) is to provide grazing while assuring that livestock management is consistent with the Malheur National Forest Plan and/or moves toward meeting aquatic and other resource Forest Plan standards, as amended, including PACFISH Riparian Management Objectives (RMOs) at a near natural rate of recovery. Areas of concern would be dealt with through adaptive management and administrative changes; however, Alternative 3 also utilizes physical changes to improve allotment management (such as new water developments, new fence construction, and changes in allotment/pasture configuration).

The proposed action is designed to achieve the near natural rate of recovery which would be similar to the rate of recovery that would occur without livestock grazing. The near natural rate of recovery is intended to not have carryover effects from one year to the next. However, due to the nature of grazing and complexities and uncertainties of having livestock move throughout an allotment, some effects would occur, which would be allowable under PACFISH. The Forest acknowledges that standards would not be met in some years in some locations; however, the Forest would use the adaptive management strategy to respond to those concerns. The Malheur National Forest Riparian Monitoring Strategy (Appendix D) provides a starting point for acceptable level of effects or condition thresholds (end-point indicators-see Chapter 6, Glossary). The intent of PACFISH is that no negative cumulative effects that would retard attainment of riparian management objectives (RMOs) would occur as a result of the project. The proposed action would have an improving cumulative trend on riparian conditions over the life of the EIS.

Alternative 3 uses adaptive management to help achieve PACFISH and other Forest direction. Alternative 3 provides management tools in the form of new improvements and other specific actions to increase management flexibility and achieve better distribution of livestock. Generally, less intensive management (by both the permittees and Forest Service) should be required to meet PACFISH and Forest direction with the use of these tools, and by providing upland water, additional upland forage is made accessible.

Proposed Action Description:

The Blue Mountain and Prairie City Ranger Districts, Malheur National Forest propose to combine 8 allotments into 6 and to continue authorization of livestock grazing on these six grazing allotments and three administrative pastures. Alternative 3 utilizes all “Elements Common to all Grazing Alternatives within the Planning Area,” described in Chapter 2, plus additional proposed actions specific to this alternative. These elements include: implementing deferred or rest rotational grazing, minimize duration of hot-season grazing, meeting or moving toward Forest Plan standards, as amended, adjusting grazing based on monitoring, maintaining allotment facilities, use of administrative action, continuation of currently planned range improvements and practices, and the continuation of current management activities unrelated to livestock management (such as recreational use and fire protection). The proposed action establishes a maximum number of Animal Unit Months (AUMs) which allows for a range of permitted animal numbers and season of use for each allotment. AUMs may range from zero to the maximum. Permits display the “average” number of livestock for the “average” season of use so those numbers have been displayed below. See “Elements Common to all Grazing Alternatives within the Planning Area” displayed in Chapter 2 for further descriptions.

Allotment Specific Actions:

Most of the needs described in Purpose and Need can be resolved through deferred rotational grazing (or rest rotation depending on the allotment configuration) and adaptive management as described above. The following tables list additional actions necessary to more effectively implement deferred (or rest) rotational grazing or to further control timing, intensity, frequency, or duration. Maps showing the proposed changes are in the Map Section (Figures 2-8). Cattle would be the permitted livestock on all allotments.

Implementation of the allotment management plans that emerge from this analysis is anticipated to be implemented in spring 2006.

Austin Allotment

FS Acres	Average Season of Use	Permit/Average Number	Maximum AUMs
0 ac.	**N/A**	**N/A**	**N/A**

- Eliminate allotment status because the allotment is vacant and from a range management stand point it would be logical to manage these units with the adjacent allotments to facilitate management of resources.
- Incorporate Bates and western-most pasture (about 80 acres) into Upper Middle Fork allotment.
- Incorporate two eastern Austin Allotment pastures (about 80 acres) into Blue Mountain allotment.

Bear Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
1,710 ac. (incl. Bird Pasture)	**6/1 – 10/15** (5/1-10/15)	**84 Cow/calf pair**	**496 AUMs**

- Add 230-acre Bear administrative pasture to Bear Allotment as new (Bird) pasture. Adding the Bird Pasture to the Bear Allotment will allow for rotational grazing (deferred or rest) and accelerate riparian shrub development on the MFJD River.

Blue Mountain Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
22,480 ac.	**6/16-10/9** (5/15-10/9)	**163 Cow/calf pair**	**817 AUMs**

- Officially incorporate two eastern Austin Allotment pastures (about 80 acres) into Blue Mountain allotment.
- Reconstruct/improve 1 livestock water development at Pie Meadow. Reconstruction is intended to improve flow and increase water storage capacity for livestock thus reducing livestock impact to spring, reducing pressure in areas of Crawford Creek, and increasing saturated soil areas, herbaceous riparian vegetation, and raising/maintaining a high water table to maintain downslope vegetation and water conditions.
- Construct 2 new water developments in Idaho pasture to better distribute cattle to lightly used areas.
- Rest Upper Phipps Meadow Riparian pasture for the life of this AMP (at least 10 years) to allow for riparian vegetation recovery and to improve channel function in the downcut portions of the MFJD River, Squaw Creek, and Summit Creek.

Camp Creek Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
600 ac.	**6/1-10/30** (5/1-10/30)	**50 Cow/calf pair**	**327 AUMs**

- Create watergap on Middle Fork John Day river for Gibbs Pasture to allow for deferred rotational and late-season use of this non-riparian pasture, thus accelerating riparian shrub development on the MFJD River through lessened use of riparian pasture.
- Build structures to deflect livestock trailing on riverbanks in Middle Pasture to improve bank stability on the south side of the MFJD River.

Elk Allotment

FS Acres	Average Season of Use	Permit/Average Number	Maximum AUMs
0 ac.	**N/A**	**N/A**	**N/A**

- Eliminate allotment status because the allotment is vacant and from a range management stand point it would be logical to combine Elk Allotment with Sullens Allotment to facilitate management of resources.
- Incorporate Forest lands into Sullens (about 70 acres) allotment.

Lower Middle Fork Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
54,500 ac.	**6/1 – 10/31** (5/1-10/31)	**549 Cow/calf pairs**	**3,623 AUMs**

- Fence spring source at Pizer Meadow to prevent livestock trampling impact to spring and increase saturated soil areas, herbaceous riparian vegetation, and a high water table to maintain downslope vegetation and water conditions; construct water source ¼ mile west of Pizer to better distribute livestock use.

Sullens Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
45,070 ac. (incl. Elk acres)	**6/16-10/15** (5/15-10/15)	**241 Cattle**	**1266 AUMs**

- Officially incorporate Elk allotment (about 70 acres) into Highway pasture of Sullens allotment.
- Construct water development at Wigwam Spring to improve livestock grazing distribution in the allotment and reduce livestock impact to spring and increase saturated soil areas, herbaceous riparian vegetation, and a high water table to maintain downslope vegetation and water conditions.
- Reconstruct Looney Spring water development, expanding exclosure and moving troughs to reduce livestock trampling impact to spring and improve spring conditions as described under Wigwam Spring.
- Construct water development at Squaw Meadows spring to provide off-stream water source to reduce livestock impacts to banks from concentrated use.
- Increase # of pastures from 5 to 6. Create North Squaw pasture by subdividing and fencing Savage Pasture into 2 pastures providing for deferred rotational grazing; install 2 cattleguards at road crossings.

Upper Middle Fork Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
54,080 ac. (incl. Austin acres)	**6/1 – 10/15** (5/1-10/15)	**485 Cow/calf pair**	**2868 AUMs**

- Combine Blackeye and Caribou pastures into one pasture called Caribou.
- Incorporate Bates Pasture of the Austin allotment (about 80 acres) into Upper Middle Fork allotment to use as a holding pasture; officially incorporate the western-most pasture of the Austin allotment into the Lower Vinegar Pasture of the Upper Middle Fork allotment.

Administrative Pastures

Area and FS Acres	Season of Use	Average Number	Maximum AUM/AMs
Bear Administrative Pasture Appx. 250 ac.	**See Bear Allotment**	**See Bear Allotment**	**See Bear Allotment**

- Bear Administrative Pasture – Add 230-acre pasture to Bear Allotment, naming it “Bird” Pasture-refer to the Bear Allotment. Fenced section along MFJD River will not be used for grazing.

A Project Schedule for the proposed action is found in Chapter 2 under Project Schedule.
Forest Plan Amendments

A non-significant Forest Plan amendment would be required to implement Alternative 3. Alternative 3 was designed, in part, to reduce impacts to riparian areas. Selecting Alternative 3 would include a site-specific, non-significant amendment to the Malheur National Forest Plan, as amended. The amendment would convert a 230-acre portion of the Bear Administrative Pasture from MA19 (Administrative Area) to MA2 (Rangeland) since this area would be added to the Bear Allotment as the Bird Pasture.

Selection of this alternative would be consistent with the Forest Plan, as amended (36 CFR

219.10 (c)). See also Chapter 2, Alternative 3 for a description of this alternative.

Decision Framework (Ref. FSH 2209.13 Sec. 92.21)

Based on the interdisciplinary analysis presented in the Final Environmental Impact Statement (EIS), the Malheur National Forest Supervisor is the responsible official who will decide whether or not to continue authorization of grazing on the allotments in the Middle Fork John Day Range Planning Area. If the decision is to continue to authorize grazing, it will also include deciding the kind, class and number of livestock, approximate season of use, and management prescriptions (including standards, guidelines, mitigation measures intended to mitigate any environmental effects, and monitoring). If a decision is made to construct or reconstruct developments described in the proposed action, this environmental assessment will serve as the site-specific analysis to support that decision.

The Proposed Action (Alternative 3) will require a non-significant Forest Plan amendment related to management Area designation (see Proposed Action, above). The Responsible Official will also determine if the selected alternative is consistent with the Forest Plan, as amended.

After completion of the Draft EIS, there will be a 45-day public comment period. Based on response to this Draft EIS and the analysis disclosed in the Final EIS, the Responsible Official will make a decision and document it in a Record of Decision (ROD) which will accompany the Final EIS.

Desired Conditions

The desired conditions described for the Forest Plan (USDA Forest Service 1990), in conjunction with the other Forest Plan direction outlined below, provide the parameters for identifying and defining project-specific desired future conditions. The purpose and need for an action is driven by the difference between the existing and desired condition. Watershed analyses (Southeast Galena and Upper Middle Fork, USDA Forest Service 2002, 1999, 1998) were reviewed for both existing and desired conditions. The proposed actions for each allotment were developed with the purpose of moving or to continuing to move riparian areas and other plant communities towards desired conditions.

Rangeland Resources

- Modified grazing strategies will increase the rate of improvement in riparian vegetation; other riparian areas within pastures will show improvements due to reduced utilization of grasses and shrubs/hardwoods. Woody shrubs will be more prevalent (Forest Plan IV-7). In the long-term (2039), manage most available suitable livestock range for full utilization of forage available to livestock. Developments will function to obtain uniform cattle distribution, use of forage, and plant vigor (Forest Plan IV-10).
- Provide a sustained production of palatable forage for grazing by livestock and dependent wildlife species (Forest Plan IV-2) and improve trends on areas adversely affected by past grazing and maintain those communities in good condition.

- Range improvement structures are designed to distribute livestock use while meeting other resource standards and guidelines. An adequate number and distribution of range improvement structures are maintained to facilitate sound rangeland management (Forest Plan IV-34-35).
- Deferred rotation grazing systems are preferred to maximize plant vigor. Repeated grazing during the active growing period is avoided.
- Grazing pastures consistently meet implementation standards for forage utilization and bank stability.

Riparian Vegetation (From PACFISH Enclosure B – see Appendix G)

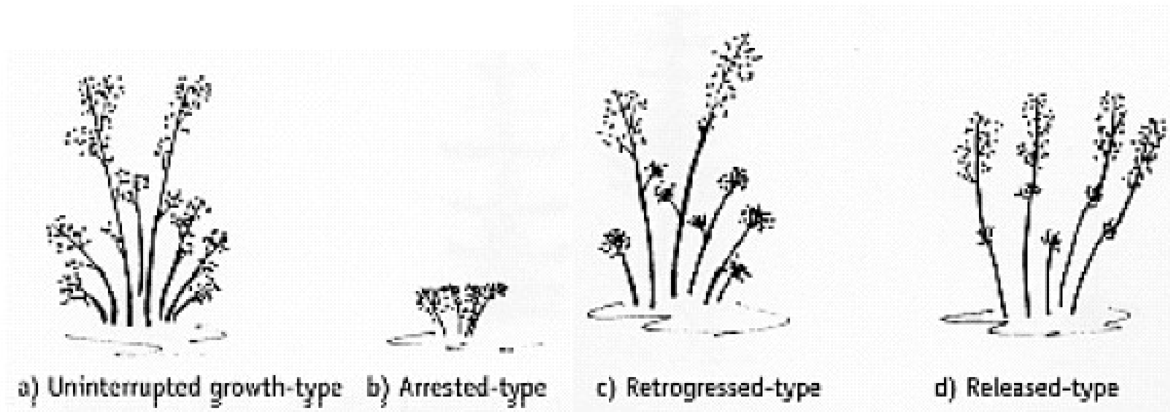
- Species indicative of maintenance of riparian soil moisture (late seral riparian vegetation such as sedges and rushes) are present (PACFISH Enclosure B);
- Diverse age structure for woody species is present where such species are a part of the natural system (PACFISH Enclosure B);
- plants exhibit high vigor (PACFISH Enclosure B);

The following recommendations further establish the desired condition and needs for riparian vegetation and riparian areas in this project:

- Maintain or improve conditions, where the criteria for "late seral" ecological status are met or exceeded (i.e., it is easier to protect healthy riparian systems than restore degraded ones) (PACFISH Enclosure B, see Appendix G).
- Adjust management practices, where the criteria for "mid-seral" ecological status are met but the trend is static or downward. This is especially important, where vegetative factors are primarily responsible for the mid-seral rating (i.e., making adjustments at this stage is likely to prevent stream bank/channel damage of a lasting nature) (PACFISH Enclosure B).
- Adjustments in management practices, where the criteria for "early seral" ecological status are met, and primarily tied to deteriorated stream bank/channel conditions (especially in cases of severe channel downcutting where channel evolution has not re-created a floodplain), may contribute little to the recovery of the system in the near term (PACFISH Enclosure B).
- As a surrogate for seral stage (where seral stage information is lacking), the following approximate crosswalk relates functioning condition and ecological status and provides some direction for desired condition: Proper Functioning Condition - late seral, Functional-At Risk, upward trend - mid-seral, Functional-At Risk, static trend - mid-seral or early seral depending on site specific conditions, Functional-At Risk, downward trend or Non-Functional - early seral (PACFISH Enclosure B)
- Influences of livestock grazing must result in riparian restoration at a minimum of “near natural” rates. “Near natural” rates of recovery can occur by limiting environmental effects to those that do not carry through to the next year, thereby avoiding cumulative, negative effects (PACFISH Enclosure B).
- “Manage the composition and productivity of key riparian vegetation to protect or enhance riparian-dependent resources. Emphasis…on… remnant hardwood shrub…” (Forest Plan IV-63). …meet or move toward standards for shade provided by the shrub and hardwood (such as aspen and cottonwood) component based on the site

potential as outlined in Malheur Forest Plan Amendment #29 for Management Area 3B. To meet or move toward those riparian management objectives, riparian shrubs need to be abundant, diverse, naturally regenerating (from seed, sprouts, etc.), and in uninterrupted or released architecture where site potential exists (see Figure 12 and Chapter 6, Glossary-Architecture).

Figure 12: Architectures exhibited by shrubs (from Keigley and Frisina. 1998. Browse Evaluation by analysis of growth form-see also Chapter 6 of this EIS)



Watershed and Fisheries

This builds on desired conditions for riparian vegetation.

- streambank vegetation protects stream banks and dissipates energy during high flows (i.e., consider community type composition, rooting characteristics, and plant density).
- Streambanks are building at near natural rates of recovery and carryover effects do not impact stream channel geomorphology including profile and bank angle.

The Forest Service recognizes the Riparian Management Objectives (RMOs) from PACFISH (1995) are important for high quality fish habitat. However, conditions are not expected to change enough during the life of this NEPA document to meet RMOs. PACFISH (Enclosure B, see Appendix G) gives direction to use change in vegetation condition rather than change in RMOs as a predictor of riparian condition and trend - "Since the condition of the riparian vegetative community directly affects these RMOs and changes in riparian vegetation are generally detectable within shorter time periods, the recovery of the vegetation component of the riparian system will be used to predict whether grazing will ultimately degrade, retard, or prevent the attainment of the RMOs." The following are Watershed and Fisheries desired conditions:

- Riparian areas will meet or move toward Riparian Management Objectives (Forest Plan Amendment #29) where potential to meet those standards exists, at a near natural rate of recovery. The stream habitat elements of sediment/substrate, water quality (temperature), channel morphology (pool frequency, bank stability/bank angle, and width:depth ratios) and riparian vegetation (ground cover, % of stream bank vegetated, and shade/canopy closure), all of which can be impacted by livestock and livestock management, are managed within their historical range of variability (HRV) (Forest Plan Amendment #29). This would ensure that streams contain high habitat complexity and quality to support all life histories of trout and salmon throughout the year; this includes winter and summer rearing as well as spawning habitat.

- Stream channels will exhibit stream channel attributes typical of their geomorphology and position on the landscape. For example, a stretch of stream that is fairly flat, found in a wide valley bottom, with stream banks or beds composed of dirt/silt/sand would likely have multiple-aged native riparian vegetation (deep-rooted sedges and grasses or hardwoods, or a combination thereof) covering the banks and shading the stream, would be fairly narrow and have many bends (with pools in the bends), would have some undercut banks, and would likely have a raised water table (and often, moist, spongy soils) (see Figure 10 for areas that might be expected to be in this desired condition).
- Native and desired non-native plant communities in riparian areas will be diverse, productive, and will provide shade and cover, large woody debris (LWD), and sediment/erosion reduction characteristic of natural aquatic and riparian ecosystems.
- Streams will either meet Oregon State Water Quality Standards for temperature, or be delisted from the State 303 (d) list where temperature is not influenced by land management practices. Temperatures will be adequate to allow connectivity and to remove or reduce thermal barriers throughout tributary streams and the MFJDR for both anadromous and resident salmonids.

Heritage

- Protection of known or yet to be discovered National Register of Historic Places (NRHP) eligible or potentially eligible sites that evidence grazing related impacts is achieved by selecting from a range of mitigation measures. These measures are presented in greater detail in this document's accompanying Heritage Specialist Report (Haynal 2005 in the Project Record).

Economics/Social

- Long-term economic and social stability is maintained by sustaining healthy rangelands and watersheds while providing sustainable domestic livestock grazing.
- The planning area provides a wide range of social and economic benefits and opportunities and provides a mix of goods and services to meet public needs while protecting other resource needs.

Management Areas and Objectives

Relationship to the Forest Plan

National forest planning takes place at several levels: national, regional, forest, and project.

This EIS is a project-level analysis; its scope is confined to addressing the significant issues and possible environmental consequences of the project. It does not attempt to re-address decisions made at higher levels. It does, however, implement direction provided at those higher levels. The Forest Plan embodies the provisions of the National Forest Management Act, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Malheur National Forest. Where appropriate, the EIS tiers to the Forest Plan FEIS, as encouraged by 40 CFR 1502.20. Forest Plan Management Areas. The goals, objectives, desired future conditions, locations, and management direction for these management areas were analyzed in the Final Environmental Impact Statement (FEIS) for the Malheur National Forest Land and Resource Management Plan. This EIS does not address these issues, but tiers to the analysis described in the FEIS and the decision as documented in the Forest Plan and its Record of Decision.

Forest Plan Direction Related to Grazing

Each resource area has standards related to grazing. The following Forest Plan management direction outlined in the Malheur Forest Plan relate specifically to range management and are summarized below:

Goals (Forest Plan IV-2)

- Provide a sustained production of palatable forage for grazing by livestock and dependent wildlife species.
- Manage rangelands to meet the needs of other resources and uses at a level which is responsive to site-specific objectives.
- Permit livestock use on suitable range when the permittee manages livestock using prescribed practices.

Objectives (Forest Plan IV-18)

- Manage uplands to utilize available forage while maintaining vegetation and site productivity. Coordinate management of these areas with adjacent riparian pastures.
- It is estimated that permitted grazing use will decrease …[somewhat over the Forest over the next five decades}…However, this Forest Plan does not establish an absolute level of livestock grazing. Annual forage utilization requirements will be established in each allotment management plan (AMP) as a tool to achieve or maintain the desired condition.
- All AMPs will be prepared or updated based on the goals, objectives, and standards in this Forest Plan…
- Analyze allotments to determine proper stocking levels. Use specific management area goals and standards to resolve conflicts between wild horses, cattle, and big game.

Forest-wide Standards (Forest Plan IV-34 and 35)

- Manage big game and livestock numbers at a level which utilizes available forage while maintaining plant vigor, composition and density.
- Prepare, update, or revise AMPs to address emerging resource management issues or concerns.
- Inventory and analyze forage resource production, condition and trend.
- Administer and manage the range resource to ensure permit compliance and resource protection.
- Manage residues to facilitate the use of forage by domestic livestock.

The Forest Plan was amended in 1995 by PACFISH (Interim Strategies for Managing Anadromous Fish Producing Watersheds on Federal Lands in Eastern Oregon and Washington, Idaho, Western Montana and Portions of California, Decision Notice 2/24/1995) to provide direction to maintain management options for anadromous fish habitat while the Forest Service developed long-term management strategies. PACFISH identified Riparian Management Objectives (RMOs), which set criteria for desired pool frequency, large woody debris, bank stability, lower bank angle, and width/depth ratios associated with streams where the Forest Plan did not address RMOs sufficiently. A key assumption of PACFISH (Enclosure B, see Appendix G) is that influences of livestock grazing must result in riparian restoration at a minimum of "near natural" rates. The Malheur Forest Plan has some more stringent objectives, which remain in place (see Amendment 29 to Forest Plan, 8/18/94). Those analyses are documented in the Final EIS and Record of Decision for the Forest Plan, and the environmental assessments for PACFISH and other related documents. These documents are incorporated by reference, as appropriate, throughout this EIS.

Management Areas

The Forest Plan uses management areas to guide management of the National Forest System lands within the Malheur National Forest. The Forest Plan, as amended, contains both Forest-Wide Standards and Guidelines as well as Standards and Guidelines for specific management areas. Each management area provides for a unique combination of activities, practices and uses. The 186,500 acre Middle Fork John Day (MFJD) Range Planning Area includes approximately 180,000 acres of National Forest lands that are allocated by the Forest Plan, as amended, to management areas (see Figure 9, Map Section). Management area designations overlap; when a specific segment of land falls under the goals or standards of two or more management areas, acres are assigned to the higher priority management area (see Table 1-1). The Management Area acres and map used in this analysis are based on computer calculations and data in Geographical Information System (GIS).

Table 1-1: Acres of Malheur National Forest Management Area (MA) and other Ownership by Allotment

Management Area (MA)	Acres per Allotment								MA Total Acres	Percent of Planning Area*
	Austin	Bear	Camp Creek	Lower M.Fork	Elk	Blue Mtn.	Upper M.Fork	Sullens		
1-2 Forest and Rangeland	13	54	84	10,214	14	5,441	22,567	25,991	64,378	36%
RHCA & 3B Riparian Areas	38	212	155	8,813	7	2,921	8,817	4,948	25,911	14%
4A Big Game Winter Range	0	917	171	21,547	0	0	6,493	0	29,128	16%
7 Scenic Area	0	0	0	8,592	0	0	1,520	0	10,112	6%
9 Research Natural Area	0	0	0	0	0	0	60	0	60	>1%
12 Dev. Rec. Sites	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
13 Old Growth	0	0	0	1,282	0	2,011	1,588	4,148	9,029	5%
14F Visual Corridor	21	295	185	1,208	50	1,907	2,055	2,614	8,335	5%
14M Visual Corridor (and MA 1-2)	85	0	0	0	1	10,125	7,768	8,730	26,709	15%
16 Min Level Mgmt	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
19 Admin. Sites	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
21 Wildlife Emphasis Area	0	0	0	2,888	0	0	3,105	0	5,993	3%
Total Malheur NF	157	1478	595	54,544	72	22,405	53,973	46,431	179,655	100%
Private Land	513	12	0	1541	138	33	531	44	2,812	
BLM	0	40	0	0	0	0	0	40	80	
Other National Forest	0	0	0	2876	0	177	394	80	3,527	

* Malheur National Forest Only

N/M-"Not Mapped" - these areas are Management Areas, but they are not in the Forest Plan Management Area GIS layer because the Forest Plan did not map these MAs.

Private Land

Two allotments (Austin and Elk) are "On-Off" Allotments which include private land in the term grazing permit; in these allotments, private land was managed as part of the allotment. Currently, the private land in Austin and Elk Allotments is excluded from Forest Service land and is no longer included in or managed as part of these allotments. Private land inholdings occur within the remaining allotments and in the overall Planning Area; private land in these areas is not included in the term grazing permit, nor is it managed as part of the allotment. Approximately 2,800 acres within the Planning Area are private property (see Table 1-1 and Figures 2-8 and 9, Map Section). Conditions and actions on private lands are considered for cumulative effects (see Chapter 3 and Appendix A, Cumulative Effects).

Bureau of Land Management (BLM) and Other Forest Service System Lands

BLM land is an inholding surrounded by Forest Service land. BLM land is very likely not fenced though it lies within the borders of Forest Service lands and allotments (Pers. Com. Ken Primrose, BLM 2004, see Figures 3, 7 and 9). Officially grazing is not authorized on BLM land because there are no permits for livestock use. It is likely that Forest Service permitted livestock are grazing on BLM land, but the BLM and Forest Service do not allocate additional AUM's to the parcels (Pers. Com. Ken Primrose, BLM 2004). Any use of BLM by Forest Service permitted livestock would reduce overall use of Forest lands.

Approximately 3,500 acres of the allotments fall within the Wallowa-Whitman and Umatilla National Forests (see Table 1-1). Currently the Malheur National Forest manages these areas for livestock through informal agreement with the other Forests. In the Umatilla National Forest, most of the acreage is within Management Area A8 – Scenic Area (2,300 ac.) or labeled as Private (likely patented mining claims – 700 ac.); about 10 acres are MA B2 – Wilderness, and about 250 acres are MA D2 – Proposed Research Natural Area. In the Wallowa-Whitman National Forest about 150 acres are MA 1 – Timber emphasis, 90 acres are MA 15 – Old Growth, and less than 10 acres are MA 17 – Utility Corridors. These acres occur along the outer edges of the planning area and allotment boundaries where Forest boundaries follow U.S. Public Land Survey lines (usually section lines) and allotments follow ridgetops or other geographic boundaries. Some of these acres are high elevation with little livestock use, and some may be included due to mapping/fence location errors. Known localized concerns in these areas are discussed in this analysis.

The following is a description of management areas in the MFJD Range Planning Area:

Management Area 1 – General Forest

This management area provides for timber production on a sustained yield basis while providing for other resource values. Generally, acres for MA 1 and MA 2 are combined (see Table 1-1 and Figure 9, Map Section).

Management Area 2 - Rangeland

Management Area 2 consists primarily of non-forested grasslands and low elevation ponderosa pine sites unsuitable for timber production, and is usually included as non-forested lands within other management areas, primarily MA 1 – General Forest. The goal of this MA is to emphasize forage production on a sustained yield basis while providing for other resources and values (Forest Plan IV-53). About 26,700 acres in Table 1-1 are identified in GIS as middleground or 14M (see Figure 9, Map Section); these acres are MA 1-2, but show up in Table 1-1 as MA 14M because of an overlap related to Management Area standards.

Management Area 3B – Anadromous Riparian Areas and Riparian Habitat Conservation Areas (RHCAs)

Management Area 3B consists of lakes, perennial streams and seasonally flowing streams; lands adjacent to lakes, perennial and seasonal streams; floodplains and wetlands; wet, moist areas such as meadows, springs, seeps, bogs, and wallows; and quaking aspen stands in watersheds currently or potentially supporting anadromous fish (see Figures 9 and 10, Map Section).

The goals of this MA are to: manage riparian areas to protect or enhance their value for wildlife, anadromous fish habitat, and water quality, manage timber, grazing, and recreation to give preferential consideration to anadromous fish on that portion of the MA that is "suitable" for timber, grazing, or recreation management, and design and conduct management to maintain or improve water quality and beneficial uses (Forest Plan IV-62).

MA 3B includes areas not addressed in PACFISH, for which standard Riparian Habitat Conservation Area (RHCA) buffers were not defined but which are protected under Forest Plan standards for MA 3B; these areas include dry aspen stands and ephemeral draws.

The 1995 PACFISH Decision Notice amended the Malheur Forest Plan, establishing standards and guidelines for management of riparian resources. One standard establishes RHCAs across all management areas. RHCAs are generally wider than the riparian buffers established as MA 3B and incorporates both MA 3B and adjacent MAs. Riparian-dependent resources receive primary emphasis in all RHCAs. All project actions must be in compliance with PACFISH.

Best Management Practices (BMPs) are the primary mechanisms to enable the achievement of water quality standards (Environmental Protection Agency 1987). BMPs have been selected and tailored for site-specific conditions to arrive at the project level BMPs for the protection of water quality.

Management Area 4A - Big-Game Winter Range Maintenance

Manage to maintain or enhance winter range habitat for deer and elk and manage forage, cover, and open road densities for elk on potential winter range (Forest Plan IV-69). In these areas, prioritize forage utilization to provide for big game species at levels derived in consultation with Oregon Dept. of Fish and Wildlife and include the forage needs of big game in late fall when preparing/updating Allotment Management Plans (Forest Plan IV-71).

Management Area 7 - Scenic Area

Manage to preserve and protect the outstanding natural aesthetics of the Vinegar Hill-Indian Rock Scenic Area (Forest Plan IV-91). Livestock grazing is permitted in accordance with Forest-wide standards.

Management Area 9 - Research Natural Areas

Manage area for nonmanipulative research, observation, and study of undisturbed ecosystems (Forest Plan IV-95). MA 9 has the most restrictive resource element standard with regards to grazing. MA 9, Standard 7 (page IV-95) states: “Livestock grazing is permitted only where essential to maintain a specific vegetative type for which the Research Natural Area (RNA) was, or will be, established. Boundary fencing may be used to exclude livestock.”

Management Area 12 – Developed Recreation Sites (No acres mapped)

Management Area 12 consists of developed campgrounds in the Planning Area (Lower Camp Creek, Dixie, Deerhorn, Middle Fork and Head O’Boulder). They are managed for developed campground opportunities; livestock grazing is prohibited. All campgrounds but Head O’ Boulder are fenced to exclude livestock.

Management Area 13 – Old Growth

Management Area 13 is composed of mature and over mature trees (150 years or older). It is managed to provide: habitat for wildlife and plant species dependent on mature and over-mature forest conditions; ecosystem diversity; and preservation of aesthetic qualities across the landscape (Forest Plan IV-105). MA-13 includes both Dedicated Old Growth (DOG) and Replacement Old Growth (ROG) areas (see Figure 9, Map Section). Livestock grazing is permitted in accordance with Forest-wide standards.

Management Area 14 – Visual Corridors

Management Area 14 consists of visible and potentially visible landscapes along major travel routes, and state scenic waterways where the traveling public has a high to medium sensitivity to scenery. The goal of MA 14 is to manage corridors within scenic viewsheds with primary consideration given to their scenic quality and the growth of large diameter trees. The Forest Plan direction is to manage the Highway 26 and Highway 7 Corridors with visual quality objectives of retention in the foreground and partial retention in the middleground and County Road 20 Corridor for partial retention in the foreground and modification in the middleground while providing for other uses and resources (Forest Plan IV-131). The acreage displayed in Table 1-1 includes about 26,700 acres identified in GIS as middleground or 14M (see Figure 9, Map Section); while this area has specific standards for management of visual quality objectives, these acres are MA 1-2.

Management Area 16 – Minimum Level Management (no acres mapped)

Management Area 16 includes rocky (talus) areas, scablands, areas of shallow soils, and other areas of non-forest or low-productivity forest. These sites are not displayed on management area maps, though these sites are discussed, where known, in Chapter 3 of the EIS and in the Project Record. The goal of MA 16 is to provide the minimum management necessary for resource protection and management of adjacent areas. Livestock grazing is permitted in accordance with Forest-wide Standards (Forest .

Management Area 19 – Administrative Sites (no acres mapped)

Management Area 19 includes work centers and other administrative sites. Sunshine, Bear, and Blue Mountain administrative sites are covered under Management Area 19. The Bear administrative pasture is about 250 acres and has been used in the past for hay production and grazing of pack and saddle stock. This use has ceased for over ten years due to a reduction in Forest Service stock. These sites are not displayed on management area maps, though these sites can be found on Figures 1 and 3 (in the Map Section). The goal of MA 19 is to provide and maintain sites for facilities necessary for the administration of Malheur National Forest lands. The direction is to manage these sites for administrative needs.

Management Area 21 - Wildlife Emphasis Area with Non-scheduled Timber Harvest

Manage to provide for high quality fish and wildlife habitat and water quality. Timber harvest will be on a non-scheduled basis and will be used only to meet a fish and or wildlife habitat objective (Forest Plan IV-131). These areas, named “ Jump-off Joe” and “Dixie Butte,” lie north and south of the MFJD River, respectively (see Figure 9, Map Section). In these areas, prioritize forage utilization to provide for big game species at levels derived in consultation with Oregon Dept. of Fish and Wildlife, schedule (build) cost-efficient range improvements to improve range conditions (as needed and consistent with MA objectives), and design improvements to protect wildlife habitat and distribute livestock use (Forest Plan IV-132, 133).

Actions Outside of this EIS to Address Management Needs

The intent of the proposed action is to focus on managing livestock grazing to maintain or improve conditions, not to address all resource issues in the planning area. The Forest Service recognizes that past management (including timber harvest, mining, road building, recreation, and grazing) has contributed to existing conditions that do not match desired conditions in the planning area (see Chapter 3, Existing Condition by resource section). In some areas, such as steep, v-shaped canyons or areas with dense conifer overstory and little forage, range management may have little effect because cattle have difficulty in accessing these locations or do not use these areas. In other locations, such as broad floodplains in lower reaches which tend to get heavier livestock use, a change in range management could improve the function of riparian areas. Range management will be used as one of many tools in moving towards desired condition.

The proposed project activities described in this DEIS do not address all the desired conditions in the planning area. Several projects located within the Middle Fork John Day Range Planning Area were identified through range and other planning processes to help move the planning area towards desired conditions, particularly toward desired riparian conditions.

The Forest Service will complete several rangeland management and watershed restoration projects in the Middle Fork John Day Range Planning Area under separate NEPA decisions to improve resource conditions. Projects completed or currently underway and reasonably foreseeable projects in the planning stage are listed and described in Appendix A (Cumulative Effects). These activities are considered as part of the existing condition and/or they are part of the cumulative effects analysis (see also Appendix A and Chapter 3).

The effects of these activities and decisions are discussed in the cumulative effects sections of Chapter 3.

Public Involvement

The Middle Fork John Day Range Planning analysis was initiated in December 1998. Public scoping for the MFJD Range Planning Area was initiated in January 1999 with the project's inclusion on the January Schedule of Proposed Actions (SOPA). On February 12, 1999, a project information letter was mailed to over 100 individuals, organizations, and agencies for their comment. These individuals and organizations included grazing permittees, State and Federal resource management agencies, and other special interest organizations. Scoping was initiated in conjunction with the Wallow-Whitman National Forest. A Notice of Intent (NOI) to prepare an EIS was published in the Federal Register (64 FR 9305) on February 25, 1999. In October 1999, the analysis was temporarily put on hold.

In January 2002, the Malheur National Forest proposed resuming efforts on this project under the Forest's 2002 program of work. Consequently, a letter describing the revised proposed action was sent on August 13, 2002 to those who: commented on the original proposal, are landowners in and adjacent to the area, expressed interest in receiving updates on the original proposal, or are affected by grazing management in the area. The 2002 scoping letter proposed temporary redesignation of water rights; this proposal was dropped, but is further discussed in Chapter 2 under Alternatives Considered but Eliminated from Detailed Study. A revised NOI was sent to the Environmental Protection Agency and was published in the Federal Register on August 19, 2002. Ten letters were received in response to the revised NOI and scoping letter. The project was reinitiated in 2004 and was listed in the Winter/Spring and Summer 2004 and Spring 2005 SOPAs.

The permittees using the allotments analyzed in this EIS were included throughout the process. Every effort was made to address permittee concerns. The permittees provided input on alternatives and site specific development proposals for their respective allotments. As part of the public involvement process, the agency met with permittees in August and September 2004

Information provided as a result of the scoping process is located in the Middle Fork John Day Range Planning Area Project Record. Using the comments from the public, other agencies, and tribes, (see Key Issues section), the interdisciplinary team developed issues to address and developed the alternatives described in Chapter 2 of this EIS.

Coordination with Other Governments and Agencies

In February 1999, a project information letter was mailed to the three tribes that have rights or interests in the Middle Fork John Day Range Planning Area: the Confederated Tribes of the Warm Springs Reservation, the Confederated Tribes of the Umatilla Indian Reservation, and the Burns Paiute Tribe. Based on a government-to-government relationship, as directed in Executive Order 13175 (EO 13175), Consultation and Coordination with Indian Tribal Governments, November 6, 2000, the purpose of the contact was to exchange information, answer questions, and to work closely and continuously with each other to integrate tribal rights and interests in the planning process. Fisheries representatives from the USDI Fish and Wildlife Service and Confederated Tribes of the Warm Springs Reservation attended a meeting to discuss the proposal on April 19, 1999. Further information was provided to the tribes in August 2002, and discussions with Tribal staff have been ongoing. Concerns have been raised by the tribes related to cultural plants, treaty rights, riparian management (fish and wildlife habitat, particularly regarding the Tribal Recovery Plan), range and rangeland management, soil, water rights, water quality, and heritage, as well as monitoring and administration. The tribes' concerns have been considered and addressed in Chapters1, 2, and 3 of this EIS. Letters and documents were sent to the tribes in June 2005 to provide information and additional opportunities for coordination.

The Forest Service continues to consult with the tribal governments of the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of Warm Springs, as well as the Oregon State Historic Preservation Office, the Oregon Department of Fish and Wildlife, the US Fish and Wildlife Service and NOAA Fisheries (National Oceanic and Atmospheric Administration, formerly National Marine Fisheries Service), and other federal, state, and local government officials (see also Chapter 4).

Key Issues

Significant issues, otherwise known as key issues, for the Middle Fork John Day Range Planning Project came from the tribes, the public, the livestock grazing permittees, other agencies, organizations and businesses, and Forest Service resource specialists in response to the Proposed Action. Issues are defined as a point of discussion, debate, or dispute about environmental effects. Key issues are used to formulate alternatives, prescribe mitigation measures, and analyze environmental effects. Issues are "significant" because of the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflict (40 CFR 1508.27). Three key issues were identified through internal and external scoping. The key issues were approved by the Responsible Official.

In addition to the key issues, there are "other analysis" issues addressed in the effects analysis and often used to compare alternatives. These are discussed below as Other Analysis Issues, this chapter.

The environmental consequences of the proposal are disclosed in Chapter 3 for each resource affected by the significant or key issues. A key issue has indicators to allow members of the public and the Responsible Official to determine how well the issue is addressed by the alternatives (see Tables 2-2 and 2-3, Chapter 2 for effects of the alternatives on significant issues). A summary of each issue and its indicators is given below.

Key Issue #1 –Changes in management and use may have financial impacts on local permittees and the Forest Service

The MFJD Range Planning Area livestock grazing resource is a component of the social and economic conditions of the surrounding communities and people. The Forest Plan states that big game and livestock numbers should be managed at a level which utilizes available forage while maintaining plant vigor, composition and density (Forest Plan p. 4-34). Changes in management or restrictions of use on the affected allotments can impact the local permittees and communities. The amount of forage available to livestock and the timing of use of that forage can affect ranch employment and wages. Ranch purchases for goods and services from other businesses in the communities are indirect effects. The federal government also makes purchases locally associated with the range management program, and returns a portion of its grazing receipts to counties. Changes in livestock grazing on these allotments can impact many social and cultural conditions such as the traditional lifestyle of permittee ranching families.

Changes in allotment management and administration can affect the financial efficiency of allotment management and overall ranching operational feasibility. Permittees, government (taxpayers), and others incur costs, and benefits from grazing are distributed to these entities. Recent Forest Service range management budgets have required more involvement on the part of the permittees in the form of monitoring and cost-share improvement projects. The future of livestock grazing on these allotments will depend on the economic feasibility of livestock management, including monitoring and development maintenance.

Measurements –
- Permitted AUMs
- Operations Cost
- Implementation/Improvement Cost
- Grazing Receipts to County

Key Issue #2 - Livestock grazing may impact aquatic resources

The Middle Fork John Day Range Planning Area contains a number of important stream habitats. These habitats are affected by many uses and resources. Several of the riparian areas in the planning area are in earlier ecological stage than prescribed as desired condition. Some of the factors which reflect the health of riparian/aquatic systems include vegetative diversity, water quality, streambank condition and fish habitat. Direct solar radiation is a key factor that increases water temperature. Stream width and riparian shade control the amount of direct solar radiation that accesses streams. High wetted width to depth ratios also reduce the quality and quantity of fish habitat during low flow periods. Stream banks that are functioning provide overhang and hiding cover. Historic livestock grazing has contributed to high wetted width to depth ratios compared to Riparian Management Objectives (RMOs) listed in PACFISH (1995). Livestock grazing can affect streambank vegetation, integrity and recovery, thus affecting narrowing of streambanks and wetted width to depth ratios.

Measurements –
- Percentage of monitored Designated Monitoring Areas (DMAs) or Sensitive Stream Reaches in late riparian ecological status including shrub abundance, growth form and age class (a diversity of shrub species and age classes and abundant riparian shrubs in uninterrupted or released architecture). DMAs or Sensitive Stream Reaches are often key habitat areas for fish and are those areas most sensitive to change due to management of domestic livestock. These areas are also more likely to be influenced by livestock management

Key Issue #3—Livestock grazing during spawning periods may cause an adverse direct effect to Endangered Species Act-listed fish by trampling redds and disturbing spawning adults.

The Middle Fork John Day Range Planning area contains streams that provide spawning habitat and potential spawning habitat for steelhead and bull trout, which are listed as Threatened under the Endangered Species Act. It has been identified through consultation that grazing activities during spawning periods, prior to July 15 for steelhead and after August 15 for bull trout, would result in a Likely to Adversely Affect determination for listed fish. Timing and location of livestock grazing may affect listed fish species.

Measurement-
- Pastures where spawning habitat or potential spawning habitat exists and cattle may graze during spawning periods.

Other Analysis Issues

Other analysis issues raised by the tribes, the public, Forest Service resource specialists and others are addressed through mitigation, in the effects analysis, and are used to compare alternatives, or are considered outside the scope of the proposed action. Other analysis issues are important and were considered as this project was developed and analyzed. These issues did not drive alternatives, but they were addressed or used in this analysis.

The following meets Council on Environmental Quality (CEQ) NEPA regulations, which require this delineation in Sec. 1501.7: "identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)."

Some other analysis issues are already addressed through other processes or in the Forest Plan, some led to mitigation measures (see Management Requirements and Mitigation Measures in Chapter 2), and some are analyzed in Chapter 3.

The tribes, the public, and others brought up the following areas of concern that may be affected by livestock grazing or other proposed activities; these areas of concern have been discussed in Chapter 3:

- Culturally important plants and tribal uses of these plants in the project area.
- Shrubs and hardwoods (including aspen, cottonwood, and planted shrubs)
- Range conditions including vegetation
- Attainment of Riparian Management Objectives (RMOs) and the rate of achieving this.
- Grazing may impact upland vegetation, particularly as livestock distribution decreases in riparian areas and increases in uplands.
- The effects of livestock grazing on ponderosa pine forests.
- Reforestation plantations that could be damaged by livestock.
- Soil conditions (including soil productivity and soil crusts) and provide discussion of impacts of grazing on soils.
- Vegetative cover, soil compaction and nutrient cycling. Identify effects on compaction, infiltration, water holding capacity, soil productivity, runoff, surface erosion, fertility
- Biological soil crusts and effects of alternatives.
- Water temperature, turbidity and bank stability
- How Total Maximum Daily Loads (TMDLs) will be integrated into planning.
- Late season flows and water rights (including instream) and relate effects of grazing on water rights and water quality.
- The effect of grazing on beaver populations and the effects that that might have on watershed recovery.
- Proposed activities could adversely affect Threatened, Endangered, and sensitive (TES), management indicator species (MIS), and featured species identified in the Forest Plan of wildlife and plants.
- Habitat and population trends of management indicator species (wildlife, fish, Plants).
- Viability of regional fish, wildlife and plant populations most likely to be affected by grazing.
- Big game winter range
- Concerns that cow bird populations can be elevated through grazing practices and that this may have a detrimental affect on nesting songbirds.
- Concern that activities in riparian habitat could contribute to further population decline of neotropical migratory bird species.
- Recreational/aesthetic experiences of some visitors.

The tribes, the public, and others brought up the following items and asked us to describe their existing condition; these areas of concern have been discussed in Chapter 3:

- Grazing history and current grazing - area grazed, number of livestock, AUMs, forage levels, duration/season, results of grazing monitoring.
- Current range conditions: vegetation, noxious weeds, compaction, erosion
- Capability/suitability analysis for the Middle Fork John Day Range Planning Area.

The following areas of concern have been reduced or mitigated through project design or mitigation (see Chapter 2); effects to these areas of concern are disclosed in Chapter 3:

- Effects of hot-season grazing.
- Spread of noxious weeds.
- Archaeological and historic sites.

Outside the scope:

- Cultural plants can be damaged by noxious weed spraying. Noxious weed treatment is an ongoing action, outside the scope of this analysis, which will occur in all alternatives. Currently noxious weed treatment is done by hand or through mechanical means (not through spraying of herbicides) so there would be no effect to cultural plants from weed spraying.
- Funding to cover allotment administration is not always guaranteed and is dependent on yearly budget processes. If no, or less than adequate funding is available, then livestock management would be adjusted on NFS rangelands. The budget is outside the scope of this analysis.
- Grazing fees aren't high enough to cover administrative costs. Grazing fees are determined by congressional action and cannot be affected by this decision.
- Private rangeland adjacent to or within Forest Service allotments should be managed for ecosystem sustainability. The Forest Service has no authority to change private rangeland management, but cumulative effects analysis will consider past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.
- The Forest received several comments on range administration and the need to resolve range administration difficulties. Administration of grazing permits is outside the scope of this environmental analysis because administrative actions and activities are part of the terms and conditions of the grazing permits; these issues are and will be handled through administration of the permit and, as needed, administrative action.
- The Forest received several comments on the methods of range monitoring. Since about 2003 range monitoring on the Malheur National Forest is being conducted by an interdisciplinary team that includes watershed or fisheries representatives and range management specialists, sometimes other resource specialists such as a botanist, and the permittee/s are also asked to attend (see also Appendix D).

Laws and Regulations

This EIS adheres to the following legal requirements and coordination, and regulations:

The Preservation of American Antiquities Act of 1906:

This Act makes it illegal to "appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated."

The National Historic Preservation Act:

This Act requires Federal agencies to consult with State and local groups before nonrenewable cultural resources, such as archaeological sites and historic structures, are damaged or destroyed. Section 106 of this Act requires Federal agencies to review the effects project proposals may have on the cultural resources in the Planning Area.

The Endangered Species Act of 1973, as amended:

The purposes of this Act are to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section." The Act also states "It is further declared to be the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." A biological assessment is being prepared to document effects of proposed activities on endangered and threatened species in the Middle Fork John Day Range Planning Area. Appropriate coordination, conferencing, and consultation with USFWS and NOAA-Fisheries will be completed before the FEIS is published.

The Migratory Bird Treaty Act of 1918:

The purposes of this Act are to establish an international framework for the protection and conservation of migratory birds. The Act makes it illegal, unless permitted by regulations, to "pursue, hunt, take, capture, purchase, deliver for shipment, ship, cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in this Convention…for the protection of migratory birds. . .or any part, nest, or egg of any such bird" (16 USC 703). The original 1918 statute implemented the 1916 Convention between the United States and Great Britain (for Canada). Later amendments implemented treaties between the United States and Mexico, Japan, and the Soviet Union (now Russia).

The National Environmental Policy Act (NEPA) of 1969, as amended:

The purposes of this Act are “To declare a national policy which will encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality” (42 U.S.C. Sec. 4321). The law further states “it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans” [42 U.S.C. Sec. 4331(a)]. NEPA establishes the format and content requirements of environmental analysis and documentation, such as the Middle Fork John Day Range Planning Project. The entire process of preparing an environmental impact statement was undertaken to comply with NEPA.

The National Forest Management Act (NFMA) of 1976:

This Act guides development and revision of National Forest Land Management Plans and has several sections to it ranging from required reporting the Secretary must submit annually to Congress to preparation requirements for timber sale contracts. There are several important sections within the act, including Section 1 (purpose and principles, Section 19 (fish and wildlife resource), Section 23 (water and soil resource), and Section 27 (management requirements). All alternatives were developed to be in full compliance with NFMA.

The Clean Water Act, as amended in 1977, 1982, and 1987:

The primary objective of this Act is to restore and maintain the integrity of the nation’s waters. This objective translates into two fundamental national goals: 1. Eliminate the discharge of pollutants into the nation’s waters; and 2. Achieve water quality levels that are fishable and swimmable. This Act establishes a non-degradation policy for all federally proposed projects. The proposed action meets anti-degradation standards agreed to by the State of Oregon and the Forest Service, Region 6, in a Memorandum of Understanding (Forest Service Manual 1561.5). This will be accomplished through planning, application, and monitoring of Best Management Practices (BMPs). Site-specific BMPs have been designed to protect beneficial uses.

The Clean Air Act, as amended in 1990:

The purposes of this Act are “to protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare and the productive capacity of its population; to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and to encourage and assist the development and operation of regional air pollution prevention and control programs."

Multiple-Use Sustained-Yield Act of 1960:

The Multiple Use - Sustained Yield Act of 1960 requires the Forest Service to manage National Forest System lands for multiple uses (including timber, recreation, fish and wildlife, range, and watershed). All renewable resources are to be managed in such a way that they are available for future generations. The harvesting and use of standing timber can be considered a short-term use of a renewable resource. As a renewable resource, trees can be re-established and grown in again if the productivity of the land is not impaired.

Treaty with the Walla Walla, Cayuse,and Umatilla Tribes, June 9, 1855, and Treaty with the Tribes of Middle Oregon, June 25,1855:

These treaties established "That the exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians, and at all other usual and accustomed stations, in common with citizens of the United States, and of erecting suitable house for curing the same; also the privilege of hunting, gathering roots and berries, and pasturing their stock on unclaimed lands, in common with citizens, is secured to them." All actions to be taken must fully consider and comply with native American treaty rights.

The planning area falls within lands ceded by the Confederated Tribes of the Warm Springs Reservation and within lands that have an overlap of use with the Confederated Tribes of the Umatilla Indian Reservation. These tribes have reserved rights to anadromous fish, and Federal court decisions have specifically established that the tribes have treaty rights to an equitable share of the Columbia Basin fishery resource (CRITFC 1995, Vol. I, p. 4-1 – 4-3). Under a provision of the treaty with the Confederated Tribes of the Warm Springs Reservation and the Confederated Tribes of the Umatilla Indian Reservation, they retain the reserved right to "pasture their stock" in common with other American citizens on public lands. The Forest will continue to strive to meet its treaty obligations as it provides for permitted grazing.

Public law 92-488:

This law recognizes the Burns Paiute Tribe and their reservation. As a Federally recognized tribe, the Burns Paiute Tribe retains rights of inherent sovereignty. The planning area is within the traditional and current use area of the Burns Paiute Tribe. The planning area is within the aboriginal use area of the Burns Paiute tribe. All actions to be taken must fully consider and comply with native American treaty rights.

Migratory Bird E. O. 13186:

On January 10, 2001, President Clinton signed an Executive Order" (E.O. 13186) titled

"Responsibilities of Federal Agencies to Protect Migratory Birds." This E.O. requires that *"environmental analysis of Federal actions, required by NEPA or other established environmental review processes, evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern."*

Natural or Depletable Resource Requirements and Conservation Potential:

The Middle Fork John Day Range Planning Project has been designed to conform to applicable laws and regulations pertaining to natural or depletable resources, including minerals and energy resources. Regulations of mineral and energy activities on the National Forest, under the U.S. Mining Laws act of 1872 and the Mineral Leasing Act of 1920, are shared with the Bureau of Land Management. The demand for access to National Forest System lands for the purpose of mineral and energy exploration and development is expected to increase over time.

Environmental Justice:

On February 11, 1994, President Clinton signed Executive Order 12898. This order directs each Federal agency to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. On the same day, the President also signed a memorandum emphasizing the need to consider these types of effects during NEPA analysis. On March 24, 1995, the Department of Agriculture completed an implementation strategy for the executive order. Where Forest Service proposals have the potential to disproportionately and adversely affect minority or low-income populations, these effects must be considered and disclosed (and mitigated to the degree possible) through the NEPA analysis and documentation (see Environmental Justice, Chapter 3).

Prime Farmland, Rangeland, and Forestland:

All alternatives are in accordance with the Secretary of Agriculture Memorandum 1827 for prime farmland, rangeland, and forestland. "Prime" rangeland and forestland are terms used only for non-Federal land, which would not be affected by proposed alternatives. Regardless of the alternative selected, National Forest System lands would be managed with sensitivity to adjacent private and public lands.

Floodplains and Wetlands (E. O. 11988 and 11990):

The purpose of these 1977 orders are to "…avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development…" and similarly "…avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands…" Wetlands that meet the Jurisdictional Definition (Corps of Engineers) are found in the Middle Fork John Day Range Planning Area.

Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended):

This act directed the Secretary of Agriculture to prepare a Renewable Resources Assessment and updates. These assessments include "an analysis of present and anticipated uses, demand for, and supply of the renewable resources, with consideration of the international resource situation, and an emphasis of pertinent supply, demand and price relationships trends." The USDA Forest Service Forest Inventory and Analysis unit provides updates for this assessment.

Executive Order 12962 (aquatic systems and recreational fisheries):

This 1995 order's purpose is to conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. It requires federal agencies to evaluate the effects of federally funded actions on aquatic systems and document those effects relative to the purpose of this order.

Executive Order 13112 (invasive species):

This 1999 order requires Federal agency whose actions may affect the status of invasive species to identify those actions and within budgetary limits, "(i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species… (iii) monitor invasive species populations… (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded;… (vi) promote public education on invasive species…and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species…unless, pursuant to guidelines that it has pre-scribed, the agency has determined and made public…that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."

Consumers, Civil Rights, Minorities, and Women:

All Forest Service actions have potential to produce some form of impacts, positive or negative, on the civil rights of individuals or groups, including minorities and women. An analysis of this potential impact is required by Forest Service Manual and Forest Service Handbook direction (see Socio-Economics, Chapter 3).

Project Record

This EIS hereby incorporates by reference the Project Record (40 CFR 1502.21). However, Chapter 3 provides a summary of the Specialist Reports in adequate detail to support the rationale for the decisions and the appendices provide supporting documentation. The Project Record contains Specialist Reports and other technical documentation used to support the analysis and conclusions in this EIS. These Specialist Reports are for Forest Vegetation, Fire and Fuels, Roads, Wildlife, Soil, Water, Fisheries, Scenery, Recreation, Range, Botany, Heritage, and Socio-Economics.

Incorporating these Specialist Reports and the Project Record helps implement the CEQ Regulations' provision that agencies should reduce NEPA paperwork (40 CFR 1500.4), that EISs shall be "analytic rather than encyclopedic," and that EISs "shall be kept concise and no longer than absolutely necessary" (40 CFR 1502.2). The objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated, without repeating detailed analysis and background information available elsewhere. The Project Record is available for review at the Blue Mountain Ranger District Office, 431 Patterson Bridge Rd., John Day, Oregon, Monday through Friday, 7:45 a.m. to 4:30 p.m.

CHAPTER 2. ALTERNATIVES

Introduction

Chapter 2 describes the proposed action and alternatives to the proposed action, including a no grazing alternative. This chapter also describes the measures necessary to mitigate environmental effects, identifies management requirements, develops monitoring plans, and shows a summary comparison of the alternatives as they relate to key issues and the purpose and need for action. Maps (labeled as figures) of alternatives considered in detail are included in a Map Section at the end of this DEIS. In the Map Section, figures that compare action alternatives are generally organized consecutively to make visual comparisons easy.

The Middle Fork John Day Range Planning DEIS incorporates information and relies on direction provided by the Malheur Forest Plan, as amended. All alternatives have been designed to adhere to State and Federal laws and regulations.

This chapter is divided into seven sections:

- Alternative Development Process
- Alternatives Considered but Eliminated from Detailed Study
- Alternatives Considered in Detail
- Management Requirements, Constraints, and Mitigation Measures
- Monitoring Plans
- Comparison of Alternatives
- Implementation Schedule

Affected environment and environmental consequences of implementing alternatives for the Middle Fork John Day Range Planning Area (MFJDRPA) can be found in Chapter 3. The analysis file is referenced throughout this document and contains additional documentation and analysis.

Alternative Development Process

This chapter of the FEIS describes in detail three alternative ways to manage land and resources in the Middle Fork John Day Range Planning Area, Alternative 1 (No Grazing), Alternative 2 (Current Management), and Alternative 3 (Proposed Action). The Proposed Action was developed using the District Ranger's specific direction in the Project Initiation Letter. Public participation to review and comment on proposed activities in the Middle Fork John Day Range Planning Area began in February 1999 and continues with this DEIS. Forest Service resource specialists were part of an interdisciplinary team (IDT) that worked on development of action alternatives. Based on comments received from the public and other agencies, direction given by Forest leadership, and through incorporating Forest Plan amendments, existing State and Federal laws, and Forest Service interim direction, the range of alternatives considered in detail is limited. The alternatives were designed to stay within a framework of ecological stewardship and the Malheur Forest Plan (USDA Forest Service 1990).

One assumption the IDT used in creating the alternatives is that permitted use (as measured in Animal Unit Months, see the tables by allotment in Alternatives 2 and 3, Alternatives Considered in Detail) is the upper limit of use for the life of this analysis. Reductions in permitted use are supported by the Malheur Forest Plan (USDA Forest Service 1990) and other Forest Service decision documents. The Malheur Forest Plan does not establish an absolute level of livestock grazing; instead, annual forage utilization requirements are established in allotment management plans as a tool to achieve or maintain the desired condition (IV-18). Additionally, the Chief of the Forest Service determined in a 9/10/84 appeal decision for the San Juan and Grand Mesa, Uncompahgre and Gunnison National Forests that there is no assurance the projected outputs (from forest plans) will occur. Both grazing alternatives were designed to use adaptive management to move toward desired conditions; adaptive management allows for the upper limit as well as for reductions in permitted use.

In creating the alternatives, the IDT assumed that livestock management is economically feasible in all of the allotments (see Chapter 3, Social and Economic). Additionally, the existing condition identified some range developments such as spring developments, ponds and fences as being in need of maintenance, repair, or reconstruction. Some maintenance, repair, and reconstruction is ongoing under the grazing permits; major work will be analyzed under other NEPA documents (see Appendix A). These projects will improve range conditions and have been discussed in Chapter 3 of this document under Cumulative Effects.

Other assumptions used in designing action alternatives and assessing effects are described under Elements Common to All Grazing Alternatives (this chapter).

Each action alternative analyzed in detail discloses environmental effects associated with its implementation, thereby facilitating a comparison of alternatives. This comparison of effects along with projected environmental consequences detailed in Chapter 3 provides the Responsible Official with information needed to make an informed choice between alternatives.

The IDT and Responsible Official felt the alternatives to be analyzed in detail represented a range of reasonable alternatives (40 CFR 1502.14 (a)) and that they address the Purpose and Need. The “No Action” alternative is required by NEPA. Consideration of the no grazing alternative (Alternative 1) meets the intent of the “No Action” alternative as required by NEPA.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). The following 10 alternatives were considered, but eliminated from detailed consideration for reasons summarized below.

Rest one or more of the allotments for the foreseeable future and cancel the permit/s to improve riparian conditions

This proposal, to rest allotments and cancel permits to improve riparian conditions, was brought forward in responses to the 2002 scoping letter. This alternative is the same as or closely resembles the no-grazing alternative (Alternative 1): it is analyzed in Chapter 3.

Reduce permitted livestock numbers (up to half) in all allotments to improve riparian conditions

Proposals to reduce/cut use by livestock (up to one half) in all the allotments, to reduce the need for monitoring and to improve riparian condition, were brought forward by the IDT, the tribes, and in responses to the 2002 scoping letter. This alternative was eliminated from detailed study because cutting numbers alone without changing management strategy would not meet management objectives, i.e, livestock at any stocking rate would still be expected to congregate in areas under certain conditions (such as late season). Further, adaptive management (part of Alternatives 2 and 3) allows for the reduction of permitted numbers if concerns with management are found.

Use one (or more) of the allotments in the Middle Fork area as a “grassbank” or swing allotment to increase flexibility in use of the allotments

A proposal to use one (or more) of the allotments as a “grassbank” (“an area available to be grazed when other areas need to be rested”) or a “swing” allotment was brought forward by the IDT, the tribes, and in responses to the 2002 scoping letter. This alternative was considered and would not be precluded by any alternative. For example, the vacant Sullens Allotment may be approved for use by livestock through a decision on this EIS, but that decision does not require the Forest to issue a term permit/s for that use. An administrative decision to use the allotment as a swing allotment may be made at any time. Similarly, when a permittee waives use in an allotment for any year, a decision to use that allotment (e.g., by another permittee whose allotment is being prescribed burned) may be made administratively. Since this strategy could be chosen through an administrative decision after the FEIS is completed, it was eliminated from detailed study in this EIS.

Implement the guidance found in "A Course Screening Process for Potential Application in ESA Consultations" and in “Wy-Kan-Ush-Mi Wa-Kish-Wit” (the Tribal Recovery Plan), as recommended by the Columbia River Inter-Tribal Fish Commission (CRITFC)

A proposal to implement the guidance found in "A Course Screening Process for Potential Application in ESA Consultations" and the Tribal Recovery Plan, as recommended by CRITFC was brought up by the tribes during project consultation. The team reviewed that guidance and the “Recommended Habitat Enhancement Actions for the John Day Subbasin”.

We believe objectives of this Range Planning Project are commensurate with the Tribal Recovery Plan/Spirit of the Salmon documents. The purpose and design of this project is to provide grazing while assuring that aquatic and other resources are consistent with the Malheur National Forest Plan and/or move toward meeting Forest Plan standards, as amended, including PACFISH Riparian Management Objectives (RMOs) at a near natural rate of recovery. Specifically, increasing shade to reduce stream temperatures and restricting livestock in areas that do not meet desired conditions are within the scope of this project and effects are described in watershed and aquatic species sections of the EIS. Implementation and effectiveness monitoring are described in Appendix D, the Malheur National Forest Riparian Monitoring Strategy in the DEIS. Finally, adaptive management through monitoring is a design element of the proposed action. Since the action alternatives are commensurate with the Tribal Recovery Plan/Spirit of the Salmon documents, a separate alternative was not needed to follow this guidance recommended by the tribes.

Conduct prescribed burning and tree thinning and harvest to improve quality and quantity of forage (i.e., burn Bear Administrative Pasture, thin lodgepole in Elk Allotment area to improve forage)

The IDT and respondents to the 2002 scoping letter brought up an alternative that conducted prescribed burning and tree thinning and harvest to improve range conditions was considered. The IDT considered this alternative, but eliminated it from detailed analysis because prescribed burning, tree thinning, and harvest are outside the scope of this analysis. Additionally, prescribed burning, tree thinning, and harvest projects in the Middle Fork John Day Range Planning Area are being considered and analyzed under separate NEPA analysis (see Appendix A, Cumulative Effects for a list of projects). These projects would improve quality and quantity of forage and have been discussed in Chapter 3 of this document under Cumulative Effects.

Allow sheep to graze in Sullens Allotment

Members of the public interested in grazing sheep brought up an alternative that would allow sheep to be grazed in Sullens allotment. This alternative was eliminated from detailed analysis in order to limit the scope of the project, and to reduce the complexity of the project and the environmental analysis.

Temporary rest of MFJD River through temporary fencing

A tribe representative recommended temporary fencing be used on the MFJD River in Blue Mtn/West Summit pasture to “rest” portions of the River; they further recommended moving the fence/rested portion down stream from year to year. This alternative was considered. This alternative was considered but eliminated from detailed analysis because it was considered currently unnecessary. A 2004 greenline (Winward 2000) survey found the herbaceous vegetation in potential natural community (a step above late seral) with herbaceous vegetation in a strong upward trend (USDA Forest Service 2005 [2004 end-of-year report, App. A]). This generally puts the area at desired conditions though additional shrub recruitment (from seed, sprout, etc.) is desired. Proposed management of riparian vegetation should maintain or improve conditions for shrubs (see Chapter 3).

Reduce big game (elk and deer)

The IDT brought up and considered an alternative to improve riparian and upland shrub conditions by reducing big game numbers in the planning area. This alternative was eliminated from detailed analysis because big game numbers are determined and set by the State (Oregon Department of Fish and Wildlife). Changing the big game numbers is outside of the scope of Forest Service management, and is therefore outside the scope of this project.

Invigorate and maintain Upper Phipps Meadow range vegetation conditions by using livestock

The range permittee and permittee's consultant brought up a proposal to invigorate and maintain the Upper Phipps Meadow range vegetation condition by grazing livestock at 60% utilization to help eliminate biomass that has accumulated in the pasture. This alternative was considered. It was eliminated from detailed analysis because 60% utilization does not meet Forest Plan standards.

Include proposals to redesignate (or temporarily redesignate) water rights to instream use for fish

A proposal to redesignate or temporarily redesignate USDA Forest Service water rights in the allotments with Forest Service water rights (Bear and Camp Allotments) to instream use for fish was brought forward by the IDT, by the tribes, and in responses to the 2002 scoping letter. This proposal was considered by the IDT. This alternative was eliminated from detailed analysis because temporary redesignation of water rights was considered outside the scope of this analysis (see also Appendix C).

Alternatives Considered in Detail

As described in the Alternative Development section, the No Grazing and two grazing alternatives were analyzed to predict their effect on the environment. The Elements Common to all Grazing Alternatives within the Planning Area section displays assumptions, background information, and design elements common to both Alternative 2 and 3. The basic purpose and design of each alternative is detailed in this section. The Forest Service developed the management requirements, constraints, and mitigation measures to be used as part of the action alternatives. These methods to avoid or mitigate possible undesired consequences of alternatives are described in the next section, Management Requirements, Constraints, and Mitigation Measures, of this chapter. Tables 2-1 through 2-4 at the end of this chapter provide a tabular comparison of alternatives by activity and issue.

The "No Action" alternative is required by NEPA. Consideration of the no grazing alternative (Alternative 1) and the current grazing alternative (Alternative 2) meets the intent of the "No Action" alternative as required by NEPA.

Alternative 1 (No Grazing/No Action)

Purpose and Design:

Alternative 1 represents the 'no grazing' alternative. Under this alternative, all Term Grazing Permits would be canceled. No permits would be issued for the eight affected allotments until and unless a subsequent NEPA decision to re-authorize grazing on any or all of the allotments was made. The purpose of the no-grazing alternative is to describe the effects of cancellation of grazing permits.

Other management activities taking place in the area would continue if Alternative 1 were selected, but no livestock management activities would take place. Activities such as motorized access travel management, road maintenance, dispersed recreation, noxious weed management, and fire protection would be allowed to continue as they currently take place in the Planning Area.

Description of Specific Features:

All Allotments

Permittees would be given two years written advance notice of the cancellation of their permits as provided under 36 CFR 222.4 (a)(1).

All range developments currently in existence on the allotments (such as fences and water developments) would be left in place but not maintained. If removal or maintenance of any developments for other resource needs was desired, subsequent administrative decisions would need to be made regarding those developments. Permittees would be reimbursed for their amortized share of cooperative range improvements where they participated in the development (FSH 1109.13 Chapter 70).

Allotment exterior boundary fences would be assigned to any adjacent permittees for continued maintenance. Private land boundary fences would remain intact with ownership assumed to belong to the private landowner.

As there would be no livestock grazing under this alternative, there would be no mitigation measures related to livestock management. Actions proposed and mitigation measures for livestock distribution, riparian habitat conditions, or other conditions would not be completed under this decision. However, this would not preclude their completion under a subsequent plan and NEPA decision.

Consistency with Forest Plan Standards and Guidelines, as amended

While no grazing would occur in the Middle Fork John Day (MFJD) Range Planning Area in Alternative 1, no Forest Plan amendments would be required to implement this alternative.

Elements Common to all Grazing Alternatives within the Planning Area:

This section displays assumptions, background information, and design elements common to the grazing alternatives, Alternatives 2 and 3. The IDT assumed that, if the following elements are followed, then effects from livestock use will be acceptable.

Deferred and/or rest rotations will be emphasized and implemented

Eliminate or reduce livestock use in the same area at the same time from year to year. Implementation of deferred and/or rest rotational grazing systems will be emphasized in the management of all allotments and in development of the specific Allotment Management Plans (AMP).

Minimize duration of hot-season grazing

Limit duration of hot season grazing in any unit to a maximum of 30 days wherever and whenever possible to reduce pressure on riparian areas and streams. This could be done, for example, by putting livestock on allotments earlier in the year and thus leaving allotments earlier, combining herds to increase number of pastures used, or increasing numbers (intensity) while decreasing duration. In all allotments, in years when range is ready (see Range Readiness in Chapter 6, Glossary), earlier use will be allowed in an effort to minimize the duration of hot-season grazing.

Forest Plan standards and guidelines as amended by PACFISH will be met

Rangeland management strategies and methods that are based on range and other resource science are incorporated into the Allotment Management Plans specific to each allotment/pasture and are commensurate with resource needs. The objective behind these strategies is to manage rangeland and riparian resource conditions to meet or move toward attainment of desired conditions through an ongoing monitoring and adjustment process (adaptive management). They also specifically define the monitoring and protocols (IIT 2004). Monitoring includes identification of designated monitoring areas (DMAs) on sensitive stream reaches (in terms of fish habitat) and establishment of site specific, appropriate thresholds and end-point indicators (including values for residual stubble height, bank alteration, or shrub utilization or shrub architecture – see Chapter 6, Glossary); riparian shrub end-point indicators will apply to aspen and cottonwood. Thresholds and end-point indicators may change during the life of this EIS based on adjustments made in response to monitoring results, timing, or climatic conditions. For riparian resources, recovery to desired conditions must occur at a near natural rate - PACFISH implies that if appropriate end-point indicators are not exceeded and Standards and Guidelines for forage and browse utilization are not exceeded, then effects from livestock use will be acceptable and limited to those that do not carry through to the next year, thereby avoiding cumulative negative effects. Carryover effects of grazing will be minimized so that "near natural" rates of riparian recovery can occur (PACFISH Enclosure B, see Appendix G).

The action alternatives are designed to achieve the near natural rate of recover which would be similar to the rate of recovery that would occur without livestock grazing. The near natural rate of recovery is intended to not have carryover effects from one year to the next. However, due to the nature of grazing and complexities and uncertainties of having livestock move throughout an allotment, some effects would occur, which would be allowable under PACFISH. The Malheur National Forest Riparian Monitoring Strategy (Appendix D) provides a starting point for acceptable level of effects or condition thresholds (endpoint indicators). The intent of PACFISH is that no negative cumulative effects that would retard attainment of riparian management objectives (RMOs) would occur as a result of the project. The action alternatives would have an improving cumulative trend over the life of the EIS.

The DMAs represent use in the most sensitive portion of the pasture, and generally when standards are met at the DMA, standards will be met elsewhere in that pasture (IIT 2004). To provide monitoring results representative of grazing use, small areas where livestock use is affected by range developments (such as at water gaps or areas directly next to fences) or where human use would be expected to be high (such as camp sites) would not be chosen for DMAs.

Adaptive management will be used on all active allotments to move toward desired conditions

Annual Operating Instructions (AOIs) give an approximate schedule for rotation and duration of time in pastures. Actual move dates depend on meeting triggers and end-point indicators. Necessary changes to livestock management (including move dates) will be made through permit administration to ensure thresholds are not exceeded. Management strategies and methods are subject to change in response to various resource conditions, climate, and natural events such as debris torrents or floods.

The monitoring protocol developed by the Interagency Implementation Team (IIT), as amended in 2004 (IIT 2004) and as amended in the future, will be used to determine if grazing is meeting or moving towards desired conditions (see Appendix D, Riparian Monitoring Strategy). Based on these monitoring results, the Forest Service may adjust grazing management using a variety of management tools to adjust timing, intensity, duration and season of use. Methods may be used singly or in combination with each other. These methods could include:

- Changing livestock numbers;
- Changing the time livestock are in pasture (length of use);
- Changing the time of year a pasture is used (season of use);
- Riding/herding/salting (i.e. more intensive management);
- Fencing areas to limit access and use (fences may be permanent or temporary);
- Temporarily curtailing/suspending use (resting pastures); and/or
- Cancellation of grazing permits in whole or in part.

If resting pastures is determined to be needed to improve riparian conditions, rest can be prescribed through administration of the grazing permit.

Animal Unit Months (AUMs), average animal use, and cow/calf pairs

Alternatives 2 and 3 establish a maximum number of Animal Unit Months (AUMs) which allows for a range of permitted animal numbers and season of use for each allotment. AUMs may range from zero to the maximum. AUMs allow flexibility for annual adjustment of both numbers and/or season within the permitted use level. Animal Unit Months (AUMs) listed below in Alternative 2 and 3 tables by allotment are the maximum number that will be permitted in the allotment-number of animals and season of use would be adjusted so as not to exceed the total AUMs. The tables in Alternatives 2 and 3 identify the permit livestock numbers (an average number of livestock) and both the average and maximum period of use which includes the earliest possible “on” dates related to range readiness and the latest dates that livestock are permitted to be on the allotments. The actual livestock numbers and period of use may be adjusted in response to discussions with the permittee and in response to range readiness (the permittee may increase the number of livestock using the allotment while reducing the season of use, or may increase the season of use while reducing the number of livestock). For example, running livestock for the full season (starting at the earliest on date) would require the permittee to reduce the number of livestock (below the permitted number) to meet allowed AUMs. Flexibility that allows for annual adjustments provides a management tool to assure that riparian and rangeland objectives would be met. Under the adaptive management process, animal numbers and season of use may be adjusted annually to protect resources, to meet objectives, or meet permittee operational needs. Changes to numbers and season of use would be displayed in the Annual Operating Instructions.

The permits will display the “average” number of livestock for the “average” season of use (Grazing Permit Admin. Handbook 2209.13, Section 15.13; these dates and numbers may vary year by year in Allotment Operating Instructions, but when combined, will be equal to or less than the permitted AUMs). The grazing permit will display cow/calf pairs, but the decision maker may make an administrative decision to allow other classes of livestock on all of the allotments. The number of animals would be based on permit AUMs.

Endangered Species Act consultation requirements will be followed

All grazing alternatives would implement actions required by the Section 7 ESA consultation process. Changes in livestock management to meet Terms and Conditions of Biological Opinions (for fish, wildlife or plant species) could occur. Continued implementation of such actions that are or could become required through the ESA consultation process would be followed.

Allotment facilities are maintained

Permittees are required to perform all annual maintenance of range improvements (i.e., fences and water developments) assigned in permits. All fences will be functional before animals are turned out onto the pasture being used.

Appropriate administrative actions will occur

Appropriate administrative actions will be taken when the permittee's management is not in compliance with the grazing permit (for example, if fence maintenance is not completed or deferred or rest rotations are not followed). Consequences will occur as described in Forest Service Handbook 2209.13, Sec. 16.21. Under the Terms and Conditions of the Forest Service Term Grazing Permit (Part 2, number 8(b)) the Forest Officer in charge may modify the permitted number to protect resources. This is consistent with Forest Service Manual direction given in FSM 2200, section 2204.3-2 (c), and further detailed within Forest Service Handbook 2209.13, section 16.13.

Currently planned range improvements and practices will be implemented

New fences and developments completed under other decisions would be implemented. The fences and water developments described in Appendix A, would be constructed, but the decisions will occur through categorical exclusion and Decision Memos. Analysis of the effects of these developments will be included as cumulative effects, as appropriate, in this document.

Current management activities unrelated to livestock management would continue

Current management activities taking place in the area that are unrelated to livestock management would continue if Alternative 2 or 3 were selected. Activities including motorized access travel management, road maintenance, recreation, noxious weed treatment, fire protection, and other management actions would still occur in the Planning Area (Appendix A, Cumulative Effects). However, resumption of livestock grazing after prescribed burning or wildfire would be subject to the Forest's post burn grazing guidelines (USDA Forest Service 2003-Appendix B).

Noxious weed strategy

The prevention of the spread or invasion of noxious weeds is an objective common to all alternatives. No treatment of weeds is proposed with this EIS, but the prevention strategy in Appendix J is incorporated into Alternatives 2 and 3 and mitigation (described in Mitigation Measures) will be applied. A major component of the noxious weed strategy relative to livestock management is ongoing District-wide weed treatment; ongoing weed treatment currently involves mechanical and manual treatment to prevent plants from going to seed. The Malheur National Forest is in the process of doing National Environmental Policy Act (NEPA) analysis for invasive plants including noxious weeds-future management of noxious weeds will follow management methods described in this analysis (see also Appendix A).

Alternative 2 (No Change)

Purpose and Design:

The purpose of this alternative (Alternative 2) is to provide grazing while assuring that livestock management is consistent with the Malheur National Forest Plan and/or moves toward meeting aquatic and other resource Forest Plan standards, as amended, including PACFISH Riparian Management Objectives (RMOs) at a near natural rate of recovery. Areas of concern would be dealt with through adaptive management and administrative changes. Alternative 2 is designed to provide continued grazing and meet PACFISH and other Forest direction with minimal changes to the range management improvements (such as fences and water developments).

Alternative 2 is designed to meet PACFISH and other Forest direction, mainly through intensive range management. This alternative uses existing fences, existing water developments and other existing range improvements to control livestock distribution and use. It does not add new improvements, which are included in Alternative 3. The effects of using the existing improvements are included in Chapter 3 of this document, and it is expected that intensive management (by both the permittees and Forest Service) will be required to meet PACFISH and Forest Direction.

Alternative 2 is designed to achieve the near natural rate of recover which would be similar to the rate of recovery that would occur without livestock grazing. The near natural rate of recovery is intended to not have carryover effects from one year to the next. However, due to the nature of grazing and complexities and uncertainties of having livestock move throughout an allotment, some effects would occur, which would be allowable under PACFISH. The Malheur National Forest Riparian Monitoring Strategy (Appendix D) provides a starting point for acceptable level of effects or condition thresholds (endpoint indicators). The intent of PACFISH is that no negative cumulative effects that would retard attainment of riparian management objectives (RMOs) would occur as a result of the project. Alternative 2 would have an improving cumulative trend over the life of the EIS.

Alternative 2 Allotment Specific Actions:

Alternative 2 proposes no physical changes to current management of the eight allotments. This alternative would manage the allotments as they are currently described in their permits and as adjusted (adjustments are documented in permittee's Annual Operating Instructions (AOIs)). Areas of concern would be dealt with through adaptive management and administrative changes (such as change or reduction in timing, intensity, frequency, and duration of use); no physical changes (such as water developments or fence construction), except those already being considered under Categorical Exclusions (CEs), would be implemented. This alternative proposes current livestock management strategies. Alternative 2 utilizes all "Elements Common to all Grazing Alternatives within the Planning Area," described above. Implementation of the allotment management plans that emerge from this analysis are anticipated to be implemented in spring 2006. Maps showing the existing condition (as well as the proposed changes that would be implemented through

Alternative 3) are in the Map Section (Figures 2-8). Cattle would be the permitted livestock on all allotments. The Austin, Elk, and Sullens allotments would be left vacant.

Austin Allotment

Allotment and FS Acres	Average Season of Use	Permit/Average Number	Maximum AUMs
Austin 160 ac.	**N/A-vacant**	**N/A-vacant**	**N/A-vacant**

Bear Allotment

Allotment and FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
Bear 1,480 ac.	**6/1 – 10/15** (5/1-10/15)	**84 Cow/calf pair**	**496 AUMs**

Blue Mountain Allotment

Allotment and FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
Blue Mountain 22,400 ac.	**6/16-10/9** (5/15-10/9)	**163 Cow/calf pair**	**817 AUMs**

Camp Creek Allotment

Allotment and FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
Camp Creek 600 ac.	**6/1-10/30** (5/1-10/30)	**50 Cow/calf pair**	**327 AUMs**

Elk Allotment

Allotment and FS Acres	Average Season of Use	Permit/Average Number	Maximum AUMs
Elk 70 ac.	**N/A-vacant**	**N/A-vacant**	**N/A-vacant**

Lower Middle Fork Allotment

Allotment and FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
Lower Middle Fork 54,500 ac.	**6/1 – 10/31** (5/1-10/31)	**549 Cow/calf pairs***	**3,623 AUMs***

*# of Livestock and AUMs are allotted by permittee (permittee #1 has 150 c/c, 990 AUMs; permittee #2 has 190 c/c, 1254 AUMs, permittee #3 has 209 c/c, 1379 AUMs)

Sullens Allotment

Allotment and FS Acres	Average Season of Use	Permit/Average Number	Maximum AUMs
Sullens 45,000 ac.	**N/A-vacant**	**N/A-vacant**	**N/A-vacant**

Upper Middle Fork Allotment

Allotment and FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
Upper Middle Fork 54,000 ac.	**6/1 – 10/15** (5/1-10/15)	**485 Cow/calf pair**	**2868 AUMs**

Administrative Pastures

Allotment and FS Acres	Season of Use	Maximum Permitted Number	Maximum AUM
Sunshine, Bear, and Blue Mountain Administrative Pastures 490 ac.	**Intermittently**	**No Permit-Limited to Administrative Use**	**No Permit-Limited to Administrative Use**

Consistency with Forest Plan Standards and Guidelines, as amended

No Forest Plan amendments would be required to implement this alternative. Selection of this alternative would be consistent with the Forest Plan, as amended (36 CFR 219.10 (c)).

Alternative 3 (Proposed Action)

The proposed action is an alternative developed early in the NEPA planning process to accomplish stated purposes, needs, and goals based on the best information available at the time. It is the first alternative brought to the public and is used to identify issues and develop other alternatives for further study. Alternative 3 is the proposed action.

Purpose and Design:

Like Alternative 2, the purpose of this alternative is to provide grazing while assuring that livestock management is consistent with the Malheur National Forest Plan and/or moves toward meeting aquatic and other resource Forest Plan standards, as amended, including PACFISH Riparian Management Objectives (RMOs) at a near natural rate of recovery. As in Alternative 2, areas of concern would be dealt with through adaptive management and administrative changes; however, Alternative 3 also utilizes physical changes (such as new water developments, new fence construction, and changes in allotment/pasture configuration) to improve allotment management.

The proposed action is designed to achieve the near natural rate of recover which would be similar to the rate of recovery that would occur without livestock grazing. The near natural rate of recovery is intended to not have carryover effects from one year to the next. However, due to the nature of grazing and complexities and uncertainties of having livestock move throughout an allotment, some effects would occur, which would be allowable under PACFISH. The Malheur National Forest Riparian Monitoring Strategy (Appendix D) provides a starting point for acceptable level of effects or condition thresholds (endpoint indicators). The intent of PACFISH is that no negative cumulative effects that would retard attainment of riparian management objectives (RMOs) would occur as a result of the project.

The proposed action would have an improving cumulative trend over the life of the EIS.

Alternative 3 uses adaptive management to help achieve PACFISH and other Forest direction and provides the same AUMS as Alternative 2. The primary difference between the action alternatives is that Alternative 3 provides management tools in the form of new improvements and other specific actions to increase management flexibility and achieve better distribution of livestock. Generally, less intensive management (by both the permittees and Forest Service) should be required to meet PACFISH and Forest direction with the use of these tools, and by providing upland water, additional upland forage is made accessible.

Proposed Action:

The Forest Supervisor of the Malheur National Forest proposes to continue authorized domestic livestock grazing on six grazing allotments (portions of the original eight allotments would be combined into six allotments) and three administrative pastures within the Upper Middle Fork John Day, Galena, and Camp Creek Watersheds on the Blue Mountain and Prairie City Ranger Districts.

Alternative 3 utilizes all "Elements Common to all Grazing Alternatives within the Planning Area," described above, plus additional proposed actions specific to this alternative. Implementation of the allotment management plans that emerge from this analysis is anticipated to be in spring 2006.

Alternative 3 Allotment Specific Actions:

Most of the needs described in Purpose and Need can be resolved through deferred rotational grazing (or rest rotation depending on the allotment configuration) and adaptive management as described above. The following tables list additional actions necessary to more effectively implement deferred or rest rotational grazing or to further control timing, intensity, frequency, or duration. Maps showing the proposed changes are in the Map Section (Figures 2-8). Cattle would be the permitted livestock on all allotments.

Austin Allotment

FS Acres	Average Season of Use	Permit/Average Number	Maximum AUMs
0 ac.	**N/A**	**N/A**	**N/A**

- Eliminate allotment status because the allotment is vacant and from a range management stand point it would be logical to manage these units with the adjacent allotments to facilitate management of resources.
- Incorporate Bates and western-most pasture (about 80 acres) into Upper Middle Fork allotment.
- Incorporate two eastern Austin Allotment pastures (about 80 acres) into Blue Mountain allotment.

Bear Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
1,710 ac. (incl. Bird Pasture)	**6/1 – 10/15** (5/1-10/15)	**84 Cow/calf pair**	**496 AUMs**

- Add 230-acre Bear administrative pasture to Bear Allotment as new (Bird) pasture. Adding the Bird Pasture to the Bear Allotment will allow for rotational grazing (deferred or rest) and accelerate riparian shrub development on the MFJD River.

Blue Mountain Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
22,480 ac.	**6/16-10/9** (5/15-10/9)	**163 Cow/calf pair**	**817 AUMs**

- Officially incorporate two eastern Austin Allotment pastures (about 80 acres) into Blue Mountain allotment.
- Reconstruct/improve 1 livestock water development at Pie Meadow. Reconstruction is intended to improve flow and increase water storage capacity for livestock thus reducing livestock impact to spring, reducing pressure in areas of Crawford Creek, and increasing saturated soil areas, herbaceous riparian vegetation, and raising/maintaining a high water table to maintain downslope vegetation and water conditions.
- Construct 2 new water developments in Idaho pasture to better distribute cattle to lightly used areas.
- Rest Upper Phipps Meadow Riparian pasture for the life of this AMP (at least 10 years) to allow for riparian vegetation recovery and to improve channel function in the downcut portions of the MFJD River, Squaw Creek, and Summit Creek.

Camp Creek Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
600 ac.	**6/1-10/30** (5/1-10/30)	**50 Cow/calf pair**	**327 AUMs**

- Create watergap on Middle Fork John Day river for Gibbs Pasture to allow for deferred rotational and late-season use of this non-riparian pasture, thus accelerating riparian shrub development on the MFJD River through lessened use of riparian pasture.
- Build structures to deflect livestock trailing on riverbanks in Middle Pasture to improve bank stability on the south side of the MFJD River.

Elk Allotment

FS Acres	Average Season of Use	Permit/Average Number	Maximum AUMs
0 ac.	**N/A**	**N/A**	**N/A**

- Eliminate allotment status because the allotment is vacant and from a range management stand point it would be logical to combine Elk Allotment with Sullens Allotment to facilitate management of resources.
- Incorporate Forest lands into Sullens (about 70 acres) allotment.

Lower Middle Fork Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number*	Maximum AUMs*
54,500 ac.	**6/1 – 10/31** (5/1-10/31)	**549 Cow/calf pairs***	**3,623 AUMs***
▪ Fence spring source at Pizer Meadow to prevent livestock trampling impact to spring and increase saturated soil areas, herbaceous riparian vegetation, and a high water table to maintain downslope vegetation and water conditions; construct water source ¼ mile west of Pizer to better distribute livestock use.			

*# of Livestock and AUMs are allotted by permittee (permittee #1 has 150 c/c, 990 AUMs; permittee #2 has 190 c/c, 1254 AUMs, permittee #3 has 209 c/c, 1379 AUMs)

Sullens Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
45,070 ac. (incl. Elk acres)	**6/16-10/15** (5/15-10/15)	**241 Cattle**	**1266 AUMs**
▪ Officially incorporate Elk allotment (about 70 acres) into Highway pasture of Sullens allotment. ▪ Construct water development at Wigwam Spring to improve livestock grazing distribution in the allotment and reduce livestock impact to spring and increase saturated soil areas, herbaceous riparian vegetation, and a high water table to maintain downslope vegetation and water conditions. ▪ Reconstruct Looney Spring water development, expanding exclosure and moving troughs to reduce livestock trampling impact to spring and improve spring conditions as described under Wigwam Spring. ▪ Construct water development at Squaw Meadows spring to provide off-stream water source to reduce livestock impacts to banks from concentrated use. ▪ Increase # of pastures from 5 to 6. Create North Squaw pasture by subdividing and fencing Savage Pasture into 2 pastures providing for deferred rotational grazing; install 2 cattleguards at road crossings.			

Upper Middle Fork Allotment

FS Acres	Average Season of Use (Maximum Season)	Permit/Average Number	Maximum AUMs
54,080 ac. (incl. Austin acres)	**6/1 – 10/15** (5/1-10/15)	**485 Cow/calf pair**	**2868 AUMs**
▪ Combine Blackeye and Caribou pastures into one pasture called Caribou. ▪ Incorporate Bates Pasture of the Austin allotment (about 80 acres) into Upper Middle Fork allotment to use as a holding pasture; officially incorporate the western-most pasture of the Austin allotment into the Lower Vinegar Pasture of the Upper Middle Fork allotment.			

Administrative Pastures

Area and FS Acres	Season of Use	Average Number	Maximum AUM/AMs
Bear Administrative Pasture Appx. 250 ac.	**See Bear Allotment**	**See Bear Allotment**	**See Bear Allotment**
▪ Bear Administrative Pasture – Add pasture to Bear Allotment, naming it "Bird" Pasture-refer to the Bear Allotment.			

A Project Schedule for the proposed action is found in Chapter 2 under Project Schedule.

Consistency with Forest Plan Standards and Guidelines, as amended

A non-significant Forest Plan amendment would be required to implement Alternative 3. Alternative 3 was designed, in part, to reduce impacts to riparian areas. Selecting Alternative 3 would include a site-specific, non-significant amendment to the Malheur National Forest Plan, as amended. The amendment would convert a 230-acre portion of the Bear Administrative Pasture from MA19 (Administrative Area) to MA2 (Rangeland) since this area would be added to the Bear Allotment as the Bird Pasture.

Selection of this alternative would be consistent with the Forest Plan, as amended (36 CFR 219.10 (c)).

Mitigation Measures

This section on mitigation measures is small because design elements (Elements Common to all Grazing Alternatives within the Planning Area, Chapter 2) are expected to reduce or mitigate most negative effects of livestock grazing, and other actions needed to reduce or mitigate effects of livestock grazing will occur through the adaptive management process. The Forest Service developed the following additional mitigation measures to be used as part of the action alternatives. Throughout the project, all applicable Watershed Management, and Vegetative Management BMPs (General Water Quality Best Management Practices, Pacific Northwest Region 1988) will be used to enable the achievement of water quality standards:

- RM-1: Range Analysis, Allotment Management Plan, Grazing Permit System, and Permittee Operating Plan
- RM-2: Controlling Livestock Numbers and Season of Use
- RM-3: Controlling Livestock Distribution Within Allotments
- RM-4: Rangeland Improvements

Headings in the tables indicate which alternatives a mitigation measure relates to. Unless noted otherwise in the decision document, these management requirements, constraints, and mitigation measures are mandatory if the Responsible Official selects an action alternative for implementation.

Range

Management Requirement/Mitigation Measure	Objective	Responsible Person
Alternatives 3		
New water developments will be constructed by digging a hole approximately 2-6 feet deep, which will allow for the placement of a springbox for water collection. A buried pipe will extend to a water trough, preferably equipped with a limiter switch to conserve water. This trough will be placed well away from the spring source to protect the headworks from possible trampling. If the spring rests in a wet area, an exclosure will be constructed to provide additional protection to the spring source. All headworks and spring sources will be protected by fencing.	To maintain and improve spring conditions.	Range Management Specialist

Watershed

Management Requirement/Mitigation Measure	Objective	Responsible Person
Alternatives 3		
For fence construction along riparian areas, no repeated use of ATVs or other motorized vehicles may occur within riparian areas.	To avoid damaging soil and riparian conditions	Range Management Specialist, Hydrologist, or Fish Biologist

Fisheries

Management Requirement/Mitigation Measure	Objective	Responsible Person
Alternatives 2, 3		
Place salt blocks outside of RHCAs.	Reduce impacts to riparian areas	Range Management Specialist
Alternatives 3		
Emphasize placing new water gaps in portions of channels where fine spawning gravels are not present	Eliminate damage to redds	Range Management Specialist

Terrestrial Wildlife

Management Requirement/Mitigation Measure	Objective	Responsible Person
Alternatives 2, 3,		
Known raptor nests and new raptor nests discovered in or immediately adjacent to the Planning Area will have nest protection and disturbance standards adhered to during fence/water development construction and reconstruction. To conduct these activities during a prohibited date a waiver must be obtained from the District Biologist.	Protect raptor nests from alteration and disturbance	Range Specialist, District Wildlife Biologist
Riparian shrub standards (related to livestock grazing) will apply to cottonwood and aspen.	Improve this "featured" habitat	Range Specialist

Heritage

Management Requirement/Mitigation Measure	Objective	Responsible Person
Alternatives 2, 3		
If monitoring indicates a need for mitigation measures for any or all of the 42 sites, specific mitigation measures will be tailored to meet the conditions at each site. Past experience (see Browning 1996), however, demonstrates that one or more of the following mitigation measures will normally suffice: -The erection of permanent or temporary fence around site perimeters -Altering livestock on/off dates within the allotment in order to lessen disturbance at sites with subsurface components located in areas vulnerable during wet or moist seasons -Data recovery for small lithic scatters with no subsurface component -Streambank stabilization in riparian areas where erosion is threatening a site -Providing alternative water sources for livestock in cases where troughs or stock ponds are within site perimeters. Other mitigation measures may be considered.	Protect NRHP eligible and potentially eligible sites from significant grazing related impacts	District Archaeologist, Range Specialist
Any newly discovered sites located during new survey will be evaluated for NRHP eligibility and submitted to SHPO for concurrence, along with all potential mitigation recommendations (for examples, see above).	Protect NRHP eligible and potentially eligible sites from significant grazing related impacts	District Archaeologist, Range Specialist

Noxious Weeds and Sensitive Plants

Management Requirement/Mitigation Measure	Objective	Responsible Person
Alternatives 2, 3		
Permittees will be provided with a current list of noxious weeds and sensitive plant identification material (and Threatened and Endangered plants if any become listed). A map showing known noxious weed infestations and sensitive plant sites within each allotment will be reviewed at each annual operating meeting. Permittees will be asked to add known noxious weed locations not shown on the map.	To reduce the risk of spreading noxious weeds and protect TES plants	District Botanist, Range Specialist
All equipment used to construct, reconstruct, or maintain water developments and fences will be cleaned in a manner sufficient to prevent noxious weeds from being carried onto the Planning Area. This requirement does not apply to passenger vehicles or other equipment used exclusively on roads. Cleaning will occur off of National Forest System lands. Cleaning will be inspected and approved by the Forest Officer in charge of administering the project.	To reduce the risk of introducing noxious weeds	Range Specialist, District Botanist
Any seed used in the construction, reconstruction, or maintenance of water developments or in restoration projects will be certified weed free.	To reduce the risk of introducing noxious weeds	Range Specialist, District Botanist

Recreation and Visual Corridors

Management Requirement/Mitigation Measure	Objective	Responsible Person
Alternatives 3		
Where there are established dispersed campsites that are not impacting riparian areas, fences would be built as to not eliminate access to sites.	To allow continued use of established dispersed campsites	Range Specialist, Recreation Specialist

Roads/Access

Management Requirement/Mitigation Measure	Objective	Responsible Person
Alternatives 2, 3		
Forest roads will be used in accordance with the Malheur National Forest Road Rules dated 5/16/1991 (USDA Forest Service 1991).	Prevent resource damage; provide safety; protect roads and investment in road	Range Management Specialist

Monitoring Plans

The following monitoring would occur in Alternatives 2 and 3 (see also Appendix D). The direction for monitoring changes or is modified over time. Monitoring will be adjusted to use the most recent direction. Monitoring and evaluation items associated with the allotments include Forest Plan direction, Interagency Implementation Team's (IITs) implementation and effectiveness monitoring, Section 7 conclusions by the Level 1 Team, commitments within the Biological Assessments for the allotments (currently revised annually), terms and conditions within the Biological Opinion for Effects on Steelhead (USFWS), and the Biological Opinion for Effects on bull trout (NOAA).

1. Riparian Monitoring (see also Appendix D)

a) Monitor end of season grazing as defined by PACFISH. Use IIT protocols as modified to conduct Multiple Indicator Monitoring. Monitoring will be done with an Interdisciplinary Team including, at a minimum, a Range Management Specialist and Fishery Biologist or Hydrologist. Monitoring occurs annually on a portion of the allotments as defined by the IIT process.

b) Monitor riparian utilization of herbaceous plants and shrubs during grazing based on a pasture priority basis, on key species in key areas (Designated Monitoring Areas). It is the permittee's responsibility to meet standards; monitoring will be done with an Interdisciplinary Team (see 1.a).

c) Follow and monitor items as required in the USFWS and NOAA-Fisheries end of year monitoring report. Monitoring will be done by Range Management Specialist/s and others as needed.

d) Effectiveness monitoring including greenline (Winward 2000) surveys, channel cross-sections, substrate composition, and channel typing will be done with an Interdisciplinary Team including, at a minimum, a Range Management Specialist and Fishery Biologist or Hydrologist.

e) Monitor Riparian Management Objectives (RMOs-Forest Plan Amendment #29) by performing Level II stream surveys at approximately 10 year intervals. The Forest Watershed/Fisheries Program is responsible.

f) Continue to monitor stream temperatures until restoration efforts on the allotment have been accomplished. Responsibility is the Forest Watershed/Fisheries Program as funding allows.

2. General Rangeland Monitoring

a) On-going monitoring of sensitive upland areas such as spring areas for possible protective measures. District Wildlife Biology and Rangeland Management department responsibility.

b) Monitor utilization of upland forage areas, on key species/ key areas, after the cattle have left in order to better determine the forage variable for elk winter ranges. District Rangeland Management responsibility with assistance from the Wildlife Biology department.

c) Monitor other grazing permit terms and conditions (i.e. improvements maintenance, adherence to Forest Service issued written instruction, etc.) in accordance with District and Forest policy. District Rangeland Management department.

d) Monitor permittee effectiveness in moving cattle prior to meeting Forest Plan utilization standards and guidelines. District Rangeland Management department.
e) Long term effectiveness monitoring will consist of re-surveying key Parker 3-step Clusters (C/T plots) and monitoring cover frequency, establishing and/or re-reading permanent camera points (according to the publication "Recording the Changes"), or other accepted methods described in the Forest Monitoring Guidelines (currently being developed). This should be accomplished during the ten year life cycle of the AMP's. District Rangeland Management department.

3) Heritage Site Protection Monitoring

a) Monitor sites that have exhibited evidence of significant grazing impacts after the implementation of appropriate mitigation measures (as discussed in Chapter 2 under Management Requirements, Constraints, and Mitigation Measures-Heritage) on a regular basis to be determined in consultation with Oregon SHPO. This monitoring will evaluate the effectiveness of implemented mitigations. District Archaeologist.
b) Monitor other NRHP sites or potentially eligible sites in areas of frequent, heavy cattle congregation in order to determine if mitigation measures need to be implemented. District Archaeologist.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in Tables 2-1 through 2-4 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives. Tables 2-2, 2-3, and 2-4 summarize how the alternatives respond to the identified key issues. See Chapter 1 for background on the issues, and Chapter 3 for a complete description of effects and for the scientific basis for results in the comparison table. Acres used in this analysis are approximations based on on-the-ground estimates and computer analysis. Actual figures may vary slightly from these planning numbers.

Table 2-1: Comparison of Alternatives by Activity

Activity	Unit of Measure	Alt. 1 (No Grazing)	Alt. 2 (No Change)	Alt. 3 (PA)
Permitted Animal Unit Months				
Austin	AUMs	0	0*	0
Bear	AUMs	0	496	496
Blue Mountain	AUMs	0	817	817
Camp Creek	AUMs	0	327	327
Elk	AUMs	0	0*	0
Lower Middle Fork	AUMs	0	3,623	3,623
Sullens	AUMs	0	0	1,266
Upper Middle Fork	AUMs	0	2,868	2,868
Acres per allotment				
Austin	Acres	0	0*	0
Bear	Acres	0	1,480	1,710
Blue Mountain	Acres	0	22,400	22,480
Camp Creek	Acres	0	600	600
Elk	Acres	0	0*	0
Lower Middle Fork	Acres	0	54,500	54,500
Sullens	Acres	0	45,000	45,070
Upper Middle Fork	Acres	0	54,000	54,080
Number of new or improved range development structures (including new fences, new water developments, reconstructed water developments)				
Austin	Total #	0	0	0
Bear	Total #	0	0	0
Blue Mountain	Total #	0	0	3
Camp Creek	Total #	0	0	2
Elk	Total #	0	0	0
Lower Middle Fork	Total #	0	0	1
Sullens	Total #	0	0	4
Upper Middle Fork	Total #	0	0	0
Economics				
Permits issued	# of permits	0	5	up to 6
Permitted AUMs	# AUMs	0	8,131	9,397

*These existing but vacant allotments contain about 160 acres (Austin) and 70 acres (Elk) that would remain vacant with no permitted AUMs.

Table 2-2: Comparison of Alternatives by Measurement – Key Issue #1 – Financial Impacts

Measurement	Alt. 1 (NA)	Alt. 2	Alt. 3 (PA)
Permitted AUMs	-	0	0
Operations Cost	+	0	0
Implementation/Improvement Cost	+	0	+
Grazing Receipts to County	0	$25,000	$25,000

Alternative 2 will be used as the baseline for comparison purposes. The table uses 0 (zero) as the baseline, - (minus) to reflect a decrease to the permittee, and + (plus) to reflect an increase to the permittee

Table 2-3: Comparison of Alternatives by Measurement – Key Issue #2 – Aquatic Resources

Measurement	Unit of Measure	Existing Condition	Alt. 1 (NA)	Alt. 2	Alt. 3 (PA)
Percentage of monitored DMAs (or Sensitive Stream Reaches) in late riparian ecological status (or "potential natural condition) including shrub abundance, growth form and age class	%	60%	Increase	Increase	Increase

Table 2-4: Comparison of Alternatives by Measurement – Key Issue #3 – Endangered Species Act Fish

Measurement	Unit of Measure	Alt. 1 (NA)	Alt. 2	Alt. 3 (PA)
Pastures where spawning habitat or potential spawning habitat exists and cattle may graze during spawning periods	Number of pastures where Domestic livestock grazing could trample Redds or egg masses	0	50	50

Project Schedule

Depending on which alternative is decided upon by the Responsible Official, activities included in the decision would occur in approximately the following timescale (Table 2-6).

Table 2-6: Timeframe for MFJD Range Analysis Project Treatments

Activity	2006	2007	2008	2009	2010	2011
Fence/water development/improvement maintenance	X	X	X	X	X	X
Incorporation of allotments/pastures (Austin/Upper Middle Fork, Bird/Bear, Elk/Sullens)	X					
Exclude use/rest pasture (Austin, Blue Mtn)	X					
Water development reconstruction (Blue Mtn., Sullens)	X	X				
Water development/gap/improvement construction (Blue Mtn, Camp Cr., Lower Middle Fork, Sullens)	X	X				
Build structures/fence to deflect use on MFJD (Camp Cr.)	X	X				
Build fence (Sullens)	X	X				
Management requirements/mitigation measures	X	X	X	X	X	X
Monitoring	X	X	X	X	X	X

Identification of the Preferred Alternative

Alternative 3 has been identified as the preferred alternative for the Middle Fork John Day Range Analysis Project. This alternative is described in detail in this chapter under Alternative 3 in Alternatives Considered in Detail and includes Elements Common to All Action Alternatives, Tables 2-1, 2-2, 2-3, and 2-4 as well as Management Requirements and Mitigation Measures described for Alternative 3.

CHAPTER 3. EXISTING CONDITION AND ENVIRONMENTAL CONSEQUENCES

This chapter summarizes the physical, biological, social, and economic environments of the Planning Area and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in the alternatives chapter.

This analysis is organized by resource area, with Vegetation and Range resources first followed by Economics, the resource most significantly affected by the alternatives, followed by the remaining resources. Within each section, the affected environment is described first, followed by the effects of the No Grazing Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.

Introduction

The grazing alternatives (2 and 3) were designed to achieve the near natural rate of recovery which would be similar to the rate of recovery that would occur without livestock grazing. The near natural rate of recovery is intended to not have carryover effects from one year to the next. However, due to the nature of grazing and complexities and uncertainties of having livestock move throughout an allotment, some effects would occur, which would be allowable under PACFISH. The Forest acknowledges that standards would not be met in some years in some locations; however, the Forest would use the adaptive management strategy to respond to those concerns. Effects disclosures in Chapter 3 address the effects of occassionally not meeting standards. The Malheur National Forest Riparian Monitoring Strategy (Appendix D) provides a starting point for acceptable level of effects or condition thresholds (endpoint indicators). The intent of PACFISH is that no negative cumulative effects that would retard attainment of riparian management objectives (RMOs) would occur as a result of the project. The grazing alternatives would have an improving cumulative trend on riparian conditions over the life of the EIS.

Under the no action alternative a natural rate of recovery would occur. This compares to a near natural rate of recovery under alternative 2 and 3. At the present time the science is not available to distinguish between the natural rate of recovery and the near natural rate of recovery. PACFISH allows some effects from grazing under the near natural rate, and slower recovery may occur with Alternatives 2 and 3. Monitoring would be required to distinguish this difference, if it is measurable. Regardless of the rate as discussed above, it could be decades before some plant communities reach high or potential conditions. Return to original conditions on some previously altered sites will be very slow or non-existence (Laycock 1989, Winward 1991).

The existing condition descriptions in the following sections of Chapter 3 show that in some years it has been difficult to meet standards or to reach desired conditions in areas of concern with the range developments that currently exist on the allotments. The IDT expects that by addressing areas of concern, the allotments are more likely to meet standards and more likely to move towards desired conditions. While Alternatives 2 and 3 both address areas of concern through adaptive management, Alternative 3 has added benefits to grazing management and resource conditions. The effects disclosures for Alternative 3 in the following sections emphasize the benefits to grazing management and resource conditions of added range improvements. Improvements under Alternative 3 directly address areas of resource concern and make it easier to meet standards.

The expectation is that grazing standards would be met more often in Alternative 3 than in Alternative 2 because Alternative 3 directly addresses concerns in areas that have not met standards or are not meeting desired conditions. For example in Alternative 3, livestock will still be provided with water near springs, but be excluded from small areas where springs are currently being negatively affected by livestock. In addition, Alternative 3 would have less affect on permittees because it would reduce the need to invoke adapative management techniques. For instance, with more water available in a pasture (Alternative 3), animals may have enough upland or off-stream forage to last for 2 weeks with near-stream forage for 2 weeks, whereas in Alternative 2, animals may only have near-stream forage for 2 weeks. In this case, adaptive management, in the form of reducing season of use in the pasture or another method, may need to be used for Alternative 2 to meet riparian standards, but not for Alternative 3. Situations change from year-to-year and month-to-month, but some form of adaptive management may be required on a more regular basis in Alternative 2 than in Alternative 3.

Specialist Reports

This EIS hereby incorporates by reference the Range, Forest Vegetation, Fire and Fuels, Roads, Wildlife, Soil, Water, Fisheries, Scenery, Recreation, Botany, Heritage, and Socio-Economics Specialist Reports in the Project Record (40 CFR 1502.21). These Specialist Reports are located in each specialist's section of the Project Record and contain the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation that the resource specialists relied upon to reach the conclusions in this EIS.

Watershed Analyses (WAs) for the Galena and Upper Middle Fork John Day River (USDA Forest Service 2002, 1998) were consulted for information for this EIS. Information found in the existing condition of this EIS and the Specialist Reports updates those WAs.

Vegetation and Rangeland Resources

Overview

Vegetation and rangeland resources have been combined in this section because they are closely linked. To give readers a general picture of the analysis area, an overview of upland and riparian conditions is followed by an overview of existing range conditions relative to the entire planning area. Rangeland and upland may be used synonymously, but here, upland will be used to refer to a location of vegetation while rangeland will be used as a range management term. These sections are followed by specific descriptions of the vegetation and range condition for each allotment. Vegetation and Rangeland Resources Specialist Reports in the Project Record discusses conditions on a pasture by pasture basis. Sensitive plants and noxious weeds are present in the planning area and are part of the vegetative condition; they are considered here and are discussed by alternative.

Regulatory Framework

The regulatory framework for vegetation and rangeland management is discussed fully in Chapter 1 under Background, Desired Conditions, and Management Areas and Objectives.

Vegetation

The Regulatory Framework for Watershed applies to Riparian Vegetation. Guidelines and Standards for riparian shrubs apply to shrub-sized aspen and cottonwood, which are technically hardwood trees rather than shrubs. Aspen and cottonwood habitats are classified as riparian areas, regardless of location on the landscape because of the need for either surface or subsurface water for establishment, survival, and growth.

Sensitive Plants

The National Forest Management Act states that federal agencies need to maintain viable populations of all desired native plant species, and this includes our rare sensitive plant species. According to Forest Service Manual direction, the Regional Forester is directed to maintain a list of sensitive plants. This list includes Threatened, endangered and proposed species under the Endangered Species Act as well as sensitive species. Sensitive species are rare species that are threatened by human activities. Management objectives for these species is to manage for them in a way which will not cause them to become threatened or endangered.

Native American Culturally Important Plant Species

Since these lands have been ceded to the U.S. government by Native American tribes, we are committed to manage these resources for the use of these peoples. The Malheur National Forest Land and Resource Management Plan (Forest Plan) recognizes the obligations of Treaty Rights (Appendices – Forest Plan FEIS, Appendix H).

Noxious Weeds

The following laws and policy and direction from the Forest Service Directives System in Forest Service Manuals (FSM) and Forest Service Handbooks (FSH) pretaining to control and management of noxious and non-native species are listed here but not limited to:

Federal Noxious Weed Act of 1974, February 3, 1999 Executive Order on Invasive Species, FSM 2060 Ecosystem Classification, Interpretation, and Application, FSM 2070 Biological Diversity, FSM 2080 Noxious Weed Management, FSH 2090.11 Ecological Classification and Inventory Handbook, FSM 2150 Pesticide-Use Management and Coordination, FSH 2109.14 Pesticide-Use Management and Coordination Handbook, FSH 2509.13 Burned-Area Emergency Rehabilitation Handbook, Oregon State List of Noxious Weeds.

Analysis Methods

This document provides basic rangeland resource information within the Middle Fork John Day Planning Area and will divide the approximately 186,000 acre planning area into eleven subunits (8 grazing allotments and 3 administrative horse pasture) for the purpose of addressing the specific resources.

Forest Service evaluations include Proper Functioning Condition (PFC) Assessments (USDI, 1993), range inspections, long-term trend studies, riparian trend studies, and photo points. In addition, the history of the allotments/pastures, past permittee performance, compliance with utilization standards, on the ground knowledge of area, conversations with permittees, professional judgment, team input, multiple indicator monitoring, condition and trend transects, area ecologists notes, and literature review were used to determine current resource conditions (1950, 2210/2230/2240/2270, 2600 Files).

Information/reports on vegetation and range conditions in the MFJD Range Planning Area were submitted by people including Christopher Christie and Patricia Larson (Project Record). The "methodologies used [in these reports]"…"do not allow for determining condition and trend" and "Both implementation (endpoint indicator) and effectiveness (riparian objective) monitoring is necessary to determine if near natural rates of recovery are being achieved." (USDA Forest Service 2005 [2004 Range End-of-year-report]). This data was examined by the IDT, but was not used in this EIS for the reasons displayed in the End-of-Year Report (USDA Forest Service 2005). The reports were used to help generate the key and other analysis issues described in Chapter 1.

In terms of compliance with utilization, the following information applies:

Between 2000 and 2003, Annual Operating Instructions (AOI) generally specified up to 45% utilization was allowed (roughly equivalent to 4-6 inch end-of-season stubble height in riparian "greenline") in the allotments. In these years 4-inch stubble height (or higher) was considered to meet the standard; 10 of the 27 pastures that met standards (not including rested pastures) had 6 inch or higher end-of-growing-season stubble heights (or end-of-grazing-season if it's later than the growing season).

Between 1992 and 1999, the Forest Plan allowed for up to 55% utilization (usually based on % removed by weight for grass, grasslike, and forbs), but AOIs specified up to 45% utilization until new AMPs were developed.

Dependent on the allotment and pasture, AOIs or Biological Opinions (from Endangered Species Act consultation) specified shrub utilization and bank stability "standards": for example, in Upper Middle Fork Allotment, the AOI did not specify a utilization level so the BO end-point indicator of light utilization was used. Most allotments had a "Light shrub" end-point indicator between 1999 and 2001 (Lt shrub = Light shrub utilization - most shrubs have less than 30% of their leaders up to 4 ½ ' high browsed). In some allotments in 2002 end-point indicator changed to L-M = 'Light to Mod" shrub utilization (Mod shrub = Moderate shrub utilization - most shrubs have less than 60% of their leaders up to 4 ½ ' high browsed). Compliance displayed in the tables by allotment below was based on the indicator for the year monitored.

Vegetation

Several assumptions were made in analyzing information about vegetation conditions. Most of these were related to the use of Plant Association Groups (PAGs) and of structural stages within the Warm Dry Forest Plant Association. Because GIS queries about PAG information were based on different covers from the queries on allotment size, differences in estimates of areas were resolved by adjusting PAG queries proportionately to match estimates of allotment size. Other data were also pro-rated when boundaries of analyzed areas were not the same. An assumption was made that not all structural stages are typical of all plant associations. Prescribed fires were considered to have burned in both Hot, Dry Forest and Warm, Dry Forest PAGs. Pictures in "Photo Series for Quantifying Natural Forest Residues in Common Vegetation Types of the Pacific Northwest" (USDA Forest Service, 1980) represented selected structural stages of the Warm, Dry Forest PAG.

The distribution and other characteristics of vegetation palatable to livestock were characterized using plant associations (Johnson, 1992), plant association groups (PAGs) (Williams, 2002), and structural stage descriptions and data for the project area. Plant associations and PAGs are different levels of classification for plant communities; PAGs are groups of similar plant associations. Their use as a classification system is described in more detail in the section that follows. Structural stages are categories used to describe stand structure or the arrangement and size of trees within forest stands. Plant association and PAG data were queried from the Malheur National Forest GIS. Data for structural stages were obtained from the Upper Middle Fork John Day River Watershed Analysis (USDA Forest Service, 1994), Upper Middle Fork John Day Watershed Analysis Report (USDA Forest Service, 1998), and Galena Watershed Ecosystem Analysis at the Watershed Scale – Watershed Analysis (USDA Forest Service, 1999).

Sensitive Plants

Potential habitat for individual species was identified using field knowledge and photo interpretation. Generally, riparian and natural openings were selected for surveys since these areas contain habitats for most of the species on the July 2004, Region 6 Regional Forester's Sensitive Plant list. The Malheur GIS database and past survey maps were also searched for known locations. Surveyors used a controlled intuitive meander method, surveying areas with high and moderate potential for plant habitat and other areas only incidentally as surveyors traveled between high probability sites. Field surveys were first conducted during the 1999 field season. The Oregon state sensitive species list was revised late in 1999, and as a result, additional surveys for newly added sensitive plants were completed in 2002.

Noxious Weeds

The lands comprising the Malheur National Forest are managed to achieve a desired condition as described in the Forest Land and Resource Management Plan and to maintain a healthy ecosystem. Noxious weeds interfere with the achievement of these desired goals. To achieve the desired condition on the land, noxious weeds have to be managed. The Malheur National Forest emphasizes that the first and most important aspect of noxious weed management is a prevention strategy (see Appendix J for USDA-Forest Service, Guide to Noxious Weed Prevention Practices). The primary method to the prevention of noxious weeds is to detect and ameliorate (improve) the conditions that cause or favor the presence of competing or unwanted vegetation, i.e. Maintain healthy, desirable plan communities. In addition, prevention includes education of both administrative personnel and the public. Currently the Forest does not have an approved noxious weed management plan. This has effectively limited control to manual and biological treatments. In several areas, various species of biological controls have been applied to different infestations with varying results. This project contains no specific treatment of noxious weeds.

Much of the planning area has been inventoried for the presence of Noxious Weeds. The Malheur National Forest uses the 2004 Grant County noxious weed list and the State weed list to survey and document weed sightings. The listed weed species are the priority for implementing weed prevention practices in cooperation with adjacent landowners and partners (see Appendix J). All sites have been entered into the Forest TERRA data base and mapped, after January 2004.

Existing Condition

Vegetation

The vegetation section is organized into three broad groupings. The first part includes the Classification of Plant Communities. The second part is a discussion of Upland Vegetation with an overview and discussions on non-forested and forested vegetation; the discussion is organized by Plant Association Groups or similar categories of vegetation. The third part is a discussion of riparian vegetation, including aspen and cottonwood and sections based on riparian features. “Streamside and Floodplain” is based on three categories of drainages: fish-bearing and perennial streams, intermittent streams, and ephemeral draws.

Native American Culturally Important Plant Species

These plant species (including aspen, cottonwood, native riparian shrubs, and native forbs and grasses) are important for stable ecosystems, wildlife habitat, and human uses. Since these lands have been ceded to the U.S. government by Native American tribes, we are committed to manage these resources for the use of these peoples. Nearly all native plants have traditional uses and these uses are considered in all management considerations.

Classification of Plant Communities (Plant Associations and Plant Association Groups)

The plant association concept is used in the Blue Mountains to classify and characterize vegetation based on successional relationships and probable climax species. Plant association groups (PAGs) are broad potential vegetation classes with similar temperature and moisture conditions, and similar structure. For example, the "Hot Dry Upland Forest" PAG includes a variety of ponderosa pine forests with sagebrush or bunchgrass understory.

Plant associations are based on the concept that, if a stand of vegetation is able to develop and persist in its environment, and if the competitive forces are without major disturbing influence, then following a relatively long period of time those plants capable of reproducing in competition will constitute the "climax community". The unit of classification based on the probable, or projected, climax community type is defined as the "plant association". As a combination of similar to compensating environmental factors are repeated across the landscape, a predictable plant community will occupy those sites given time and the lack of disturbance. This will be a climax community comprising the basis of the plant association. (Johnson, 1992). Plant associations are abstract classification terms. Plant communities are concrete entities on the landscape, recognizable and tangible to the field observer.

The landscape in the Blue Mountains has undergone and continues to undergo modifications that prevent the formation of long-term stable plant communities. Both natural events (i.e. fire) and human-induced activities (i.e. timber harvest) tend to forestall or disrupt the natural development of vegetation that would result in communities with more stable composition and structure. Succession may be arrested (i. e. maintained by fire at a particular stage), accelerated (i.e. mortality of earlier seral tree species from insects, diseases, and windthrow), and retarded (i.e. continued ungulate grazing pressure which degrades the grassland from perennial to annual vegetation dominance). (Johnson, 1992).

Plant associations are the "units" or building blocks on which broader classifications such as PAGs are organized. The plant associations discussed in this document are described in "Plant Associations of the Blue and Ochoco Mountains" (Johnson, 1992). The PAGs discussed in this document are described in a letter of direction (Blue Mountain National Forests, 2002).

Structural stages are categories used to describe stand structure. They are used to classify forest vegetation based on its vertical and horizontal arrangement and size. These characteristics are influenced by the dominant processes of growth, development, competition, and mortality. Seven structural stages have been defined.

Production of vegetation palatable to livestock varies by forest plant association, even between associations grouped into PAGs. Generally vegetation palatable to livestock is characteristic of at least one plant association, during at least one seral or structural stage, within most PAGs; often vegetation palatable to livestock is not typical of the majority of plant associations. Exceptions to this generalization are the Warm Dry Forest and Hot Dry Forest PAGs. Most plant associations included in the Warm Dry Forest and Hot Dry Forest PAGs are characterized by ground vegetation that is palatable to livestock during most structural stages.

Upland Vegetation

Rangelands (MA 2) are described in the Forest Plan as non-forested grasslands and low elevation ponderosa pine sites unsuitable for timber production. Ground and shrub vegetation in this management area and in other management areas throughout the Project Area is available for use by cattle and wild ungulates as described in Chapter 1 under the Background, Desired Conditions, and Management Areas and Objectives sections. The Middle Fork planning area is mostly forested. About 7% (13,000 ac.) is non-forested. Upland non-forested areas comprise only 1-2% (2,000-4,000 ac.) of the project area. Cattle graze in upland portions of the project area that provide vegetation palatable to livestock.

Plant communities classified in the Warm Dry Forest and Hot Dry Forest Plant Association Groups (PAGs) typically produce understory vegetation, chiefly elk sedge, pinegrass, and some bunchgrass, that is palatable to livestock. These communities provide the majority of vegetation palatable to livestock in the project area because of forest stand characteristics, because, combined, they are among the most extensive PAGs in the project area, and because non-forested plant communities, which often, elsewhere, provide vegetation palatable to livestock, comprise such a small proportion of the project area. The Warm Dry Forest and Hot Dry Forest PAGs cover about 47% of the project area.

Activities since European contact in the mid-1800s have influenced the upland vegetation, including that classified in the Warm Dry Forest and Hot Dry Forest PAGs, in complex ways. The exclusion of fire combined with timber harvest and various stand treatments has resulted in a mosaic of conditions which is considered to differ from the mosaic that was created by natural disturbances prior to European contact. The Area Ecologist prepared a report for grazing permit renewal or continuation in which the vegetation condition on the allotments was characterized as being outside the natural range of variation in 1995 (Johnson, 1995). The reasons for this characterization are that activities have either been too severe for the ecosystems to sustain or that natural ecosystem “maintenance” disturbance processes have not occurred for at least the last 50 years. These changes have affected both stands that typically provide vegetation palatable to livestock and those which usually do not.

The historic shift in conditions has been modified slightly since the mid-1990s as much of the stand management implemented since that time has been directed toward developing conditions that would allow the re-introduction of fire, particularly, low intensity, high frequency burns. This shift in management has occurred predominantly in the Warm Dry Forest and Hot Dry Forest PAGs where low intensity, high frequency fires are typical. These more recent forest treatments (since about 1995) were designed to move vegetation condition toward the natural range of variation. These kinds of treatments have been implemented to date on a relatively small portion of the project area. They are expected to continue to be implemented; projects including these kinds of treatments are proposed for the foreseeable future and are included in Appendix A, List of Projects considered for Cumulative Effects. Examination of structural stage data included in watershed analyses and analysis by the project’s silviculturist and fuels specialist confirm shifts in vegetation conditions for several PAGs, including some structural stages of the Warm Dry Forest and the Hot Dry Forest, remain.

Fire, or rather its exclusion, is the element of the ecosystem which has had the most profound influence on the quality of the plant communities, particularly, on the forested communities, since the intensive grazing period of the late 1880s and early 1900s. The effect of curtailment of the normal fire cycle in fire adapted plant communities over time has been pronounced during the past 50 years (Johnson 1995) as intervals between fires lengthened beyond the natural range resulting in an accumulation of biomass. The exclusion of fire has resulted in many forested stands that are denser now than before European contact. The effect of development of denser stands on vegetation palatable to livestock is discussed in more detail by PAG later in this section.

Johnson (1995) also ascribes changes in stand conditions to incursions by administrative projects to harvest trees. The 1995 Middle Fork WA indicates that about 13,500 acres across the project area have been harvested under various prescriptions in about the previous 30 years; other changes including the Summit Burn and subsequent harvest and additional harvest elsewhere in the project area is estimated to have increased treated areas to about 25,000 acres. More recent treatments have included higher proportions of commercial thinning. Prescribe burns were implemented on up to 10,000 acres (includes areas burned more than once), primarily in Lower and Upper Middle Fork allotments, in the last 12 years and in the late 1980s (about 2200 acres). These treatments which allow the re-introduction of fire also create conditions favorable to the growth of vegetation palatable to livestock.

Precommercial thinning in some forest types has tended to move stands towards a more natural fire seral stage. Recent harvest (since the mid-1990s) in some forest types has included a high proportion of commercial thinning which also moves treated stands towards a more desirable condition relative to expected fire regimes. However the bulk of timber harvest - harvest before about 1990 - favored the removal of larger, fire seral trees and compounded the effects of curtailing the natural fire regime. Overall, harvest and exclusion of fire together have resulted in overstocking and/or the promotion of later seral tree species over about half of the forested landscape or 70 percent of the forested landscape in which grass or grass-like plants are the expected ground cover (Hot Dry Forest; Warm Dry Forest; and some plants associations included in Cold, Dry Forest; Cool, Dry Forest; and Cool, Moist Forest PAGs). These plant communities are now outside the natural range of variation (Johnson, 1995).

Although vegetation palatable to livestock is produced primarily in the Warm Dry Forest and the Hot Dry Forest PAGs, the removal of larger trees coupled with removal of fire from the ecosystem across the landscape has led to conditions which affect the overall rangeland/allotment health and production. Harvest which favored the removal of fires seral tree species resulted in the promotion of later seral tree species. This effect is observed in the portion of the Warm Dry PAG in which grand fir or Douglas fir are the climax species as well as in other forested PAGs. Stands in several PAGs or structural stages within a given PAG are overstocked with ponderosa pine, Douglas fir, grand fir and lodgepole pine. Some of these stands that formerly provided vegetation palatable to livestock now have conditions, such as dense undergrowth of small sized trees and brush and downed dead timber, which limit access to livestock as well as reducing the amount of ground vegetation. The exclusion of fire and lack of adequate timber harvest resulted in a loss of area suitable to cattle grazing and has resulted in reduced forage production which has only recently begun to be addressed. At the time of his report (1995), Johnson indicates that, for these reasons, it is difficult to state that overall upland range conditions are continuing to improve as the reverse may be more appropriate in these forest stands. Maintenance of these conditions has the potential effect of forcing grazing livestock and wildlife onto fewer total acres of the allotment. The pattern of disturbance in cool moist forest and cold moist and dry forest PAGs has been altered although the typical lack of vegetation palatable to livestock make these changes less important directly to range management. These conditions are discussed in more detail by PAG later in this section.

The portions of the Warm Dry Forest PAG dominated by Douglas fir or grand fir (65,000 acres) have been affected to a greater extent by harvest and fire exclusion than either the portion of the Warm Dry PAG dominated by ponderosa pine or the Hot Dry Forest PAG. Examination of structural stand data included in watershed analyses and analysis by the silviculturist and fuels specialist indicate that portions of the dry forests and some of the moist forests have accumulated biomass and experienced lengthened fire free intervals.

Many of the pine dominated stands of the Warm Dry Forest or Hot Dry Forest PAGs (totaling about 21,000 acres), in which grass or grass-like plants are the expected ground cover have either been treated to be within stocking levels expected with frequent low intensity fire or, on the driest, forested ground, have only moderate amounts of overstocking, probably due to lack of water availability in the residual soils. Conditions on these portions of the dry forests may vary from those present historically but remain conducive to providing vegetation palatable to livestock.

Cool dry and cold (either moist or dry) forests, which generally do not provide ground vegetation that is palatable to livestock, are considered to be within the expected fire return interval, canopy closure range, and fuels accumulation. The changes in the dry forests (Hot Dry and Warm Dry PAGs) have most directly influenced vegetation that is palatable to livestock. These conditions are discussed below in more detail by PAG.

Plant communities classified in other upland PAGs such as the various upland herblands, shrublands, and woodlands may produce vegetation palatable to livestock. Together these PAGs cover about 1-2 % of the project area. However due to several factors, cattle do not appear to be using the vegetation in some of these areas. Low elevation plant communities in these PAGs in the project area either do not produce vegetation palatable to livestock since the former project botanist observed little sign of livestock use in various locations (Wood 2002) or the uneven ground (fissured bedrock or other rocky soils interspersed with herbland soils) acts as a barrier to cattle movement and use of this vegetation. High elevation grasslands and meadows are often located above dense forest stands which produce little ground vegetation or steep ground, either of which acts as a natural barrier to cattle movement. Dry to moist meadows at low to mid elevations may produce vegetation that is palatable to livestock but these are small and widely distributed, and probably total less than 1000 acres. Typically plant communities classified in other forested PAGs do not produce vegetation that is palatable to livestock.

The Area Ecologist describes a substantial increase of invasive plants across the both range and forested lands. Invasive plants in this context include trees which are encroaching in stands either where they would not naturally occur in the presence of fire or in greater densities than would be expected under natural fire regimes. In addition, numerous roads and old harvest units and landings contain populations of aggressive, exotic perennial grasses (such as intermediate wheat grass, orchard grass, timothy) that both produce forage and provide sources of invasion of otherwise intact native plant communities within the planning area. Noxious weed populations, mostly near roads, threaten a few upland grassland sites.

Annual grasses (cheatgrass, venenata, & medusahead) occur, but mostly lower in the watershed. These aggressive weeds, exotic and annual grasses present the most immediate threat to native plant communities (see below, for further discussion of weeds).

The characteristics of PAGs and their importance in providing vegetation palatable to livestock are discussed later in this section and includes discussion of the departure from the natural range of variation for some plant communities. Specific allotment descriptions contain additional details. More discussion of vegetation actually used by cattle is included in the Range section.

NON-FOREST VEGETATION:

The non-forested uplands are composed of herblands, shrublands, and woodlands (Blue Mountain National Forests, 2002). Herblands include scablands; grasslands; small, dry meadow openings within forested areas; sub-alpine steppe meadows, large ridge areas of dry grasslands, and riparian areas (Wood 2002). The terms meadow, grasslands, and scablands are used interchangeably with herblands in this document. Shrublands include both areas with upland shrub species and riparian species. Woodlands are usually dominated by either juniper or aspen. Riparian areas are discussed below in the riparian vegetation section.

Mapped non-forested uplands make up about 1-2% (2,000-4,000 ac.) of the Planning Area (Project Record). Non-forested uplands also occur as small openings (generally < 1 ac.) within forest stands. These openings are found primarily within the Hot Dry and Warm Dry forests and are included in the forest vegetation discussion along with herbaceous ground cover.

Most non-forested uplands are dominated by grasses or grass-like plants although shrubs also occur on scablands and sub-alpine steppe meadows. The condition and trend of each type of non-forested upland is discussed below. Recent condition and trend plot data are available for dry meadows and other meadows.

According to the Area Ecologist most non-forested uplands within the Planning Area have improved markedly since the 1970s due to an increased awareness by permittees and public land administrators. One exception is the dry meadows in the project area for which Condition and Trend (C/T) plots, remeasured in 2003, showed a declining trend. Impacts at the turn of the century and continuing into the 1950s were often too severe for the dry, warm non-forested communities to sustain. The result was degraded rangeland ecosystems with little opportunity (time) for natural rectification (reasserting of balance) of the natural community. He notes the improvements since the 1970s were mainly where rotational grazing (deferred or rest) was implemented, generally with added fencing. Areas that have not improved in condition are included in the discussion below.

Grasslands and scablands:

Scablands and grasslands generally occur at lower elevations on benches above the Middle Fork John Day River valley floor. The scablands are areas of "very shallow, very stony soils" and are most common over basalt bedrock (Wood 2002). They support either grassland or shrub plant associations. The condition of the shrubs in these areas is similar to that described for shrub lands below. These areas appear to provide little vegetation that is used by livestock either because it is not palatable or the fissured bedrock conditions intermingled with soil are a barrier to livestock movement and use.

With the exception of the high elevation subalpine meadows around Vinegar Hill and Indian Rock, most of the upland grasslands and scablands of the MFJD drainage are in mid to late seral stages and fairly good ecological condition (Wood 2002) although indicators of concerns were identified. These indicators include pedestaling. Grasslands and scabs in the vicinity of Butte and Caribou creeks were rated in various seral stages and conditions (Wood 2002), partly due to historic grazing and current shrub by wildlife.

A large "Palousian" (gently rolling grassland) bunchgrass ridge is located north of McKinney Creek near the western boundary of the Planning Area and the Forest. These productive, late seral stands of dry native grasses appear to be in good condition.

Threats to the ecological integrity of these areas come primarily from ground disturbance that facilitates the spread of exotic plant species, including, but not limited to, noxious weeds. Increased use by ungulates increases ground disturbance, accelerating conversion to exotics and loss of the highly productive late seral perennial bunchgrasses.

Dry meadows:

Dry meadows are found as openings within the forest matrix of the Planning Area. These range in size from three acres to one hundred acres. Numerous, smaller openings, too small to map, are also present throughout the planning area, as described under Forest Vegetation. These areas provide vegetation palatable to livestock.

Condition and trend (C/T) plots were read in 1999 or 2003 for three areas classified as dry meadow forty to fifty years ago. One of these (Pie Meadow) appears to have been a partially moist to wet meadow prior to construction of a railroad grade through it before WWII The initial sampling of the C/T plots after WWII classified it as a dry meadow. Because much of it is still moist to wet, it is included in the discussion of moist and wet meadows in the Riparian Vegetation by Allotment Report. The remaining two dry meadow C/T plots indicate that vegetation in dry meadows is in poor to fair condition with a downward trend. The reason for the downward trend has not been identified. In addition two C/T plots in areas originally classified as other kinds of meadows are located in areas more typical of dry meadows or grasslands/scablands. These two plots were in fair and excellent condition with a generally downward trend. It is the combined professional judgment of the team that conditions in the majority of other dry meadows are similar to those sampled with C/T plots, although, overall, the range of conditions is wider. Exceptions to the general condition are included in discussions of specific allotments and pastures.

Sub-alpine steppe meadows:

Sub-alpine steppe meadows are found on exposed ridges such as Vinegar Hill, Boulder Butte, and Indian Rock along the Greenhorn Mountain crest and Dixie Butte on the opposite side of the valley (1999 WA). These support grasses, mountain big sage, and many forbs limited to higher elevations. They occur in a mosaic with forested stands, commonly sub-alpine fir, spruce, or aspen. Portions of these meadows retain native plant communities typical of early seral stages of more productive perennial grasslands. These areas produce vegetation at various levels that is palatable to livestock; but, typically, livestock do not use these areas since they are located above natural barriers (either steep slopes or extensive areas of forested stands which do not provide vegetation palatable to livestock) to livestock movement.

The Area Ecologist reports that the upper crest of the Greenhorns has severely denuded meadows and non-forest slopes which have not rebounded from excessive domestic sheep grazing. The native perennial decreaser plants (plants that tend to decrease due to their high palatability to grazers) are gone. Restoration and intervention is necessary for returning native perennial decreasers. The former District botanist indicates that the plant species composition in a substantial portion of these meadows has been altered probably beyond their capability to recover or even be actively restored; the Area Ecologist indicates that active restoration would require a substantial commitment. Extensive historic sheep grazing compacted and initiated erosion, resulting in the loss of topsoil and the native perennial grass cover and conversion to large stands of non-native flleeceflower and an abundance of increaser species such as mountain brome, phlox, yarrow, and hawksbeard.

Shrubs and Shrub lands:

Shrub lands are generally found as isolated stands of mountain mahogany on rocky ridges with minimum soil or as either sagebrush stands in the subalpine steppe or as bitterbrush stands on scabs, both of which were incorporated into the grassland/scab descriptions above. These areas generally do not provide vegetation palatable to livestock.

The upland shrub component does not reflect the general improvement in range conditions. In general, continued use by ungulates coupled with lack of periodic under burning has kept the shrub population in a deteriorated state. Several shrub species are at risk of elimination from the local ecosystem. The shrub species most palatable to big game are in decline throughout the uplands (C. Johnson 1995, J. Wood 2002). All shrub species, both those under canopy and those predominating in scabland plant associations occur at low frequency and in poor condition. Recruitment of young shrubs of all species is low to nonexistent for a combination of reasons, including heavy browsing that eliminates reproduction, soil disruption and compaction that degrade the seedbed, and canopy closure that reduces the light-rich habitat many shrub species require to thrive. Likewise, the aspen and cottonwood stands are mostly stagnant or decadent due to a combination of human impacts: changes in hydrologic regimes, fire suppression, and intense browsing by unnaturally high populations of ungulates. The increase in elk populations may be offsetting the decline in domestic livestock use and the ability of the rested vegetation to continue its upward trend. More timely and frequent monitoring is needed to ascertain total cause and affect, however (C. Johnson, 1995).

Continued use by wild and domestic ungulates coupled with a lack of periodic underburning has kept the shrub population in a deteriorated state. Some shrubs have ceased to occupy sites as a result of insufficient reproduction for sustaining the population (Johnson, 1995).

Also see discussion of the shrub component of forest stands below.

FOREST VEGETATION

Conifer forests cover about 93 % (about 173, 000 ac*)* of the Analysis Area. Forest vegetation includes “forest stands” and additional canopy layers such as shrubs and live ground cover found below the forest canopy. Distribution of forest stands is chiefly controlled by soils, aspect, and elevation. Forest vegetation is grouped by plant associations into Plant Association Groups (PAG) which are similar to biophysical environments. PAGs are the basis of both the general discussion of forest vegetation, including live ground cover, found below and the allotment specific discussions found later in this section. Live ground cover, if present, is a source of forage for cows and wild ungulates.

Forested PAGs range from Hot Dry to Cold Dry and include forest types such as ponderosa pine, mixed conifer, lodgepole, and subalpine fir. Representation of the sub-canopy components varies based on the biophysical environment and varies from near zero amounts under the densest stands to greater than 90% in open stands where soil moisture is sufficient The distribution of forested PAGs by pasture is shown by allotment in tables below. Forest stands contain numerous openings that are too small to be mapped, generally less than one acre in size. Because of their small size, these openings are usually vegetated with ground cover similar to that of the adjacent forest or, for the larger openings, a slightly drier plant association. When these openings are created by shallow soils or rock, plant associations may be quite different from the ground cover present in the adjacent forested area and is often less abundant. These drier areas may resemble the scablands/grasslands or dry meadows described above.

Upland vegetative cover for the allotment consists of bluebunch wheatgrass plant communities, pinegrass-elk sedge communities and Idaho Fescue. Based on Forest Service records, most of the uplands on the Blue Mountain Allotment have an upward trend, however, the acres available for forage are decreasing over time due to the ingrowth of young trees in many forested stands in the absence of fire.

Blue bunch wheatgrass, Idaho fescue, elk sedge, and pinegrass remain common and abundant in most ponderosa pine stands in the Hot Dry biophysical environment and to a lesser extent in a portion of the Warm Dry biophysical environment. Pinegrass and forbs dominate live ground cover in the Warm Dry forests.

Shrubs are not a major component in most of the forested plant associations found in the Planning Area. Many of the shrubs that are present are dependent on gaps in the forest canopy for both establishment and maximum growth, and tend to be sparsely represented in much of the planning area due to historic fire suppression and current canopy closure (e.g. mountain mahogany, Scouler willow, snowbush ceanothus) with the exception of the Summit Burn area in the Lower Middle Fork Allotment.

Generally the forested upland portion of this allotment is overstocked with ponderosa pine, Douglas fir, grand fir and lodgepole pine. Many of these stands have limited access to livestock due to dense undergrowth of small sized trees and brush as well as downed dead timber. Lack of fire and adequate timber harvest has resulted in a loss of area suitable to cattle grazing and has resulted in reduced forage production. This has the potential effect of forcing grazing livestock and wildlife onto fewer total acres of the allotment. This is also the situation on the other allotments within the planning area as well.

A summary of the condition of forest vegetation based on PAGs follows. This distribution does not appear to match the data from 1936 showing ponderosa pine forests over about 2/3 of the Planning Area. Natural fire would have maintained a higher percentage of open grown pine in cool moist forest than is now present.

ICBEMP mapping of forest conditions in 1936 shows extensive pine forests of various diameters throughout the Middle Fork Planning Area. (NOTE: the distribution of diameters presented was probably influenced by contemporaneous railroad logging.) These forests occurred in the Hot Dry and Warm Dry PAGs on either residual or ash soils. Although the Warm Dry PAGs may be dominated by pine, Douglas fir, or grand fir, according to the 1936 map, much of this area was dominated by ponderosa pine, probably due to the lasting influence of the earlier low intensity, high frequency fires. Some of these areas are still dominated by ponderosa pine; others have grown in with mature Douglas fir or grand fir. The results of C/T plots indicate that the areas dominated by pine are generally in fair to excellent condition and in an upward trend for grass/forb vegetation and soil with a couple of exceptions. These are discussed in more detail in the allotment discussions. No C/T plot data are available for stands dominated by Douglas fir or grand fir.

The historic exclusion of fire has differentially affected the species mix present in these two PAGs. Historically, in the presence of fire, most of these areas were maintained in relatively open condition with crown closure ranging from 20-40% in most Hot Dry areas. Crown cover probably ranged from 40 to 90% in a mosaic pattern in the Warm Dry PAGs. Hot Dry areas, often on residual soils, have generally retained ponderosa pine as the dominant and most abundant species although much of these areas are considered moderately overstocked with crown cover approaching 40%. A few of the Hot Dry ponderosa pine stand, especially in the Bear Allotment, are considered heavily overstocked and are believed to support less than half the amount of live ground cover found in the fully stocked or moderately overstocked stands. Precommercial and commercial thinning and prescribed fire over much of the north side of the Planning Area has maintained stand conditions which are similar to historic ones.

Evaluation of vegetation palatable to livestock is based on observations by the Area Ecologist, range conservationists and other vegetation specialists.

Hot Dry: Hot Dry PAGs, often on residual soils, are the historically open, park-like stands of ponderosa pine. They total about 3% (4,500 ac.) of the analysis area. They have generally retained ponderosa pine as the dominant and most abundant species although much of these areas are considered moderately overstocked with crown cover approaching 40%. Live ground cover in these stands is generally believed to be about 90% or greater of what is expected because ingrowth of trees is limited by soil moisture content in late summer. Many of these areas were pre-commercially thinned in the 1980s. Much of the area was burned with low intensity prescribed fire after 1990. These activities helped maintain the open canopy and the high amount of live ground cover. Several C/T plots located either in the pine dominated stands of this PAG or the Warm Dry Forest PAG indicate that range conditions are generally in an upward trend. A few of the Hot Dry ponderosa pine stands, especially in the Bear Allotment, are considered heavily overstocked and are believed to support less than half the amount of live ground cover found in the fully stocked or moderately overstocked stands. Shrubs are a minor component in these plant associations according to Johnson (1992).

Warm Dry: These forest stands compose approximately 81,500 ac. or 44% of the Planning Area, generally at mid elevations. They are more common on the north-facing slopes south of the MFJDR and at mid elevations on the north side. A complex interaction among several processes, both natural and human-induced, influences on stands in this PAG have combined to influence The forest species mix in much of the Warm Dry biophysical environment has been converted from one of mostly ponderosa pine, maintained by frequent, low intensity fire, to a mosaic with numerous stands closer to that of the biological climax forest which develops in the absence of fire. Instead of open pine stands similar to those described for the hot forest, some stands are a denser mixture of pine, Douglas fir and grand fir. Currently crown closure currently ranges from 40 to 90% depending on the dominant species. Live ground cover also occurs in a mosaic, depending on crown closure, and ranges from near zero to about 80% of the potential under the more open, fire maintained condition. Elk sedge or pinegrass tends to dominate the ground cover. Also, substantial portions of plant communities in this PAG have shifted to early structural stages as a result of large fires, resulting in an increase in vegetation palatable to livestock for several reasons related to structural or seral stage characteristics.

Also within this area are stands which transition between the ponderosa pine forests maintained by fire and the grand fir forests which burn with a “mixed fire regime”. A “mixed fire regime” is one that burns with relatively low intensity over about 70% of the burn area and with higher intensity which often kills individual or patches of trees over a total of about 30% of the area burned.

Several C/T plots located either in the pine dominated stands of this PAG or the Hot Dry Forest PAG indicate that range conditions are generally in an upward trend. No C/T plots were located in stands dominated by Douglas fir or grand fir. Most of the structural stages of the plant communities in this PAG produce vegetation palatable to livestock. Structural stage, species composition, and harvest information provided in watershed analysis (USDA Forest Service, 1994, December 1998, and June 1999) and other data (USDA Forest Service, May 1980) were interpreted and used to further characterize conditions in this PAG. The exclusion of fire has resulted in overstocking of ponderosa pine stands and mixed fire regime stands and to encroachment of both Douglass fir and grand fir into stands which were historically maintained by fire as ponderosa pine dominated. Neither overstocking nor encroachment in the plant communities of this PAG necessarily result in dense canopies because, often, the limiting factor for tree growth is soil water. The “stem exclusion closed canopy” structural stage has increased the most; the increase is estimated to be about thirty per cent compared to the natural distribution of structural stages. At this stage, the residual soils can support a stand which is characterized by at least 70% canopy closure with the bulk of the trees ranging from 5-25 inches in diameter. The predominance of the "stem exclusion closed canopy" stage is partially due to stand condition following the logging of the early to mid twentieth century and subsequent stand growth. The understory (re)initiation and young forest multi strata stages have increased by a smaller amount. The biggest reduction has occurred in the old forest single stratum stage. Other structural stages are represented at near historic levels. Harvest treatments since 1995 have reduced the formerly, more pronounced shift toward denser stands. Stands in the "stem exclusion closed canopy" stage naturally produce vegetation palatable to livestock at lower levels than the other structural stages because of the nearly closed canopy. The effect of overstocking, structural stage and species composition shifts, and harvest treatments on vegetation palatable to livestock in other structural stages/diameter classes is considered to be slight because, usually, before canopies can close, preventing light from reaching ground vegetation, the moisture-limiting nature of the residual soils is effective in limiting tree numbers and distribution. Vegetation palatable to livestock grows and shifts into dormancy about late July before soil moisture becomes a limiting factor for tree growth (about August 15). Vegetation palatable to livestock has increased where fires resulted in a shift to earlier structural or seral stages. Shrubs are a minor component in these plant associations according to Johnson (1992).

Cool, Moist: These forest stands compose approximately 24,500 ac. or 13% of the Planning Area, generally at mid to high elevations. They are more common on the north-facing slopes south of the MFJDR. These stands also tend to occur in a mosaic of canopy closures, although overall they are more dense than stands of similar forest vegetation in the Warm Dry PAG. They are dominated by grand fir and include Douglas fir, ponderosa pine, and larch. Herbaceous ground cover also occurs as a mosaic based both on cover and on species mix, which vary by structural and seral stage. Live ground cover ranges from near zero to about sixty percent. The species mix includes pinegrass and forbs with a tendency toward more forbs. Grouse and big huckleberry are common shrubs and may provide cover greater than 50% according to Johnson (1992); most grass species often present with either huckleberry are considered palatable to livestock. While some of the ground cover is considered vegetation palatable to livestock, the variability, generally low abundance, overall distribution, including patchiness, and difficult accessibility due to other stand conditions often results in little use in the project area, based on observations by team members. Vegetation palatable to livestock has increased where fires resulted in a shift to earlier structural or seral stages. No C/T plots were remeasured in this biophysical environment. These stands burn with the mixed fire regime. Exclusion of fire has resulted in dense overstocking, a reduction in live ground cover, and a reduction in patchiness.

Cold Dry: These forest stands of grand fir, lodgepole pine and subalpine fir/spruce compose approximately 50,500 ac. or 27% of the Planning Area. Plant associations which include certain grasses and grouse huckleberry (because of the grass species often present with grouse huckleberry) provide vegetation palatable to livestock during some structural stages and some seral stages. Vegetation palatable to livestock has increased where fires resulted in a shift to earlier structural or seral stages. No C/T plots have been placed in plant communities typical of this PAG. Fires are stand-replacing in this PAG.

Cool Dry: These forest stands of subalpine fir and spruce compose approximately 9,500 ac. or 5% of the Planning Area. Typical understory species include pinegrass and some herbaceous ground cover and grouse huckleberry. Plant associations which include pinegrass and grouse huckleberry (because of the grass species often present with grouse huckleberry) provide vegetation palatable to livestock during some structural stages and some seral stages. Vegetation palatable to livestock has increased where fires resulted in a shift to earlier structural or seral stages. Fires are usually stand-replacing in this PAG.

Limited amounts of other forest PAGs are also found in the Analysis Area: Cool Wet (25 ac.), Hot Moist (300 ac.), Warm Moist (1,900 ac.), and Warm Very Moist (35 ac.). The plant communities typical of these PAGs provide relatively small amounts of vegetation palatable to livestock.

Riparian Vegetation

Riparian vegetation occurs along streams, in seeps, springs and bogs and in wet and moist meadows within the Planning Area. Riparian vegetation is heavily controlled by water-soil relationships and other ecological conditions and processes. Soil-water relationships have been altered by activities over the last 140 or more years (see further description in the Stream Morphology section). Most riparian vegetation is considered palatable to livestock.

Historic mining, grazing, horse and railroad logging, roading and beaver trapping often resulted in alteration of valley bottoms and stream beds and banks. Subsequent loss of soil and vegetation along stream banks and shifts in the geomorphic character of streams occurred as a result of these activities and moved these streams away from their potential. Stream potential (Rosgen, 1997) is a concept which defines streams in balance with the landscape. Numerous pictures and historic comments in the range files show or describe previous bare soil and loss of herbaceous and hardwood riparian vegetation in the Planning Area. Riparian vegetation along altered streams, including hydrophytic (“water-loving”) species, began to recover following changes in grazing practices authorized by the Taylor Grazing Act (1934) and downward shifts in demand for both minerals and railroad-yarded logs.

Riparian plant communities are resilient and are recovering in species abundance, distribution, composition, and stage of seral development wherever water-soil relationships have become re-established. The recovery of riparian vegetation and the re-formation of stream beds and banks is self-reinforcing. When disturbance to stream channels has been so severe as to expose bare soil and alter physical characteristics of stream channels, recovery requires vegetation to build banks which in turn provide substrate for establishment and growth of additional riparian vegetation.

Currently, the recovery of riparian plant communities along some stream segments in the Planning Area is well advanced although some components of riparian plant communities remain missing, are reduced in numbers or vigor, or are less extensively distributed. In other places, stream vegetation and stream channel and function are much less recovered. In addition, the projected recovery of riparian vegetation is being interrupted by on-going or recent disturbance. Disturbance agents continuing to influence riparian vegetation condition include the exclusion of fire, continued use of riparian areas by large ungulates (wild and domestic), roading and remaining railroad grades, displacement of beaver, valley bottom alteration, the introduction or expansion of non-native, invasive plants, and accelerated, flashy overland flow run-off due to past/legacy disturbance.

Hardwood shrubs in upper elevations riparian areas are generally limited to areas where there are natural or created openings in the conifer tree canopy. Shrubs in mid-elevation reaches currently show the effects of historic harvest, livestock grazing and poor road location. Hardwoods increase in these reaches, especially alder, willow, dogwood, and occasional cottonwood and aspen trees. Hardwoods often show reduced vigor from excessive browsing and lack of natural disturbances such as fire or beaver to stimulate new growth.

The negative effects of past large ungulate use continue to affect the condition of riparian shrubs and the composition, abundance, and distribution of streamside vegetation. They continue to influence the pattern of recovery from past activities. Within the planning area some riparian shrubs and streamside vegetation conditions continue to be negatively affected by domestic livestock. This is especially true where use by wild ungulates is also high.

Generally these impacts are found along flatter gradient streams or in wet and moist meadows. Rosgen (1997) identifies these segments as sensitive to disturbance and often as responsive to reductions in disturbance. Approximately 92 flatter gradient stream segments were identified for the Planning Area (see Figure 10, Sensitive Stream Segments, Map Section). Most of these segments are perennial and lie within about 35 streams. These segments vary in length from about one quarter mile to three miles.

Historically, browsing by large ungulates has affected plants by damaging plant architecture (stunting and changing growth form) and reducing the vigor of riparian shrubs along most of the stream segments. Riparian shrubs remain stunted and vigor has not improved along many streams throughout the project area because wildlife browsing continues. Past grazing that did not meet standards has contributed to riparian shrub condition. Plant architecture and vigor are considered damaged when carryover effects on growth occur into the next year. It is generally accepted that no carryover effects on shrub architecture or vigor occur when no more than fifty per cent of shrub leaders are browsed. The modified Winward surveys or observations by team members indicate that shrub recovery is occurring in some places based on the increased proportion of young, unstunted plants in inventory samples. Protocols to classify, measure, describe and quantify shrub utilization have been developing over the last half century and only recently have reliable protocols been published (IIT, 2000 and Keigley and Frisina, 1998).

Historic and recent use by large ungulates on streamside vegetation has had negative effects on bank stability. Currently, stream bank damage is considered to occur when grazing standards or indicators are not met. Recent monitoring and observations indicate that variable amounts of bank alteration are occurring or have occurred recently. Observations by some team members indicate that hoof action in excess of the threshold occurred in recent years along some stream segments.

Protocols to classify, measure, describe and quantify effects of large ungulate use on streamside vegetation and stream bank condition have been developing over the last three decades. Reliable protocols that provide immediate results, rather than trend, have only recently been published (IIT, 2000). One parameter included in these protocols is mechanical ground disturbance by hooves. The principles used in these protocols were used to estimate and describe past effects of ungulates on the condition of streamside vegetation and stream banks. Mechanical ground disturbance in the past is believed to have contributed to the current degradation of riparian vegetation condition and stream banks in two ways. Some stream banks were directly altered because excessive grazing over time cumulatively interrupted the synergistic relationship between vegetation and stream banks. Excessive grazing also prevented the recovery of riparian plant communities along streams previously disturbed by other activities or natural events.

When the geomorphic condition of the streams and other riparian areas is considered, it is recognized that the existing soil-water relationships are not typical of those believed to be present before European contact. Recovery of the soil-water relationships is often distributed narrowly along the "greenline" and is not complete. Vegetation along valley floors is typical of drier meadows rather than riparian communities because of stream downcutting resulting from past activities. Downcutting resulted in accelerated drainage of valley bottoms and lowering of the water table. Lowering of the water table subsequently disconnected interactions between stream channels and flood plains.

Several components typical of healthy riparian vegetative communities are present. Random, modified greenline surveys indicate that species and plant associations along the greenline are often typical of late seral. Observations, limited samples, and the presence of wide wetted width-to-depth ratios indicate that riparian vegetation is limited in distribution both within the channel and across the floodplain. Dependent on location, shrubs are often moderately to severely hedged and exhibit arrested architecture.

Streamside and Floodplains:

Fish-bearing and perennial streams:

Eight locations on 4 allotments were randomly selected for modified Winward surveys (Winward, 2000). In addition five more modified Winward surveys were conducted at selected locations including along the Middle Fork of the John Day River, at sites selected by the permittees of one allotment and within the Summit Burn area. These surveys were done to determine riparian seral stage.

Seral stage is a measure of vegetative condition which varies from very early to late seral with potential natural community (PNC) being the latest seral stage. Generally, an area falls into a later seral stage if it has a high percentage of "stabilizers" (usually native, deep-rooted sedges and grasses, and in some places rocks and down wood) and a shrub component. Areas with a higher percentage of "colonizers" (usually short-lived, shallow-rooted plants that respond quickly to change, including non-native plants) and with fewer shrubs are in earlier seral stages (adopted from Winward, 2000).

PACFISH (USDA Forest Service 1995) defines seral stage by percent similarity of riparian vegetation to PNC or stream condition: under 25% similarity to PNC or "poor" stream condition equals early seral, over 50% similarity to PNC or "good" or better stream condition equals late seral. In terms of riparian function, later stages provide better stability and function, but in terms of forage, mid- and early seral stages tend to provide more production. The majority of sites sampled are in late seral stage. Six of the randomly selected locations are in late seral stage; two are in early seral condition. The site selected along the MFJDR is in very early condition. The sites selected by the permittees are in late seral or potential natural community stage. The two sites sampled within the Summit Fire are in early or mid seral stage.

Most stream channels in late seral stage (a measure of vegetative condition) are not recovered physically. Wetted width-to-depth ratios do not meet Forest Plan standards. Proper Functioning Condition assessments assigned ratings of "Functional-at-Risk" for several reasons. Stream classifications are often transitional between two Rosgen stream types indicating that recovery is continuing. Many of the streams do not have well-defined stream banks; stream channels are considered to have splayed, "dish bowl" banks. Consequently, although the riparian vegetation along the Winward-defined "greenline" appears to be recovering, bank building and development may be delayed (personal communication, J.Staats, Nov. 18, 2004). The physical characteristics of streams are discussed in more detail in the Stream Morphology section.

Also the extent of vegetative recovery across formerly moist to wet valley bottoms is reduced.

Surveys and monitoring indicate that bank alteration is occurring at levels sufficient to arrest stream bank recovery. Riparian shrubs which are common at many locations display reduced vigor, reduced variety of age classes and reduced recruitment of young shrubs, and stunted architecture at about 70% of sites due to over-browsing. These shrubs are not providing shade to the adjacent streams due to reduced canopy or their absence.

Riparian vegetation conditions are discussed in more detail in the allotment descriptions below. A discussion of channel morphology follows later in the Aquatics section.

Streamside vegetation ranges from cool moist conifer-dominated and moist meadow communities in the upper stream reaches, to mixed conifer/hardwood types in the middle elevation reaches, to grass/sedge/shrub dominated communities in the lower elevation wider valley bottoms. The dominant existing vegetation is not always the potential.

The upper elevation reaches are dominated by diverse mixes of vegetation including mixed conifer stands with high proportions of Engelmann spruce and subalpine fir, hardwood shrubs and/or riparian herbs, and aspen. At mid to high elevations within the closed canopy forest, hardwoods (primarily alder) are generally limited to areas where there are natural or created openings in the canopy. Mid-elevation reaches currently show the effects of historic harvest, livestock grazing and poor road location. The large diameter conifer component is lacking in most accessible reaches. Hardwoods increase in these reaches, especially alder, willow, dogwood, and occasional cottonwood and aspen trees. These hardwoods often show reduced vigor due to the effects of excessive browsing pressures and lack of natural disturbances such as fire or beaver.

Wider valley bottom areas, lower in the watershed, support meadow grass communities consisting of Kentucky Bluegrass and various sedges and rushes. Recent surveys indicate that native grass or grass-like species are not as abundant as expected based on physical characteristics of streams. These plant communities are largely displaced along some streams and in some valleys due to a combination of factors. These factors include changes in water table levels and seeding of aggressive non-native grasses that are both highly productive and palatable to livestock. Grazing pressure is heavy because of plentiful forage and the presence of water in these areas.

Streamside roads limit the vegetative potential along many streams where roadbeds occupy significant portions of the historic floodplains (examples include all or segments of Squaw Creek, Dry Fork Clear Creek, Crawford Creek, Summit Creek and Bridge Creek). Roads interrupt subsurface water flow, change overland flow, and typically occupy sites at toe slopes where riparian hardwoods such as aspen are often found. Roads in or near riparian areas reduce the number of trees available for recruitment for large woody debris. Freshly disturbed areas, such as new, reconstructed roads, or native surfaced roads disturbed by significant use, can be ideal sites for noxious weeds (Upper Middle Fork John Day Watershed Analysis Report, 1998).

Intermittent streams: Riparian vegetation is generally a slightly moister version of the vegetation present on the hillslopes and is generally considered to be nearly typical of the site potential except where disturbance has accelerated erosion. Stream side zones along intermittent streams may be slightly dryer than before European contact due to the reduced amount of coarse woody material and legacy conditions which disturbed soil.

Ephemeral draws: similar to intermittent ---except where channels have eroded due to human or natural disturbance has occurred resulting in drier vegetation than is typical of undisturbed draws.

Wet and Moist Meadows:

A few wet meadows (Lobelia and Japanese Meadows) in the upper regions of the watershed still support a large proportion of native grasses and forbs. Five Condition and Trend (C/T) plots were conducted (re-read) in wet meadows in 2003. The results of these C/T plots showed these meadows to be in poor to fair rangeland condition with mostly downward trends (one trend was static). The C/T data shows that these meadows have dried outs since the plots were established forty to fifty year ago. The files indicate that the primary cause was the construction of adjacent roads that are intercepting groundwater/soil water flow. Based on the C/T plots and team observations, most other wet and moist meadows are thought to have partially dried out for similar reasons.

Seeps and Springs:

Approximately 50 seeps and springs have been developed for stock watering. Some of these developments include protection of water sources with fencing and placement of watering troughs at a distance with the overflow returned to the seep/spring or downslope of the source.

Aspen, Cottonwood, Shrubs, and Other Culturally Important Plants

Lack of historical disturbance by fire, flooding, and beaver activity coupled with road building, mining, riparian grazing, and resulting water table changes, have reduced much of the habitat for these important hardwood species.

Aspen

To date, only an estimated 86 acres of aspen stands have been documented within the 186,500 acre analysis area. Within the 25,911 acres of riparian areas, less than 1 percent (0.3%) contain aspen. Aspen populations are generally declining and are predominantly mature (have passed their peak growth) to over-mature (nearing the end of their life) with little structural or age diversity. There are now fewer and smaller groups of trees, usually with only two structural/age classes – young plants less than a couple of feet tall have been heavily browsed since they emerged; and remnant old trees, weakened by insects and disease that may not have enough energy to regenerate by sprouting from roots – the only regeneration method. Constant heavy browsing by domestic livestock, deer and elk has exacerbated the stagnant condition of most aspen clones within the analysis area, keeping young plants from maturing and eliminating most regeneration.

Aspen clones occur in isolated small areas of localized high soil moisture, such as riparian zones, ephemerally wet draws, wet meadows, and areas of groundwater seeps. Communities are most commonly found in the mid-elevations (4500-5500 ft.). Aspen under stories are usually dominated by non-native grass species (e.g. Poa pratensis), and tend to be more heavily grazed.

Cottonwood

Cottonwoods are not as common as they one were because reproductive habitat has decreased as roads occupy habitat, water-tables have declined, and heavy grazing within riparian areas has limited the chance of young trees establishing in the main flood plain. Cottonwood regenerates primarily from seed which must fall on exposed gravel along stream banks where the soil is continually moist. This species is present along some portions of lower elevation portions of low gradient streams within the analysis area. Existing cottonwood seedlings have similar problem from browsing animals, reducing structural and age diversity. Condition is generally poor, with little of no regeneration, and few or no young plants are present to replace the large, old trees.

Suitable habitat is now most common along smaller tributary streams and road cut banks, both of which provide the disturbed soil and the freedom from over story shading that this species requires.

Shrubs

Hardwoods in upper elevations riparian areas are generally limited to areas where there are natural or created openings in the conifer tree canopy. Mid-elevation stream reaches currently show the effects of historic harvest, livestock grazing and poor road location. Hardwoods increase in these reaches, especially alder, willow, dogwood, and occasional aspen trees. Hardwoods often show reduced vigor due from excessive browsing and lack of natural disturbances such as fire or beaver to stimulate new growth.

Wider valley bottom areas, lower in the watershed, sustain wet meadow grass communities dominated by Kentucky bluegrass and various sedges and rushes. Grazing pressure is heavy because of plentiful forage and the presence of water. Native grass species have commonly been displaced due to a combination of factors, which include changes in water table levels and seeding of non-native grasses that are both highly productive and palatable to livestock.

Sensitive Plants

Twenty-seven known sensitive plant populations have been documented within the Blue Mountain, Lower Middle Fork, and Upper Middle Fork Allotments (see Table VR-1). Where sensitive species have been documented domestic livestock use and accompanying management practices do not seem to have impacted plants or habitat because sites are located in areas where cattle don't tend to concentrate. These areas include riparian areas on steep slopes in confined drainages, small riparian areas isolated from main animal travel routes, or where conditions are so harsh that vegetation is so sparse there is little forage and no available water.

Grazing has greatly affected potential habitat as concentrated use by large numbers of cattle have compacted soil and browsed plants, especially in riparian areas. Plants in these areas may not have been found because habitat conditions are no longer favorable.

The higher ridges such as Dixie Butte and Vinegar Hill represent an unusual type of habitat, but have been severely altered by historic sheep grazing and no longer support their original plant associations due to soil loss. Ecologists are doubtful that restoration efforts can succeed at these higher elevations. In riparian areas concentrated cattle use has caused soil compaction and transported invasive plants. Invasive, non-native plants have reduced the habitat available to rare, sensitive plants.

Table VR-1: Documented Sensitive Species

Scientific Name	Number of Sites
Botrychium crenulatum	9
Botrychium lanceolatum	1
Botrychium minganense	5
Botrychium montanum	2
Botrychium pinnatum	4
Carex interior	4
Eleocharis bolanderi	1
Listera borealis	1

Source: Malheur NF GIS 2004, Project Records.

Noxious Weeds

A *"weed"* is defined as a plant growing outside of its desired location. The term *"noxious weed"* is a legal designation, usually established by The State Department of Agriculture or Local Weed Districts, and refers to any species of plant which is, or is liable to be, detrimental or destructive and difficult to control or eradicate. Noxious categorization may result due to the potential economic consequences of a weed invasion, or because of the threat to native vegetation communities. In a general sense, they are plants that are usually not native to the area in which they are growing and whose growth is so rapid, dominant, or toxic that they out-compete native plants, often taking over complete sites or ecosystems over time.

Noxious weeds alter plant composition and are detrimental to ecosystem functions and processes such as nutrient cycling and energy flow. Soil texture is changed, affecting soil moisture regimes. Serious weed infestations degrade soil stability. Surface runoff and sediment yield can be increased substantially. Noxious weeds have acquired attributes which allow them to gain a competitive edge over other plants, rapidly invade, establish and and dominate disturbed sites. These traits also make them difficult or impossible to eradicate once established.

These characteristics include wide ranges of adaptability, rapid growth rates from vegetative stage to flowering, abundant seed production (up to one half million per single plant), ability to re-sprout from root nodes, ability to spread through vegetative or root fragments, extended duration of seed viability in the soil (ten years or more for some weeds).

Undisturbed native forest and range plant communities are fairly resistant to invasion by weeds, however, many weeds introduced to the United States in the last century can compete successfully with native plants. Many noxious weeds are early seral, pioneering species and the disturbance which they need in order to succeed as well as they do, is caused predominantly by human activity.

Noxious weeds most commonly get established in areas where ground-disturbing activities (coupled with import of non-native seed) have occurred and created even very small areas of bare soil and where a seed source is already present or in some way is brought in to the area. Once established, they often spread into adjacent stands of native vegetation. Areas where noxious weeds are expected to occur in higher densities are road systems, timber harvest skid trails and decking/landing sites, campgrounds, recreation trails and trailheads, areas of livestock concentration, utility corridors, mineral development sites, water transportation ditches, and stream systems.

Mechanisms of spread:

Though all Noxious Weeds are undesirable, some are easier to control than others, and this usually relates directly to the spread mechanisms of the weed. Several weed species have the ability to spread vegetatively (to re-sprout from a piece of root or stem) in addition to spread by seed. The following is a summary of how weed species are spreading and being introduced.

- Seed carried along roadsides on the tires and undercarriage of passing vehicles.
- Seed carried on animals' bodies and by animals which have consumed the seed.
- Seed and vegetative matter carried in mud and soil that has collected on equipment, tires, shoes, etc.
- Seed and vegetative matter carried from contaminated gravel pits, and spread along roadsides in fill material and surface gravel.
- Seed introduced through contaminated hay fed to pack animals.

Weeds do not recognize land ownership or administrative boundaries. Noxious weed management can only be successful if all land owners and administrators recognize the need for a united effort. The Malheur National Forest has an obligation to its neighbors in this regard.

General Noxious Weed/Weed Conditions:

Nineteen Oregon Department of Agriculture listed noxious weed species occur on the Malheur National Forest. The species of greatest concern within the MFJD planning area are spotted knapweed, diffuse knapweed, Russian knapweed, yellow star thistle, dalmatian toadflax, St. Johnswort, and white top. These weeds can spread quickly, crowding out native plants, and are difficult to eradicate once established. Inventories conducted on the Malheur National Forest over the past decade have mapped about 3,000 acres of noxious weeds.

Informing people as to the identity, methods of spread, and undesirable/dangerous results of noxious weeds in ecosystems remains the single most effective way to prevent or control expansion of non-native plants on the Forest. Management and treatment efforts continue to be carried out, targeting the most explosive and competitive species first in the attempt to maintain the diversity of native species in forest and rangeland vegetation.

The existing condition and extent of noxious weeds treated as noxious by the Malheur National Forest is further described below by allotment.

Rangeland

Planning Area

The Middle Fork John Day Range Planning Area is located approximately 20 to 25 air miles north and east of John Day, Oregon, on the Blue Mountain and Prairie City Ranger Districts. The Range Planning Area includes portions of the Middle Fork John Day, Galena and Camp Creek watersheds. It is comprised of eight cattle and horse (C & H) grazing allotments and three administrative use pastures. The allotments encompass approximately 186,500 acres of mainly National Forest System lands with BLM and private land included in some allotments. The administrative use pastures occupy a combined total area of approximately 490 acres. Administrative pastures are areas reserved for Forest Service use; in this case they have been used in the past for pasturing horses used by the Forest Service.

Introduction

The climate in the Planning Area is characterized by hot, dry summers and cold winters. Precipitation averages 18 to 20 inches per year, with most occurring as snowfall during the winter months. Maximum summer temperatures may get into the 90s with winter lows getting below zero. The growing season is generally from late April through September, with a chance for frost in every month of the year.

Weather conditions and, consequently, forage production varies year to year. Permits with constant numbers and seasons of use result in variable percentages of utilization from year to year. The analysis of effects on upland conditions is based on average conditions, but actual utilization may have a substantial range in the amount of use that occurs annually.

Capable/Suitable Rangeland

Rangeland capability is defined in 36 CFR 219.3 as the potential of an area of land to produce resources and allow resource uses under an assumed set of managment practices and at a given management intensity. The IDT used a computer model in GIS to conduct an analysis of capable/uncapable rangeland in 2002 (see Table VR-2). The IDT used the definitions and criteria for canopy closure, slope, forage production, soil stability/surface erosion potential, and distance from water from FSH 2209.21 Chapter 200 Range Analysis & Management Handbook, 05/84 to calculate capable rangeland (see Appendix E). The following acres of capable/uncapable rangeland are estimates from a 2002 GIS analysis. Recognized limitations with this data discussed in Appendix E may over- or under-estimate capable acres. Acres burned within the Lower Middle Fork allotment and other allotments that have had recent stand-replacing wildfires are currently providing substantial amounts of high-quality forage; some of the acres providing forage now may not be part of the capable acres shown below, because under historic forest conditions, these stands would be too high in canopy closure.

Table VR-2: Acres of Capable Range by Allotment

Allotment	Capable Acres	Percent of Allotment that is Capable
Austin	130	81%
Elk	70	100%
Bear	1230	83%
Camp Creek	340	57%
Blue Mountain	14,490	65%
Lower MiddleFork	27,300	50%
Upper Middle Fork	27,500	51%
Sullens	27,800	50%

The 1990 Malheur Forest Plan FEIS (USDA Forest Service 1990, FEIS V-20, and Appendix B, B-60 and B-71-75) used FORPLAN to estimate Animal Unit Months (AUMs) and range capability/suitability of the Forest, including these allotments. The information was used during development of the Forest Plan. In the Forest Plan FEIS, the definition of capability and suitability appear to be switched from their present definitions. The Forest Planning effort used similar criteria to those described here to determine “suitability” including forage production of 50 lbs/acre, and criteria such as “without damage to vegetation and soil resources.” This analysis was a Forest-wide estimate that did not provide capability or suitability on a site-specific basis. The IDT performed a capability analysis for the MFJD Range Analysis Area to provide data comparable to the Forest Plan, but on a site-specific basis.

Rangeland suitability is defined in 36 CFR 219.3 as the appropriateness of applying certain resource management practices to a particular area of land. On the Malheur Natinal Forest, rangelands are termed suitable unless they are developed campgrounds, administrative sites (other than designated horse pastures), exclusive use special use areas, fenced road rights of way, Research Natural Areas (MA 9) where records show grazing is not essential to maintain a specific vegetative type for which the RNA will be established, long-term exclosures, and lands which have been shown to be uneconomical to manage under any reasonable management system. The MFJD Range Analysis Area includes allocations of Management Areas 9, 12, and 19 - the Dixie Butte proposed RNA, a few developed campgrounds along and near the MFJD River, and Sunshine and Blue Mountain Guard stations. These areas as well as several long-term exclosures are considered to be unsuitable. These areas total about 250 acres and are scattered throughout the analysis area; most of the larger areas (over 3 acres) are discussed in Chapter 3 of this EIS. All other areas in the analysis area would meet the definition of suitable land. The 1990 Forest Plan FEIS provided for a reduction of livestock use (and "capability") of 5% Forest-wide and 12% in riparian areas (V-20). The IDT looked only at acres and was not required to determine livestock use based on suitability, so no livestock use based on suitability was calculated for this EIS. NFMA does not require that a suitability analysis be conducted at the project level. On August 24, 1999, the U.S. Court of Appeals for the Ninth Circuit concluded the Forest Service had complied with NFMA by adopting the Forest Plan, including its allocation of acreage suitable for grazing. This range planning analysis is done to determine whether or not to authorize livestock grazing in the project area (Wilderness Society v. Thomas 188 F.3d 11(9th Cir. 1999)).

Allotment Specific Descriptions

Austin Allotment

The Austin Allotment is a small inactive allotment, in the headwaters of the Middle Fork of the John Day River (see Figures 1 and 2, Map Section).

Vegetation Conditions

Most of this allotment is riparian/meadow, with a small percentage of Hot Dry to Warm Dry forest in the uplands. The riparian/meadow is likely best described as Fire Regimes II and IV, while the forested areas are in Fire Regime I. Since European contact, disturbance has reduced the extent of moist meadow. Limited use of the Forest Service portion of this allotment has occurred since 1993 (rest except for unauthorized use in 1999). Livestock impacts to vegetation are likely not discernable on the Forest Service portion of this allotment because this area has been rested for many years.

The majority of these pastures lie in the broad Middle Fork John Day River valley. The condition of the MFJD River in the eastern-most pasture is considered to be similar to that of the river segment just upstream in the West Summit Pasture, Blue Mountain Allotment, where Proper Functioning Condition and modified greenline (Winward 2000) surveys were completed in fall 2004. The dominant vegetation is alder/sedge-rush with lodgepole, and the segment is considered to be near or at Proper Functioning Condition and in late seral ecological stage.

In the east pasture that is surrounded by private land, the condition of the MFJD River is considered to be Functional-At-Risk, but in an improving trend, based on visual observation and professional judgment. Compared to the other east pasture, there are fewer shrubs, less species diversity, and lower vigor. This stream reach is estimated at a mid-seral ecological stage because the more stable, late-seral vegetation is becoming more common than early seral vegetation.

Sensitive Plant Species

There are no sensitive plants documented within this allotment, but habitat for twelve sensitive plant species exists within riparian and meadow areas.

Noxious Weeds/Invasive Plants

Noxious weeds cover about 13 acres (3%) of this allotment. Noxious weeds occupy approximately 20% of the acreage in the east pasture that is surrounded by private land, where large populations of Canada thistle and spotted knapweed have been documented along Oregon Highway 7 (Malheur NF GIS April 20, 2005). There is also a large patch (3.3 acres) of Canada thistle on the northern tip of the west pasture. Most of this population is outside the pasture.

Range Conditions

Table VR-3: Austin Allotment Existing Range Condition

Size-Acres of FS	# AUMs permitted	# Livestock	Season of Use	# of Pastures	Miles of Fence	Water Developments
157	0	N/A	N/A	4 parts to this allotment	2	0

History and Grazing Management

The Austin Allotment is a small inactive allotment, which previously encompassed 157 acres of National Forest land and about 513 acres of private land in the headwaters of the Middle Fork of the John Day River (see Figures 1 and 2, Map Section and Table VR-3). The allotment was vacated in 1993 because the private land-owner/permit holder no longer had interest in holding a federal grazing permit. Grazing was authorized under a Term Grazing Permit with On/Off provisions. On/Off provisions are added to a permit when the majority landowner within an allotment is private. Prior to 1993, 3 cow/calf pairs were authorized to graze from June 1 to October 30 on the publicly owned portion of this allotment. In 1992 the Forest Service worked in cooperation with the permittee and landowner to construct new fences on the property boundaries of this allotment, thus separating the private and public land. The grazing permit was waived back to the government in March of 1993. To date the Austin Allotment remains vacant. The old allotment boundary fences have not been removed.

The Austin allotment now consists of four pastures (see Figure 2, Map Section). Two small pastures are east of the private land on the Middle Fork John Day River, one on each side of Highway 7, totaling approximately 80 acres. The "Bates" Pasture lies just north of the private land and the old town of Bates. The last small pasture lies to the west of the private land.

After the allotment was vacated, the previous permittee's fence maintenance responsibilities for the Bates and western pasture were not assigned (to the adjacent permittee or the Forest Service) and so maintenance of the allotment division fence between the Upper Middle Fork and Austin allotment has not occurred. The Forest Service has maintenance responsibility for the fences on FS property in the two eastern-most pastures; maintenance of the allotment division fence between the Blue Mountain and Austin allotment has been done, but maintenance of the other fences has not occurred on a regular basis. Many of these fences are in a poor state of repair.

An irrigation ditch runs through the Bates pasture. The owner of the water right is concerned with a long season of use in this area, because, if allowed, livestock congregate near the private fence and use the ditch for water, damaging the ditch banks. The lack of allotment fence maintenance, gates being left open, and a water source close to the private-land fence, was the cause of unauthorized use on this pasture (1999) on this allotment and on adjacent private lands.

East of Highway 7 there is a quarter mile of fence on Forest Service System land, which was authorized by the Long Creek District Ranger. This fence exists to enable the adjacent landowner to easily trail livestock to and from private property across the highway. The landowner was authorized to build and maintains this fence for moving livestock across the highway.

No range monitoring data was collected on this allotment between 1992 and the present.

Bear Allotment

The Bear Allotment covers approximately 1,480 acres of National Forest land, 40 acres of Bureau of Land Management land and 12 acres of private land along the Middle Fork John Day (MFJD) River (see Figures 1 and 3, Map Section, Table VR-5, and discussion under Management Areas in Chapter 1).

Vegetation

Upland Vegetation Conditions

Hot Dry or Warm Dry forest Plant Association Groups (PAGs) dominate the uplands in the Bear Allotment (Table VR-4). Common ground cover includes bluebunch wheatgrass, pinegrass/elksedge and Idaho fescue (Johnson and Clausnitzer 1992). Over the past half century, increases in canopy cover related to increased tree stocking have likely reduced forage production. The Hot Dry forest type is generally in a “good” vegetation condition rating (relative to understory vegetation conditions-extrapolated from C/T plot data). There has been a slight decrease in forage production resulting from increases in forest canopy closure. About 14% (150 ac.) of the Warm Dry forest is dominated by ponderosa pine. The remainder of the Warm Dry forest (about 900 acres) is mixed conifer. The Warm Dry forest is also considered to be in a “good” vegetation condition rating (relative to understory vegetation conditions-extrapolated from C/T plot data), but in this allotment both mixed conifer and ponderosa pine-dominated Warm Dry forest have a considerable reduction in forage due to large increases in canopy cover due to a lack of thinning treatment and harvest. The Hot Dry and Warm Dry Plant Association Groups are included in Fire Regime I, low severity – high frequency fire regime.

There are also small, scattered grasslands (Gibbs Meadow), shrublands, herblands, and a large, grassy ridge in the northern portion of the allotment. Non-forested areas are generally considered to be at a mid to late seral stage of ecological succession (J. Wood, pers. obs. 2001). These non-forested areas are Fire Regimes II, III, or IV depending on the plant association group (Fire/Fuels Specialist Report). Pasture G contains introduced non-native forage species in the herbland/meadow areas; these species are expected to persist.

Table VR-4: Plant Association Groups (PAGs), Vegetation in Bear Allotment

Plant Association Group	Percent of Allotment
Hot Dry forest	13%
Warm Dry forest	69%
Cool Dry forest	<1%
Herblands	<1%
Riparian Shrublands	2%
Riparian Herblands	8%
Areas without assigned PAG (mainly non-forested)	6%

Riparian Vegetation Conditions

This allotment contains few streams (see Figure 3, Map Section). Stream and riparian seral stage conditions in this allotment vary from early to late seral. Late seral stages are found on most of Mosquito Creek in Pasture E/F; shrub vegetation is diverse and vigorous with many age classes and species of shrub (P. Edwards/S. Burton, pers. obs. 2004). Little browsing occurs because the creek is located in a steep, narrow canyon. Early seral greenline stages were found on the Middle Fork John Day River and were related to channelization of the river in Pastures C1 and C2. Early seral stages were also found on Armstrong Creek-an intermittent stream; the greenline is in early seral stage because the low volume of water and lack of water late in the season do not sustain riparian vegetation. Riparian shrub conditions appear to be improving; in several locations abundant young shrubs have recently been observed. Overall condition trend of both greenline herbaceous vegetation and shrub vegetation is improving in riparian areas in the Bear Allotment. These riparian areas are Fire Regimes II, III, or IV depending on the plant association group (Fire/Fuels Specialist Report). In general, no need was identified to change livestock management in riparian areas, though livestock management that keeps vegetation moving towards desired conditions should be continued. While early season use has improved shrub conditions in pastures C1 and C2, a change in pasture management may be needed to allow for deferred use of these pastures.

Sensitive Plant Species

There are no sensitive plants documented within this allotment, but potential habitat exists within shaded conifer sites, and in and near riparian areas associated with seeps and springs in areas. Gibbs Meadow is one of these sites. Potential habitat for sensitive plants is restricted by the lowered water table along the Middle Fork John Day River.

Noxious Weeds/Invasive Plants

Noxious weeds have been identified in two pastures in the allotment, Pastures Cole/C1 and Hill - E/F. Weeds total about 19 acres in the allotment. Within the E/F pasture there are three weed populations that total about 6% of the pasture; a 9.6 acre patch of spotted knapweed, a 0.1 acre spot of St. Johnswort, and a 6.7 acre infestation of Sulphur cinquefoil. Weeds are found along the southern boundary; near the upper segment of FR (Forest Road) 2000893, and along the eastern segment of FR 2000978. A small area of weeds (Sulphur cinquefoil), less than 0.1 acre, are also found in Pasture C1.

Range Conditions

Table VR-5: Bear Allotment Range Existing Condition

Size-Acres of FS	# AUMs	# Livestock Cow/calf	Season of Use	# of Pastures	Miles of Fence	Water Developments
1,480	496 AUMs	84	6/1 - 10/15	9	19	14

Introduction

Bear Allotment is split into 9 pastures by fencing (Table VR-5). Pastures C1 and C2 are located on the MFJD River. Prior to Forest ownership, segments of the MFJD River within these pastures had been diverted and channelized in a new location near the hillside on the west side of the pastures which affected valley bottom vegetation. About 1.5 miles of the MFJD River lies within the boundary of the allotment, but are fenced out of the remaining pastures due the location of pasture fences. Pastures E and F are managed as one pasture (Hill) since no division fence exists.

History

The land and water rights in the Bear Allotment were acquired in a land exchange between the Kinzua Corporation and the Forest Service in 1979. An allotment management plan (AMP) was written to create this allotment and guide its management in 1984. The major feature of this AMP, when fully implemented, was forage production to sustain a target of 140 head of livestock from about June 1 to October 15 (630 AMs). The AMP described the grazing system as a deferred rotation, and included intensive use of irrigated meadowlands (with pastures C1 and C2 being used twice each year because they were irrigated). There was also an emphasis on early season utilization of the riparian pastures in order to minimize shrub browsing by livestock.

The intensive use of meadows (use twice each year) has been halted for some time because of reduced forage production related to the poor condition of irrigation developments (see water use and rights). File records show that the animal months target level was never reached and no more than 84 cow/calf pairs have used the allotment. Most recently, the Annual Operating Instructions (AOI) have been the primary document guiding management on the Bear Allotment. The AOI (and the permit) reflect the adjustment from 140 cow/calf pairs to 84 cow/calf pairs related to reduced forage production.

Water Use and Rights

Land acquisition, within the Bear allotment, included 137 acres of irrigated hay lands with four associated water rights, and one domestic water right. Per direction in the Forest Service Manual (FSM 2541.4) these water rights should be managed "to ensure these valuable United States properties are not lost." There are five water rights certificates issued within the boundaries or associated areas of the Bear allotment. Pastures A, B, C1 and C2 (and the Administrative Bear Pasture) were irrigated to produce hay when this land was privately owned prior to 1979. Irrigation for forage production continued with only partial success after Forest acquisition of the land and water rights. An irrigation ditch diverts water from the Middle Fork of the John Day River near pasture B1 to irrigate the C-1; irrigation is difficult and inefficient because the ditch leaks and because about 100’ of culvert, used as part of the ditch along County Road 20, has heaved out of the ground. The diversion point for pastures A and B is in Bear Creek; pasture C2 is sub-surface irrigation with water from the Middle Fork and Mosquito Creek. The poor condition of diversions and ditches makes irrigating time-consuming and not cost-efficient. Irrigation is occurring but is likely reduced because of the conditions of ditches and diversions. Due to reduced irrigation, less forage is available than was planned for in the 1984 AMP. The

Forest Service owns and maintains water rights for this water. The water rights usage is pasture irrigation, but could be useful for instream use.

Grazing Management

Since the completion of the allotment management plan in 1984, three stock reservoirs and 5 stock tanks have been installed on the allotment. Approximately 7.5 miles of fence have also been constructed or reconstructed. Three water developments in pastures A and G have recently been maintained or reconstructed to keep them working properly.

The grazing system in past AOIs calls for a 9-pasture deferred rotation; however, some pastures may be used at a similar time each year (early to mid-season use - C-1, C-2, late-E/F, G, H). Notes by permittee in the 2210 files say that pastures B-1, C-1, C-2, and D need to be utilized early because they either run out of water (B-1 and D) or the forage dries out early so it becomes unpalatable (C-1, C-2, and D).

Permittee Use

Tables VR-6 through VR-8 display compliance with end-point indicators for allowable use of forage (grasses and herbaceous material) and shrubs; this data is separated into two sets of years because data collection changed starting in 1999 related to PACFISH. In those tables: “Y” indicates that the end-point indicator was met, “N” means the end-point indicator was not met, “REST” indicates the pasture was not used by the permittee, and a “-“ indicates the pasture was assumed to be used, but no monitoring was done or data was not recorded.

The permittee has used this allotment every year except one for the past 20 years. Current management of the Bear Allotment is considered successful, with isolated, intermittent failures to meet end-point indicators (see Tables VR-6 through VR-8 below). These intermittent failures are not causing carry-over effects. Big game use has been documented in this allotment (Range Monitoring Files-2270) and this area is big game winter range. Because livestock and big game are both expected to utilize shrubs to some degree depending on management and conditions, shrub utilization is an end-point indicator that must be monitored carefully. During 2004 modified greenline surveys (Winward 2000), shrub use appeared to meet end-point indicators.

Table VR-6: Bear Allotment Recent Utilization End-point indicators and Achievement Based on Stubble Height End-point indicator

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
C2 (Corral)	Riparian	45% - 4 in.	-	N	Y	Y*	Y
C1 (Cole)	Riparian	45% - 4 in.	-	Y	Y	N*	Y
D (Def)	Upland	45% - 4 in.	Y	-	-	-	-
A (Antler)	Riparian	45% - 4 in.	-	N	-	Y*	-
G (Gibbs)	Upland	45% - 4 in.	-	-	-	N/Y* (FS/ permittee results differ)	-
E/F (Hill)	Riparian	45% - 4 in.	-	Y	-	Y*	-
B (Bend)	Upland	45% - 4 in.	-	-	-	Y*	-
B1 (Bear)	Riparian	45% - 4 in.	Y	Y	Y	Y*	-
H (Horse)	Upland	45% - 4 in.	-	-	Y	Y*	-

Source: Malheur National Forest, Long Creek Ranger District 2210 files, *Data collected by permitttee.

Table VR-7: Bear Allotment Recent Utilization End-point indicators and Achievement Based on Shrub Utilization End-point indicators

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
C2 (Corral)	Riparian	None AOP, BO Light	-	Y	Y	-	Y
C1 (Cole)	Riparian	None AOP, BO Light	-	Y	Y	-	Y
A (Antler)	Riparian	None AOP, BO Light	-	N	-	-	-
E/F (Hill)	Riparian	None AOP, BO Light	-	N	-	-	-
B1 (Bear)	Riparian	None AOP, BO Light	-	N	N	-	-
G (Gibbs)	Riparian	None AOP, BO Light			-	Y	-

Source: Malheur National Forest, Long Creek Ranger District 2210 files

Table VR-8: Historical Utilization Standards and Achievement in Bear Allotment

Pasture	Utilization Standard[1]	Utilization Standard Achievement						
		1992	1993	1994	1995	1996	1997	1998
C2 (Corral)	45%	Y	Y	Y	Y	-	-	Y
C1 (Cole)	45%	Y	Y	Y	Y	-	-	Y
D (Def)	45%	Y	-	Rest	Y	-	-	Y
A (Antler)	45%	Y	-	Y	-	-	-	-
G (Gibbs)	45%	Y	Y	Y	N	-	-	-
E/F (Hill)	45%	Y	-	Y	N	-	-	-
B (Bend)	45%	Y	-	Y	-	-	-	-
B1 (Bear)	45%	-	-	-	-	-	-	-
H (Horse)	45%	Y	-	Y	N	-	-	-

Source: Malheur National Forest, Long Creek Ranger District 2210 files

Bank alteration monitoring was done through visual estimations in Pastures C-1 and C-2 in 2000, 2001, and 2003, Pasture F in 2000, and Pasture G in 2002. The bank alteration end-point indicators (less than 10% bank alteration caused by livestock) were reported to have been met in all pastures monitored in the Bear Allotment.

Blue Mountain Allotment

The Blue Mountain Allotment is 22,400 acres located is northeast of Prairie City, Oregon. It lies north of US Highway 26 and East of State Highway 7 (see Figures 1 and 4, Map Section).

Vegetation

Upland Vegetation Conditions

PAGs are fairly evenly distributed in the pastures. A large portion of the allotment (about 38%) is in PAGs that provide little forage for livestock (Cool Dry, Cold Dry, Cool Moist-see Table VR-9).

Rangeland vegetative cover for the allotment consists of bluebunch wheatgrass plant communities, pinegrass-elksedge communities and Idaho Fescue. Based on Forest Service records, most of the rangelands on the Blue Mountain Allotment have an improving trend, however, the acres that are accessible for grazing are decreasing over time because tree stocking and resultant canopy cover is increasing in forested stands as described in the Upland Vegetation Overview.

Generally the forested upland portion of this allotment is overstocked with ponderosa pine, Douglas fir, grand fir and lodgepole pine. Many of these stands have limited access to livestock due to dense undergrowth of small sized trees and brush as well as downed dead timber. Lack of fire and timber harvest has resulted in a loss of area suitable to cattle grazing and has resulted in reduced forage production. This has the potential effect of forcing grazing livestock and wildlife onto fewer total acres of the allotment.

Approximately 55% of the allotment is within Fire Regime 1 and 37% is within Fire Regime IV. The remainder of the allotment is comprised of small areas of Fire Regimes II and III. A small number of stands within the allotment don’t have site-specific plant association information to determine the Fire Regime at this time (Fire/Fuels Specialist Report).

Table VR-9: Plant Association Groups (PAGs), Vegetation in Blue Mountain Allotment

Plant Association Group	Percent of Allotment
Hot Dry forest	5%
Warm Dry forest	50%
Cool Dry forest	10%
Cold Dry forest	27%
Cool Moist forest	1%
Woodlands	<1%
Shrublands	<1%
Areas without assigned PAG (mainly non-forested)	7%

This allotment contains more moist to wet meadows and formerly wet meadows than the other allotments. The condition of these meadows along with other riparian conditions are discussed in the Vegetation/Range Specialist Report by pasture and stream.

Condition and Trend plot data is inconsistent between readings and observations in 1999 and 2003. Crawford Meadow was partially evaluated by a range technician in 1998 at an area estimated to be the original plot location. A condition and trend transect within this meadow which was established in 1956 was re-read. The rangeland was judged to be in "excellent" condition. However, observations in 2003 indicate that this plot is placed in the drier part of the meadow and that it could not be relocated exactly. Another transect (established 1960) was read in Pie Meadow in 1999. The rangeland condition in this meadow was "good". However, the 2003 measurement found that this meadow is in downward trend, probably due to further drying out of the meadow. These conditions are discussed in more detail in the Vegetation/Range Specialist Report Crawford Pasture description in the Project Record.

Riparian Vegetation Conditions

Several surveys of riparian vegetative and stream channel condition were conducted at various locations in this allotment in 2000 and 2004. Modified greenline surveys (Winward 2000) were conducted in Idaho, Crawford, and East Summit pastures in fall 2004. Proper Functioning Condition assessments were conducted in 2000 and 2004 on in Squaw and West Summit pastures and in the Upper Phipp’s Meadow riparian pasture/exclosure. Proper Functioning Condition assessments were conducted on two segments of Summit Creek in East Summit Pasture in 2004. Multiple Indicator Monitoring, including a greenline survey (Winward 2000) was done in West Summit Pasture in 2004.

Overall, greenline vegetation was at late seral stage, with one survey on Idaho Creek in Potential Natural Community. Greenline vegetation on the wet part of Crawford Creek was determined to be early seral. The existing road that runs along Crawford Creek, and the intermittent nature of the channel strongly influence riparian vegetation conditions along Crawford Creek. Livestock and big game use may also be affecting riparian vegetation. Based on observations made during the modified greenline (Winward 2000) and other surveys, shrub abundance varies from sparse to common with some stream segments lined with nearly continuous mature alder. Alder and currant are the most common hardwood shrubs present with small amounts of dogwood and other species. Shrub architecture varies from uninterrupted to arrested growth-types. Often, some to many of the shrubs sampled in the greenline survey were moderately to severely hedged; arrested growth was attributed to both wild and domestic ungulates. Additionally, all PFC assessments were in Funtional At Risk Upward Trend or Properly Functioning Condition in 2004.

The results of formal assessments combined with the cumulative body of observations made by IDT members over a period of years in conjunction with this project and others are used to describe riparian vegetation condition in the sampled locations. The cumulative body of observations made by IDT members over a period of years in conjunction with this project and others in these subwatersheds and interpretation of the results of the formal assessments were used to evaluate riparian conditions in areas not included in the formal surveys. The cumulative body of observations is based on multiple field visits, informal surveys, interviews with agency and non-agency people familiar with this area. The results of the riparian surveys are consistent with observed variation in riparian vegetation conditions and with the recent history of use on this allotment.

Between 2000 and 2004 a Proper Functioning Condition assessment along the Middle Fork in one pasture improved from Functional At Risk in a no apparent trend to Functional At Risk in an upward trend due to shrub abundance. This upward shift in trend is believed to be representative of riparian conditions over much of the allotment and is reflected in additional PFC assessments conducted in 2004.

Three conclusions from integration of the surveys with professional experience and judgment are that 1) ecological status of riparian vegetation within this allotment is variable from early seral stage to Potential Natural Community (PNC); 2) regardless of ecological status, herbaceous riparian vegetation appears to be in an upward trend; and 3) riparian vegetation along some streams, regardless of seral stage, appears to both be sensitive to disturbance associated with grazing and to have the potential to recover relatively quickly (two grazing seasons) if the disturbance is arrested before impacts accumulate. Legacy effects from historic management activities are affecting riparian vegetation along some streams and contributing to the variability of conditions.

Based on observations by team members and others, riparian herbaceous species appear vigorous and resilient where modified greenline (Winward 2000) surveys were rated as late seral or PNC or where PFC assessments were conducted in 2004. Vigor and resiliency are not included as formal measures in modified Winward surveys; they are indirect measures in PFC assessments. Prior to the last two years, some team members expressed concern that the vigor of riparian plants would be reduced if use continued to not meet standards, if mechanical damage continued to affect herbaceous structure, or if riparian plant condition continued to show no apparent trend in the Proper Functioning Condition assessments. When Proper Functioning Condition was assessed in 2000 or when riparian forage standards were not met, plants along the greenline appeared to lack adequate vegetative structure and diversity in size structure which help dissipate stream flow energy.

Riparian vegetation is less abundant across most valleys in the allotment than before European contact due to geomorphic disturbance of stream channels and valley floors by historic activities.

Stringer meadows along streams tend to be drier due to the entrenchment of stream channels and subsequent lowering of the water table as well as drainage network increases. Kentucky blue grass is common on former floodplains that are now low terraces. Wider valleys tend to have been affected by a variety of disturbances, some of which lowered water tables and some of which altered valley soils.

The riparian vegetation trend is upward in East Summit, Upper Phipps, West Summit, and Squaw pastures based on PFC assessments; however, the vegetation trend is unknown in Crawford Pasture and parts of Idaho Pasture. Greenline herbaceous trend was not determined in Crawford due to a lack of past data and there is concern due to the arrested architecture of riparian shrubs and the lack of young shrub age classes on the northern (upper) part of Idaho Creek and on Crawford Creek No need to change current livestock management was identified for East Summit, Upper Phipps, West Summit, and Squaw pastures, though removing restrictions due to bull trout in West Summit pasture should make grazing the entire pasture less difficult. In parts of both Crawford and Idaho pastures, water may be limiting; reconstruction (or construction) of water developments may be needed. In Idaho pasture, a need to change current livestock management in conjunction with the Wallowa-Whitman National Forest was identified related to fence maintenance for this pasture. Overall in this allotment, deferred rotations are not happening-which affects grasses (which may not go to seed in some places) and riparian shrubs (shrubs more likely to be impacted in later-grazed areas). An overall management change for vegetation conditions (both upland and riparian) is the need for flexibility to do deferred rotation.

Sensitive Plant Species and Proposed Sensitive Plant Species

Two populations of *Carex interior*, a sedge, are located in the Idaho Pasture. Also in Idaho Pasture, three populations of *Eleocharis bolanderi*, Bolander's spikerush, have been documented along Summit Creek and at the northeast portion of Summit Meadow. Although this plant is currently not on the Region 6 sensitive list, it will automatically be added at the next update. It has not been included in the past because no one had seen this species on federal land in many years.

Noxious Weeds/Invasive Plants

This allotment has numerous, large weed patches where Canada thistle, houndstongue, and St. Johnswort are the dominant weed (Table VR-10). Most weed infestations are located along or near roads. The following table displays weed acres and relative cover within each pasture. The absence of documentation does not mean additional populations do not exist.

Table VR-10: Blue Mountain Allotment Weed Coverage

ALLOTMENT NAME	PASTURE NAME	PASTURE ACRE	WEED ACRES	% WEED COVER
Blue Mtn C & H	Crawford	8,430.95	67.83	0.80%
	East Summit	1,195.62	193.56	16.19%
	Idaho	10,543.59	610.03	5.79%
	Squaw Creek	80	0.00	0.00%
	Upper Phipps Mdw	44.35	0.29	0.65%
	West Summit	2,320.04	54.37	2.34%
Blue Mtn C & H TOTAL		**22,614.55**	**926.09**	**4.10%**

Source: Malheur NF GIS, April 2005

Aspen

There are limited aspen stands in this allotment. They are found as single stands scattered or as small groups of stands in the Crawford, East Summit, and West Summit pastures.

Range Condition

Table VR-11: Blue Mountain Allotment Existing Range Condition

Size-Acres of FS	# AUMs permitted	# Livestock Cow/calf	Season of Use	# of Pastures	Miles of Fence	Water Developments
22,400	817 AUMs	163	6/16-10/9	6	30	36

Introduction

The Blue Mountain Allotment is 22,400 acres located is northeast of Prairie City, Oregon. It lies north of US Highway 26 and East of State Highway 7 (see Figures 1 and 4, Map Section and Table VR-11). The Blue Mountain allotment is now comprised of six pastures; 2 large ones (Idaho & Crawford), three smaller ones (West Summit, Squaw, East Summit) and a recently added small riparian pasture (Upper Phipps).

History and Grazing Management

For many years the Blue Mountain Allotment had a deferred rotation grazing system in place, until approximately 1996. File references indicate a 45% utilization level at least 15 years ago, as well as limited shrub utilization. At Forest Plan writing the Blue Mountain Allotment was considered one of the few, which had a “Quality Intensive” management system in place.

The functionality of several water developments in Crawford and Idaho pastures is poor or is unknown. A documented history of allotment/forest boundary fence maintenance neglect along the Idaho Pasture boundary is negatively affecting allotment management. Notes in the Allotment file document unauthorized use, particularly in Idaho Pasture by cattle from the adjacent West Burnt River Allotment which is administered by the Wallowa-Whitman National Forest; evidence of cattle presence was found on in Idaho Pasture in 2004 though use was light (Greenline survey data forms 2004). The Blue Mountain Allotment permittee is reluctant to push cattle to the north end of this pasture (for fear they will continue to travel through the fence). Along the boundary to the Crawford pasture, a gate near Crawford Flat is regularly left open, allowing livestock to wander onto State Highway 7

Pasture rotation has been the same since 1996. Cattle are normally turned out into the Squaw Pasture and remain there for only 2 or 3 days to “mother up” before they are moved into the West Summit Pasture. They are then moved from the West Summit Pasture into the Crawford Creek Pasture, then the Idaho Pasture. East Summit Pasture has received little use in the past several years because it has been used as a gathering pasture (where cows are pushed through and out of the pasture quickly) at the end of the season. This rotation may be based on the lack of adequate water in the Crawford Pasture in the late summer to switch the rotation and on the permittee’s aim to meet standards in East Summit Pasture (a small, largely riparian pasture used late in the season).

Permittee Use

This allotment has not been grazed for two years. Standards for forage use were met in three of four pastures monitored in 2002 and in two of four pastures monitored in 2001 although other team members observed short stubble heights in a second pasture in 2002 and a third pasture in 2001 (Tables VR-12, 13, and 14). In those tables: “Y” indicates that the end-point indicator was met, “N” means the end-point indicator was not met, “REST” indicates the pasture was not used by the permittee, and a “-“ indicates the pasture was assumed to be used, but no monitoring was done or data was not recorded. From 2000-2002, shrub utilization standards were not met in about three quarters of the times and places that monitoring occurred.

Observations of shrub use in the East Summit pasture made during a 2004 field visit when livestock had not grazed the pasture suggest that big game use of shrubs may contribute to shrub use that exceeds standards. However, monitoring done during rest (2003) shows that stubble height and riparian shrub use were able to pass end-point indicators without use by livestock. This suggests use by big game was not so heavy as to not meet end-point indicators or to make end-point indicators unachievable because of big game.

Table VR-12: Blue Mountain Recent Utilization Standards and Achievement Based on Stubble Height Standard

Pasture	Type/ Location	Utilization Standard	Utilization Standard Achievement				
			1999	2000	2001	2002	2003
Crawford	Riparian	45% - 4 in.	-	-	N	N	-
Idaho	Riparian	45% - 4 in.	Y	-	N	Y	Rest (Y)
East Summit	Riparian	45% - 4 in.	-	-	-	Y	Rest (Y)
West Summit	Riparian	45% - 4 in.	-	Y	Y	Y	Rest (Y)
Squaw	Riparian	45% - 4 in.	-	-	Y	-	-

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 8/2002 and 10/2002.

Table VR-13: Blue Mountain Recent Utilization Standards and Achievement Based on Shrub Utilization Standards

Pasture	Type/ Location	Utilization Standard	Utilization Standard Achievement				
			1999	2000	2001	2002	2003
Crawford	Riparian	Lt shrub	-	-	N	N	
Idaho	Riparian	Lt shrub	-	-	Y	N	Rest (Y)
East Summit	Riparian	Lt shrub	-	-	-	Y	Rest (Y)
West Summit	Riparian	Lt shrub	-	N	N	N	Rest (Y)
Squaw	Riparian	Lt shrub	-	-	-		

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 8/2002 and 10/2002.

Table VR-14: Blue Mountain Historical Utilization Standards and Achievement in the Planning Area

Pasture	Utilization Standard[1]	Utilization Standard Achievement[2]						
		1992	1993	1994	1995	1996	1997	1998
Crawford	45%	Y	N	N	Y	N	-	Y
Idaho	45%	Y	N	N	N	N	-	-
East Summit	45%	Y	N	N	Y	Y	-	-
West Summit	45%	Y	-	Y	Y	Y	-	Y
Squaw	45%	-	-	-	Y	Y	-	-

Source: Malheur National Forest, Long Creek Ranger District 2210 files, John Day, OR, 5/26/99.

Camp Creek Allotment

The Camp Creek Allotment is located at the confluence of the Middle Fork of the John Day River and Camp Creek (see Figures 1 and 5, Map Section). It covers approximately 600 Forest Service System acres.

Vegetation

Upland Conditions

The Warm Dry forest Plant Association Group (PAG) is the dominant vegetation group within the Camp Creek Allotment, with small amounts of the Hot Dry and Warm Moist forests, and large riparian areas (see Table VR-15). Riparian herb and shrublands are mostly found in Gibbs Meadow, Lower Camp and Middle Pasture (see riparian and pasture descriptions below). Warm Dry and Hot Dry forest are the dominant PAGs found in the remaining pastures.

The non-forested and riparian shrubland or riparian herbland that are within this allotment fall within Fire Regime 2. The upland forest is all Fire Regime I. The remainder of the allotment is comprised of small areas of Fire Regimes III and IV.

Common ground cover in the Hot Dry and Warm Dry forest includes bluebunch wheatgrass, pinegrass/elksedge and Idaho fescue (Johnson and Clausnitzer 1992). Over the past half century, increases in canopy cover related to increased tree stocking have likely reduced forage production. On about 49% of the allotment, the Hot Dry forest and ponderosa pine-dominated portion of Warm Dry forest, is considered to be in a “good” vegetation condition rating (relative to understory vegetation conditions-extrapolated from C/T plot data) with only minor reductions in forage production due to small increases in tree canopy closure. The remainder of the Warm Dry forest (about 19% of the allotment) is mixed conifer; this plant association group is also considered to be in a “good” vegetation condition rating (relative to understory vegetation conditions-extrapolated from C/T plot data), but forage has likely considerably decreased as tree stocking and resultant canopy closure increased due to a lack of thinning treatment and harvest.

Non-forested areas are generally considered to be at a mid to late seral stage of ecological succession (J. Wood, pers. obs. 2001). Gibbs Meadow and Lower Camp Pasture contain substantial amounts of introduced non-native forage species; these species are expected to persist.

Table VR-15: Plant Association Groups (PAGs), Vegetation in Camp Creek Allotment

Plant Association Group	Percent of Allotment
Hot Dry forest	3%
Warm Dry forest	65%
Warm Moist forest	2%
Riparian Shrublands	6%
Riparian Herblands	20%
Areas without assigned PAG (mainly non-forested)	4%

Riparian Conditions

Stream and riparian seral stage conditions in this allotment vary from to early to late seral   Early seral greenline stages were found on intermittent streams in the allotment and on Camp Creek. On the intermittent streams, the greenline is in early seral stage because the low volume of water and lack of water late in the season do not sustain riparian vegetation. On Camp Creek, early seral stages are related to downcutting of the channel and poor shrub species composition and condition (Lower Camp Pasture), conditions at a narrow water gap designated for livestock use (Road Pasture), and non-native species along a short section of creek (Campground Pasture). Riparian shrub conditions vary. Riparian shrub conditions along intermittent streams are static; these conditions are similar to upland shrub conditions. Along perennial streams, shrub conditions appear to be improving in all but the Middle Pasture, where the trend is static likely due to use by livestock. Big game browse may affect shrub architecture along Camp Creek (see Lower Camp Pasture). Condition trend of both greenline herbaceous vegetation and riparian shrub vegetation is generally improving in riparian areas in the Camp Creek Allotment, though some exceptions exist.

Several needs to change livestock management or pasture management were identified to improve riparian conditions or improve management of the allotment. Water is needed in Gibbs Meadow pasture to allow mid- and late-season use of this pasture. In the Middle Pasture, changes are needed in fence location (or access along the fence needs to be blocked in places) to reduce livestock impact to river banks, and poor shrub conditions need to be improved (possibly by limiting duration of hot-season use).   In the North pasture, a need was identified to fix the pond to provide water for this pasture. In the Road Pasture, no need for livestock management change has been identified but development of a water source away from Camp Creek would make more primary forage available to livestock.

Sensitive Plant Species

There are no sensitive plants documented within this allotment although potential habitat exists within forested and riparian areas.

Noxious Weeds/Invasive Plants

A total of about 17 acres of noxious weeds have been documented in Gibbs Meadow, Lower Camp, Road and Upper Camp Pastures and in the Camp Creek campground exclosure (Table

VR-16). In Lower Camp Pasture, 4 acres of whitetop and patches of Scotch (0.1 acre) and Canada (2 acres) thistles are present. Upper Camp Pasture contains Canada and Scotch thistle (2.7 acres) and Sulphur cinquefoil (3.4) acres. The Camp Creek campground exclosure contains Canada thistle.

Table VR-16: CampCreek Allotment Weed Coverage

ALLOTMENT NAME	PASTURE NAME	PASTURE ACRE	WEED ACRES	% WEED COVER
Camp Creek C & H	Gibbs\Meadow	56.17	2.93	5.21%
	Lower\Camp	89.68	6.14	6.85%
	Middle\Unit	45.71	0.00	0.00%
	North Unit	97.95	0.00	0.00%
	Road Unit	124.23	1.17	0.94%
	Upper Camp	141.8	6.13	4.32%
	Campground Unit	40	0.00	0.00%
Camp Creek C & H TOTAL		595.54	16.37	2.75%

Source: Malheur NF GIS, April 2005

Non-native invasive plants such as Kentucky bluegrass and other palatable forage species are common in some pastures, partly because management activities have seeded palatable forage species.

Range Condition

Table VR-17: Camp Creek Allotment Range Existing Condition

Size-Acres of FS	# AUMs	# Livestock	Season of Use	# of Pastures	Miles of Fence	Water Developments
600	327 AUMs	50 cow/calf	6/1-10/30	7	10	2

Introduction

The MFJD River runs through the allotment from east to west, and Camp Creek runs south to north. Both stream channels and adjacent riparian areas have been substantially altered by past activities including channelization, historic railroad logging, roading, dredge mining, and historic grazing.

Camp Creek allotment is a small, productive allotment divided into 7 pastures (see Table VR-17). Private land adjacent to the allotment and private in-holdings are excluded by fencing.

Water Use and Rights

The property within the allotment has "acquired property" status, with water rights attached. Per direction in the Forest Service Manual (FSM 2541.4) these water rights should be managed "to ensure these valuable United States properties are not lost." There are four water rights certificates issued for irrigation within the boundaries or associated areas of the Camp Creek Allotment. All four irrigation diversions are on Camp Creek: two are on National Forest System Lands and two are on private lands. Three diversions are in workable condition and are being used to irrigate about 23 acres of private land (O'Rorke), 49 acres of private land and Lower Camp pasture (Lane Ditch/Camp Creek #1), and 35 acres of Lower Camp and Road pastures (Camp Creek Ditch #2). At these three diversions, the push up dam diversion points have been improved by replacing them with infiltration galleries.

Historically, the Gibbs Meadow pasture was irrigated through the use of the Camp Creek Ditch #3, with heavy equipment building push up dams annually. Push up dams are generally no longer an approved method of diverting water in this creek and have not been constructed since at least 1997 when the channel was further entrenched. The diversion point is located on Camp Creek in Lower Camp Pasture. The creek has become incised, leaving the culvert approximately three feet above the creek which would make it difficult to connect the diversion to the stream. While the permittee is still interested in irrigating this pasture, a great deal of work and funds would be required to bring this system into working order and up to standards. The Forest Service owns and maintains water rights for this water.

Grazing Management

The confluence of the MFJD River and Camp Creek is a natural area of livestock congregation because it is flat, lies along the bottom of two drainages, and lies at a confluence of two allotments and private land. If not controlled, livestock will naturally wander to this location, especially at the end of the grazing season. Fence work is not expected to fix this problem because the problem relates to livestock behavior. The corral (sorting/handling facility) being built through a CE signed in April 2005 near the intersection of Forest Service Roads 36 and 3670 to hold stray cattle and to improve livestock holding, sorting, and transporting in the area may be used to resolve this problem. Within the allotment, some fences are poorly located (see Middle Pasture) and water may be unavailable late in the grazing season (see Gibbs Meadow and North Pastures). The grazing system in past AOIs calls for a 7-pasture deferred rotation; actual rotations may not have occurred as planned partially because Gibbs Meadow and North Pastures may not have been useable late in the season due to a lack of water.

Permittee Use

Tables VR-18, 19, and 20 display compliance with end-point indicators for allowable use of forage (grasses and herbaceous material) and shrubs; this data is separated into two sets of years because data collection changed starting in 1999 related to PACFISH. In those tables: "Y" indicates that the end-point indicator was met, "N" means the end-point indicator was not met, "REST" indicates the pasture was not used by the permittee, and a "-" indicates the pasture was assumed to be used, but no monitoring was done or data was not recorded.

Monitoring records show that end-point indicators are being met more regularly than in the past. Since 1999, riparian end-point indicators for herbaceous species have been met during all years monitored. Shrub utilization failed in the two years it was monitored in Lower Camp and Middle Pastures (see Table VR-19). The permittee is paying very close attention to use levels; this may account for the recently observed increase in willow in Lower Camp pasture (see Lower Camp Pasture description below). This area is big game winter range. Heavy use of shrubs by big game was noted in the Middle Pasture in 2001 (Range Monitoring Files-2270) and in Lower Camp in 2003 (Winward survey 2003), though use by big game was not noted in other years monitored. Because livestock and big game are both expected to utilize shrubs to some degree depending on management and conditions in this allotment, shrub utilization is an end-point indicator that must be monitored carefully.

Between 1992 and 1998, the allotment was rested for two years while the allotment was involved in litigation. When the allotment was used during this time, riparian end-point indicators were met about 60% of the time (see Table VR-20). In 1993, a new permit was issued to a different permittee. This new permittee has operated the allotment from 1993 to the present.

Table VR-18: Camp Creek Recent Utilization End-point indicators and Achievement Based on Stubble Height End-point indicator

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
Gibbs Meadow	Upland	45% - 4 in.	-	Y	-	-	-
Lower Camp	Riparian	45% - 4 in.	-	Y	Y	-	Y
North	Upland	45% - 4 in.	Rest (Y)	-	-	-	-
Middle	Riparian	45% - 4 in.	-	Y	Y	-	Y
Road	Upland	45% - 4 in.	-	Y	Y	-	-

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 8/2002 and 10/2002

Table VR-19: Camp Creek Recent Utilization End-point indicators and Achievement Based on Shrub Utilization End-point indicators

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
Lower Camp	Riparian	Lt shrub	-	N	N	-	-
Middle	Riparian	Lt shrub	-	N	N	-	-

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 8/2002 and 10/2002

Table VR-20: Camp Creek Historical Utilization Standards and Achievement in the Planning Area

Pasture	Utilization Standard	Utilization Standard Achievement						
		1992	1993	1994	1995	1996	1997	1998
Gibbs Meadow	45%	N	-	Y	Y	-	Rest	Rest
Lower Camp	45%	N	-	Y	N	-	Rest	Rest
North	45%	Y	-	Y	Y	-	Rest	Rest
Middle	45%	-	-	Y	Y	-	Rest	Rest
Road	45%	Y	-	Y	N	-	Rest	Rest
Upper Camp	45%	N	-	N	-	-	Rest	Rest

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR

Bank alteration monitoring was done through visual estimations in Middle and Lower Camp Pastures in 2000, 2001, and Middle in 2003. The bank alteration end-point indicators (less than 10% bank alteration caused by livestock) were reported to have been met in all pastures monitored in the Camp Creek Allotment.

Elk Allotment

The Elk Allotment previously lay along State Highway 26 between the Sullens and Blue Mountain Allotments (see Figures 1 and 7, Map Section).

Vegetation Conditions

The Forest Service portion of this allotment contains an intermittent tributary to Squaw Creek. Most of this allotment is Cold Dry and Cool Dry forested upland that provides little forage for livestock. These upland forest types are within Fire Regimes I and IV, depending on the plant association group. Lodgepole pine is increasing in this area, further reducing potential forage through shading from lodegpole pine growth. Livestock impacts to vegetation are likely not discernable in Forest Service portion of this allotment because this area has been rested since about 1998.

Squaw Creek lies in the privately-owned part of this allotment; during work on Highway 26, between 2001 and 2002, parts of Squaw Creek along the highway were fence and trees planted in the fenced area.

Sensitive Plant Species

No sensitive plants have been documented within this allotment. There is potential habitat for some species if any riparian habitat exists.

Noxious Weeds/Invasive Plants

No weeds have been documented within this pasture, however, there are six populations within 300 feet of the north boundary, along State Highway 26; three areas of St. Johnswort/diffuse knapweed, Canada thistle/St. Johnswort, one small populations of St. Johnswort, and three small areas of diffuse knapweed.

Range Conditions

Table VR-21: Elk Allotment Range Existing Condition

Size-Acres of FS	# AMs permitted	# Livestock	Season of Use	# of Pastures	Miles of Fence	Water Developments
72	0	N/A	N/A	N/A	0	0

History and Grazing Management

The Elk Allotment is a small "on and off" allotment (see Figures 1 and 7, Map Section and Table VR-21). On/Off provisions are added to a permit when the majority landowner within an allotment is private. The allotment has a total of 218 acres; 72 acres are publicly owned and the remaining acres are private land. Twenty-five cow/calf pairs were previously permitted to graze on the allotment from 6/10 to 10/24. Ten cow/calf pairs were permitted on the publicly owned portion of this allotment. The private landowner constructed a new fence on the property boundary in 1997 or 1998 and removed the old allotment boundary fence in 1999 or later. This allotment is now part of the Highway pasture of the Sullens Allotment. The area within this allotment has been rested since at least 1998.

No range monitoring data was collected on this allotment between 1992 and the present.

Lower Middle Fork Allotment

The Lower Middle Fork Allotment lies mostly northeast of the Middle Fork John Day River. It covers 54,000 acres and is loosely defined by the forest boundary to the northeast and to the west, County Road 20 along the Middle Fork to the southwest, and Granite Boulder Creek to the east (see Figures 1 and 6, Map Section).

Vegetation

Upland Conditions

The Lower Middle Fork allotment mostly consists of south to southwest facing drainages and ridges ranging from 3000-7000 feet elevation. Upland vegetative cover is dominated by Hot Dry forest or Warm Dry forest Plant Association Groups (PAGs) at the lower elevations, and Cold Dry, Cool Moist, or Cool Dry PAGs at upper elevations (see Table VR-22). At the highest elevations are alpine shrublands and herblands. The conditions of Cool-/Cold- forest PAGs are mainly discussed in the Upland Vegetation Overview, since they generally do not provide forage in adequate quantities to sustain livestock grazing.

Table VR-22: Plant Association Groups (PAGs), Vegetation in Lower Middle Fork Allotment

Plant Association Group	Percent of Allotment
Hot Dry forest	2%
Warm Dry forest	47%
Cool Dry forest	4%
Cold Dry forest	22%
Warm Moist forest	3%
Cool Moist forest	15%
Other Forest (cool wet, hot moist)	<0.1%
Upland Non-forest (herbland/shrubland/woodland)	2%
Riparian Non-forest (riparian herbland/shrubland)	1%
Areas without assigned PAG (mainly non-forested)	4%

Because the 1996 Summit Fire drastically reduced tree canopy cover in all forest PAGs, many of the 28,300 acres burned have become transitory rangeland with high quality and high quantity forage for ungulates. Both planting and natural regeneration have restocked the burned area with trees that are currently 3 to 6 feet tall. Ground vegetation flourished after the fire and is currently unaffected by the new trees, but in the future (20-40 years after the fire) tree shade will again reduce forage and affect forage species composition. Because of the fire, upland vegetation is currently in an early seral stage, providing transitory range.

Over the past half century, increases in canopy cover related to increased tree stocking have likely reduced forage production except in places which have recently been thinned, harvested, or burned.

North of the river, in the low elevation areas outside the fire, Warm Dry and Hot Dry second growth ponderosa pine forests have been precommerically thinned (1960-70s). Portions have also been commercially thinned and treated by prescribed burns in the 1990s. Most of this area is likely in a “good” vegetation condition rating (relative to understory vegetation conditions- extrapolated from C/T plot data); small to moderate increases in canopy cover have resulted in only minor reduction in forage production. The unburned timber in the higher elevation of Granite Boulder Creek is mostly Cold Dry forest. Pizer pasture is Warm Dry and Cool Moist forest and contains considerable amounts of large ponderosa pine that has become ingrown with dense stands of smaller fir. Forage production has likely been considerably reduced by increases in canopy cover in Pizer Pasture. At the highest elevations fire burned erratically leaving some patches of Engelmann spruce, whitebark pine, and lodgepole pine while other stands were completely killed.

South of the river, Balance Creek and Sunshine pastures are mixtures of Warm Dry and Hot Dry forest of second growth ponderosa pine at the lowest elevations and ingrown (with fir) Warm Dry larger ponderosa pine stands at middle elevations. Much of this area has likely had a significant reduction in forage due to heavy overstocking of trees and resultant increases in canopy closure. The highest elevations stands are primarily Cool Moist and Warm Moist forest.

The high elevation portions of the allotment are considered secondary range (range that livestock will not use unless they are pushed into those areas) due to dense forest stands, distance to water, and/or steeper slopes.

There are pockets of herbland, shrubland and woodland (including dry and moist meadows and scablands) scattered throughout the allotment. Non-forested areas are generally considered to be at a mid to late seral stage of ecological succession (J. Wood, pers. obs. 2001). Vegetation in two larger non-forested upland herbland/grassland areas in the allotment (Dunston scab in Sunshine Pasture and Buck Gulch in Susanville Pasture) was rated as late seral and in good condition; in the “Palousian meadow” in Pizer Pasture, vegetation varied from mid to late seral (J. Wood, pers. obs. 2001). In all of these herblands, the greatest threat to native plant species and the condition of these areas is infestation/spread of noxious weeds and non-native grasses. Livestock use was noted as light in these areas, and generally not affecting conditions. Although overall vegetation condition rating are considered fair to good, the subalpine rangelands near Indian Rock and the headwaters of Big Boulder Creek remain in poor condition from historic domestic sheep grazing. Extensive historic sheep grazing has compacted and eroded the soils and altered the species composition of many of these subalpine sites, probably beyond their capacity to recover naturally or even to be actively restored (Johnson, 1995). This area currently receives little cattle use due to its high elevation and sparse forage production.

Riparian Conditions

Modified greenline surveys (Winward 2000) were conducted on both burned and unburned portions of this allotment. In the unburned portion of the allotment, both areas surveyed were at a late seral ecological stage, but the scattered riparian shrubs in the lower part of Dunston Creek in the Sunshine Pasture showed hedged and arrested architecture while riparian shrubs in East Fork Big Creek in the Pizer Pasture were abundant, had vigorous growth, and diverse age classes.

Table VR-23: 2004 Modified Greenline (Winward 2000) Survey Summary

Seral Stage	Stream Survey	Percent Use	Recent Woody Browse Use (in 2004)
Very Early	Middle Fork John Day River	Light	New and old cattle use
Early	East Fork Coyote Creek (burn)	Mod	Big game
Mid	Myrtle Creek (burn)	Light	Big game
Late	East Fork Big Creek	Light	Big game
	Dunston Creek	Light/Mod.	Cattle and Big Game
Potential Natural Community	Lower Idaho Creek	Light	Big game

Source: 2004 Modified Windward Surveys

Greenline plant associations in unsampled, unburned areas are probably at a late seral stage with portions at mid-seral. Riparian shrub conditions are mixed in the unburned parts of Lower Middle Fork Allotment, being primarily affected by wildlife, but with some areas also affected by livestock use (see Table VR-23 above).

The Summit fire burned with high severity in many riparian areas shifting many streams to early seral ecological stages. In the burned part of the allotment, most riparian areas are now considered to be in an early to mid-seral ecological stage. Riparian shrubs and aspen in the burned area are re-colonizing, but are generally displaying some level of arrested growth from wildlife use. Modified greenline survey (Winward 2000) results in the Coyote Pasture show East Fork Coyote Creek in early seral stage with few shrubs with moderate browsing by big game. In the Big Boulder Pasture, Myrtle Creek is in mid-seral stage with most shrubs having uninterrupted growth with light browsing attributed to wildlife. Several Proper Functioning Condition assessments were conducted throughout the burned portion of the allotment as part of the evaluation for resuming grazing after the fire. Conditions in measured areas are generally Functional-At-Risk with an upward trend.

The early seral riparian stages in these pastures are related to the effects of fire or a lack of water. The overall riparian trend in Deadwood, Pizer, Chickenhouse, Susanville, Coyote, Granite Boulder, Big Boulder pastures is improving, and no livestock management changes, except those already being implemented in the allotment (see History and Grazing Management, below), were identified in these 7 pastures. However, a riparian exclosure fence in disrepair along Big Creek needs to be repaired or removed and damage occurring at Pizer Meadow (Pizer Pasture) needs to be alleviated.

Although construction of the fence between Balance and Sunshine Pastures was expected to control animal use on these creeks, present shrub architecture, lack of diverse age class representation and the lack of an apparent improving trend are cause for concern on streams in these two pastures. Livestock and big game use appear to be affecting shrub condition in these pastures (C. Miller, pers. obs. 2004). It is also felt these two pastures may be using a disproportionate share of the permitted animal months in the Lower Middle Fork allotment (S.

Burton, prof. op.). In developing the new management strategy described below, we recognized the need to change livestock management in these pastures related to potential overstocking-the 9-pasture strategy to be implemented after CE fence construction is expected to resolve this problem by spreading livestock use into three pastures instead of two pastures.

Sensitive Plant Species

Sensitive plants have been documented in two pastures, Sunshine and Pizer. In the Sunshine pasture there is a large documented population and another potential population of *Eleocharis bolanderii,* a sedge located within the Dunston Creek scab. Both sites are located along and within intermittent stream channels. There are 8 documented populations of *Botrychium* species, plants commonly called moonworts, which are related to ferns and/or *Carex interior*, a sedge at 5 sites in Pizer Pasture: four sites are near tributaries of Big Creek and one population is near a tributary of Lost Creek. No effects related to livestock have been documented on these sensitive plant populations.

Noxious Weeds/Invasive Plants

This allotment has mostly small, scattered weed populations adjacent to roads where Canada thistle, St. Johnswort, sulphur cinquefoil, and spotted knapweed are the dominant weeds (GIS 2005, Table VR-24). Sulphur cinquefoil and Canada thistle populations are the largest. All pastures in the allotment contain weeds: the highest densities are within Susanville, followed by Deadwood, Pizer, Big Boulder, Coyote, Granite/Boulder, and Sunshine, respectively.

Table VR-24: Lower Middle Fork Weed Coverage

ALLOTMENT NAME	PASTURE NAME	PASTURE ACRE	WEED ACRES	% WEED COVER
Lower Middle Fork	Balance Creek	2,033.54	2.87	0.14%
	Chickenhouse	727.74	0.01	0.00%
	Coyote	5103.16	26.82	0.53%
	Deadwood	8501.06	33.30	0.39%
	Big Boulder	13,449.73	22.82	0.17%
	Granite\Boulder	9,340.66	26.22	0.28%
	Pizer	9,036.74	27.83	0.31%
	Sunshine	4,573.55	18.87	0.41%
	Susanville	6,307.24	80.63	1.28%
Lower Middle Fork TOTAL		**59,073.42**	**239.37**	**0.41%**

Source: Malheur NF GIS, April 2005

Field surveys have also documented numerous patches of medusahead along the Middle Fork John Day River, especially downstream from Big Creek, and appear to be spreading aggressively through the grassland communities on nearby private property. Forest Road 2090 is also heavily infested with sulphur cinquefoil.

Range Condition

Table VR-25: Lower Middle Fork Allotment Range Existing Condition

Size-Acres of FS	# AUMs permitted*	# Livestock Cow/calf*	Season of Use	# of Pastures	Miles of Fence	Water Developments
54,500	3,623 AUMs	549	6/1-10/31	9	7	34

*AUMs and # of Livestock are allotted by permittee (permittee #1 has 150 c/c, 990 AUMs; permittee #2 has 190 c/c, 1254 AUMs, permittee #3 has 209 c/c, 1379 AUMs)

Introduction

The Lower Middle Fork Allotment lies mostly northeast of the Middle Fork John Day River (see Figures 1 and 6, Map Section). The allotment includes approximately 54,500 acres of National Forest lands (see Table VR-25). About 1,600 acres of private land is in the allotment boundary, but not managed as part of the allotment. Private land is located to the west and along the Middle Fork John Day River. Umatilla National Forest lies to the northeast and Malheur National Forest lies to the east. Elevations within the allotment range from approximately 3200 feet in the southwest corner to 7350 feet at Indian Rock in the north central portion of the allotment.

History and Grazing Management

Pasture configuration in this allotment has been modified extensively in response to management needs and changing conditions in the allotment:

- Prior to 1996, 3 pastures – Granite Boulder, Susanville, Balance
- 1996, fence built to divide Balance Pasture into two pastures to address livestock concentration along streams, Balance Lake and Haystack Spring, 4 pastures – Granite Boulder, Susanville, Balance, and Sunshine
- 1996-2003, after Summit Fire but before resumption of grazing in fire area, 6 Pastures – Granite Boulder and Susanville (not used), Pizer, Chickenhouse, Balance, and Sunshine
- 2003-2004, after resumption of grazing, prior to LMF fence CE, 9 pastures - Granite Boulder (this pasture was not used prior to fence construction), Big Boulder, Susanville, Deadwood, Coyote, Pizer, Chickenhouse, Balance, and Sunshine (see Figure 6, Map Section)
- 2005 grazing season or after LMF Fence CE fences are constructed, 9 pastures – same as above with all pastures used (see Figure 6, Map Section)

The existing condition will be discussed according to the new pasture configuration.

Prior to 1996 a deferred rotation system was implemented on the two pastures north of the MFJD River, Granite Boulder & Susanville, with 459 head from June 1 to October 16. South of the river, the Balance Pasture was used season long with an additional 90 head. Because the Balance Pasture had difficulties in meeting utilization standards, a division fence was constructed in

1996. In the summer of 1996, the Summit Fire burned about 28,300 acres of the original Susanville and Granite Boulder pastures. Another 7,000 acres of this allotment burned in the 1994 Reed fire. About 25% of the allotment on the north side of the MFJD River did not burn in the two fires. The portion of the allotment south of the river did not burn. The division fence between Granite Boulder and Susanville pastures was destroyed by the Summit Fire and was removed. An administrative decision was made to temporarily suspend grazing in the portion of the allotment burned by the Summit fire, with the resumption of grazing dependent on achievement of certain parameters (USDA Forest Service, Malheur N.F. 1997 – Summit ROD). Pizer and Chickenhouse pastures were developed in the unburned portion of the fire to allow grazing and provide more intensive management within the Susanville pasture. In 1997 and 2000-2002, some livestock from the portion of the Lower Middle Fork Allotment that was burned by the Summit fire were permitted to use portions of the Upper Middle Fork Allotment to make up for grazing reduced by the Summit Fire decision (see Upper Middle Fork Allotment discussion).

In 1999, the Malheur National Forest requested assistance from the National Riparian Service Team (Team) to help determine what parameters should be used to measure when the system would be able to safely support proper grazing and to determine if the "Summit Fire Recovery" area had recovered sufficiently to allow grazing to resume. The Team consensus was *how* grazing is reinitiated is far more important than *when* grazing is reinitiated. They estimated the reduction of forest over story has resulted in far more forage availability in the short term than is required for permitted livestock. Given present conditions, the Team was confident recovery would continue if a proper grazing strategy were implemented. They also felt the post fire conditions and associated issues indicate the pre-fire grazing strategy was no longer appropriate because of changes in the vegetation community and a reduction of physical barriers associated with vegetative structure and downed wood.

In order to continue to recover from the effects of Summit fire, it was recognized that there was a need to intensify management of the Lower Middle Fork Allotment. The management strategy prescribes 9 pastures and a riparian exclosure and is being incrementally implemented. This plan was developed in full recognition of stream recovery objectives and sensitivity to listed fish species. It also is intended to accelerate improvement in areas of historical livestock concentration and continue the upward trend in riparian areas recovering from the Summit fire. The plan was developed in partnership with the permittees. To the permittees it is of the utmost importance the plan take into account the varied management styles of the permittees, previous areas of use, proximity to private land or base of operation and the desire to take personal responsibility for outcomes. The 9-pasture system is compatible with and supported by the individuals who will implement the management.

Grazing resumed in 2003 when evaluation showed the defined parameters in the Summit EIS ROD (USDA Forest Service 1997) had been met. Grazing resumed with fewer numbers than allowed under the full permit. Full numbers were permitted to graze in 2004. When grazing resumed in the burned portion of the allotment, nine smaller pastures were identified, but the Granite Boulder pasture was rested.

Following completion of a Decision Memo in April 2005 and fence-building, all nine pastures will be used in conjunction with a riparian exclosure. The new configuration reduces the size of some of the original pastures while retaining the original names. New fences and the fence between Balance and Sunshine pastures are the only boundary fences present in this allotment; most pasture boundaries in this allotment are defined by natural topographic barriers and fenceless herding strategies. The Forest Service in conjunction with permittees considered installing more pasture division fences, but determined that more riding would be used to manage livestock distribution. This method was used in 2003 and 2004 with good success.

Prior to the fire cattle distribution had been a problem in isolated locations throughout the allotment. The lack of fencing and water developments on this allotment has created areas of concern from the lack of even livestock distribution. These areas include: Balance Lake, Sunshine Creek, Dunston Creek, Lehman Spring, Onion Gulch, confluence of Deadwood & Big Creek, Coyote Meadow, Lower Coyote Creek, and Pizer Meadow. Additionally, pasture rotations appear to have allowed season-long use of the Balance pasture and use at a similar time each year in other pastures (Susanville-late, Granite Boulder-early). Some unauthorized grazing occurred in the burned portion of the allotment between 1996 and 2003. The 9-pasture system, fences done through CE, and rotations that are being implemented are expected to resolve many of these concerns. However, some concern still exists for areas of past livestock concentration because these areas remain sensitive to livestock use and relatively few fences are being constructed. Fences between the Umatilla and Malheur National Forests (Pizer Pasture) are in disrepair. Some springs/water developments are being impacted by livestock use and are in need of reconstruction.

However, other areas have received very little livestock use and are in good condition. These areas include parts of Big Creek, Deadwood Creek, Elk Creek, Beaver Creek, and Granite Boulder Creek, and others.

Permittee Use

Three permittees have used this allotment for the past several years. As described above, large portions of this allotment were rested between 1996 and 2003. Table VR-26 shows that since 1999, riparian end-point indicators for herbaceous species have been met during the years monitored in Sunshine, Susanville, and Pizer and not met in Chickenhouse nor in Balance (Balance was monitored at an upland monitoring site). Shrub utilization end-point indicators were met about half the times monitored (see Tables VR-26, 27, 28). In those tables: “Y” indicates that the end-point indicator was met, “N” means the end-point indicator was not met, “REST” indicates the pasture was not used by the permittee, and a “-“ indicates the pasture was assumed to be used, but no monitoring was done or data was not recorded.

This allotment falls within big game winter range and wildlife emphasis area (Chapter 1, Management Areas). In 2002, shrub monitoring done on two rested pastures, Granite Boulder and Susanville, showed that these pastures failed or partially failed shrub end-point indicators. This failure was likely due to use by big game.

Between 1992 and 1998, standards were met about 80% of the time, with the failures occurring in Balance and Susanville pastures (see Table VR-28).

Table VR-26: Lower Middle Fork Recent Utilization End-point indicators and Achievement Based on Stubble Height End-point indicator

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
Balance	Upland	45% - 4 in.	-	N	-	-	-
Sunshine	Riparian	45% - 4 in.	Y	-	-	Y	-
Granite Boulder	Riparian	45% - 4 in.	Rest	Rest	Rest (Y)	Rest	N/A
Susanville	Riparian	45% - 4 in.	Y	Rest	-	Rest	-
Chicken House	Riparian	45% - 4 in.	-	-	-	N	-
Pizer	Riparian	45% - 4 in.	-	Y	-	-	Y

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 8/2002 and 10/2002.

Table 27: Lower Middle Fork Recent Utilization End-point indicators and Achievement Based on Shrub Utilization End-point indicators

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
Sunshine	Riparian	L-M shrub	N	-	-	Y	
Granite Boulder	Riparian	L-M shrub	Rest	Rest	Rest (Y)	Rest (Y/N)	Y
Susanville	Riparian	L-M shrub	Y	Rest	-	Rest (N)	
Chicken House	Riparian	L-M shrub	-	-	-	N	
Pizer	Riparian	L-M shrub	-	N	-		Y

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR , 8/2002 and 10/2002.

Table VR-28: Lower Middle Fork Historical Utilization Standards and Achievement in the Planning Area

Pasture	Utilization Standard	Utilization Standard Achievement						
		1992	1993	1994	1995	1996	1997	1998
Balance	45%	N	Rest	Rest	N	Y	-	-
Sunshine	45%	-	-	-	-	-	-	Y
Granite Boulder	45%	Y	Y	Y	Y	-	Rest	Rest
Susanville	45%	Y	Y	Y	N	Y	Rest	Rest
Chicken House	45%	-	-	-	-	-	-	Y
Pizer	45%	-	-	-	-	-	-	Y

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 5/26/99.

The bank alteration end-point indicator, less than 10% bank alteration caused by livestock, were reported to have been met in all pastures monitored between 1999 and 2001. In 2002, Sunshine passed and Chicken House failed, and in 2003, Granite Boulder and Pizer both passed bank stability end-point indicators.

Sullens Allotment

The Sullens Allotment is northeast of Prairie City, Oregon and south of US Highway 26. It is about 45,000 acres, and includes portions of the Middle Fork of the John Day River drainage above Bates (see Figures 1 and 7, Map Section).

Vegetation

Upland Conditions

Vegetative cover for this allotment varies greatly, as does topography. There are limited herbland/grassland types within this allotment, with wheatgrass and Idaho fescue as the chief forage producing plants (Table VR-29). This allotment also has a limited amount of forest PAG types that provide abundant forage (Table VR-29). Only 2% (1,050 ac.) of the Sullens allotment is dominated by more open ponderosa pine stands (Hot Dry forest, and the ponderosa pine vegetation type in the Warm Dry forest). Forage values within the Warm Dry forest, which represents the majority of useable acres, vary considerably. North-facing slopes at the lowest elevations have been treated through precommercial and commercial thinning, and prescribed fire in the recent past, somewhat reducing canopy cover and increasing available forage. At mid-elevations, stands of larger ponderosa pine trees contain ingrown smaller grand fir. The highest elevations stands are primarily grand fir and western larch of all sizes, and extensive stands of lodgepole. Most of this mid- and upper elevation forest produces little livestock forage.

Table VR-29: Plant Association Groups (PAGs), Vegetation in Sullens Allotment

Plant Association Group	Percent of Allotment
Hot Dry forest	<1%
Warm Dry forest	34%
Cool Dry forest	7%
Cold Dry forest	48%
Warm Moist forest	<1%
Cool Moist forest	10%
Upland Non-forest (herbland/shrubland/woodland)	<0.1%
Riparian Non-forest (riparian herbland/shrubland)	<1%
Areas without assigned PAG (mainly non-forested)	<1%

The 2002 Easy Fire burned 3,500 acres of the Bridge Creek pasture. About 940 acres of that burn was high severity with mixed severity in other areas resulting in a mosaic of stand conditions. Much of the area that burned has or will become transitory rangeland. As grasses recover, the burned area is expected to have high quality and high quantity forage for ungulates. In the future (20-40 years after the fire) tree shade will begin reducing forage and affecting forage species composition. Because of the fire, upland vegetation is currently in an early seral stage, providing transitory range.

The major meadows in Sullens allotment include Squaw Meadows, Olmstead Meadows, and Camp Noxage Meadow. Unnamed stringer meadows are also located throughout the area. Lodgepole pine and other conifers are encroaching into the majority of the meadows. 2003 Condition and Trend plots in Squaw Meadow show a "fair" vegetation condition rating (with a downward trend, with the downward trend related to drying of the meadow). Historic activities have impacted the streams and meadows. In early 1980s, livestock concentrated season-long along Squaw Creek, Dry Fork Clear Creek, Camp Noxage Meadow, Olmstead Meadow, Phipps Creek and Squaw Meadows resulting in over use of riparian vegetation and bank alteration. "Uncontrolled use", primarily in the Savage Pasture, by livestock from adjacent allotments (South Burnt River Allotment on the Wallowa-Whitman National Forest and Reynolds and Dixie allotments on the Malheur) has affected and continues to affect the vegetative recovery rate within Squaw Meadows and Olmstead Meadows and other locations in this allotment.

Riparian Conditions

Overall riparian recovery has been in an improving trend with an increase of shrubs and grasses overhanging the stream banks, allowing the banks to heal and become more stable. Modified Winward (2000) surveys done in 2004 showed Clear Creek to be in late seral stage and Squaw Creek to be in early seral stage. Both had moderately abundant riparian shrubs; moderate use by big game of riparian shrubs was noted on Clear Creek. Greenline seral stages throughout the allotment are generally mid- to late seral (2000 PFC data) with shrubs moderately abundant. Data from 2000 indicated one greenline early seral stage was determined on Dry Fork Clear Creek in the Bridge Creek pasture (near the fence with Savage Creek); no determination of cause or effect of livestock was made (2000 PFC data). Fisheries biologists, hydrologists, and range conservationists (MNF) indicate that the majority of the perennial streams located on the allotments have attained a proper functioning condition or are in an upward trend (2000 PFC data). Small sections of Squaw Creek and Clear Creek have no trend due to the effects of old disturbance from past management activities. On Squaw Creek, adverse impacts were primarily related to livestock use which was excessive in 2000 as well as roads (2000 PFC data). On Squaw Creek the trend is considered to be improving in 2004 due to the rest since 2000, although recovery toward PFC may not be as great as would be expected in the absence of heavy grazing in 2000. Other exceptions include Bridge Creek and small parts of Dry Fork Clear Creek where current road locations limit stream function, and sometimes riparian vegetation.

Riparian shrub conditions appear to be improving on many streams. Modified greenline surveys done in 2004 indicate that riparian shrubs were well represented/numerous with multiple age classes. In addition to the PFC rating, the improving trend is noted through general observations, photos, grass/shrub vegetative growth and vigor, stream riparian survey data, and improved bank stability (Biological Assessment 2000).

Few livestock management changes were identified for the allotment. In the entire allotment, the lack of division fences could lead to a lack of control of livestock. In the Bridge Creek pasture needs for management change are related to lack of fences (division and highway) and lack of water. Protection of sensitive areas such as Squaw Meadows was also identified as being necessary.

Sensitive Plant Species

None have been documented within this allotment.

Noxious Weeds/Invasive Plants

There are many small infestations of Canada thistle, scotch thistle, dalmatian toadflax, diffuse knapweed, spotted knapweed, houndstongue, St. Johnswort, and spotted knapweed scattered along roads throughout all pastures (see Table VR-30). Dalmatian toadflax, Canada thistle, and diffuse knapweed are the dominant weeds. Most populations are less than a tenth of an acre, however, larger infestations are adjacent to U.S. Highway 26. The highest weed density is located within or adjacent to the Easy Fire area, between Easy Creek and Clear Creek where dalmation toadflax is the dominant weed.

Table VR-30: Sullens Allotment Weeds

ALLOTMENT NAME	PASTURE NAME	PASTURE ACRE	WEED ACRES	% WEED COVER
Sullens C & H	26	563.14	2.50	0.44%
	Bridge Creek	26,115.47	23.83	0.09%
	Highway	3,132.93	2.30	0.07%
	Savage Creek	16,789.77	16.25	0.10%
	Squaw Mdw	98.29	0.00	0.00%
Sullens C & H TOTAL		**46,699.60**	**44.88**	**0.10%**

Source: Malheur NF GIS, April 2005

Aspen

There are scattered aspen stands within Bridge, Highway and Savage pastures, but the majority of the stands are within the Bridge Pasture. Bridge Pasture has twenty stands, Highway has three, and Savage Pasture has two. None have been documented within Squaw Meadows or Highway 26 Pastures.

Range Condition

Table VR-31: Sullens Allotment Range Existing Condition

Size-Acres of FS	# AMs permitted	# Livestock Cow/calf	Season of Use	# of Pastures	Miles of Fence	Water Developments
45,000	0	N/A	N/A	5	44	31

History and Grazing Management

The Sullens Allotment is northeast of Prairie City, Oregon and south of US Highway 26. It includes portions of the Middle Fork of the John Day River drainage above Bates (see Figures 1 and 7, Map Section). It consists of roughly 45,000 acres of National Forest system lands, 170 acres of private land and 40 acres of Bureau of land Management (BLM) land. Private land within this allotment is excluded by fencing. Since 1998 the Sullens permit has been in vacant status (see Table VR-31). The permitted livestock numbers were for 241 cow/calf pair from June 16 through October 15 (1266 AUMs/959 AMs). Both cattle and sheep have used this allotment, with cattle being the most recent livestock authorized.

The Sullens allotment is currently vacant. Early in 1998, the permit was canceled for repeated failures to comply with term grazing permit terms and conditions. Specifically, failure to maintain assigned range improvements, failure to control livestock in accordance with the Annual Operating Instructions and failure to control livestock within the authorized period of use (during years of use). Use on the allotment in 1997 exceeded standards as a result of the permittee's failure to control livestock. Since 1998 the permit has been in vacant status. However, in 2000, a temporary authorization to graze the Savage pasture was approved for an adjacent permittee needing to rest his allotment. The temporary use was not successful. Livestock use has not been authorized on the Sullens Allotment since.

The Sullens allotment is divided into 5 pastures; two large pastures (Bridge Creek & Savage), one medium-sized pasture (Highway) and two small pastures (Squaw Meadows & 26 Pasture). The small pasture at Squaw meadows has been used for livestock handling purposes, though the length of the use has been excessive some years. There are also two wildlife exclosures located on the allotment. One of the exclosures is for fisheries habitat protection; Squaw Fish Exclosure on Lower Squaw Creek, and the other is an aspen protection exclosure; Quaking Aspen Spring.

Two permittees grazed the Sullens allotment (which included today's Sullens and Blue Mountain Allotments) when, in 1979, the management was deemed unacceptable because season-long use was occurring. The allotment was divided along Ranger District Boundaries, separating permittees, and the new Sullens allotment was grazed season-long until the early 1980s. A rest rotation grazing system was prescribed in the early 1980s when the allotment was divided; however, rest-rotation in an allotment with two large pastures essentially uses one large pasture season-long every other year. This system allows grasses to go to seed every other year, but is not conducive to restoration of hardwoods or their recruitment because shrubs don't mature in a year. Livestock tend to concentrate in areas of preference, riparian zones. This is especially true on steeper terrain, in overstocked timber stands or in areas with an inactive permittee.

The allotment contains about 53 miles of fences of which the permittee is responsible to maintain 44 of these miles, plus 31 water developments. If these improvements were in good condition, they would be expected to help disperse livestock throughout the allotment to achieve more even utilization. However, many of the range improvements within the Sullens Allotment are in a poor or non-functional condition, and are not serving their intended purpose. The majority of the developments have suffered from neglect (through non-use or lack of maintenance when used), and some have been destroyed by fire. This allotment also lacks a handling/gathering facility (corral) making permittees use Squaw Meadows for gathering and "mothering up". The present system, season, number and disproportionate size of existing pastures does not lend itself to a functional rest rotation grazing system to allow for plant maturation. In addition, seasonal concerns associated with the presence of listed fish species make this allotment very difficult to manage.

The Sullens Allotment also has a documented history of fence maintenance neglect and failure to control livestock by the adjacent permit holder on the Wallowa-Whitman National Forest in the Savage Pasture and adjacent permit holders on the Malheur (Reynolds & Dixie). This unauthorized use has affected and could continue to affect the vegetative recovery rate within this allotment.

Permittee Use

Since 1998 the Sullens permit has been in vacant status. Between 1986 and 1998 the allotment was authorized for use only four times (1989, 1990, 1993, 1997). Although non-use (rest) was authorized for rest in the other years, unauthorized use occurred in 1991, 1994-1996, and 2001. Authorized use during the 1980s, 1990's and in 2000 was essentially season-long use of the two large pastures (since rest rotation in meant one pasture was used one year, then rested the next). Riparian standards were not met in 1991, 1993, and 1994-1996, 1997 (see Tables VR-32, 33, 34). In those tables: "Y" indicates that the end-point indicator was met, "N" means the end-point indicator was not met, "REST" indicates the pasture was not used by the permittee, and a "-" indicates the pasture was assumed to be used, but no monitoring was done or data was not recorded. The failures to meet standards by permitted livestock in 1993 and 1997 are more attributed to lack of livestock control, lack of permittee involvement, and the difficulty related to keeping livestock from overusing areas of preference under a season long system than to overstocking. Unauthorized use has also contributed to or been the cause of failure to meet standards.

In 2000, a temporary authorization to graze the Savage pasture was approved for an adjacent permittee needing to rest his allotment. The temporary use was not successful. Use in 2000 passed stubble-height end-point indicators, but failed shrub end-point indicators. Livestock use has not been authorized on the Sullens Allotment since 2000. Pasture 26 has not been grazed for at least 10 years.

The bank alteration end-point indicators, less than 10% bank alteration caused by livestock, were reported to have been met in all pastures monitored between 1999 and 2001. No further data was available for Sullens.

Table VR-32: Sullens Allotment* Recent Utilization End-point indicators and Achievement Based on Stubble Height End-point indicator

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
Bridge Creek	Riparian	45%	Rest	Rest	Rest (Y)	Rest	Rest
Highway	Rip/Upl.	45%	Rest	Rest	Rest (Y)	Rest	Rest
Savage	Riparian	45%	Rest	Y	Rest	Rest	Rest
Squaw Meadows	Riparian	45%	Rest	-	Rest	Rest	Rest
Pasture 26	-	45%	Rest	Rest	Rest	Rest	Rest

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 8/2002 and 10/2002.

* Sullens allotment - Highway pasture monitoring was done in the riparian area until 2000. It was changed to upland monitoring after perennial stream riparian areas were fenced out in 2000. Livestock were moved on and off Squaw Meadows pasture (pasture used for 2-3 days) in 2000 after a steelhead redd was found. Prior to 1999, the Pasture 26 area was being used by livestock, but it was not determined which FS pasture had administrative duties. In 1999, a fence was built and Prairie City took on the administration of Pasture 26.

Table VR-33: Sullens Allotment Recent Utilization End-point indicators and Achievement Based on Shrub Utilization End-point indicators

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
Bridge Creek	Riparian	L-M shrub	Rest	Rest	Rest	Rest	Rest
Highway	Rip/Upl.	L-M shrub	Rest	Rest	Rest	Rest	Rest
Savage	Riparian	L-M shrub	Rest	N	Rest	Rest	Rest
Squaw Meadows	Riparian	L-M shrub	Rest	-	Rest	Rest	Rest

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR

*Sullens allotment – L-M Shrub: in Sullens Allotment, Shrub end-point indicator allowed light to moderate shrub use when it was used in 2000. Highway pasture monitoring was done in the riparian area until 2000. It was changed to upland monitoring after perennial stream riparian areas were fenced out in 2000. Livestock were moved on and off Squaw Meadows pasture (pasture used for 2-3 days) in 2000 after a steelhead redd was found. Prior to 1999, the Pasture 26 area was being used by livestock, but it was not determined which FS pasture had administrative duties. In 1999, a fence was built and Prairie City took on the administration of Pasture 26.

Table VR-34: Sullens Allotment Historical Utilization Standards and Achievement in the Planning Area

Pasture	Utilization Standard	Utilization Standard Achievement						
		1992	1993	1994	1995	1996	1997	1998
Bridge Creek	45%	Rest	N	Rest	Rest	Rest	Rest	Rest
Highway	45%	Rest	N	Rest	Rest	Rest	N	Rest
Savage	45%	Rest	Rest	Rest	Rest	Rest	Y	Rest
Squaw Meadows	45%	Rest	Rest	Rest	Rest	Rest	Rest	Rest

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 5/26/99.

Upper Middle Fork Allotment

The Upper Middle Fork allotment (UMF) is located near the head of the Middle Fork John Day River, north and west of Highway 7. The river divides this 54,000-acre allotment in nearly two equal pieces, one north of the river and the other to the south (see Figures 1 and 8, Map Section).

Vegetation

Upland Conditions

Vegetative cover for this allotment varies greatly, as does topography. Elevation ranges from 3600-8100 feet. Vegetative cover consists of about half Hot Dry or Warm Dry forest Plant Association Groups, found at the lower elevations, and half Cold Dry, Cool Moist, or Cool Dry plant forest Plant Association Groups, found in the upper elevations (see Table VR-35). At the highest elevations are alpine shrublands. Common ground cover in the Hot Dry Warm Dry forests includes bluebunch wheatgrass, pinegrass/elksedge and Idaho fescue (Johnson and Clausnitzer 1992). The conditions of Cool-/Cold- forest types are discussed mainly in the Upland Vegetation Overview, since they generally do not provide forage in adequate quantities to sustain livestock grazing.

Because there is diversity in vegetation cover, plant associations, and species composition, there is also diversity in fire regimes. Approximately 50% of the allotment is within Fire Regime 1, and 20% of the allotment is within each Fire Regime III and Fire Regime IV.

Table VR-35: Plant Association Groups (PAGs), Vegetation in Upper Middle Fork Allotment

Plant Association Group	Percent of Allotment
Hot Dry forest	4%
Warm Dry forest	49%
Cool Dry forest	3%
Cold Dry forest	20%
Warm Moist forest	<1%
Cool Moist forest	21%
Other Forest (cool wet, hot moist, warm very moist)	0.1%
Upland Non-forest (herbland/shrubland)	1%
Riparian Non-forest (riparian herbland/shrubland)	<1%
Areas without assigned PAG (mainly non-forested)	1%

Over the past half century, increases in canopy cover related to increased tree stocking have likely reduced forage production except in places which have recently been thinned, harvested, or burned. North of the river, lower elevations are Warm Dry and Hot Dry second growth ponderosa pine forests that have been precommerically thinned (1960-70s), with parts commercially thinned and prescribed burned in the 1990s; most of this area is likely in a “good” vegetation condition rating (relative to understory vegetation conditions-extrapolated from C/T plot data) with a minor reduction in forage production due to small to moderate increases in canopy cover. North of the river the timber in the higher elevation is mostly Cold Dry forest. A windstorm in Upper Vinegar pasture blew down a sizable amount of timber in the Vincent and Vinegar Creeks headwaters; this area now contains jackstrawed logs and natural regeneration.

South of the river are Warm Dry and Hot Dry stands of second growth ponderosa pine at the lowest elevations and ingrown (with fir) warm dry larger ponderosa pine stands at medium elevations. The highest elevations stands are primarily Cool Moist forest.

There are pockets of herblands and shrublands (including dry and moist meadows and scablands) scattered throughout the allotment. Most of the uplands are considered to be in mid-seral stage of succession, in fair to good rangeland condition, with the exception of the subalpine meadows of the Greenhorn Mountains in the Vinegar Hill/Indian Rock area. Extensive historic sheep grazing has compacted and eroded the soils and altered the species composition of many of these subalpine sites, probably beyond their capacity to recover or even to be actively restored (Johnson, 1995). Areas dominated by western needlegrass communities mixed with bottlebrush squirreltail and mountain big sagebrush are common, and represent early seral stages of more productive perennial grasslands (Johnson and Clausnitzer, 1992).

The high elevation portions of the allotment are considered secondary range (range that livestock will not use unless they are pushed into those areas) due to dense timber stands, accessibility, distance to water, and/or steep slopes.

Riparian Conditions

The overall riparian vegetation trend in the Upper Middle Fork Allotment is believed to be improving because of substantial rest in the allotment for the past 15 years (see Tables VR-38 through 40, below). Data and information in Butte and Lower Vinegar pastures suggest improving trends. However, in some areas (Caribou, Deerhorn pastures) the recent trend of riparian vegetation conditions is unknown due to limited data or data limited by its ability to compare today's conditions to conditions 5-15 years ago. Based on IDT knowledge of the area, the ecological stage of greenline riparian vegetation along the MFJD river and most streams in the Upper Middle Fork Allotment is considered to be mid-seral. Modified greenline (Winward 2000) surveys in 2004 determined riparian seral stages in Butte and Lower Vinegar pastures. Butte Creek was late seral; Lower Vinegar (in Lower and Upper Vinegar pastures) was early seral. Vincent Creek (also in Lower and Upper Vinegar pastures) and Tincup and Windlass Creeks (in Caribou pasture) are also estimated to be in early seral or early to mid-seral greenline stage in many areas. Historic activities in Vinegar, Vincent, Tincup and Windlass Creeks straightened the channels, caused entrenchment, and altered soil conditions across the valley bottoms. These conditions resulted in drier conditions in the valley bottoms and disturbance of riparian plant communities. The combination of past effects with recent livestock use is likely the cause for the early seral greenline stages in these creeks. The greenline in Mill Creek in the Austin pasture is estimated to be in early to mid-seral stage based partially on historic livestock grazing effects and on vegetation conditions related to low stream flow (with areas that flow year-long, and areas that dry up and go underground for part of the year).

Shrub conditions throughout the allotment vary but appear to be improving because of limited livestock use. Shrubs vary in composition, abundance, architecture and age class along the streams in the allotment. The Butte Pasture modified greenline survey (Winward 2000) found that over half the shrubs were classed in the Sapling/Young group with a few Seedling/Sprouts. In other pastures, shrub conditions include areas with few shrubs (Davis Creek in Deerhorn Pasture, Tin Cup and Windlass Creeks in Caribou Pasture), or shrubs with arrested architecture (Lower Vinegar, Tailings Pastures). Shrubs along several streams in the Deerhorn pasture were described as being heavily browsed (with most use by livestock and some use by big game) in 2001, a year when livestock were permitted to use the pasture and shrub use did not meet end-point indicators (see Table VR-39).

As discussed in the overview, valley bottom disturbance is limiting the distribution of riparian vegetation in parts of this allotment. Past management activities such as roading, railroad logging, and grazing have resulted in a lower water table and reduction in riparian species.

In the Austin Pasture, no need for management change was identified, but the south/lower end of this pasture along Mill Creek is an area to pay attention to livestock management because it is a short stream segment in a flatter area sensitive to livestock use and it is at a down hill fence corner (a place where livestock may be funneled) (see 1999 unauthorized use in the Austin Allotment). In Blackeye pasture, no need for livestock management change was identified for this pasture, but the pasture could be managed with the Caribou pasture. The riparian vegetation condition trend is unknown for this pasture. A need to change pasture rotation/stop season-long use was identified for this pasture. A need to control unauthorized livestock use was identified in the Upper Vinegar (and Lower Vinegar) pasture, either through range administration or through fencing on the private land boundary. A need for management change was identified in the Shop Pasture and relates to controlling livestock use on the private land boundary, either through range administration or through fencing.

In Butte pasture, no need for livestock management changes were identified in this pasture other than those identified for the allotment in general. In the Deerhorn pasture, no need for livestock management changes were identified except continued general avoidance of the proposed RNA. No need for management change was identified in the River Pasture. No need for management change was identified for the Tailings Pasture, though early season use may help to improve shrub conditions in this small riparian pasture

Sensitive Plant Species

Fifteen sensitive plant populations on the Region 6, Regional Foresters' Sensitive Plant List occur within Caribou, Blackeye, Deerhorn, and Upper Vinegar Pastures. All plants are associated with riparian habitat: *Botrychium* species, plants commonly called moonworts, which are related to ferns; *Listera borealis*, an orchid; and *Carex interior*, a sedge. No effects related to livestock have been documented on these sensitive plant populations.

Noxious Weeds/Invasive Plants

This allotment has numerous, large weed patches where Canada thistle is the dominant weed.

(see Table VR-36). Most of these weed locations are located along or near roads and riparian areas. Below are the amounts of weed acres and relative cover within each pasture. The absence of documentation does not mean additional populations do not exist.

Table VR-36 – Upper Middle Fork Allotment Noxious Weed Coverage

ALLOTMENT NAME	PASTURE NAME	PASTURE ACRE	WEED ACRES	% WEED COVER
Upper Middle Fork C	Austin	4,408.38	98.50	2.23%
	Blackeye\Creek	665.84	0.00	0.00%
	Butte	13,334.58	113.93	0.85%
	Caribou	9,592.58	828.69	8.64%
	Deerhorn	13,854.19	21.43	0.15%
	Lower Vinegar Creek	7,001.66	199.05	2.84%
	River	110.98	17.63	15.89%
	Shop Pasture	313.01	13.70	4.38%
	Tailing	47.2	16.44	34.84%
	Upper Vinegar	5,569.10	427.22	7.67%
Upper Middle Fork C TOTAL		**54,897.52**	**1736.60**	**3.16%**

Source: Malheur NF GIS, April 2005

Range Condition

Table VR-37: Upper Middle Fork Allotment Range Existing Condition

Size-Acres of FS	# AUMs	# Livestock Cow/calf	Season of Use	# of Pastures	Miles of Fence	Water Developments
54,000	2,868 AUMs	485	6/1-10/15	10	49	21

Introduction

The Upper Middle Fork allotment (UMF) is located near the head of the Middle Fork John Day River, north and west of Highway 7 (see Figures 1 and 8, Map Section). Approximately 1,000 acres of privately owned property are in the allotment boundary but not managed as part of the allotment.

There are six major pastures: Austin, Lower Vinegar, Upper Vinegar, Caribou, Deerhorn, and Butte; one small pasture, Blackeye, left over from range evaluation project research, and 3 riparian pastures on the river; Shop, River and Tailings (see Tables VR-36 and 37). Another small research pasture, Ragged Rocks, was incorporated into the Butte pasture.

History and Grazing Management

Riparian condition and livestock use in this allotment are affected by many factors which differ geographically (such as steepness, lack of springs and available water, and vegetative communities that provide little forage). Multiple factors interact in some places, influencing livestock distribution differently than where single factors are present. In addition the lack of authorized use and the amount of unauthorized use in recent years make it difficult to describe what the current effect of livestock grazing is.

Historically permitted riparian use was higher. For instance, prior to the implementation of the Forest Plan, this allotment was managed under the "*Oxbow Ranch Coordinated Range and Related Resource Management Plan" (CRMP)* which was signed in 1978. Up to 70% utilization of riparian forage species was permitted under this plan and Forest Service regulations, despite the CRMP also expressing concern about degradation of riparian areas.

Generally, where slopes exceed 45% within this allotment, livestock distribution has been a problem in the past and may continue to be a problem in the future. Steep slopes limit cattle distribution in most of the pastures. Livestock have tended to concentrate in the lower reaches of nearly all the streams on the allotment because the low gradient and wide valley bottom along the streams make them highly accessible to livestock and they provide forage and water. This has resulted in heavy utilization in these riparian zones. Unauthorized use in Upper and Lower Vinegar pastures is also affecting riparian conditions. Moving livestock on this allotment is difficult because of topography and because the Upper Middle Fork Allotment does not have holding/gathering facilities.

Problems were somewhat mitigated by fencing and upland water developments. Over 45 miles of fence were constructed on the Upper Middle Fork Allotment to improve livestock distribution and facilitate further control of timing, duration and intensity of use. Unsatisfactory riparian conditions resulting from livestock distribution problems have generally been reversed as a result of these range improvements and the intermittent rest within the last fifteen years. Currently, however, the most significant management problem on this allotment is the poor condition of the existing fences, especially interior pasture divisions. As of writing of this document, the interior fences have not been adequately maintained to effectively implement any grazing system other than a fenceless, herding strategy. In addition, 5 water developments are in poor condition (they may be providing no or limited water for livestock) and require reconstruction.

An additional challenge in the Upper Middle Fork Allotment is that, from a management and permittee standpoint, the allotment is in a state of flux. During the last fifteen years, relatively few acres saw use by the permittee of record, by personal choice. Over this time period there have been three different permit holders and at least 7 years of rest (with some unauthorized use occurring during rest). Since 1997 portions of the allotment were lightly stocked by permittees unable to graze the adjacent "Summit Fire" burned area, within the Lower Middle Fork Allotment. For these reasons, realistic actual use data, as judged by current resource standards, is non-existent. With these variables, it is extremely difficult to estimate current appropriate stocking levels and management strategies. There is not currently an effective strategy for pasture rotations in this allotment. One pasture (Caribou) has been used season-long in several recent years (1995, 2000, 2001, 2002). This season long use tends to over use areas livestock prefer with no opportunity for rest or recovery.

Permittee Use

Recent and past monitoring records show that end-point indicators are difficult to meet in this allotment (see Tables VR-38, 39, 40). In those tables: “Y” indicates that the end-point indicator was met, “N” means the end-point indicator was not met, “REST” indicates the pasture was not used by the permittee, and a “-“ indicates the pasture was assumed to be used, but no monitoring was done or data was not recorded. The bank alteration end-point indicators, less than 10% bank alteration caused by livestock, were reported to have been met in all pastures monitored between 1999 and 2001. In 2002, Caribou failed, Upper Vinegar failed in one DMA and passed in another, and Lower Vinegar failed. In 2003, Caribou passed. Monitoring done during rest (2000-2002) shows that stubble height and riparian shrub use were able to pass end-point indicators without use by livestock. This suggests use by big game was not so heavy as to not meet end-point indicators or to make end-point indicators unachievable because of big game. There are indications that big game use the allotment; in 2004, most riparian shrub use in Lower Vinegar Pasture was attributed to big game (see Lower Vinegar). Some of the inability to meet end-point indicators may be related to the lack of an on-going permit causing a lack of knowledge of how to use this allotment.

Table VR-38: Upper Middle Fork Allotment Recent Utilization End-point indicators and Achievement Based on Stubble Height End-point indicator

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
Butte	Riparian	45% - 4 in.*	N	-	-	Rest (Y)	-
Caribou	Riparian	45% - 4 in.*	-	-	-	N/Y (No at 2 of 3 DMAs)	Y
Austin	Upland	45% - 4 in.	-	Rest	Rest (Y)	Rest (Y)	-
Deerhorn	Riparian	45% - 4 in.*	-	Rest (Y)	N	Rest	-
Lower Vinegar	Riparian	45% - 4 in.*	-	Rest	Rest (Y)	N/Y (No at 1 of 3 DMAs)	-
Upper Vinegar	Riparian	45% - 4 in.*	-	Rest	Rest	Y	-
River	Riparian	45% - 4 in.*	-	-	-	Y	-

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 8/2002 and 10/2002.

*End-of-season stubble height end-point indicator was 6 inches in these areas in 1999.

Table VR-39: Upper Middle Fork Allotment Recent Utilization End-point indicators and Achievement Based on Shrub Utilization End-point indicators

Pasture	Type/ Location	Utilization End-point indicator	Utilization End-point indicator Achievement				
			1999	2000	2001	2002	2003
Butte	Riparian	L-M shrub	-	-	-	Rest (Y)	-
Caribou	Riparian	L-M shrub	-	-	-	N/Y (No at 1 of 3 DMAs)	Y
Deerhorn	Riparian	L-M shrub	-	Rest (Y)	N	Rest	-
Lower Vinegar	Riparian	L-M shrub	-	Rest	Rest (Y)	N/Y (No at 2 of 3 DMAs)	-
Upper Vinegar	Riparian	L-M shrub	-	Rest	Rest	N/Y (No at 1of 3 DMAs)	-
Tailings	Riparian	L-M shrub	-	N	-	-	-
River	Riparian	L-M shrub	-	-	-	Y	-

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 8/2002 and 10/2002.

Table VR-40: Upper Middle Fork Historical Utilization Standards and Achievement in the Planning Area

Pasture	Utilization Standard	Utilization Standard Achievement						
		1992	1993	1994	1995	1996	1997	1998
Butte	45%	Rest	Rest	N	-	Rest	-	Rest
Caribou	45%	Rest	Rest	Rest	-	N	-	Rest
Austin	45%	Rest	Y	N	-	Rest	-	Rest
Deerhorn	45%	Rest	Rest	N	Rest	N	Rest	Rest
Lower Vinegar	45%	Rest	Rest	Rest	Rest	N	Rest	Rest
Upper Vinegar	45%	Rest	Rest	N	-	Y	-	Rest

Source: Malheur National Forest, Blue Mtn. Ranger District 2210 files, John Day, OR, 5/26/99.

Sunshine, Bear and Blue Mountain Administrative Pastures

Three administrative use pastures are within the planning area: Sunshine, Bear and Blue Mountain. They occupy a combined total area of approximately 490 acres. Currently domestic livestock grazing is not prohibited in these pastures and has occurred intermittently through annual authorization. Government horses have used the Sunshine and Blue Mountain pastures intermittently in more recent years.

Bear Administrative Pasture (Bird Pasture)

The land encompassed in this pasture was also acquired in a land exchange between the Kinzua Corporation and the Forest Service in 1979. Prior to acquisition this land was used in the same manner as described in the Bear Allotment description. Evidence of an old homestead remains today. This area was not included in the Bear Allotment, but retained for Forest use. It is part of Management Area 19 (MA 19-Administrative Area), but like several other small MAs, it is not mapped (see Chapter 1, Management Areas and Objectives). Use by the government has included hay production and aftermath grazing for pack and saddle stock. This use has ceased for over ten years. Use by wildlife and unauthorized livestock has been the extent of use in the Bird Pasture. Forage has become rank, unpalatable and less productive.

Sunshine Administrative Pasture(s)

There are two administrative pastures at the Sunshine Guard Station on the Middle Fork of the John Day River. One pasture is north of the river and county road 20, adjacent to the Sunshine Guard Station. The other is south of the road and contains a portion of the MFJD river. These pastures have been used to provide forage and pasture for government horses. Portions have also been used intermittently as livestock holding and gathering pastures for permitted livestock within the MFJD area. A significant portion of the fence around the North Sunshine Administrative Pasture, connected with the guard station, was burned beyond repair during the Summit Fire.

This pasture has had intermittent unauthorized use in the past, some attributed to poor communications. The river is not considered at the desired future condition, but is in upward trend. With ongoing limited use, the upward trend will continue.

Environmental Consequences

Environmental effects, discussed here, apply throughout all the allotments; the effects are expected to be generally the same in each allotment unless noted otherwise.

Vegetation Conditions

Environmental consequences for vegetation are divided into two major groups – upland vegetation and riparian vegetation. Within each group, the Direct and Indirect Effects and the Cumulative Effects of Alternative 1 (No Grazing) are discussed first. These effects are followed by those for Alternatives 2 and 3. The upland effects are divided into Forested and Non Forested Uplands for Alternative 1, but these topics are summarized for Alternatives 2 and 3 because of the similarity of effects. These topics are further subdivided in the discussion for Alternative 1 as needed. Riparian effects are divided into sections based on riparian features; within the Streamside and Floodplain Sub-section, effects are discussed by stream type.

Upland Vegetation

Alternative 1 (No Grazing)

Direct and Indirect Effects

Upland vegetation would remain outside the natural range of vegetation as characterized by the area ecologist (Johnson, 1995) and described in the Existing Condition section.

NON-FOREST VEGETATION:

Dry Meadows, Grasslands and Scablands

The current downward trend in condition for dry meadows is expected to continue since they are considered to be in poor to fair condition. The reason for the downward trend is unknown and in the absence of information suggesting a shift in trend, the current trend is expected to continue. Erosion would continue on Caribou, Butte Creek Overlook, and Middle Fork Overlook scabs or grasslands in the vicinities of Butte and Caribou creeks which is likely to reduce plant abundance and vigor and shift species composition over time. The ecological condition of most other low- to mid-elevation non-forested areas would be maintained or improved since existing conditions appear stable at a minimum.

Sub-alpine Steppe Meadows

Erosion would continue on portions of the non-forested sub-alpine grasslands in the Vinegar Hill-Indian Rock Scenic Area. Erosion pathways would continue to connect, concentrating flow that is likely to wash out elk sedge and other plants along some hillslopes including those above the headwaters of Granite Boulder, Wray, and Beaver creeks. Meadow condition would remain in a degraded state in a downward trend as described in the Existing Condition. Other areas would remain populated with non-native species as described by Johnson (1992).

Shrubs and Shrublands

Upland shrub populations would remain in a deteriorated state as described in the Existing Condition unless activities beyond those proposed in this project were implemented. Recruitment of young shrubs would remain low unless other actions were taken.

FOREST VEGETATION

Cessation of grazing is expected to have minor effects on the conifer trees or forest stand management. The increased growth of ground vegetation, regardless of PAG classification, can lead to increased amounts of fine fuels that can affect the intensity and subsequent mortality from fires. Accumulation of fine fuels would be controlled by periodic prescribed underburning or controlled natural burns and is not expected to be a major impact on timber stand management in the Hot, Dry Forest and Warm, Dry Forest PAGs. Increased fine fuels are not considered to be an influential factor affecting rates of burn in other PAGs. .

Forest vegetation would remain outside the natural range of vegetation as characterized by the area ecologist (Johnson, 1995) and described in the Existing Condition section. The historically altered species mix and increased stocking and basal area of current forested areas would remain. These shifts in species and stocking may result in stress-related disturbances such as increased insects and disease and tree mortality, based on local experience.

Cumulative Effects

The list of past, on-going and foreseeable activities displayed in Appendix A (Cumulative Effects) was reviewed for inclusion in the discussion on cumulative effects.

Elimination of grazing would result in the continuation of the current condition and trend of upland vegetation because grazing is neither improving nor detrimentally impacting upland vegetation. Condition and trend of upland vegetation in the Planning Area is affected by legacy conditions, such as erosion, or other on-going activities, such as wildlife use and the exclusion of fire. Foreseeable activities such as the Balance and Crawford projects are expected to move uplands toward conditions that will support frequent, low intensity fire which would be expected to improve abundance and vigor of ground vegetation.

Future forest stand density management is currently being planned for overstocked ponderosa pine stands (Hot, Dry Forest and Warm, Dry Forest PAGs), and when implemented will allow for more forage plant growth in the uplands. In addition, there are plans to convert some stands that have become ingrown with fir trees back to ponderosa pine dominated stands (Warm, Dry Forest PAG). This will also increase the forage that is available for ungulates in these stands. Along with the increase in grasses and forbs on the forest floor, the increased sunlight will also stimulate shrub growth of the characteristically sparse shrubs. The net impact of future forest restoration management activities should result in increased forage availability for wildlife.

Alternatives 2 and 3

Upland plant material would be removed under either Action Alternative (see Rangeland effects below). Since FP standards for the amount of utilization of upland vegetation would be met and because the science with regard to utilization of plants for grazing, on which these standards are developed, is well developed, no measurable effects on the health or vigor of vegetation used for upland forage or browse are expected. Additional indirect effects of grazing on vegetation are discussed in the Soils Section.

Direct and Indirect Effects

Generally, effects of activities proposed under either Action Alternative on the upland vegetation are expected to be similar to those described for the No Grazing Alternative. Upland vegetation utilization is not the limiting factor affecting grazing use of these allotments. Grazing activities typical of those proposed generally are not contributing to the observed deterioration of upland vegetation in dry meadows, grasslands, or shrublands.

Grazing at any of the levels prescribed in the alternatives, based on past experience, is not expected to have any significant effects on the trees or forest stand management. There may be some trampling damage of planted young trees in areas of concentration (for instance around water sources) but the overall effect is very minor.

It has been suggested that grazing reduces grass competition to seedlings, leading to increased natural regeneration. This is just speculation at this time, there is no known research that proves or disproves this theory. If it were true, there would be a positive effect if regeneration were desired. In areas that are already stocked with an overstory, experience has shown that the overstory density has a much greater effect on seedling establishment than vegetative competition and that seedling ingrowth is minimal when overstory density is greater than 60 ft2/acre of basal area.

If regeneration were not desired because it would eventually lead to overstocking, grazing would have a negative effect on stand management. The excess trees would need to be removed periodically, either by cutting them or killing them with periodic underburning, which is either ongoing or being planned for in most ponderosa pine stands.

Cumulative Effects

The list of past, on-going and foreseeable activities displayed in Appendix A (Cumulative Effects) was reviewed for inclusion in the discussion on cumulative effects.

Since the proposed actions are expected to meet standards and foreseeable actions are similar regardless of alternative, it is expected that the cumulative effects of grazing on upland vegetation will not differ measurably from those described for the No Grazing Alternative.

Since portions of the Warm, Dry Forest and Hot, Dry Forest have been prescribe burned in the past when grazing was an on-going activity, prescribe burns are expected to continue, as described in Appendix A, and to have beneficial effects on vegetation palatable to livestock. These effects would also apply to the additional forage growth described below in this section.

Future forest stand density management is currently being planned for overstocked ponderosa pine stands, and when implemented will allow for more forage plant growth in the uplands. In addition, there are plans to convert some stands that have become ingrown with fir trees back to ponderosa pine dominated stands. This will also increase the forage that is available for grazing in these stands. Along with the increase in grasses and forbs on the forest floor, the increased sunlight will also stimulate shrub growth, mainly benefiting wildlife foraging. The net impact of future forest restoration management activities should result in increased forage availability for both cattle and wildlife.

Riparian Vegetation

Alternative 1 (No Grazing)

Direct and Indirect Effects

Streamside and Floodplain:

Perennial streams:

In the absence of other disturbance seral stage development from the present stage would continue until the potential natural community was reached. Potential natural communities would be maintained in the absence of other, natural or human-caused, disturbance.

Seral stage development varies and is highly influenced by environmental factors such as the amount of sediment being transported by the stream, the current seral stage and the related potential for colonization of hydrophytic species, and the geomorphic characteristics of the stream channel.

Generally, hydrophytic species, such as sedges and rushes, would be expected to colonize streams in very early seral stage with fine soils in the banks over the next seven to ten years, probably moving into early seral stage in about ten years, based on observations of exclosures on Camp Creek (MFJDR). Recovery may begin with sparsely scattered plants along the edge of low water or in slow water near the edge of the stream. The pattern of recovery of hydrophytic species along stream channels with larger substrate, such as the Middle Fork in C1 and C2 pastures is expected to be different. Riparian hardwoods and trees may become established or expand first followed by colonization by hydrophytic forbs as sediment accumulates and is held by the roots of the larger plants. Recovery would be closely tied to sediment deposition, especially in areas of tailings or gravel deposits produced from tailings which have a small amount of finer soil particles.

Hydrophytic forbs present on streams in early seral stage, such as Squaw, lower Crawford, and East Fork Coyote creeks would be expected to expand in three directions. Isolated colonies would become more connected along the stream edges. They would also expand outward, widening the band of hydrophytic vegetation, and inward, both widening the band of vegetation and narrowing the average stream width. Average stream width is defined as the distance across a stream from the perennial vegetation on one side to similar vegetation on the other side. The length of time to reach mid-seral stage is variable, again based on sediment availability and other disturbances in the drainage. It could take as few as 3-5 years under ideal conditions, representing the recognized resilience of riparian areas, or closer to ten years.

Hydrophytic forbs present on streams in mid seral stage, such as Myrtle Creek would be expected to expand similar to that described for early seral, filling in gaps along the linear edges of the streams and widening the band of hydrophytic vegetation with similar results on the average stream width. In systems where sediment is plentiful and other disturbance low, recovery to late seral stage may take less than five years.

Hydrophytic forbs present on streams in late seral stage are expected to continue to expand and narrow the average stream width and to fill in any remaining gaps along the stream edge until about 98% coverage is reached along the greenline except where the anchored rocks and logs are elements of the greenline (Winward, 2000). Stream segments already at late seral condition would be expected to maintain that condition under common flow regimes.

The rapidity of progression from earlier seral stages to later ones is variable and likely to be more rapid in drainage systems which retain characteristics of resilient systems such as remnant plant communities and sediment transport and channel incision in balance with the landscape.

Eliminating cattle use would improve shrub vigor, distribution, and reproduction, and improve soil conditions in riparian areas, promoting conditions favorable for native grasses, forbs, and shrubs. However, wildlife browse would continue to affect shrub vigor and structural diversity at endemic level.

Riparian hardwood shrubs and some trees are expected to become more abundant over the next five to ten years depending on availability of seed or vegetative propagation sources along streams with gradients of about 0.5% or greater or where flows are adequate to periodically cut banks and deposit bars. Plants classified as either young/seedlings or sprouts are expected to increase. Hardwoods along most stream segments are expected to show some degree of arrested growth form due to browsing by wildlife unless they are protected. The range of arrested growth forms is expected to range from plants exhibiting a low percentage of excessive branching and which may be nearly as tall as protected plants to plants which exhibit excessive branching on nearly every leader and are often only 20-30 % of the height of protected shrubs (aka "bonzai" shrubs). These observations are based on multiple years of informal monitoring of shrub condition and on observations made while planning, organizing and implementing hardwood protection projects.

Recovery on low gradient (0.5%) segments of the Middle Fork is expected to be tempered by existing conditions caused by past activities such as mining. Riparian vegetation recovery is expected to follow different paths in the short term depending on local channel conditions. The segment of the Middle Fork in Camp Allotment is expected to recover as seral stages development over time from the current condition of early to mid seral stage, as described above. This channel is wide and narrow floodplains remain on either side where sediment has and will be deposited and, consequently, colonization by hydrophytic forbs and a few shrubs has occurred. Segments of the Middle Fork in Tailings, Shop and River pastures are already exhibiting similar recovery with the development of torrent sedge (<u>Carex nudata</u>) communities.

The pattern of recovery along the segment of the Middle Fork located in C1 and C2 pastures is expected to be different due to past channelization. Currently hardwood shrubs such as alder are colonizing the banks which are composed of dredge tailings. Due to the lack of floodplain with the channelized segment, flows do not slow and deposit sediment which can be colonized by hydrophytic forbs. Consequently, hardwoods have become established. As the hardwood community matures over time, it is expected to trap debris and sediment which would create small pockets where hydrophytic forbs could become established. Wildlife use of these shrubs is expected to be variable and some are expected to mature based on observations of nearby sites.

As stream channels and floodplains move toward later seral stages and coarse woody material from mature shrubs forms logjams, probably in twenty or more years, it is expected that soil water relationships in the valley bottoms adjacent to stream channels will change, resulting in more persistent, higher seasonal water tables. Consequently the area with soil water conditions capable of supporting riparian vegetation will expand outward into the valley bottoms.

Stream bank alteration generally caused by cattle trampling and post-holing would be eliminated, reducing mechanical damage to the roots of hydrophytic plants which often results in death and reduced abundance.

Intermittent Streams: Vegetation along intermittent streams tends to be a moister version of the vegetation on the adjacent uplands with some riparian vegetation in areas of seeps. Effects of no grazing would be similar to those described for the uplands above except in places where channel erosion would continue, as below the 2010-159 road or in the sub-alpine steppe. Vegetation would not become established in these areas.

Ephemeral Draws: Effects of no grazing would be similar to those described for the uplands above except in places where draws are eroding as below the 2010-159 road or in the sub-alpine steppe. Vegetation would continue to be removed where channels are developing

Wet and Moist Meadows:

Lobelia and Japanese meadows would remain wet and support plant communities similar to those described for the Existing Condition. Other meadows which are drier now than before adjacent road construction would remain drier. The vegetation shift to drier species would be maintained.

Seeps and Springs:

Water developments would gradually become ineffective or be removed from about fifty springs and seeps. Water flow would return to the original area of seeps/spring before flowing subsurface in the lower portions of most locations, possibly realigning the shape and extent of the seep. Some seeps would continue to be used by wildlife and show some trampling, generally on less than ten per cent of the area, or, occasionally, be used for wallows which may locally remove riparian vegetation and expose surface water.

Aspen, Cottonwood, Shrubs and other Culturally Important Plants:

Eliminating cattle use would improve shrub vigor, distribution, and reproduction, and improve soil conditions in riparian areas, promoting conditions favorable for native grasses, forbs, and shrubs. However, wildlife browse would continue to affect shrub vigor and structural diversity at a reduced level.

Aspen stands would continue to decline as described in the Existing Condition because little regeneration is occurring or, if occurring, being recruited in to the next age class. Conifer encroachment, exclusion of fire and browsing by wild ungulates would continue. Cottonwood regeneration may occur along smaller, open streams and road cut banks and along the flatter, wider, more disturbed sections of the MFJDR such as those in Camp Creek allotment.

Cumulative Effects

The list of past, on-going and foreseeable activities displayed in Appendix A (Cumulative Effects) was reviewed for inclusion in the discussion on cumulative effects.

Elimination of livestock grazing in riparian areas is expected to result in improved conditions. The "natural" rate of recovery is expected where riparian areas are not impacted by effects that were initiated by and continue from past activities or by effects caused by on-going activities such as roading or wildlife use. Native species would colonize or expand opportunistically into newly available sites following improvements in soil, water table elevations, and vegetation conditions. Recovery of shrub growth form (architecture) is expected to be limited by wildlife browsing. More resilient plant communities are expected to develop which would be stable and in balance with local landscape conditions. Plants important to Native Americans are likely to become more abundant and easier to gather. Traditional products gathered from mature shrubs may be the exception to this trend due to the reduced recovery of shrub form due to wildlife browsing. Beaver would be expected to recolonize areas with increased riparian hardwood shrubs and trees. Construction of dams and associated flooding would result in sediment trapping in downcut stream channels, in recovery of local water tables, and further recovery of floodplain function.

In areas where effects of legacy conditions continue or where on-going activities are limiting recovery, elimination of livestock grazing is not expected to change the overall pattern of recovery.

Alternatives 2 and 3

The rate of recovery of riparian vegetation that occurs under appropriate grazing management has been compared to the rate of recovery under grazing exclusion. Borman, Massingill & Elmore (1999) found that differences in rate of improvement could not be detected between reaches with appropriate grazing management and those under exclusion in Eastern Oregon. Kauffman et al. (1997) stated that livestock exclusion has demonstrably resulted in a rapid recovery of riparian vegetation. Belsky et al (1999) reviewed literature related to grazing in riparian areas. They conclude that damage to riparian areas from grazing livestock can be reduced by utilizing improved grazing practices; other literature (USDA Forest Service, 2005) indicates, along with Belsky et al (1999) that recovery may occur but would take longer with grazing than without. These concerns are addressed by PACFISH with the Key Assumption that grazing under some conditions with carefully identified “triggers” and endpoints would result in a “near natural rate” of recovery (USDA Forest Service, May 24, 1995 and August 14, 1995). .

Recovery of herbaceous riparian species, including sedges, and shrubs, is expected to occur at a “near natural rate” (USDA Forest Service, May 24, 1995 and August 14, 1995) which would occur when “triggers” and endpoints are met annually and when Forest Plan Standards for riparian vegetation are met (USDA Forest Service, 2005) A “near natural rate” of recovery would also occur when adaptive management was implemented, as described in PACFISH Guideline GM-1, when grazing did not meet standards or when annual monitoring indicated that adjustments were needed in “triggers” or endpoints (see Monitoring Strategy section in this document). PACFISH allows some effects from grazing under the near natural rate. A slower rate of recovery, which is not expected to be measurable, may occur under the Action Alternatives. A “near natural rate” of recovery is used interchangeably with wording in the following sections that states “effects would be similar to those of the No Action Alternative”. Regardless of the rate of recovery under the No Action and the Action Alternatives, some plant communities may take decades to reach high or potential conditions (Elmore, 2004). Return to conditions present before European contact on some previously altered sites will be very slow or non-existent (Laycock, 1989, Winward, 1991).

Effects of these alternatives on specific types of riparian vegetation are described below.

Streamside and Floodplains:

Perennial streams:

Effects of grazing on riparian vegetation are expected to be similar regardless of seral stage. In the absence of other disturbance and, since grazing effects would be limited to those not expected to “carry over” in a meaningful way to the next growing season, seral stage development would be similar to that described under the No Grazing Alternative until the potential natural community was reached. Potential natural communities would be maintained in the absence of other, natural or human-caused, disturbance.

Effects of implementing either Action Alternative are expected to be similar to those described above for the No Grazing Alternative because recovery of vegetation would be at near natural rates since no meaningful “carryover effects” are expected. Permittee involvement combined with the present infrastructure of range improvements or slightly less permittee involvement combined with the current and additional, proposed range improvements is expected to result in meeting Forest Plan, as amended, standards and annual endpoints and “triggers”. Riparian vegetation is not expected to colonize hardened water gaps or to expand in other water gaps. Because these areas represent less than one per cent of stream length, conditions in these areas is not expected to measurably change the average conditions along a segment of stream.

Shrub use is expected to meet thresholds, triggers and endpoints. In the absence of other disturbance, newly established seedlings would be expected to reach mature growth form in ten to twenty years. These alternatives would reduce cattle impacts by meeting standards by various methods. By attaining the objective of improving native plant conditions, especially within riparian areas, native plants should benefit by increasing vigor, distribution, and achieving age, species and structural diversity. The level of improvement would depend upon wildlife use.

Stream bank alteration generally caused by cattle trampling and post-holing would meet thresholds, triggers, endpoints, standards and guidelines, reducing the amount of mechanical damage to roots of hydrophytic plants to an amount which would not be expected to carryover to the following year and would not contribute to death and reduced abundance of these species.

Intermittent Streams: Effects on intermittent streams would be similar to those described for the No Grazing Alternative.

Ephemeral Draws: Effects on ephemeral draws would be similar to those described for the No Grazing Alternative.

Wet and Moist Meadows:

Grazing to standards such as defined thresholds, triggers and endpoints is expected to maintain the current condition of these meadows as described in the Existing Condition section. Meadows which have dried out over time due to roading or other reasons are unlikely to improve in condition.

Seeps and Springs:

Approximately fifty springs would continue to be developed to supply water to livestock troughs or other facilities. Effects of grazing on the seeps and springs which are currently protected by fences and on seeps and springs where water developments are proposed would be similar to those for the No Grazing Alternative as water would be re-routed back to the lower area of the seeps and livestock would be excluded from the seep/spring vegetation. Trampling and grazing of vegetation in seeps and springs with current developments that do not include protection of the source water would continue. Impacts on these areas would be expected to meet standards or to result in modifications to the developments or to grazing practices to protect vegetation if standards were not met routinely.

Aspen, Cottonwood, Shrubs and other Culturally Important Plants:

Browsing on aspen, which is considered to be Management Area 3B, Anadromous Riparian Areas, would be expected to meet utilization standards for riparian hardwoods. Meeting this standard would not contribute to further degradation of aspen stands.

These alternatives would reduce cattle impacts by meeting standards by various methods. By attaining the objective of improving native plant conditions, especially within riparian areas, native plants should benefit by increasing vigor, distribution, and achieving age, species and structural diversity. The level of improvement would depend upon wildlife use.

In the absence of other, detrimental disturbance and given the development of suitable habitat following high flows along streams, cottonwood seedlings would be expected to become established. Browsing on cottonwood which occurs chiefly would be expected to meet utilization standards for riparian hardwoods which would allow young cottonwoods to become established and to grow into the sapling/pole stage over the next twenty years.

Cumulative Effects

The list of past, on-going and foreseeable activities displayed in Appendix A (Cumulative Effects) was reviewed for inclusion in the discussion on cumulative effects.

Since the proposed actions are expected to meet standards in riparian areas (see Fisheries discussion), it is expected that the cumulative effects of grazing on riparian vegetation will be similar to those described for the No Grazing Alternative and a “near natural rate” of recovery is expected to be achieved. Improved soil and vegetation conditions would allow native species to occupy traditional sites. The result should be more resilient plant associations and a more stable ecosystem, especially within riparian habitat. Plants important to Native Americans would be more abundant and easier to gather.

Regardless of the rate of recovery under the No Action and the Action Alternatives, some plant communities may take decades to reach high or potential conditions (Elmore, 2004). Return to conditions present before European contact on some previously altered sites will be very slow or non-existent (Laycock, 1989, Winward, 1991).

Sensitive Plants

Direct and Indirect Effects

Alternative 1 (No Grazing)

Existing sensitive plants and potential habitats would not be affected by grazing, but would still be impacted by other ungulate use. Cattle would no longer transport weeds and reduced use of mechanized equipment to maintain fences and water developments would reduce the risk that invasive species would spread.

Alternatives 2 and 3

Known sensitive plants populations would be unaffected by domestic grazing. Potential habitats would improve at riparian sites and additional populations may appear when habitat requirements are met.. Because no new infrastructure would be added, there is a reduced risk of spreading invasive plants into small riparian sites (springs, seeps) that might have been proposed for new water developments. A majority of sensitive plants habitat is associated with riparian areas. Riparian and upland sites would slowly improve as concentrated cattle use of these areas declines.

Existing populations of invasive plants would continue to spread, limiting habitat. Riparian and upland habitats would slowly improve as native riparian vegetation re-establishes.

Cumulative Effects

All Alternatives

Recovery of native vegetation and improved soil conditions should increase the amount and distribution of potential habitats. Plants currently on the sensitive plant list might become more common, and even be removed from the list.

Noxious Weeds

Direct and Indirect Effects

Noxious weeds are generally plants not native to the area in which they are growing and whose growth is so rapid, dominant, or toxic that they out-compete the native plants, often taking over complete sites or ecosystems over time. They most commonly get established in areas where ground-disturbing activities have created even very small areas of bare soil and where a seed source is already present or in some other way is brought in to the area. They are introduced or spread by people, vehicles, animals, birds, wind, water, and fire.

Alternative 1 (No Grazing)

Under the no-grazing alternative, the permittees would no longer play a role in the detection and management of noxious weeds potentially allowing weed populations to become well established prior to detection. Also under the no grazing alternative, any role played by permitted livestock in the spread of noxious weeds would be eliminated. Forest Service funds derived from grazing fees would not be available for noxious weed treatment. However, any role played in the spread of noxious weeds by grazing permittees and their livestock in the Planning Area would cease.

With reduced disturbance and with plant communities moving towards potential natural conditions, there would be fewer opportunities for noxious weed establishment. Established noxious weed sites would be at a competitive disadvantage from native plants.

Alternatives 2 and 3

Permitted livestock can introduce noxious weeds by transporting seeds in their hair/wool or in digestive systems if coming from or trailing through an area already infested with weeds. Similarly, they can start new populations by ingesting plants and moving seeds to new areas through fecal deposits; this more often occurs with horses and sheep who will consume several species, like thistles, after seedheads are already produced.

Livestock grazing or associated permittee actions have not been identified as a major factor in the establishment and spread of noxious weeds in the Planning Area. Alternatives 2 & 3 may increase the chance of noxious weed spread by livestock within the Planning Area, however permittees and Forest Service Range Management Personnel presence on allotments would assist in detection and control of noxious weeds. In addition, grazing fee funds would be available for noxious weed treatment under these alternatives.

Alternative 3 has the greatest potential to increase the chance of noxious weed introduction and spread, as this alternative has proposed ground disturbing activities: improvement of existing and construction of new water developments. Care to wash heavy equipment prior to work will help lessen this potential, as will seeding of desired species over disturbed ground.

District personnel and permittees will continue to work together to develop an accurate and up to date inventory of the noxious weeds present on allotments within the Planning Area. Once inventoried, each site would be treated; manually until such time as the Forest has authorization to use herbicides (as part of ongoing actions). Domestic livestock would be managed to not measurably contribute to the spread or persistence of noxious weeds. Permittees are encouraged to monitor high-risk sites (loading and unloading sites, corrals, high impact sites) take immediate action if noxious weeds are found and report such findings.

The Forest will continue to conduct a noxious weed management program that will minimize the spread of state-listed species that implements an integrated program focusing on prevention, early detection, and timely treatment of priority species. (See Appendix J or Weed List, Distribution and Prevention Strategy)

Cumulative Effects

All Alternatives

Certain noxious weed populations will almost certainly continue to expand, regardless of the alternative chosen, due to natural increase of existing populations from all the complex ways these species are spread. However, other species that occupy limited area (plus other species that are not yet here) will be managed to the extent possible to stop the spread.

Existing noxious weed populations will continue to spread onto adjacent or intermingled private and other agency lands; similarly, populations from other-ownership lands will continue to spread onto the Forest. Both conditions require coordination with country weed and pest offices to manage populations and their effects regardless of land ownership and property boundaries.

The prevention of the spread of noxious weeds is an objective common to all alternatives. Weed prevention is an ongoing Forest program, accomplished through the implementation of the strategy found in Appendix J. In addition, noxious weed treatment is conducted annually by mechanical or hand to prevent plants from going to seed.

Range Conditions

The analysis in this section is from the Rangeland Resources Specialist Report, which is available in the project record.

The direct effect of livestock grazing is the removal of plant cover, which under proper grazing is a temporary impact. Indirect effects of livestock grazing on plant community composition (through removal of plant cover) are alteration of the microenvironment and influence on natural ecosystem processes such as nutrient cycling, energy flow, and the water cycle (Miller, 1994).

Plant community alteration can occur when selective grazing pressure occurs on a species mix. The individual plant effect of grazing or tolerance to grazing is dependent on the following factors:

- Time of grazing (season of use)
- Frequency (number of times a plant is grazed)
- Intensity (amount of plant removed)
- Specific plant species physiology & morphology (function & structure)
- Site characteristic and ecological status (present condition)

Livestock grazing can be managed to meet predetermined conditions by effectively controlling timing, frequency, and intensity of the grazing. The Forest Plan describes forage resource conditions that meet multiple use objectives. These descriptions include upland and riparian resources. Properly managed grazing can meet these objectives. Annual operating instructions include timing (season of use), frequency (rotation strategies to minimize grazing on re-growth) and intensity (utilization rates) designed to maintain long term vegetative resources by achieving short term triggers and/or indicators. PACFISH Conservation Strategy (1995) amended the Forest Plan to include management direction for Riparian Habitat Conservation Areas. Monitoring to comply with both PACFISH and the BOs for listed fish indicates these allotments are meeting the objectives of PACFISH.

Utilization (intensity) is the proportion of the current year's forage production that is consumed by grazing animals and it may refer to either a single species of forage, or to the vegetation as a whole. Utilization by livestock can be a significant agent changing the ecological statue of grasslands, shrublands, and riparian plant communities. Although light to moderate grazing use has been shown to be beneficial in maintaining healthy plant communities, prolonged heavy use reduces the ecological status. The relationship of grazing intensity (utilization rate) and ecological status depend on timing and frequency of grazing on individual plant.

The optimal mix for all plant communities is to rotate the season of use and reduce the frequency of grazing on individual plants. This can be achieved through implementation of a rotational grazing and limiting the duration spent each pasture. Moderate use not only maintains a high ecological status and protection from soil loss, it provides residual for wildlife forage and cover. Utilization rates (or other appropriate triggers, i.e. bank alteration or shrub use/architecture) may also indicate the effectiveness of management in obtaining distribution of livestock. Native plant species composition and other endpoint indicators can be effective measurements in determining if management objectives are being achieved or movement is towards achievement of objectives.

Livestock grazing is currently occurring within the Planning Area. The general vegetative conditions on these allotments are meeting or moving towards Forest Plan objectives for resources. Data collected and analyzed along with allotment records indicate the current permitted numbers on allotments within the Planning Area are appropriate for achieving the management objectives. Grazing in riparian areas may slightly delay natural succession in these systems but, at the current stocking levels, there should be no decline in seral status.

The section below discloses effects to vegetation, both upland and riparian. Effects by each alternative are analyzed as they relate to how compatible they are in meeting plant physiological needs considered essential for meeting the desired conditions listed in the Forest Plan.

Range Vegetation and Grazing Management

Alternative 1 - No Grazing

Direct and Indirect Effects

Implementation of this alternative would provide the fastest improvement to vegetative conditions within the Planning Area. Livestock exclusion has consistently resulted in the most dramatic and rapid rates of ecosystem recovery (Elmore & Kauffman, 1994; Beschta, Platts and Kauffman 1991).

Under this alternative, riparian vegetation conditions would be maintained or would continue to improve, meeting the Anadromous Fish Strategy (PACFISH, USDA Forest Service 1995). Riparian vegetation communities with a low or mid ecological status would continue to move towards later seral states. Sites at a high or late ecological status would be maintained with successional changes driven by other disturbance processes. In many areas Kentucky bluegrass has replaced natural aquatic species because of it's competitive ability under a wide range of pressures; it can reproduce by tillering and sprouting from seed or switch solely to vegetative reproduction from short rhizomes. In these areas it may be necessary to provide vegetative manipulation in order regain a natural plant community.

With the no grazing alternative, the stream banks will become lined with vegetation appropriate for the site. The vegetation on banks in these stream reaches will eventually be at a high similarity to the potential natural community (PNC). Canopy cover of hardwoods would be expected to increase with the elimination of livestock grazing. Willows, birches, and alders would not spring up along all stream reaches because habitat for these species does not occur in all locations. The absence of domestic livestock grazing in riparian zones would increase the vigor and amount of riparian vegetation at a faster rate. Platts (1991) reviewed 17 livestock management strategies as they relate to stream riparian habitats and identified the rest strategy as the best strategy for recovering streams and riparian areas.

Upland vegetation conditions would not change where vegetation conditions are already at late seral status. Vegetation compositions would slowly change to being dominated by late seral grasses. Some shrubs and forbs would decrease. Ground cover parameters would stabilize over time, with bare ground at a minimum for the plant association. On vegetation types where conifers are a component, understory shrubs and grasses would continue to decline as canopies close, except where fire is prescribed or a wild fire occurs. Shrub communities without fire or other disturbance regimes would gradually move towards the predominance of shrubs over grasses and forbs.

Generally, improvement may occur at a rate faster than that predicted in the grazing alternatives.

Return to original conditions on some previously altered sites will be very slow or non-existence (Laycock 1989, Winward 1991). It could be decades before some plant communities reach high or potential conditions.

Riparian and upland vegetation communities would not improve where non-grazing activities are the site condition limiting factor. Conifer encroachment into upland and riparian communities would continue if fire or some other vegetation manipulation practice is not considered.

Indirect affects under this alternative include the loss of both professional rangeland managers and permittee observations and awareness of on-the-ground conditions within the Planning Area. With the decreased emphasis for livestock management of the area, trespass and other unauthorized uses could potentially go unnoticed.

Cumulative Effects

Grazed-induced seral states associated with past levels of heavy grazing still exist in some areas. These are evident in the dominance of such species as Kentucky bluegrass and meadow foxtail (*Alopecurus pretensis*). Return to pristine conditions in these areas is unlikely.

The elimination of livestock grazing would have the most significant improvement to riparian habitat because livestock tend to concentrate in these areas. The production and composition in the riparian areas and meadows should improve more rapidly than uplands due to greater soil moisture availability. Alternative 1 would improve all vegetation conditions the most quickly.

Alternatives 2 and 3

Direct and Indirect Effects

In an Eastern Oregon study, Borman, Massingill & Elmore (1999) found that differences in rate of improvement could not be detected between reaches with appropriate grazing management and those under exclusion. Kauffman et al. (1997) stated that livestock exclusion has demonstrably resulted in a rapid recovery of riparian vegetation. However, these same authors noted that appropriate livestock grazing management is important for the proper functioning of many western riparian zones. Borman, Massingill & Elmore (1999).

There are many grazing strategies that have been devised to achieve specific ecological or management goals. Successful management strategies focus on the specific components of the ecosystem in need of restoration or improvement. Hansen(1993), Kauffman, Beschta, & Platts(1993), Kinch(1989) and Skovlin(1984) have ecological approaches for developing successful grazing strategies for riparian restoration. Generalized responses of riparian ecosystems to livestock grazing strategies have been discussed by Elmore (1992), Platts and Nelson (1989), Kovalchik & Elmore (1991), Buckhouse & Elmore (1991) and Meyers (1989). Each of these approaches and reviews recognized that the rates of recovery and resultant vegetation composition for each riparian/stream system are dependent on many factors including site potential, current ecological condition, stream geomorphology and climate. Elmore & Kauffman (1994)

Under these alternatives, livestock grazing would continue to be permitted using systems designed to meet Forest Plan and PACFISH standards and guidelines. These alternatives would focus on practices that would meet resource objectives with seasonal review of use, permitted livestock numbers, and grazing strategy. These alternatives apply adaptive management to make rangeland conservation refinements. This means that a course of action is selected as a starting point that is believed to best meet or move toward the desired objectives. Monitoring would occur over time with evaluation of the results then being used by the Interdisciplinary Team and the Line Officer to make adjustments to management as needed to ensure adequate progress toward the defined objectives. All adaptive actions would be within the scope of effects documented in this environmental assessment.

Direct livestock impacts, forage removal and soil disturbance by hoof actions, would occur with the action alternatives. Effects of soil disturbance by hoof action are discussed in the soils section of this document. Forage or annual herbage removal is measured in stubble height and percent utilization. The physical removal of plant material has a tolerance threshold to the plant. Impacts above the tolerance threshold would result in lowering individual plant vigor and carbohydrate reserves, affecting the overall vegetation condition. This would require a change in management. If impacts are below the tolerance threshold, individual plant and overall conditions will be maintained or continue to improve. Riparian vegetation in low similarity and/or moderate similarity to Potential Natural Communities (PNC) would move towards high similarity. The effect of grazing upland vegetation is essentially the same as on riparian vegetation.

Under these alternative, riparian vegetation conditions would be maintained or improved, meeting or moving towards desired objectives. Riparian vegetation communities with a low or mid ecological status would continue to towards a later ecological status. Sites at a high or late ecological status would be maintained with successional changes driven by other disturbance processes. Improvement may not occur at a rate as fast as predicted in the no grazing alternative.

It is possible it could be decades before some plant communities reach high or potential conditions. Conifer encroachment into riparian or bunchgrass communities would continue if fire or some other vegetation manipulation practice is not conducted.

Alternative 2

Implicit in this alternative is distribution tools are restricted to active livestock management (no new structural developments). Mineral supplements, riding/herding, along with close monitoring of allowable use levels will be key to success. Given the localized areas of concern and current conditions, permittees would increase their livestock management efforts and distribution techniques to meet utilization standards. Consistently meeting standards in these areas will be difficult. Trespass and unauthorized use will be at minimal levels and should not affect either short or long term resource objectives. Unauthorized use has occurred within the Upper Middle Fork and Sullens allotments in the recent past; allotments receiving little to no permitted use in the last several years.

Rotating the impacts to different times in the forage plants growth cycle will benefit plant vigor and reproductive success. Plant community composition, as well as bare ground and litter percentages, will continue to improve over time.

Alternative 3

Alternative 3 provides for construction of structural rangeland improvements, along with other livestock distribution techniques (mentioned above). The structural range improvements will assist with implementation of rotational grazing strategies, limiting the duration spent in each pasture, increased livestock control and better distribution. In addition, salting and herding/riding, along with close monitoring of allowable use levels will be conducted to assure success. The additional range improvements should make it easier for permittees to meet utilization standards. Trespass and unauthorized use will be at minimal levels and should not affect either short or long term resource objectives. Unauthorized use has occurred within the Upper Middle Fork and Sullens allotments in the recent past; allotments receiving little to no permitted use in the last several years.

Rotating the impacts to different times in the forage plants growth cycle will benefit plant vigor and reproductive success. Plant community composition, as well as bare ground and litter percentages, will continue to improve over time.

Cumulative Effects

Cumulative effects are those that result from the impact of an action when added to other past, present, and reasonably foreseeable future actions within or adjacent to the analysis area. The earliest of management activities, including grazing, had the most profound effects on current conditions; many streams within the planning area were turned inside out by mining activities, changing the substrate and resultant vegetative capabilities. Railroad logging provided livestock increased access to riparian area and changed the forest area composition to favor less fire resistant species. Fire suppression has maintained this composition.

In 1996, the Summit Fire, salvage logging that followed and associated rest from grazing had a significant effect on the current vegetative composition within the Lower Middle Fork Allotment. The result is vigorous plant communities in an early seral stage, producing much more forage than permitted livestock can fully utilize. These communities will continue to progress towards later seral stages, decreasing over time (decades) the amount of available forage Actions taking place within the watershed today include: recreation (hiking, camping, horseback riding, off-road vehicle use, fishing, hunting), prescribed burning, commercial thinning, and grazing and associated range improvements. Foreseeable projects for the area include: road closures; culvert replacement/removals; prescribed burning; conifer thinning/removal, recreation and grazing. Currently planned in the area are four segments of interior management fences within the Lower Middle Fork allotment to further control timing, intensity and duration of grazing.

Past fire suppression has left many stands overcrowded and containing higher fuel loadings. Increased prescribed burning over the last several years has opened some stands, improving forage conditions. Managed fires are planned across within the MFJD area targeting fuel loadings, conifer/shrub encroachment areas, and vegetation management. The continued use of prescribed fire would be beneficial to grazing, but again may require additional management of grazing to keep cattle in appropriate areas.

Comparison of the Alternatives

Recovery of riparian vegetation occurs at a "natural" rate under the No Action Alternative. It occurs under a "near natural' rate under the two Action Alternatives. A "near natural" rate does not differ from a "natural" rate of recovery in a meaningful way. Riparian vegetation would be consumed by livestock under the Action Alternatives but consumption would not meaningfully affect recovery. Upland vegetation would be consumed by livestock under the Action Alternatives but vegetation health, vigor, abundance, and diversity would not be measurably impacted since Forest Plan standards would be met. Regardless of the rate of recovery under the No Action and the Action Alternatives, some plant communities may take decades to reach high or potential conditions. Return to conditions present before European contact on some previously altered sites will be very slow or non-existent (Laycock, 1989, Winward, 1991).

Consistency With Direction and Regulations

The three alternatives are consistent with the Forest Plan as amended with the National Forest Management Act, the National Environmental Policy Act, and other laws and regulations because of the terms of the permits which authorize grazing. PACFISH (1994) allows some effects from grazing under the "near natural" rate of recovery. The rate of recovery under the Action Alternatives would not differ meaningfully from the natural rate provided Forest Plan, as amended, Standards are met.

Irreversible and Irretrievable Commitments

There are no anticipated long-term irreversible commitments of vegetation since it is renewable as long as soil productivity and plant health and vigor are maintained. It is expected that these will be maintained or improved when grazing activities meet Forest Plan Standards, as amended, including the minimum of a "near natural rate" of recovery. There are no irretrievable commitments for activities as proposed in either action alternative or under the No Action Alternative.

The project as described will not result in any irreversible or irretrievable effects to the range resource. Thus this project is consistent with guidelines for range set forth in the Forest Plan.

Social and Economics

Regulatory Framework

NEPA requires integrated use of the natural and social sciences in all planning and decision-making that affect the human environment. The human environment includes the natural and physical environment and the relationship of people to the environment (40 CFR 1508.14). Forest Service land management planning regulations require the integration of social science knowledge into Forest and Regional planning processes (36 CFR 219.5).

Executive Order 12898, 1994, ordered federal agencies to identify and address the issue of environmental justice (i.e., adverse human health and environmental effects of agency programs that disproportionately impact minority and low income populations).

Analysis Methods

Although individuals and communities over a wide geographic area use national forest resources, the residents and businesses of counties near the forest depend most heavily on the availability of the resources. Consequently, the effects of forest management on social and economic factors are strongest within these areas. For this reason, the Malheur National Forest's primary zone of influence is defined as Grant, Harney and Baker counties in Oregon.

Existing Condition

Changes in levels of grazing use associated with the Middle Fork John Day Allotment Management Plan may affect the major social and economic characteristics of the surrounding geographic area. The affected area or impact zone for the Malheur National Forest consists of Grant and Harney counties in Oregon. Agriculture, manufacturing (particularly wood products), and retail trade are important sources of employment and income in this region. Grant County, for example, has a low level of economic diversity, a high dependence on federal timber and forage, and a low resiliency for change. Reliance on timber and forage from federal lands is moderate to high in counties in the impact zone (Kohrman 2003). The rate of conversion from wildland range to other uses has been less than 1% total between 1986 and 2001 (USDA Forest Service & ODF 2004).

Many communities are closely tied to the forest in both work activities and recreation. The local communities within an hour or two drive that are anticipated to be directly or indirectly affected by the proposed action, alternatives, and their associated economics include: Prairie City (population 1,080), Burns/Hines (4,565), Dayville (140), John Day/Canyon City (2,740), Long Creek (260), Mount Vernon (650), Monument (150), Seneca (230), Sumpter (175), and Unity (145). Austin, Fox, Greenhorn, Ritter, and Hereford are examples of other smaller communities also located in the vicinity. Larger towns and cities two or more hours away from John Day include: Baker City (10,160), LaGrande (12,795), Ontario (10,680), Bend (52,029), and Pendleton (16,915). The nearest metropolitan areas are the Tri-Cities area of Kennewick, Pasco, and Richland in Washington State, and Boise, Idaho. Most of the permittees live in the listed local communities; one permittee lives in a large town north of Portland (see Figure 13 below).

Figure 13: Communities around Middle Fork John Day River

Socially, a large portion of the American public still respects the cowboy figure as symbolic of ruggedness, straight talk, self-reliance, freedom, and the American West. The Hollywood western and other media has perpetuated this stereotype. While the level of westerns seen both at the movies and television has dropped significantly from its highs in the 1950's and 1960's, the "white hat" image remains.

Nationally, regionally, and locally, the social values and demands are changing on the national forests. A recent national survey has shown there is wide support for management of public lands to provide a diversity of uses, including grazing (Shields et al., 2002). However, the same study shows the importance to manage forest and grasslands to provide different types of recreational opportunities, including preserving the ability to have a "wilderness experience". The *Draft Current Management Situation Report* for the Blue Mountains forest plan revision also discusses changing social values (Revision Team, 2004). There is also a growing dichotomy between rural and urban Oregon (Kaylor, 2003).

Economics

A grazing program on portions of the Malheur National Forest has been around since the establishment of the forest as part of the Blue Mountain Forest Reserve in 1906 and as a separate unit in 1908 (Mosgrove, 1980). Economically, the cattle ranching business has been an economic mainstay in Grant County along with the forest products industry and government jobs.

The economics of the grazing program has evolved over time. Generally, stock animals, mainly cattle, spend the winter and early spring months on lower elevation private lands where they can be fed stored hay. In Grant County, the land is usually located along the John Day River and its tributaries. Most of these lands are in the ownership of the permittees. The animals are moved to higher elevation private lands and public lands, mainly the Bureau of Land Management (BLM) and Forest Service, as these lands become range ready in the spring. It is necessary for the cattle to be moved off their winter pastures so these private lands can be irrigated for forage production then stored for the upcoming winter.

This system of moving cattle to other pastures in the spring through fall maximizes the use of prime rangelands for forage production. It allows for a larger herd size then can be supported by keeping the stock just on private low-elevation lands. The longer cattle are kept off these prime rangelands, the greater the opportunity to produce two or more hay crops ("hayings"). The more forage produced, the more cattle can be held over the winter, and the rancher/permittee is better able to time the selling of their stock to take advantage of market prices. Because of worldwide concerns over the safety of food sources, situations like "mad cow disease" has made the beef market very volatile. Combined with the influx of foreign beef producing markets, there have been great highs and lows in the domestic market.

Financial institutions and the Internal Revenue Service have recognized the economic value of federal grazing permits and long-term permittees have been able to capitalize this permit as part of total ranch value for loans and property sales. However, the Forest Service does not recognize the permit as having additive financial value to an individual's property because there is no guarantee that the permit will remain with current permittee in perpetuity and that the sale of the property will automatically give the permit to the new owner.

In the current grazing system, calving is done early. Most of the calves are born between October and February. This allows the calves to be born near ranches where they can be watched and the birth assisted when necessary by the ranchers thus reducing mortality rates. The calves develop to a size by mid-spring to where they can be safely transported to new pasturage and are large enough to be protected from most predators, mainly coyotes.

The BLM uses an early on and early off strategy for utilization of forage grass. In this manner, the early grazing season allows for regrowth of the forage in the summer and fall, prior to the critical high peak flows in the spring due to snow melt. The grass recovers to a length where it retains its filtration value in trapping silt. The Forest Service also uses an early on and early off strategy for part of its administered lands. However, on the higher elevation lands another strategy is commonly used. The amount of utilization is restricted to allow for the remaining grass length to retain its filtration value over the winter into the next spring. These lands generally became ready for livestock use in mid-May or early June depending on the weather, aspect, and amount of snow pack. The cattle remain until late summer or until the end of October depending on when the amount of utilization authorized under the permit is met, or when the end of season date in the permit is reached.

Annual adjustments to the permit are made in conjunction with the results of the end-of-year survey results on utilization and bank damage. Thus, herd numbers may change up or down, and pastures may be rested in the following year. Wildfires and prescribed fires may cause portions of allotments to be rested for a period of time. Therefore, when mitigating for ecological concerns, there are both direct and indirect economic impacts to the permittees and the local economies. Economic impacts will have a social impact to rural life styles.

If either the BLM or the FS were to reduce their role in this grazing system, the permittee would need to find other private or public lands to hold their cattle while forage is being grown, or they would need to reduce their total livestock numbers. Buying and shipping forage from outside sources (a feedlot scenario) is not considered economical because of the costs. In many cases, reductions in total livestock numbers would also make some family-owned businesses uneconomical.

Permittees within the Planning Area are dependent on Forest administered rangelands. Forest allotments are an important part of the total year-round ranch operation. They provide high quality forage for cow/calf herds at a time when home pastures are growing and being harvested for winter hay. Ranch operations would be severely impacted if Forest lands were not available.

The planning area provides summer pasture for approximately 1,300 cow/calf pair for an average of four and a half months, approximating 6,500 AUMs. Presently six permittees are authorized to graze within the Middle Fork John Day Planning area. [The action alternative would potentially add another.] Four of the existing permits are family owned and operated, and the other two being in small corporate ownership. As these ranches are cow/calf operations, an estimated 1,200 calves graze on National Forest Allotments. In an average summer grazing, these calves would each gain approximately 250 pounds live weight or 150 pounds of red meat production. In total, approximately 310,000 pounds of live weight production is gained. Depending on market conditions, this gain could range from $253,800 to $350,000.

Currently one quarter of the grazing receipts received on the Forest are returned to the Forest to be spent for on the ground range improvements. Materials for construction of improvements is purchased locally.

A comprehensive economic analysis requires all economic benefits and costs be identified and compared. In lieu of a comprehensive analysis, an economic analysis based on identifiable and quantifiable costs is presented.

Quantifiable economic information on the benefits of alternatives is not available because of the difficulty in obtaining quantifiable data of the relationship between project outputs and resource impacts. For example, the flow of benefits from maintaining or enhancing ecological status and viability of riparian areas is difficult to quantify from an economic standpoint. The main problem from an analysis standpoint is that these resources are not typically allocated through a well functioning market system. Consequently, price and quantity information is frequently not available for a particular resource. This, along with the incomplete information on the production function relationship between project activities and a quantifiable effect on a given resource, makes it difficult, to impossible, to identify and measure economic benefits.

The economic analysis addresses the concern that reducing permitted livestock levels would affect the economic viability of the ranch operation because of cost associated with securing replacement range, fencing and establishing waters on replacement range, and increasing the frequency of cattle trucking to reach replacement range. In addition, there may be an overall increase in the time required by permittees in managing ranch operations.

The economic analysis focuses on three key indicators of change by alternative: 1) number of permitted animal months; 2) change in management intensity (increase or decrease in operations time); 3) cost to implement the alternative. Table SE-2 (below under Environmental Consequences) displays the comparison of alternatives as they relate to these key economic indicators for the allotments.

Employment

Cattle production and forest products provide a core employment for Grant and Harney counties. Most of the ranches are family run businesses and not corporate owned. Forest products industries include 3 major lumber mills and numerous logging companies. Wood products employment totaled 530 direct jobs (e.g., mill workers and loggers), which is approximately 14% of the total non-farm employment in Grant and Harney counties (average annual in 2000). In Grant County alone in 2000, there were about 730 jobs (16% of the total employment in the county) in farm and agricultural services, with 580 in farm services (The Wilderness Society 2004). Local government, retail trade, and services employ the most people in Grant and Harney counties (Kohrman 2003, The Wilderness Society 2004). The area surrounding the Planning Area is rural, and has disproportionately high unemployment compared with the Oregon state average and the National average. Grant County is in its sixth consecutive year of declining non-farm employment, and “this is quite possibly the longest ongoing downturn any local labor market area in Oregon has ever experienced” (Kohrman 2003).

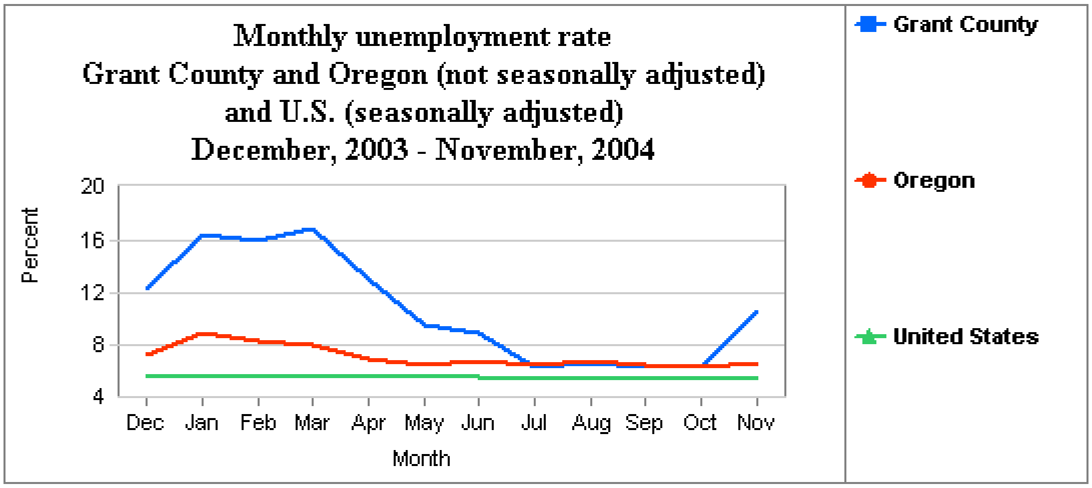
Ranchers in Grant and Harney counties, with federal permits in the analysis area, are highly dependent on forage from federally managed lands, compared to other counties in the region. The value of cattle reared on forage from federally managed lands represents more than 10% of total agricultural sales in Grant and Harney counties (Haynes & Horne, 1997). Baker, Wheeler, and Malheur counties are rated moderately dependent (3.6% to 10% of total agricultural sales come from cattle raised on forage from federally managed lands). Union, Umatilla, Morrow, and Gilliam counties are less dependent (less than 3.6%). Shifts in permitted use of federal grazing allotments change the availability of this forage source. The impact these shifts have on the local economy varies according to the adjustments that local ranchers have to make within their ranching operation. In Grant County, total gross farm income dropped between 1970 and 2000, and the percent of gross farm income from livestock had been reduced from 80% in 1970 to 43% in 2000 (The Wilderness Society 2004).

Recreation-based industries, while prevalent elsewhere in the region, have not been a major contributor to the local economies. Recent efforts indicate that the volume of business is only enough to supplement income, rather than provide a primary source of income (Kohrman 2003). The exception is hunting season, which typically draws larger numbers of people into the area. Stores that sell sporting goods benefit during this period. Recreation-based employment is seasonal and service-oriented, with wages at the lower end of the pay scale (Kohrman 2003). Economic activity based on recreation may have limited growth potential for communities in the area (Kline, 2001). Seasonal limitations, the dispersed nature of recreation within the counties, along with a general lack of large, water-based recreational opportunities, does not create the concentrated numbers of recreationists and readily-identifiable recreation destinations necessary to support many recreation industries (Kohrman 2003). Recreation based industry had a small increase in Grant County between 1990 and 2000 (The Wilderness Society 2004).

Historically, government employment and expenditures has provided a degree of stability in rural communities (Kohrman 2003). With reduced Forest Service budgets and work force, and a switch to management emphasis that produces generally lower amounts and value of commodity products, federal workforce and program expenditures has not buffered economic downturns as in the past (Oregon Department of Employment, 2001). This situation, combined with fluctuations in the other base industries, has had a significant effect on the economy (Kohrman 2003).

The communities surrounding the Middle Fork John Day area have a disproportionately high unemployment compared with the Oregon State average of 6.5% and the National average of 5.7%. Unemployment in Baker County for August 2004 was 6.2%, Grant County – 6.7%, Harney County – 6.3% and Malheur County – 8.4%. However, in September 2003 the Oregon average was 7.3% and the National average of 5.8% with unemployment in Baker County at 12.6%, Grant County – 14.6%, Harney County – 13.1% and Malheur County – 11.4% (Oregon Employment Department, 2003 & 2004). The average unemployment rate in 2003 for Baker County was 9.5%, for Grant County was 11.3% and for Harney County was 11.3%. The following table (SE-1) shows unemployment figures per month from December 2003 through November 2004 for Grant County (Northwest Area Foundation Website).

Table SE-1: Unemployment Figures per month for Grant County



From Northwest Area Foundation Website/
http://www.indicators.nwaf.org/ShowOneRegion.asp?IndicatorID=14&FIPS=41023

Average Wages

Average annual pay per job provides an indication of the wage contribution of jobs in the analysis area. Average income for the affected counties is below the national and state averages: United States $36,200, Oregon $33,200, Baker County $24,200, Grant County $24,500, Harney County $23,300, Malheur County $23,200 (Kohrman 2003). Wages in Grant and Harney counties are lower, primarily due to lower wage rates per hour and a larger number of part-time jobs, compared to the state as a whole (Kohrman 2003).

Per Capita Income

Per capita income measures economic well being, taking into account both population and income changes, although it does not address income distribution. Per capita personal income is total personal income divided by the estimated population. Per capita income in Grant and Harney counties is approximately $22,400 and $22,700 (2003 dollars), respectively. These counties lag behind the statewide average of $29,300 (2003 dollars).

Environmental Justice

The population of the area is predominately white, followed by Hispanics (2.2% Grant County, 4.4% Harney County), and American Indians (1.7% Grant County, 4.4% Harney County). The region is sparsely populated, and contains low populations of minorities (5.5% of the Grant County population, 5.4% of Baker County, 9.9% of Harney County, and 31.2% of Malheur County (of which about a fourth is of Hispanic origin with the majority living east of Vale) (Kohrman, 2003; United States Census Bureau 2003; Malheur National Forest, 2004). The primary American Indian tribes involved are the Burns Paiute, Umatilla, and Warm Springs. The Warm Springs has purchased lands in the Middle Fork John Day. Virtually the entire Middle Fork John Day Range Planning Area falls within the ceded lands of the Confederated

Tribes of the Warm Springs. Under the terms of the Treaty of 1855, the Confederated Tribes reserve the rights to hunt, fish, gather plant crops, and pasture livestock within these ceded lands. These reserved treaty rights are important in the maintenance of traditional economic strategies (Treaty with the Tribes of Middle Oregon).

It is important to stress that the 1855 Cayuse, Umatilla and Walla Walla treaty (the peoples of the current Umatilla Reservation) and the Treaty with the Tribes of Middle Oregon, which were proclaimed in 1859, allow for "grazing in kind" with the citizens of the United States. Recent federal court rulings concerning Native American off-reservation fishing rights have resulted in "the 50% share rule" (Moffitt 2000). This rule reserves 50% of all fish taken along the Columbia River to treaty tribes. The 50% rule is often applied to other economic resources shared between the general citizenry and Native American tribes on public lands that are part of the ceded territory of a given tribe. In this instance the Warm Springs Tribes may wish to invoke their right at some future date to graze livestock within the current Planning Area.

With the exceptions of the Burns Paiute and Hispanics east of Vale, minorities are scattered throughout the counties. Poverty rates provide some indication of the percentage of the population in surrounding communities with low-incomes. Poverty rates for both Grant and Harney counties are 13.7%. The Oregon statewide average rate of persons living below poverty is 11.6% (Kohrman 2003).

Data regarding minorities or people with disabilities employed in the region in the timber, mining, ranching, road construction, forestry services, and recreation sectors is unavailable. Some firms contracted by the Forest Service for reforestation work have traditionally hired Hispanic workers that comprise a migratory workforce in the area. Asian and Pacific Islanders uses of the area include commercial mushroom harvesting and developed camping associated with this activity. Some contracts are reserved for award to minority businesses under the USDA Office of Small and Disadvantaged Business Utilization and the Small Business Administration, although overall contract amounts to these groups has declined since 1998 (Kohrman 2003).

Plants of Interest to Local Native American Cultures

Native plant species are important for stable ecosystems, wildlife, and human uses. Since these lands have been ceded to the U.S. government by Native American tribes, we are committed to managing these resources for the use of these peoples. These resources and effects of the alternatives on these resources are discussed in the Vegetation and Rangeland Resources Section of this EIS and the Project Record.

Environmental Consequences

Direct and Indirect Effects

The analysis in this section is from the Socio-economic specialist report, which is available in the project record.

Socio-Economic

The following table displays the comparison of alternatives as they relate to these key economic indicators for the allotments. Alternative 2, Proposed Action, will be used as the baseline for comparison purposes. The table uses 0 (zero) as the baseline, - (minus) to reflect a decrease to the permittee, and + (plus) to reflect an increase to the permittee.

The economic analysis focuses on three key indicators of change by alternative: 1) number of permitted animal months; 2) change in management intensity (increase or decrease in operations time); 3) cost to implement the alternative.

Table SE-2: Comparison of Alternatives by Key Economic Indicators for Permittees, Middle Fork John Day Grazing Allotments

Indicator	No Grazing	Alternative	Proposed Action Alternative
Permitted AUMs	**-**	0	0
Operations Cost	+	0	0
Implementation/Infrastructure Cost	+	0	+
Grazing Receipts to County	0	$25,000	$25,000

Alternative 1

Under Alternative 1, No Grazing, there would be no permitted numbers on National Forest System lands, within the Planning Area, a net decrease of approximately 1,300 cow/calf pair from the current numbers (6,500 AUMS). Term grazing permits would be cancelled. With the lack of summer rangelands, and an overall shortage within the zone of influence, operational cost would dramatically increase for present permittees to find a suitable replacement. Cost associated with the development of new rangelands, transportation, travel to new pastures would also increase operational costs and trucking of cattle to new pastures would also increase operation cost. Implementation costs would increase dramatically, and are dependent on the location of new summer range.

If selected, the no grazing alternative would result in abandonment of all infrastructures in place. The investments made to date into internal pasture fences, allotment boundary fences, spring developments and other structures owned by the government would be lost. If subsequent decision is made to retain any of these improvements, funding would need to be secured for their maintenance or adjacent permittees would be reassigned maintenance responsibility. Assigning maintenance responsibility to adjacent permittee would in turn increase their operational costs. Under this alternative no grazing receipts will be collected or returned to the County.

All internal pasture and allotment division fences and range related water developments (ponds and springs) would be abandoned. All investments by the Forest to date would be lost. Subsequent decisions would need to be made regarding retention of any improvements (primarily water developments) for other resource needs and funding for maintenance of these improvements would need to be secured. This alternative does not meet Forest Plan goals and objectives to stabilize local economies or permit grazing.

Alternative 2

Under Alternative 2, there would be no change in the permitted numbers or season of use therefore the AUMS remain the same. This alternative is the baseline for comparing the alternatives. While there are no new developments planned with this alternative, previously planned improvements will continue. Routine maintenance and deferred replacement costs are not factored into this analysis and should be considered as common to the action alternative. Implementation costs associated with livestock management are neutral to increasing, based on the need to meet standards at the end of the grazing season. Given the current conditions of forested uplands and encroachment by conifers into meadow fringes (issues not addressed in this assessment), permittees would increase their livestock management efforts and distribution techniques in order to meet utilization standards.

Alternative 3

Under Alternative 3, Proposed Action, there would be no change in the permitted numbers or season of use therefore the AUMS remain the same. This alternative provides for structural range improvements to assist with increased livestock control and better distribution. Previously planned improvements will also continue. Routine maintenance and deferred replacement costs are not factored into this analysis and should be considered as common to the action alternative. Implementation costs associated with livestock management are neutral to increasing, based on the need to meet standards at the end of the grazing season.

Environmental Justice

Alternative 1 – No Grazing

Selection of this alternative would have an adverse effect upon the permittees and their employees. All these livestock operations are family businesses, with the exception of one. As many as 9 families (permit holders and employees) would potentially be affected by this alternative. This translates to the alternative affecting approximately 30 people. Permit holders would struggle to find comparable grazing opportunities within the proximity to their home ranches, due to the high demand and high cost for grazing lands in this county.

Alternative 1

Selection of this alternative would not result in adverse or disproportionate effects on permit holders or their employees. This alternative is consistent with activities implemented on National Forest System lands throughout the United States over the past several decades. As such, the environmental effects are predictable, as are the outcomes of implementing mitigation measures that have been refined over the years. There would be no displacement of minorities, changes of land use, or increases in taxes that would constitute an economic hardship. There would be no negative effects on public health.

Cumulative Effects

All Alternatives

If an alternative were selected that reduces herd numbers (Alternative 1 – No Grazing and Alternative 3 – Proposed Action), there would be a cumulative economic and social effect. As the Malheur National Forest and other national forests in the Pacific Northwest Region (Oregon and Washington) prepare more allotment management plans, it is anticipated the overall amount of cattle utilizing National Forest System lands may be reduced. The main reasons for the overall reduction of herd numbers are protection for listed threatened and endangered fish species or to improve water quality of 303d listed streams. As family ranching becomes less profitable, the number of people employed in and enjoying this life-style will decline locally, regionally, and nationally.

Forest Service Chief Dale Bosworth, in a 2003 speech (USDA Forest Service 2003), stated his concern with ending grazing (a proposal most similar to Alternative 1) on public lands: "…Without the access to seasonal grazing on national forest or other federal lands, the viability of many ranching operations in the West would be seriously in doubt. An end result would be the selling off of many of the privately owned base ranch properties adjacent to public lands. What typically happens next is the land is subdivided into ranchettes and valuable open space and wildlife habitat is lost. …"Consistency with Malheur Forest Plan and Other Regulations

This socio-economic analysis is consistent with NEPA and the Malheur National Forest Plan (1990). The Forest Plan contains direction under social-related headings such as recreation, visual quality, etc. The discussions of how the alternatives analyzed in this EIS meet that direction is included in those sections of this document.

Executive Order 12898 - None of the alternatives would substantially affect minority or low-income individuals, women, or civil rights (see Social Analysis above).

Consistency with Malheur Forest Plan and Other Regulations

This socio-economic analysis is consistent with NEPA and the Malheur National Forest Plan (1990). The Forest Plan contains direction under social-related headings such as recreation, visual quality, etc. The discussions of how the alternatives analyzed in this EIS meet that direction is included in those sections of this document.
Executive Order 12898 - None of the alternatives would substantially affect minority or low-income individuals, women, or civil rights (see Social Analysis above).

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments of resources that may result from the alternatives with respect to socio-economics because the alternatives do not permanently change the use of the area.

Watershed

Regulatory Framework

Malheur Forest Plan

The Malheur National Forest Plan (USDA 1990) as amended, provides direction to protect and manage resources. Forest Plan direction for water resources is reviewed in the watershed specialist's report in the Analysis File. This section summarizes changes in and additions to the original direction based on amendments to the Forest Plan and on changes in the Oregon Department of Environmental Quality regulations for water quality for parameters of interest in the planning area.

Management Areas and Amendments to the Forest Plan

The Forest Plan, as amended, establishes Management Area 3B, other areas of aquatic resource protection and Management Area and other Standards that pertain to aquatic resources. (Forest-wide Goals and Standards apply to all Management Areas.) On the Malheur National Forest, Forest Plan amendments and revisions by Oregon Department of Environmental Quality for Clean Water Act standards modified both the definition of the area to be considered for aquatic resource protecton and the Standards defined for this protective area and MA 3B several times. The following discussion highlights these modifications.

The original Forest Plan established Management Area MA 3B –Anadromous Riparian Areas. This Management Area, including Description, Goals, and Standards, is described on pages IV-62 to IV- 68 of the Forest Plan. Standards for Range in MA 3B apply to overall Forest management strategy, to the development of Allotment Management Plans, and to Annual Operating Instructions. Conducting this analysis supports the development of Allotment Management Plans (MA 3B Standards 16 and 17). Use of the Malheur National Forest Draft Riparian Monitoring Strategy combined with this analysis enables other standards to be met.

The Forest Plan was amended with Amendment 29 for Management Area 3B in 1994. It established a Desired Future Condition for MA 3B and modified two MA 3 Standards for the Resource Element of Fish, Water Quality and Wildlife. The description of the Desired Future Condition and the modified Standards are found in Amendment 29 to the Malheur Forest Plan.

The Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH) amended the Malheur Forest Plan in 1995. PACFISH provides interim direction to protect habitat and populations of resident native fish outside of anadromous fish habitat in parts of four states, including eastern Oregon.

PACFISH establishes Riparian Goals, Riparian Management Objectives and Standards and Guides (RMOs), Forest-wide aquatic standards and Riparian Habitat Conservation Areas (RHCAs) of standard size to protect of fish and fish habitat except when site-specific watershed analysis has been conducted and resulted in modification of these protections or current Forest Plan direction provides more protection for native anadromous fish habitat. The criteria for defining standard RHCAs and the additional Riparian Goals, RMOs and Forest-wide aquatic standards established by PACFISH are found in Appendix C of the PACFISH Environmental Assessment (USDA Forest Service, 1995).

The RMOs and standards contained in Malheur Forest Plan Amendment 29 are considered more protective than those in PACFISH, supercede comparable ones in PACFISH, and apply to the project area.

PACFISH also identifies areas, defined by standard distances from streams and wetlands, in which these Standards and Guides would apply. These areas are called Riparian Habitat Conservation Areas (RHCAs) and are applied across all Forest Plan Management Areas. PACFISH definitions of Riparian Habitat Conservation Areas do not correspond exactly with the definition of Forest Plan Management Area 3B – Non-anadromous Riparian Area. The standard RHCA widths, based on slope distances as described in Chapter 1 and the Fisheries Report, are more protective than the riparian buffers provided by MA 3B for similar streams and were adopted for this project. MA 3B includes areas not included in PACFISH; protection for these areas is provided under the Malheur Forest Plan.

Three primary differences between RHCAs and MA 3B that apply to the project area are:

- Standard widths of RHCAs are generally wider than the corresponding widths of MA 3B buffers. The standard RHCA widths apply in the Canyon Creek WUI project area along fish bearing, perennial, and intermittent streams and wetlands. Consequently, at least two Management Areas usually comprise each RHCA; RHCAs are composed of an inner core of MA 3B, defined by the Forest Plan, and an outer portion which is allocated to another Management Area.
- MA 3B includes "those Class IV streams and upland areas, . . . which have high water table conditions during some parts of the growing season. Class IV channels will be recognized as the important link between uplands and the downslope perennial streams. They will be managed to ensure bank and channel stability" (Forest Plan, p. IV-62). The direction to recognize the link between uplands and downslope perennial streams is interpreted in the project area to include ephemeral draws, which, if not managed properly, will erode into channels. "These Class IV and other riparian areas will have a variable width, depending on site specific needs for all riparian dependent species" (Forest Plan, p. IV-62). RHCAs are found along those Class IV streams which are considered intermittent.
- MA 3B, but not RHCA, includes aspen stands regardless of location on landscape from valley bottoms to upland sites and, specifically, "dry" quaking aspen stands. The presence of aspen indicates that sufficient water for their establishment, survival and growth is present, either as surface water or subsurface water, and is present at more abundant levels, that are sufficient for aspen growth, than in the surrounding area.

Aspen mapping and protection with 100 to 150 ft. buffers or RHCAs is ongoing. Aspen are protected under either the Unique Habitat Wildlife Forest Plan Standard for drier stands or as Category III or IV wetlands, depending on classification of the stand.

Both PACFISH and the Malheur Forest Plan used state water quality standards to define favorable water temperatures or to establish standards for water temperatures. The Malheur Forest Plan Forest-Wide Standard 117 also requires compliance with the Clean Water Act. Since the publication of both the Malheur Forest Plan and PACFISH, Oregon Department of Environmental Quality has revised the Water Temperature Standard in coordination with the United States Environmental Protection Agency as required by the Clean Water Act.

The Water Temperature RMO of PACFISH and the Water Temperature Standard described in Amendment 29 are superceded by the 2002 and 2004 revisions to the State of Oregon Water Quality Standard for Temperature (temperature standard) established under the Clean Water Act referenced above. The 2002 and 2004 revisions are more stringent than the RMO for temperature included in PACFISH and the numeric standard in Amendment 29 and are applicable to the project area. The Temperature Standard applies to both designated habitat and waters which are tributary to the designated habita

Parts of both the 2002 and 2004 revisions are currently in effect. Application of the Temperature Standard, provided by the Oregon Department of Environmental Quality (ODEQ), to the project area involves the Standard itself and the Oregon Clean Water Act Section 303(d) List of Water Quality Impaired Waterbodies (List). The List is developed by ODEQ when environmental conditions do not meet Standards. Both the Standard and the waterbodies included on the List are determined and published by ODEQ.

The application of the Water Temperature Standard and the Oregon Clean Water Section 303(d) List of Water Quality Impaired Waterbodies (List) is in transition between two revisions of the Standard. One revision was adopted and published in 2002; the other in 2004. The 2004 revision supercedes the 2002 revision; but, since the List based on the 2004 Standard has not been published by ODEQ, the 2002 List, which is based on the 2002 revision, remains in effect.

Information about species, life stage, fish presence and historic distribution was used to refine the 2004 Standard. The 2004 Standard designates water temperatures by specific streams based on specific fish use and distribution, using biologically based criteria, more narrowly than the 2002 Standard did. The major changes in the Water Temperature Standard between 2002 and 2004 are the degree of specificity in the new Standard (based on species and life stage) and the recognition of generally expanded geographic areas (based on historic fish distribution and other information) to which specific temperatures apply. The 2004 Standard adopted for the project area and its tributaries is more restrictive for most of the year than the one in effect in 2002 and equally restrictive for the rest of the year.

Two letters of direction for implementation of PACFISH were distributed in 1995. The first one, signed by the Regional Forester, issued in May 1995, provided direction for the implementation of PACFISH in Region 6 and included several enclosures. It provided Recommended Livestock Grazing Guidelines. A letter dated August 14, 1995 transmitted a revision of Enclosure B (dated July 31, 1995, see Appendix G) to replace the original Enclosure B for purposes of clarification, particularly of Key Assumptions and with regard to the Key Definition of “ecological status” in the first letter; most of the Recommended Livestock Grazing Guidelines were left intact. The revised Enclosure B (July 31, 1995) provides Recommended Livestock Grazing Guidelines which, along with emerging science, have been incorporated into the Malheur National Forest Draft Riparian Monitoring Strategy.

The inclusion of Standard and Guideline GM-1 in PACFISH Appendix C indicates that the definition of “near natural rate” of recovery does not exclude intermittent and localized failures to meet standards. GM-1 gives direction to “modify grazing practices…that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect listed anadromous fish. Suspend grazing if adjustaing practicies is not effective in meeting Riparian Management Objectives and avoiding adverse effects on listed anadromous fish.” The Malheur National Forest Draft Riparian Monitoring Strategy states “In this light, the focus in this report in evaluating the effects of 2004 grazing and recommending any modifications for 2005 grazing is on avoiding negative effects, the influence of which, is likely to still be existent at the beginning of the next frazing season to a degree that would meaningfully impede recovery….” (USDA-Forest Service, Malheur National Forest, 2005).

PACFISH also directs that the Standards and Guidelines may be modified through site-specific Watershed Analysis. None of the Standards and Guidelines has been modified as a result of site-specific Watershed Analysis for the project area.

Existing Condition

Introduction

Understanding of watershed function, history, condition and process in the upper Middle Fork sub-basin has developed over the last five years and continues to develop. Consequently this report on existing watershed condition in the Middle Fork John Day River Allotment Management Plan EIS is an update to the Upper Middle Fork Watershed Analysis of 1998, Galena Watershed Analysis (Galena WA) of 1999, the Middle Fork Watershed Analysis of 1995, and the Southeast Galena Update to the Galena WA of 2004.

Hillslope Condition and Upland Watershed Processes:

Hillslope condition and upland watershed processes were described in the Galena Watershed Analysis (WA) (1999) and the Southeast Galena Update to the Galena WA (2004). The primary natural erosion process is fluvial which is controlled by climate and geology. Surface erosion and mass wasting are characteristic of some soils. Surface erosion potential is higher on naturally thin soils and on granitic soils. The naturally thin non-forested soils (about 4500 acres) are distributed throughout the Planning Area; thin forested residual soils (estimated at about 3000 acres) are generally found just above the Middle Fork of the John Day valley. Both the non-forested and forested soils are often clayey and derived from marine conglomerate or volcanic geology. Surface erosion also occurs in the form of widespread soil creep. Soil creep, the gradual, steady movement of soil and loose rock downhill, is most evident on exposed soil as a result of the freeze-thaw cycle. Mass wasting, in the form of generally small to moderate sized slumps, occurs on clayey soils derived from marine conglomerate geologic formations. Ground cover meets Forest Plan (FP) standards in most of the forested area. Ground cover may not meet FP standards on non-forested areas as described in the Soils Report.

Disturbance associated with historic (prior to WW II) grazing, railroad logging, mining, and the human settlements necessary to support these activities was extensive in the Planning Area, especially along streams and draws. Although grazing, logging, and mining continued, vast areas of hillslopes have recovered or are recovering from past management disturbance or are undisturbed. Skid trails and landings used during past harvest are recovering. Ground cover in most part of the Summit and Reed burns is considered to be approaching pre-fire abundance. Dredges used after WW II for most mining affected valley bottoms rather than uplands. Limited amounts of hand work continue in upland mines, generally in sites previously disturbed.

Exceptions to this overall trend are present; upland conditions in some places have not recovered from historic disturbance. Legacy effects from these past disturbances continue to affect hydrologic function. These conditions are generally considered to be relatively local and limited to particular landforms or to places where a particular set of activities and natural conditions occurred; however, these conditions are found throughout the Planning Area.

Erosion following past activities, including early sheep and cattle grazing and railroad logging, changed characteristics of surface soils in some places. These changes continue to limit ground cover and to alter runoff patterns along the crest of the Greenhorn Mountains; at thin soiled, low elevation, low productivity forest sites on sideslopes just above the Middle Fork like those near Squatter's Flat near Beaver Creek; and in steep to moderate gradient valley bottoms along mountain streams and ephemeral draws. Sideslopes near the Greenhorn Crest in upper Lemon Creek (a tributary to Granite Boulder Creek) and upper Beaver Creek eroded following a storm event in September 1998 and remain vulnerable to runoff from future storm events.

Early placer mining claims, where surface soil and ground cover were removed and which have not revegetated, are located on hillslopes and in valleys, mostly in Vinegar, Vincent, Elk, Onion Gulch, and Swamp Gulch drainages. Mineral soil or tailings remain. Other upland locations where legacy disturbance continues include a sideslope in Vinegar Creek where the failure and continued and use of an old mining ditch has eroded the hillside below and areas near Placer Gulch where a stock driveway was maintained into the 1960s.

Management Area 3B and Riparian Habitat Conservation Areas

Management Area 3B (MA 3B) is defined in the Forest Plan. It includes seeps, springs, bogs, other wetlands, aspen stands, and variable width buffers along streams and ephemeral draws. Riparian Habitat Conservation Areas (RHCAs) are designated areas along streams, wetlands, or other aquatic features intended to protect aquatic function. They are defined in PACFISH according to stream type or size of wetland or other aquatic feature. The condition of MA 3B and RHCAs along streams is discussed in the section on Stream Channels, Floodplains and Valley Bottoms.

Seeps/Springs:

Numerous seeps and springs are scattered across the Planning Area. Many have been developed for livestock watering. About ten per cent of the developments include protection of the seep/spring, watering troughs located away from the seep/spring, and overflows returned to the seep/spring or drainage way below. Water developments do not route the entire flow away from the seep/spring.

Wet Meadows:

The Planning Area contains landforms with the potential to support wet meadows. Meadows vary in size and shape. Potential large wet meadow sites tend to be located at mid-elevations on the north side of the Middle Fork, along the Middle Fork, just above tributary confluences along the Middle Fork, and in the subalpine zone. Stringer and bead meadows tend to be found along tributaries to the Middle Fork. Wet meadows are found most commonly on Blue Mountain allotment. They are scattered throughout the rest of the allotments. When fully functional, wet meadows, regardless of size or location, often support similar vegetation. Past (over the last 150 years) and on-going disturbance is believed to have reduced the number and extent of wet meadows below the landscape potential.

Many formerly wet to moist meadows at mid-elevations are drier now than forty to fifty years ago or are less extensive and contain portions which are now dry meadows, according to the results of Condition and Trend plots re-sampled in 2003 and local observations. Drying out appears to have followed road or railroad grade construction across or near the meadows. Construction often interrupts subsurface flow to the meadows. Often subsurface flow is captured by road ditches or the road itself or ponds against the bed and is routed off the landscape more quickly than if it reached the meadows and consequently is not stored in the meadows. Some meadows, primarily in upper Mill Creek, are completely dry now. Encroachment by trees into meadows following construction and climate changes may also be affecting the overall condition.

Many meadows along tributary streams and the Middle Fork appear to be drier now than before European contact. Channelization, historic mining, roading, and acceleration of snowmelt runoff due to extensions of the drainage network appear to be the main factors contributing to drier conditions. Meadows along the Middle Fork which appear drier are located in portions of Blue Mountain, Upper Middle Fork, Camp and Bear allotments. Much of the Middle Fork and its valley in these areas were dredge mined or channelized since WW II. Meadows along the Middle Fork which have retained characteristics of wet meadows or appear to be recovering include those in other portions of Blue Mountain Allotment, in Austin Allotment, and above Sunshine Guard Station in the Upper Middle Fork Allotment. Stringer/bead meadows along many tributaries also appear drier due to downcutting and valley bottom disturbance such as skidding, landing, construction of railroad spur lines or historic hydraulic mining.

These meadows are often drier because stream downcutting has lowered the water table in the adjacent valley and reduced the subsurface connections between streams and floodplains (valley bottoms). The most common causes of drier conditions are roading (and railroading) and other valley bottom disturbance, downcutting or channelization of streams, and displacement of beaver. Stream downcutting also interrupts the normal pattern of flooding.

Aspen:

Aspen communities occur in isolated small areas of localized moderate soil moisture, such as riparian zones, ephemerally wet draws, wet meadows, and areas of groundwater seeps. They are often found on toe slopes. These areas have often been disturbed by management activities as previously described. The health of aspen communities has been and continues to be affected by these altered (in space or time) soil moisture patterns. Aspen communities in upper Mill Creek, unburned portions of Horse, Beaver and Coyote creeks, and near Phipps Meadows are among those that may have been affected by disturbance to streams, meadows, or broader valley bottoms.

Stream Channel, Floodplain, and Valley Bottom Condition

Introduction:

A variety of valley and stream types are found in the Planning Area. Past disturbances have altered the physical characteristics of many valley bottoms and stream channels, and the soil-water relationships between them, away from hydrologic potential. Alteration has occurred in drainages from the top of the Greenhorn Mountains and Dixie Butte to the Middle Fork Valley. Generally most streams and valleys are recovering from past disturbance although some exceptions exist. Stream channel, floodplain, and valley bottom conditions are a mosaic created by interactions among legacy effects, on-going activities, recent management activities implemented under more stringent standards, and various recovery processes. Conditions along specific streams are described by pasture, and allotment in the Watershed Condition by Allotment Report.

The pattern of recovery is complex, variable and often slow because of the intensity, magnitude, and duration of past disturbance and because many factors influence recovery. Some of these factors relate to physical characteristics of the Planning Area such as climate, soil types, soil parent material, and stream type. Other factors relate to the timing, duration, and magnitude of disturbances or legacy effects of these disturbances. Some effects of past disturbance are long lasting and are compounded with effects from on-going disturbance. Interactions among these factors accelerate or slow recovery in the Planning Area.

Exceptions to recovery are located in the subalpine zone where climate or thin soil make re-creation of eroded soil and establishment of vegetation very slow (see Hillslope Condition section) or non-existent. Runoff continues to be accelerated and concentrated resulting in slow if any channel recovery within this zone. Other exceptions to recovery include channel formation in normally unchanneled ephemeral draws and the headward extension of generally small channels. Erosion is likely to continue headward, mostly on residual soils, where coarse woody material is lacking or where effects of past disturbance continue to concentrate overland flows. Recovery may also be arrested annually where grazing standards are not met.

Stream channels appear to be straighter and more entrenched (downcut) than before European contact. Channel shape and dimensions (geomorphology) have been altered. Stream banks are often not well defined. Other physical characteristics which are important for proper stream functioning, such as undercut banks, are lacking because stream banks are not well defined. The extent to which stream channels have been altered, the kind of alteration, and the degree of recovery partially depends on valley types and natural characteristics of the original channels. For instance, channel types that naturally tend to be straighter (Rosgen stream types “A” or “B”) have generally been impacted less or recovered faster than channel types which tend to be meandering (Rosgen stream types “C” or “E”).

Meandering, Flatter Gradient Streams:

Meandering, flatter gradient streams are often found in wide valleys in the lower portions of the drainages of the Planning Area or in local "stringer" or "bead" meadows along tributary streams. These stream segments are usually classed by Rosgen (1997) as *sensitive* (see Figure 10, Map Section). These sensitive segments and their adjacent riparian areas often meet the established criteria for identifying Designated Monitoring Areas or other locations selected for monitoring of riparian forage, browse and other conditions.

The Planning Area contains numerous valleys and "stringer" and "bead" meadows capable of supporting meandering streams. Due to the characteristic sensitivity of meandering streams to disturbance and to the magnitude, intensity, and duration of historic disturbance, many of these channels were straightened, downcut, or widened and currently are in various stages of recovery. The pattern of recovery is complex because of the numerous factors, both human and natural, that influence it. Modification of valley bottoms as well as stream channels is contributing to the variability in and complexity of recovery processes.

Valley bottoms adjacent to these streams were also modified detrimentally either directly by the same activities or indirectly as a consequence of alterations to stream channels. Most commonly, water tables across valleys were lowered and are maintained at lower elevations. In some cases, characteristics of valley bottom soils such as depth of organic material or per cent fines were altered.

Meandering streams are characteristically more sensitive to disturbance from management activities than other streams for several reasons. These drainages are usually located on alluvial deposits; valley bottom and stream channel substrate is finer than that of mid-elevation channels and more easily moved by concentrated flows. These streams are usually dependent on vegetation for bank stabilization. Loss or reduction of riparian vegetation, such as that which accompanied historic disturbance, increased the vulnerability of these channels to additional disturbance and to normal high flows. Similarly, the displacement of beaver removed another factor which controlled runoff and stream energy, additionally increasing the vulnerability of streams to erosion within and along the channel. Meandering streams are located in wider, flatter, more accessible valleys and meadows which were attractive for concentrated development and were often the focus of historical activities by early settlers. Proximity to human development and accessibility probably increased the likelihood of disturbance and its magnitude and duration.

Meandering streams were often moved, straightened, bermed, constrained, or channelized to create larger expanses of "dry" usable ground on flatter valley bottoms. Stream channels became "dished out". "Dished out" streams are shaped like a dish in cross section with a continuous u-shaped trough and wide channel with little definition of the thalweg (low flow channel). The structural integrity of stream banks is sensitive to disturbance under these conditions because normal, energy-dissipating features of stream banks cannot be maintained.

A variety of activities or their long-lasting effects led to the development of "dished out" channels. Streamside and valley bottom vegetation was removed intentionally or as a consequence of other activities. Surface soils on the valley floors were probably compacted, excavated, moved, or otherwise impacted. Ground cover was removed or reduced and consequently runoff was probably concentrated and erosion occurred.

Downcut channels resulted in lowered water tables and streams which are still disconnected from the adjacent floodplains. Lowered water tables reduce water storage capacity in meadows for late season flows and reduce the extent and vigor of riparian vegetation, reinforcing the vulnerability of channels to erosion. Downcut channels also alter the flood cycle by routing high flows off the landscape more efficiently and reducing the extent of floods across the valley bottom.

Ground disturbance in the past, associated with the concentration of livestock, is believed to have contributed to the current degradation of riparian vegetation condition and stream banks in two ways. Some stream banks were directly altered because excessive grazing over time cumulatively interrupted the synergistic relationship between vegetation and stream banks. Excessive grazing also prevented the recovery of riparian plant communities along streams previously disturbed by other activities or natural events. These kinds of impacts are now described as “mechanical’ ground disturbance, hoof action, or trampling.

Watershed disturbance of this magnitude and duration takes decades to recover. Recovery is occurring on areas that have been disturbed multiple times and on which recovery may have been initiated and interrupted or slowed several times. Recovery under the conditions in the Planning Area is complex because of the number of kinds of past disturbance and the magnitude, duration and intensity of and interactions among the disturbances. The most intensely disturbing activities probably occurred until the Taylor Grazing Act was passed in 1934 and until demand for railroad logging and mining shifted downward in the mid twentieth century. When the intensity of the management activities which created these conditions decreased, stream channel recovery began. Recovery continued through the mid- and late-twentieth century but was probably slowed or interrupted by on-going management activities, primarily grazing, roading, and logging, which were implemented in uplands, in valley bottoms and along streams. Photographs in the Range files document the disturbed conditions in the 1930s and the progress of recovery to the present. The degree of watershed recovery is limited by nearly permanent changes to the landscape such as roads and erosion in the subalpine zone.

Livestock use continued through the late twentieth century to the present under conditions designed to permit recovery. With implementation of the Forest Plan, amending of the Forest Plan with PACFISH, initial listing of steelhead in 1998, and implementation of terms and conditions in more recent Biological Opinions, standards and indicators for riparian use became more stringent than prior to 1990. Grazing standards and indicators incorporated measures of use on herbaceous riparian species, especially hydrophytes; browsing of riparian shrubs; and bank stability.

It became apparent that protocols available in the 1990s were not adequate to classify, measure, describe and quantify effects of large ungulate use on streamside vegetation and stream bank condition at the current stage of recovery in the Middle Fork. For instance, herbaceous utilization was used as a surrogate indicator for shrub utilization and bank stability in the absence of reliable protocols. Protocols designed to evaluate bank stability also were not capturing observed impacts to stream banks.

As monitoring results were closely analyzed and monitoring protocols were evaluated and refined by the Interagency Implementation Team and District personnel, the importance of using bank alteration as an indicator of riparian condition in the Planning Area emerged. Reliable protocols that provide immediate results about bank alteration, in addition to trend, have only recently been published (IIT, 2000). The early results of these protocols appear to be consistent with observations about stream channel condition made by District and Forest aquatic specialists and others over the last decade or more. The principles used in these protocols and observation by team members were used to estimate and describe past effects of ungulates on the condition of stream banks and channels.

Bank alteration is a measure of bank integrity. Maintaining bank integrity appears to be a key factor for recovery of disturbed channels in the Planning Area, especially in "dished out" streams where banks are not well defined. Disturbance that reduces bank integrity along recovering streams appears to interrupt the synergistic interaction, between greenline vegetation and sediment, required to build and define stream banks.

The synergistic interaction between vegetation and sediment is dynamic and influenced by a variety of factors. Recolonization of exposed soil in the Planning Area appears to be variable based on the composition, abundance and vigor of the plant community, the degree of past impacts, and the period of time between repeated physical disturbances. The condition and distribution of riparian vegetation are variable as described in the Riparian Vegetation Section. Based on observations by District aquatic specialists, this synergistic interaction appears to be more sensitive to disturbance where bank stabilizing hydrophytic species are lacking or where they are limited to a narrow band along the greenline, than in areas where the hydrophytic community is extensive. In areas where the greenline is defined by a narrow band of hydrophytic vegetation disturbance of the colonizing hydrophytes may delay the otherwise expected, subsequent expansion of the hydrophytic plant community. Generally, wider wetted width-to-depth ratios are maintained when the hydrophytic community remains restricted to a narrow band and narrow as the hydrophytic plant community expands. More extensive hydrophytic plant communities are generally able to recolonize small areas of exposed sediment in the years immediately following disturbance if disturbance is controlled and grazing standards are met.

The reason for the sensitivity is that disturbance beyond a threshold crushes, kills or directly removes hydrophytic bank vegetation, either directly exposing sediment or indirectly exposing sediment by exposing roots which die on exposure to air. Exposed sediment increases the channel erosion hazard. Reduction in bank vegetation also leads to reduced soil holding capacity by the riparian plant community which contributes to additional increases in the channel erosion hazard. Hydrophytic species such as some sedges have the potential to be prolific colonizers under the "right" conditions.

Based on observations by District and other aquatic specialists, "dished out" streams appear generally to be recovering; individual streams are at various stages of recovery along a continuum from almost none to about midway, based on observed bank development. These stages are frequently controlled by the various environmental factors described in the introduction to this section. Exceptions to this trend are present; recovery of some stream segments has been interrupted due to on-going activities. Recovery processes may also take and are measured over decades because of the intensity of past and on-going disturbances.

Initial colonization by moisture loving herbaceous species appears to be followed by establishment of small colonies of pioneer hydrophytic sedges and similar species. This initial colonization is probably followed by the expansion of these species along the greenline and an increase in species diversity. Once these species are established in long, narrow colonies along the greenline, they appear to expand toward the middle of previously over-widened (wetted width) streams. This expansion results in a reduction of the wetted width-to-depth ratio. Trapping of sediment is proportional to the extent of the hydrophytic community. Bank formation and definition, which is estimated to take up to 20 years, appears to follow the narrowing of the wetted channel. Adjustment in other geomorphic characteristics, such as the development of undercut banks, appears to follow the definition of narrower wetted width channels and stream banks and is estimated to take up to 100 years. These long recovery periods reflect the physical adjustment channels are expected to undergo following initial recovery of riparian vegetation. These physical adjustments often require normally infrequent, high flow events, recruitment of large woody material, or other ecological processes which operate over decades.

On-going activities, including livestock grazing continue to have potential to alter the recovery of stream bank integrity. Currently, stream bank alteration sufficient to damage the integrity of stream banks is considered to occur when grazing standards or indicators are not met. Recent monitoring and observations indicate that variable amounts of bank alteration are occurring or have occurred recently. Observations by some team members indicate that hoof action in excess of the threshold occurred in recent years along some stream segments. The duration and magnitude of the impacts on bank integrity resulting from not meeting standards appears variable based on the seral stage and other characteristics of the specific stream segments (Example: Vinegar Creek).

An accumulation of mechanical (physical) ground disturbance results in stream bank alteration. Mechanical ground disturbance is caused by mechanisms that physically disturb the ground such as hoof action (trampling). Bank alteration (aka bank damage, trampling) that causes negative effects on streamside vegetation and stream banks is defined as depressions from hoofs greater than one half inch deep that expose plant roots on more than ten per cent of the linear bank length sampled (IIT, 2000). If more than ten per cent of the linear length sampled is damaged, recovery may take more than one year. Generally negative effects to streamside vegetation and stream banks (bank damage) are considered to occur if bank damage is likely to carryover into the following year.

It is generally accepted that mechanical bank damage that occurs on ten per cent or less of the linear bank length is unlikely to carryover into the following year because of the ability of resilient riparian plant communities to recolonize disturbed areas. Also, when more than ten per cent of stream banks is affected by bank damage, the soil holding capacity of the riparian vegetation is reduced, increasing the vulnerability of stream banks to accelerated erosion. Loss of sufficient vegetation to recolonize disturbance or the loss of soil holding capacity and subsequent erosion interrupts the synergistic relationship between streamside vegetation and stream banks. This interruption often results in additional detrimental effects to riparian vegetation and stream banks, in a self-reinforcing cycle, especially where recolonizing vegetation is limited to a narrow band along the greenline or is mostly killed by the disturbance.

The consequences on bank development and integrity when standards and indicators are not met appear to vary depending partly on the seral condition of the vegetation along the greenline and the length of greenline affected. Stream segments in late seral condition probably retain the capacity to recolonize disturbed areas which nearly meet standards and indicators in two to three years. A stream segment which is an example of this category is the Middle Fork in West Summit Pasture in the Blue Mountain Allotment. Stream segments in early seral condition may remain in that state indefinitely if periodic disturbance repeatedly interrupts initial colonization by hydrophytic species or prevents conditions required for colonization from developing. Stream segments along Crawford Creek in Blue Mountain Allotment and Vinegar Creek in the Upper Middle Fork Allotment are believed to fall in this group.

Straighter, Moderate Gradient Streams:

Naturally straighter and moderately to steep stream segments, which were either impacted to a lesser degree or have recovered to a greater degree, are often found in narrow or moderate-width V-shaped valleys. It is suspected that although some channels were either "dished out" or gullied, various factors have contributed to greater recovery of these channels compared to the flatter, more meandering channels.

Valley bottom and channel disturbance may have been less intense along these stream segments because valley width and substrate size controlled the magnitude of impacts caused by various disturbances. The intensity of disturbance may also have been lower because these mid elevation segments are located farther from areas where most past management activities were concentrated in the lower parts of the drainage. Often these segments run through forested areas with deeper soils or through areas where components of the natural plant community were retained following past management activities. Remnant plant communities were available to initiate recolonization of disturbed stream banks and adjacent riparian areas which contributed to early bank redefinition and formation. Vegetation recovery along these stream segments is often well advanced and contributes to ongoing bank development. Often the riparian vegetation communities are considered to be at or near potential natural community. Final stages of channel recovery, which include completion of bank formation and the development of undercut banks, may take decades to achieve. Normally infrequent high flow events, recruitment of additional large woody material, or the development of other ecological processes are required to reset these and other physical characteristics and to reestablish normal stream energy relationships in these streams.

Some of these straighter, steeper stream segments run through non-forested areas; the condition of these stream segments and associated valley bottoms is usually similar to that described above for flatter, meandering streams.

Steeper, High Elevation Streams:

Some high elevation steeper "cascade" stream in the subalpine zone of Vinegar Hill have been downcut or widened by concentrated flows and erosion originating within channels following hydraulic mining or from altered herblands. Ground cover has not recovered from historical sheep grazing. Numerous drainage pathways are becoming defined on the exposed mineral soil. These drainage pathways concentrate runoff and erode under some conditions. These areas continue to present risk of future accelerated high flows and erosion to downstream channels similar to the effects of the Beaver Creek and Lemon Creek events of 1998.

Extension of the Drainage Network:

Extension of the drainage network is another process which has altered stream function. The drainage network has been extended by several kinds of historical disturbance, previously described. The processes set in motion by these disturbances continue to accelerate channel formation in ephemeral draws and headward erosion in small, mostly intermittent stream channels. Ephemeral draws are developing channels which meet the PACFISH definition of intermittent streams. Intermittent streams channels are believed to be more extensive now than prior to European contact. Often the newly formed channels and headward extensions are "dished" out with poorly defined banks. Other ephemeral draws and swales often show evidence of concentrated flow such as pedestaling, small deposits of sediment, and needle "jams" as described for Caribou grassland/scabland (Vegetation Report) and more generally in the Galena WA. Past skidding implemented without Best Management Practices and roading also functionally extend the drainage network by collecting, concentrating, and accelerating runoff. For example, the interaction among road runoff and concentration of flows from an historical salting ground in a draw west of Vincent Creek is defining a flow path in the upper draw and appears to be contributing to erosion of the lower intermittent channel just above County Road 20.

Summary:

When the geomorphic condition of the streams and other riparian areas is considered, it is recognized that the existing soil-water relationships are not typical of those believed to be present before European contact. Streams in the Planning Area are in various stages of recovery. Overall recovery of the soil-water relationships is often distributed narrowly along the "greenline" and is not complete. Channel function has not recovered; recovery of some characteristics may take decades. Vegetation along valley floors is typical of drier meadows rather than riparian communities because of downcutting and lower stream elevations resulting from past activities. Lower stream elevations results in persistent, accelerated drainage of valley bottoms and maintenance of lowered water tables. Interactions between stream channels and flood plains remain disconnected.

Water Quantity and Timing

Streamflow records for the Middle Fork of the John Day River are not extensive. The Ritter, Oregon gauge, located about 15 miles downstream is the nearest gauge to the Planning Area. Because the gauge is located below the Planning Area, the summary provided in the Galena WA applies to this project.

Streams originate in seeps, springs or other wetlands and are snowmelt dominated. Baseflows are dependent on groundwater contributions. Annual discharge varies widely due to the dependence of snow accumulation and melt on annual weather.

Peak flows in the Middle Fork John Day River within the Planning Area are considered to last longer and to be less "flashy" than flows in other areas. Characteristics such as the variation in climate, elevation, and soil types and the distribution of soil types and tributary sizes contribute to this runoff pattern. Runoff from snowmelt or rain storms in some drainages is naturally "flashy" due to local elevation or soil types; but, at the river, this flashiness is buffered at the river by characteristics, primarily elevation, climate, and drainage area, of other drainages.

Human disturbance from various management activities has decreased seasonal storage in large moist and wet meadows and in stringer/bead meadows, increased the drainage efficiency of the watershed and increased the flashiness across most of the Planning Area. Because disturbance has occurred throughout the Planning Area, the overall pattern of snowmelt runoff is believed to have shifted in time but not to have changed substantially. Overall, peak flows are believed to occur earlier and to last longer than they would in an undisturbed watershed. It appears that a greater proportion of water runs off during snow melt or after rain storms because of the wide spread disturbance than would be expected in an undisturbed watershed. Consequently, because less water is stored seasonally and available for late season flows, summer low flow (base flow) is considered to be reduced proportionately compared to undisturbed areas.

There are at last nineteen irrigation diversions in the Planning Area with associated water rights. These include diversions on both private and Forest land in lower Camp Creek which irrigate or cross Forest land and those on Forest land in the former Galena Watershed (Placer Gulch downstream to Big Creek). Diversion and water rights for the irrigation of forage species are associated with Bear and Camp Creek allotments. These rights are assigned to the Forest Service.

(NOTE: Thin soils tend naturally to shed water rapidly)

Water Quality

Streams in the Planning Area are on the Clean Water Act Section 303(d) List of Water Quality Impaired Waterbodies for reasons related to water temperature. Stream temperatures are elevated, partly due to the lack of shade and widened channels and, possibly, due to summer ambient temperatures and temperature of base flow which reflects groundwater temperatures. Table WA-1 displays the 303(d) listed streams by pasture and listing reason. The Galena WA indicates that other water quality problems are rare and due to special circumstances.

Stream surveys indicate that FP shade standards are not met on most streams.

Wetted width-to-depth ratios that do not meet FP standards indicate that more solar radiation is absorbed by stream water due to the increased surface area associated with large width-to-depth ratios.

Table WA-1: Allotments and Pastures by 303(d) Listed Streams.

Stream Name	Allotment	Pasture/Parcel	Reason for 303(d) Listing
Middle Fork of the John Day River	Blue Mountain	Phipps Exclosure	3
Middle Fork of the John Day River	Blue Mountain	West Summit Pasture	3
Middle Fork of the John Day River	Austin	East Parcel 1	3
Middle Fork of the John Day River	Austin	East Parcel 2	3
Middle Fork of the John Day River	Upper Middle Fork	Tailings	3
Middle Fork of the John Day River	Upper Middle Fork	River	3
Middle Fork of the John Day River	Upper Middle Fork	Shop	3
Middle Fork of the John Day River	Administrative Pasture	Sunshine	3
Middle Fork of the John Day River	Camp Creek	Lower Camp Pasture	3
Middle Fork of the John Day River	Camp Creek	Middle Pasture	3
Middle Fork of the John Day River	Administrative Pasture	Bear Creek	3
Middle Fork of the John Day River	Bear	C1 (Cole)	3
Middle Fork of the John Day River	Bear	C2 (Corral)	3
Summit Creek	Blue Mountain	Idaho Pasture	3
Summit Creek	Blue Mountain	East Summit Pasture	3
Summit Creek	Blue Mountain	Phipps Exclosure	3
Squaw Creek	Blue Mountain	Squaw Pasture	1
Squaw Creek	Sullens	Savage Pasture	1
Squaw Creek	Sullens	Squaw Meadow Exclosure	1
Squaw Creek	Sullens	Highway Pasture?	1
Clear Creek	Sullens	Bridge Pasture	2
Clear Creek	Sullens	Highway Pasture	2
Clear Creek	Blue Mountain	Summit Pasture	2
Clear Creek	Administrative Pasture	Blue Mountain	2
Dry Fork Clear Creek	Sullens	Savage Pasture	1
Dry Fork Clear Creek	Sullens	Bridge Pasture	1
Dry Fork Clear Creek	Sullens	Highway Pasture	1
Crawford Creek	Blue Mountain	Crawford Pasture	1
Crawford Creek	Blue Mountain	West Summit Pasture	1
Mill Creek	Upper Middle Fork	Austin Pasture	1
Mill Creek	Blue Mountain	Crawford Pasture	1
Mill Creek	Austin	Bates Pasture?	1
Lunch Creek	Sullens	Bridge Pasture	1

Stream Name	Allotment	Pasture/Parcel	Reason for 303(d) Listing
Placer Gulch	Upper Middle Fork	Deerhorn Pasture	1
Davis Creek	Upper Middle Fork	Deerhorn Pasture	1
Vinegar Creek	Upper Middle Fork	Lower Vinegar Pasture	1
Vinegar Creek	Upper Middle Fork	Upper Vinegar Pasture	1
Caribou Creek	Upper Middle Fork	Upper Vinegar Pasture	1
Caribou Creek	Upper Middle Fork	Caribou Pasture	1
Caribou Creek	Upper Middle Fork	Tailings Pasture	1
Little Butte Creek	Upper Middle Fork	Deerhorn Pasture	1
Little Butte Creek	Upper Middle Fork	Butte Pasture	1
Ragged Creek	Upper Middle Fork	Butte Pasture	1
Granite Boulder Creek	Lower Middle Fork	Granite Boulder Pasture	2
Granite Boulder Creek	Upper Middle Fork	Caribou Pasture	2
Granite Boulder Creek	Lower Middle Fork	Granite Boulder Exclosure	2
Coyote Creek	Lower Middle Fork	Coyote Pasture	1
Big Creek	Lower Middle Fork	Pizer Pasture	2
Big Creek	Lower Middle Fork	Deadwood Pasture	2

1= summer rearing temperature; 2= summer bull trout temperature; 3= summer rearing temperature and spawning temperature August 15-July 15

Environmental Consequences

Direct and Indirect Effects

Alternative 1 - No Grazing

Hillslopes and Upland Watershed Processes:

Elimination of grazing would allow the isolated areas of bare soil, classed as “Soil movement local and slight” (see Soils Section) to revegetate. Ground cover conditions elsewhere would remain as described in the Soils Section. Where ground cover does not meet FP standards, the risk of erosion is elevated with smaller run off events.

Management Area 3B and Riparian Habitat Conservation Areas (RHCAs)

The outer portions of MA 3B and RHCAs are usually uplands except in some locations along the MFJDR and lower Camp Creek. The effects of elimination of grazing in the upland portions are similar to those described above for hillslopes and upland watershed processes. The portion of MA 3B and RHCAs that lies on valley bottoms, particularly those portions which are adjacent to streams, would maintain or develop soil water relations typical of the site. Where streams are entrenched or the valley soil has been disturbed by past activities, elimination of grazing will continue the recently initiated, slow, complicated recovery of streamside hydrophytic plant communities as described in the Riparian Vegetation section of the Vegetation Effects Report. As streamside vegetation recovers and stream function and morphology adjusts, soil water in the adjacent valley soils is expected to increase resulting in greater water storage and an expansion of riparian plant communities. Roots of both herbaceous and shrubby species would provide bank strength.

Stream Bank and Channel, Floodplain, and Valley Bottom Condition:

The maintenance of or recovery to late seral vegetation stages, as described in the Riparian Vegetation Section of the Vegetation Report for the elimination of grazing, is a necessary, preliminary stage to bank building in streams that are considered "dished out" (see Watershed Existing Condition). The presence of a late seral, hydrophytic plant community will result in trapping of sediment during flows that exceed the two year event. The supply of sediment in many of these streams is considered low when compared to stream systems in other parts of Eastern Oregon partly due to past activities which washed fines out and left larger substrate behind (Camp Creek, Vinegar Creek, Vincent Creek, for example) and partly to the hydrologic regime which seems to result in few run off events that detach and deposit substantial amounts of sediment within the channel. Consequently, while the hydrophytic plant community which can trap sediment is expected to develop, it may take up to twenty years to capture enough sediment to build banks completely and develop bank integrity. It may take up to eighty to one hundred years to develop under cut banks (Elmore, 2004).

Floodplains become defined during development of late seral vegetation stages and bank building. As floodplains become defined and banks reform, additional soil water will enter valley bottom soils during high spring flows. Much of this stored water will be released during normal periods of low flows. The potential to capture, store, and gradually release larger volumes of water in the valley bottom will develop over time and in coordination with improvements in channel and bank conditions.

As floodplains develop in the flatter gradient, disturbed streams ("sensitive reaches"), streamflow will interact with channel conditions to form flatter, narrower, more meandering channels. Average stream width, width to depth ratios, and bankfull widths are expected to decrease and approach the values published in Rosgen (1997) for flatter gradient streams.

Stream bank alteration generally caused by cattle trampling and post-holing would be eliminated, reducing mechanical damage to the roots of hydrophytic plants which often results in death and reduced abundance.

Stream conditions on most moderately and very steep streams will not change under the elimination of grazing. Channel conditions that do not meet values published in Rosgen (1997) are largely the legacy of historic activities and are unlikely to change quickly until the frequency of instream, large wood increases. The elimination of grazing will have no effect on the recruitment of large wood.

Water Quantity and Timing:

Elimination of grazing is not expected to change annual water yield. The recovery of storage capacity in valley bottom soils is expected to modify the runoff pattern by reducing peak flows, delaying peak flows, and providing additional volume during normal low flow periods. Due to the inherent variability of hydrologic characteristics these changes are unlikely to be measurable without intensive sampling over many years. Beaver are expected to repopulate the project area as riparian vegetation recovers. Beaver dams may result in water storage both in ponds and off channel in valley bottoms and floodplains which would augment late season stream flows.

Water Quality:

Elimination of grazing is not expected to result in measurable changes in most water quality parameters because streams in the Planning Area are considered to meet most water quality standards based on the Range Eval project (Quigley et al., 1989). Seventeen streams do not meet one or more portions of the water quality standard for temperature and are on Oregon Department of Environmental Quality 2002 List of Water Quality Impaired Streams (see Existing Condition). The elimination of grazing which will result in narrowing of the average stream width, decreased width to depth ratios, improvements in stream morphology and increased water storage is expected to result in reduced summer and spawning stream temperatures in the "sensitive" stream reaches (see Figure 10, Map Section) and below. These changes are not expected to be measurable until at least after the establishment of bank integrity which is estimated to take about twenty years. Although riparian shrubs are expected to increase in abundance, the expected increase in shade will not be proportional to shrub establishment. The Riparian Vegetation Section indicates that many newly established shrubs that are not protected are expected to exhibit arrested growth forms as mature plants because of wildlife browsing. Shrubs with short arrested growth forms do not provide shade to streams and would not influence stream temperatures.

Alternatives 2 and 3

The rate of recovery that occurs in riparian areas and stream channels under appropriate grazing management has been compared to the rate of recovery under grazing exclusion. Borman, Massingill & Elmore (1999) found that differences in rate of improvement could not be detected between reaches with appropriate grazing management and those under exclusion in Eastern Oregon. Kauffman et al. (1997) stated that livestock exclusion has demonstrably resulted in a rapid recovery of riparian vegetation. Belsky et al (1999) reviewed literature related to grazing in riparian areas. They conclude that damage to riparian areas from grazing livestock can be reduced by utilizing improved grazing practices; other literature (USDA Forest Service, 2005) indicates, along with Belsky et al (1999) that recovery may occur but would take longer with grazing than without. These concerns are addressed by PACFISH with the Key Assumption that grazing under some conditions with carefully identified "triggers" and endpoints would result in a "near natural rate" of recovery (USDA Forest Service, May 24, 1995 and August 14, 1995). .

Recovery of riparian conditions and stream channels is expected to occur at a "near natural rate" (USDA Forest Service, May 24, 1995 and August 14, 1995) which would occur when "triggers" and endpoints are met annually and when Forest Plan Standards for riparian vegetation are met (USDA Forest Service, 2005) A "near natural rate" of recovery would also occur when adaptive management was implemented, as described in PACFISH Guideline GM-1, when grazing did not meet standards or when annual monitoring indicated that adjustments were needed in "triggers" or endpoints (see Monitoring Strategy section in this document). PACFISH allows some effects from grazing under the near natural rate. A slower rate of recovery, which is not expected to be measurable, may occur under the Action Alternatives. A "near natural rate" of recovery is used interchangeably with wording in the following sections that states "effects would be similar to those of the No Action Alternative." Regardless of the rate of recovery under the No Action and the Action Alternatives, some plant communities may take decades to reach high or potential conditions (Elmore, 2004). Return to conditions present before European contact on some previously altered sites will be very slow or non-existent (Laycock, 1989, Winward, 1991).

Effects of these alternatives on watershed and channel conditions are described below.

Hillslope Condition and Upland Watershed Processes:

The soils existing condition report indicated that current grazing is generally not causing any soil damage. Isolated areas where erosion is classified as "local and slight" are present. These areas are not considered to be at risk of forming connections that would develop into erosion pathways. Grazing on hillslopes under either Action Alternative is expected to be similar to current grazing; consequently, since soil damage in excess of that classified as "local and slight" is not expected, upland watershed processes are not expected to be affected by the proposed grazing.

Management Area 3B and Riparian Habitat Conservation Areas

PACFISH indicates that meeting the thresholds, trigger, endpoints, standards and guidelines for grazing will result in a near natural rate of recovery of riparian conditions. This analysis makes the assumption that these standards and guidelines will be met under either Action Alternative. Consequently the effects of grazing under either Action Alternative are expected to be similar in pattern to those described for the No Grazing Alternative. Recovery is expected to occur at a near natural rates in previously impacted riparian areas. Riparian conditions that approach Desired Conditions currently are expected to be maintained. "Near natural rate of recovery" is considered to be a rate that can be documented at seventy per cent or greater of the "natural" rate (USDA Forest Service, August 14, 1995). Documentation at seventy per cent of the "natural" rate is acceptable because of the noise associated with and difficulty in measuring riparian and channel parameters.

Stream Bank and Channel, Floodplain, and Valley Bottom Condition

PACFISH indicates that meeting the thresholds, trigger, endpoints, standards and guidelines for grazing will result in a near natural rate of recovery of stream channel and floodplain conditions. Consequently the effects of grazing under either Action Alternative are expected to be similar in pattern to those described for the No Grazing Alternative. "Near natural rate of recovery" is considered to be a rate that can be documented at seventy per cent or greater of the "natural" rate (USDA Forest Service, August 14, 1995). Documentation at seventy per cent of the "natural" rate is acceptable because of the noise associated with and difficulty in measuring riparian and channel parameters.

Stream bank alteration generally caused by cattle trampling and post-holing would meet thresholds, triggers, endpoints, standards and guidelines, reducing the amount of mechanical damage to roots of hydrophytic plants to an amount which would not be expected to carryover to the following year and would not contribute to death and reduced abundance of these species.

Recovery of valley bottom conditions would be similar in pattern to that described under the No Grazing Alternative; the period of recovery would be proportional to the rate at which stream channels and floodplains recover.

Water Quantity and Timing

The effects of grazing under either Action Alternative are expected to be similar in pattern to those described for water quantity and timing under the No Grazing Alternative. The period of recovery is expected to be proportional to the rate at which stream banks and channels, floodplains, and valley bottoms recover.

Water Quality

The effects of grazing under either Action Alternative are expected to be similar in pattern to those described for water quality under the No Grazing Alternative. The period of recovery is expected to be proportional to the rate at which stream banks and channels, floodplains, and valley bottoms recover. If standards and guidelines for shrub utilization are met, as described in the Riparian Vegetation Section of the Vegetation Report, shade from existing shrubs is expected to be maintained and shade provided by newly established and maturing shrubs is expected to be the same as that described for the No Grazing Alternative because the extent and magnitude of wildlife browsing is not expected to change as a result of permitting cattle grazing.

Cumulative Effects

The list of past, on-going and foreseeable activities displayed in Appendix A (Cumulative Effects) was reviewed for inclusion in the discussion on cumulative effects.

Alternative 1- No Grazing

Elimination of grazing would result in the continuation of the current condition and trend of riparian conditions in most streams, resulting in improved conditions as described above. The rate of improvement is expected to be at the "natural" rate of recovery in riparian areas that are not impacted by legacy conditions or on-going activities such as roading or wildlife use. Rates of recovery on sensitive stream segments which are not currently recovering at near natural rates, such as lower Vinegar Creek and the MFJDR, would improve to near natural rates. Streams which are eroding because of legacy conditions such as the unnamed intermittent west of

Vincent Creek and below the 2010159 road and ephemeral draws on the north side of the MFJDR would continue to erode. Erosion paths in the sub-alpine steppe would continue to connect and eventually feed into established stream channels. In areas where legacy conditions or on-going activities are limiting recovery, elimination of grazing is not expected to change the overall pattern of recovery. Recovery on Camp Creek in Camp Creek Allotment would complement the on-going planting and protection and stream corridor fencing projects in Camp Creek drainage. Riparian recovery that results in more riparian vegetation is likely to be self-reinforcing as beaver recolonize the project area. Riparian conditions that approach Desired Conditions currently are expected to be maintained.

Alternatives 2 and 3

Since the proposed actions are expected to meet standards and foreseeable actions are similar regardless of alternative, it is expected that the cumulative effects of grazing on riparian, stream bank and channel, valley bottom, water quantity and timing and water quality conditions, will be similar in pattern to those described for the No Grazing Alternative. Recovery is expected to occur at near natural rates in previously impacted riparian areas. Recovery rates are expected to improve to near natural rates in sensitive stream segments which are currently improving at less than the near natural rate. “Near natural rate of recovery” is considered to be a rate that can be documented at seventy per cent or greater of the “natural” rate (USDA Forest Service, August 14, 1995). Documentation at seventy per cent of the “natural” rate is acceptable because of the noise associated with and difficulty in measuring riparian and channel parameters. Riparian conditions that approach Desired Conditions currently are expected to be maintained. Legacy conditions that are contributing to erosion in small channels and draws and in the subalpine steppe are expected to continue to detrimentally impact watershed function. Cattle grazing is unlikely to worsen these conditions because cattle do not usually graze in the subalpine steppe, because forage availability near the eroding channels and draws is generally low, and because grazing to standards and guides is expected to limit disturbance which exposes bare soil and creates erosion paths.

Continuation of either neutral or beneficial effects to impacted streams is expected from grazing as proposed. No cumulative detrimental effect from grazing would be added to ongoing processes and conditions affecting watershed function under the most common (>80% of) run-off events. Rare large run off events may interact with annual disturbance that normally would not be expected to carry over into the next year and contribute to locally increased disturbance such as erosion. The scale of the additional disturbance created by a large event interacting with local, annual disturbances associated with grazing would be incremental compared to the scale of the event and with possibly increased impacts caused by the interaction of large run off events with legacy disturbance conditions and on-going disturbances such as roading.

Comparison of Alternatives

Recovery of watershed conditions, particularly riparian and channel conditions and water quality, occurs at a “natural” rate under the No Action Alternative. It occurs under a “near natural” rate under the two Action Alternatives. A “near natural” rate does not differ from a “natural” rate of recovery in a meaningful way (USDA Forest Service, 2005). Regardless of the rate of recovery under the No Action and the Action Alternatives, some stream channels and riparian areas may take decades to reach high or potential conditions. Return to conditions present before European contact on some previously altered sites will be very slow or non-existent (Laycock, 1989, Winward, 1991, Elmore, 2004).

Consistency With Direction and Regulations

The three alternatives are consistent with the Forest Plan as amended with the National Forest Management Act, the National Environmental Policy Act, and other laws and regulations because of the terms of the permits which authorize grazing.

The four alternatives are consistent with the Clean Water Act and other applicable laws and the Forest Plan as amended because they would maintain or improve watershed conditions. The two action alternatives also provide two different strategies to maintain or improve watershed conditions.

The FEIS is consistent with the "Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters." In addition to the Protocol, the May 2002 Memorandum of Understanding Between USDA Forest Service and Oregon Department of Environmental Quality to Meet State and Federal Water Quality Rules and Regulations states "WQRP's (Water Quality Restoration Plans) should be completed where management activities have the potential to affect impaired waters 303(d) listed and a TMDL is not yet in place (p. 6). For this project the protocol and decision framework were not initiated because the project would not measurably affect the parameters (summer, spawning, and bull trout summer temperature) for which the seventeen streams are listed during the next decade and the direction of change expected is considered an improvement in condition. Therefore, a WQRP is not needed for this project. Also, the State of Oregon Department of Environmental Analysis is conducting an on-going analysis expected to result in a TMDL in 2006. The District is collaborating with the State and Tribes to implement the Protocol, as required, with the Forest Service assisting in the development of a TMDL. The TMDL for the MFJDR sub-basin is scheduled for 2007 (Oregon, 2004b). The DEIS is consistent with the direction and regulations of the Clean Water Act and 303(d) listed streams. Recognizing that the Forest would be developing a WQRP in support of the State scheduled TMDL, the components of a WQRP will be identified between publication of the DEIS and FEIS and will be incorporated into the Middle Fork Grazing FEIS in an appendix.

The proposed alternatives would have no impact on floodplains or wetlands as described in Executive Orders 11988 and 11990. Wetlands that meet the Jurisdictional Definition (Corps of Engineers) are found in the Middle Fork Grazing AMP EIS Planning Area. Many of these areas are protected.

Irreversible and Irretrievable Commitments

There are no irreversible or irretrievable effects on watershed conditions, functions, or processes under any of the alternatives.

Fisheries

Introduction

This report lists aquatic species and status of habitat in the 186,500 acre Middle Fork Allotment Management Planning Area. This report builds on conclusions from soils, vegetation and hydrology analyses and determines direct, indirect and cumulative effects on aquatic habitat and populations of aquatic animal species.

Anadromous and resident fish species are known to inhabit the Middle Fork John Day (MFJD) River subbasin including tributaries to the MFJD River for all or part of their life history. Mid Columbia summer steelhead, redband trout, bull trout, Mid Columbia spring Chinook salmon and mountain whitefish are found within this watershed. In addition, sculpins, dace, shiners, and suckers are non-game species found in most streams. Columbia spotted frog inhabit some streams and riparian areas in the Planning Area. Larger tributary streams in the subbasin are Clear Creek, Vinegar Creek, Granite Boulder Creek, Big Boulder Creek, Butte Creek, Big Creek and Camp Creek. These tributaries provide the greatest water yield and late season flows, and lowest late season water temperatures (with the exception of Camp Creek). From a fisheries perspective, all tributaries are important for steelhead since spawning and rearing occurs in small tributaries as well as the larger streams.

The major limiting factors degrading fish habitat quality and thereby fish populations in the Middle Fork Planning Area are low base flows, excessive summer water temperatures, widened channels, lack of pool habitat quality and quantity, and lack of fish habitat connectivity at all stream flows. Conditions are discussed in direct/indirect effects section where activities associated with this project would modify existing conditions or in cumulative effects if other projects will modify aquatic conditions.

Management activities that have impacted streams within the watershed include timber harvest with associated road construction, livestock grazing, as well as placer and hardrock mining. Water quality throughout the watershed is variable; individual reaches may not meet one or more of the minimum habitat objectives such as pools per mile, water temperature, large woody material (LWM) per mile, bank stability, and/or width-to-depth ratios. These habitat parameters are identified in the Malheur Forest Plan Amendment # 29 and have management objectives. The Forest Plan management objective is to manage riparian areas to meet objectives. Similarly, the matrix of habitat indicators for listed or proposed species under the Endangered Species Act (ESA), for steelhead and bull trout have many of these same objectives.

Regulatory Framework

This section describes relevant laws, management objectives, guidelines, direction, and recommendations to guide Forest Service management activities in the MF AMP Planning Area. This information comes from a variety of sources.

The Executive Order 12962 of 1995 (aquatic systems and recreational fisheries) requires federal agencies to conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. The Order requires federal agencies to evaluate the effects of federally funded actions on aquatic systems and document those effects relative to the purpose of this order.

The two principle laws relevant to fisheries management are the National Forest Management Act of 1976 (NFMA) and the Endangered Species Act of 1973 (ESA). Direction relative to fisheries is as follows:

- NFMA requires the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native wildlife species and conserve all listed threatened or endangered species populations (36CFR219.19).
- ESA requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the US Fish and Wildlife Service if a proposed activity may affect the population or habitat of a listed species.
- The MNF Forest Plan states the following as direction for management activities:

Plan and design all management activities to avoid actions which may cause a species to become threatened and endangered. Critical habitats and other habitats necessary for the conservation of these species will not be destroyed or suffer adverse modification. All actions will be coordinated with other agencies as appropriate (MNF Forest Plan p. IV-17).

Cooperate with other resources such as timber, range, recreation, minerals, etc., to identify means of facilitating the achievement of fish and wildlife management objectives. Cooperate with other agencies and groups to promote mutual objectives including funding through the Challenge Cost-share Program and program accomplishment through use of volunteer efforts (MNF Forest Plan IV-17).

All riparian areas will be managed to protect or enhance their value for water quality, fish habitat, and wildlife (MNF Forest Plan IV-19).

All new or updated allotment management plans will include a strategy for managing riparian areas for a mix of resource uses. A measurable desired future riparian condition will be established based on existing and potential vegetative conditions. When the current riparian condition is less than that desired, objectives will include a schedule for improvement. Allotment management plans will identify management actions needed to meet riparian objectives within the specific time frame. The allotment management plan will address the monitoring needed to determine if the desired rate of improvement is occurring (MNF Forest Plan IV-19).

Specify all protection or mitigation requirements (36 CFR 219.27(a)(8)) before project implementation begins. Manage all habitat for existing Federally classified threatened and endangered species to help achieve recovery objectives (MNF Forest Plan Standard 65, P. IV-33)

Perform a biological evaluation for use in planning of proposed projects when sensitive species are present or suspected. Conduct surveys in cooperation with other agencies and groups to document the locations of sensitive species populations and to provide more specific information on habitat requirements and relative management guidelines (MNF Forest Plan Standard 66, p. IV-33)

Relevant management objectives and guidelines from PACFISH (Interim strategies for managing anadromous fish-producing watersheds in Eastern Oregon and Washington, Idaho and portions of California) (USDA, 1995a) :

PACFISH GM1- Modify grazing practices (e.g. accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives (RMOs) or are likely to adversely affect native fish. Suspend grazing if adjusting practices is not effective in meeting RMOs.

PACFISH GM2- Locate new livestock handling and/or management facilities outside of Riparian Habitat Conservation Areas. For existing livestock handling facilities inside the Riparian Habitat Conservation Areas, assure that facilities do not prevent attainment of RMOs. Relocate or close facilities where these objectives cannot be met.

PACFISH GM3- Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that would not retard or prevent attainment of RMOs or adversely affect native fish.

PACFISH-Enclosure B (USDA 1995, see Appendix G) also lists recommendations for grazing based on seral stage of riparian vegetation or Proper Functioning Condition (PFC) ratings. Recommendations are as follows:

- Continue current grazing prescriptions where ecological status is "late seral" or better based on either riparian vegetation or stream bank/channel conditions or streams are rated in Proper Functioning Condition. Ensure residual herbaceous vegetation heights of at least 4-6 inches, and that no "condition thresholds" are exceeded.
- Where ecological status is "mid-seral" or streams are rated as Functioning at Risk with an Upward or Static Trend, limit grazing in pastures/allotments to provide at least 6 inches of residual herbaceous vegetation and to ensure no "condition thresholds" are exceeded. For moderate and low gradient (ie, Rosgen "B" and "C" channel types) channels, with substrates composed of medium to fine easily eroded materials, also limit use to early season grazing to provide for recovery of stream bank/channel characteristics.
- In pastures/allotments where ecological status is "early seral" or streams are rated as Functional at Risk with a Downward Trend or Non-functional, the following is strongly recommended:

In moderate and low gradient (i.e. Rosgen "B" and "C" channel types) channels with substrates composed of medium to fine easily eroded materials, consider rest.

In all moderate to high gradient stream systems (Rosgen "A" and "B" type channels) with coarse substrate materials that provide inherent stability, whose ecological status rating of early seral is tied entirely to vegetation characteristics, grazing may be permitted if limited to early season use, residual herbaceous vegetation heights of at least 6 inches are met, and no "condition thresholds" are exceeded.

The Malheur National Forest Land and Resource Management Plan (MNF Forest Plan) Amendment 29 (1994) adopted Riparian Management Objectives (RMOs) for fish habitat in response to the Columbia River Basin Policy Anadromous Fish Habitat Management Policy and Implementation Guide (1991). These RMOs amended Standard 5 in the MNF FLRMP (P. IV-63) and included habitat elements of sediment/substrate, water quality, channel morphology and riparian vegetation to be managed within their natural ranges of variability. A copy of the Decision Notice and Finding of No Significant Impact (FONSI) for Amendment 29 is available in the Project File.

Management Area 3B and Riparian Habitat Conservation Areas

Both Riparian Habitat Conservation Areas (RHCAs) and Management Area (MA) 3B were created to protect and enhance riparian areas and habitat for and fish, wildlife and water quality. RHCAs and MA3B contain riparian areas; riparian areas are generally more narrow than MA3B and RHCAs. Riparian habitats are areas of land directly affected by water that exhibit either visible vegetation (i.e. hydric species such as sedges, rushes, alder, willow) or physical characteristics reflecting an influence from the water. Generally, riparian areas vary from 3 feet to 50 feet on Planning Area streams depending on size of the stream, entrenchment of the stream and accessibility to the floodplain during high flows.

The Malheur Forest Plan describes Management Area (MA) 3B which consists of lakes, perennial streams and seasonally flowing streams; lands adjacent to lakes, perennial and seasonal streams; floodplains and wetlands; wet, moist areas such as meadows, springs, seeps, bogs, and wallows; and quaking aspen stands in watersheds that support anadromous fish (see Figure 9, Map Section). The goal of this MA is to protect or enhance riparian-dependent resources in watersheds supporting anadromous fish. MA 3B includes areas not addressed in PACFISH, for which standard RHCA buffers were not defined but which are protected under Forest Plan management objectives for MA 3B; these areas include dry aspen stands and ephemeral draws.

The PACFISH and INFISH Decision Notices amended the Malheur Forest Plan, establishing interim management objectives and guidelines for management of riparian resources. RHCAs are defined in PACFISH as portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific management objectives and guidelines. RHCAs are further differentiated by the following categories: Fish-bearing streams (Category 1), perennial streams (Category 2), and intermittent channels (Category 4). Table FI-1 below lists miles of stream channel by Category. One management objective establishes RHCAs across all management areas. RHCAs are generally wider than the riparian buffers established as MA 3A and 3B and incorporates both MA 3A/B and adjacent MAs. Riparian-dependent resources receive primary emphasis in MA 3A/B and all RHCAs. All project actions must be in compliance with PACFISH.

Table FI-1: Miles of Stream Channels by Category

Area	Category 1	Category 2	Category 4

Total Miles in MF AMP Planning Area	170	243	358

Standard Riparian Habitat Conservation Area widths are as follows:

Fish-bearing streams (Category 1): The area on either side of the stream extending from edges of active stream channel to the top of the inner gorge, or the outer edges of the 100-year floodplain, or the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet, including both sides of the stream channel), which ever is greatest.

Permanently Flowing Non-fish-bearing Streams (Perennial Streams or Category 2): The area on either side of the stream extending from edges of active stream channel to the top of the inner gorge, or the outer edges of the 100-year floodplain, or the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential trees, or 150 feet slope distance (300 feet, including both sides of the stream channel), which ever is greatest.

Ponds, lakes, reservoirs, and wetlands greater than 1 acre (Category 3): the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or to the extent of moderately and highly unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond or lake, whichever is greatest.

Intermittent Streams and Wetlands Less Than 1 Acre (Category 4): (1) The intermittent stream channel and the area to the top of the inner gorge, (2) the intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation, and (3) the area to the edge of the channel or wetland to a distance equal to the height of one-half site potential tree, or (4) 100 feet slope distance, which ever is greatest.

Existing Condition

Management Indicator Species, Threatened, Endangered and Sensitive Species

Management Indicator Species (MIS) are species of vertebrates and invertebrates whose population changes are believed to best indicate the effects of land management activities. Through the MIS concept, the total number of species found within a Planning Area is reduced to a subset of species that collectively represent habitats, species and associated management concerns. The MIS are used to assess the maintenance of populations (the ability of a population to sustain itself naturally) and biological diversity (which includes genetic diversity, species diversity, and habitat diversity), and to assess effects on species in public demand. MNF Forest Plan Standard 61 (p. IV-32) lists species and gives direction to provide for habitat requirements of MIS species; MIS species in the Planning Area are steelhead, bull trout, rainbow/redband trout.

An endangered species is an animal or plant species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range. A threatened species is an animal or plant species listed under the Endangered Species Act that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. A sensitive species is an animal or plant species identified by the Forest Service Regional Forester for which species viability is a concern either a) because of significant current or predicted downward trend in population numbers or density, or b) because of significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. MNF Forest Plan Standard 62 (p. IV-32) gives direction to meet all legal and biological requirements for the conservation of threatened, and endangered plants and animals. Assess all proposed projects that involve habitat changes or disurbance and have the potential to alter the habitat of threatened, endangered or sensitive plant and animal species. When threatened or endangered species or habitat are present, follow the required biological assessment process, according to the requirements of the Endangered Species Act (Public Law 93-205). MNF Forest Plan Standard 64 further states, "Meet all consultation requirment with the US Fish and Wildlife Service and state agencies." Steelhead trout and bull trout are endangered species which occur in the Planning Area.

Four threatened, endangered and sensitive (TES) salmonid species and one sensitive amphibian species are found in the watershed. Bull trout (*Salvelinus confluentus*) of the Columbia River Distinct Population Segment (DPS) are listed as threatened under ESA. Summer steelhead trout (*Oncorhynchus mykiss gairdneri*) of the Middle Columbia River *Evolutionary Significant Unit* (ESU) are also listed as threatened under ESA. The National Marine Fisheries Service (NMFS) designated spring Chinook salmon (*Oncorhynchus tshawytscha*) of the Middle Columbia River ESU as on the Region 6 sensitive species list; they are covered under Essential Fish Habitat (EFH) for consultation with NMFS. Redband trout (*Oncorhynchus mykiss gairdneri)* are considered the native, resident form of the rainbow trout; they are on the Region 6 sensitive species list. Columbia spotted frog (*Rana luteiventris*) is on the Region 6 Sensitive Species List.

Steelhead/Redband Trout

Steelhead trout (*Oncorhynchus mykiss gairdneri*) is the species identified as the anadromous native life form of "rainbow trout" by the Oregon Department of Fish and Wildlife (ODFW) on the Malheur National Forest. Behnke (1992) also classifies the rainbow trout species "east of the Cascades" as steelhead and redband trout. All perennial fish-bearing streams identified in the Middle Fork John Day Basin are considered to have populations of steelhead/redband trout. Redband trout is the species identified as the non-anadromous native "rainbow trout" by ODFW on the Malheur National Forest; however, Behnke (1992) also notes incidence of redband interbreeding with the anadromous form (steelhead) and occasional resident redband going through the smolting process and migrations common to the anadromous form occurring. Oregon Department of Fish and Wildlife estimates yearly returning steelhead adults to the John Day basin ranging from 10,000 to 25,000 fish.

Due to the taxonomic classification of steelhead and redband being the same, and no barriers occurring within the Middle Fork John Day basin which would prevent genetic interchange, all populations of steelhead/redband trout are assumed to be one and the same. No surveys have been conducted that specifically identify the upper limits of anadromous steelhead in any streams within the Middle Fork John Day basin.

Bull Trout

Bull trout (*Salvelinus confluentus*) are reduced in both numbers and distribution within the MFJD River subbasin as well as the Galena and Upper Middle Fork Watersheds. Currently, bull trout are found in the Big Creek drainage, in the west portion of the watershed; in Granite Boulder Creek, near the middle of the watershed; and in Clear Creek in the Upper MFJD River watershed. These summer populations constitute the Middle Fork John Day metapopulation. It is likely that some members of these populations move into the main MFJD River and possibly other tributaries when water temperatures are cooler, but currently the extent of connectivity between even these three subpopulations of the MFJD River is unknown. There have been incidental sightings of individual adult bull trout in Vinegar Creek (ODFW 2000), Butte Creek and Davis Creek (Lee 1997) which are currently listed as historic habitat. Salmonid species are the primary forage prey for adult bull trout. High summer instream temperatures in the Middle Fork John Day River are considered a thermal barrier to bull trout.

Critical habitat and potential recovery areas have not been identified for bull trout. The most likely potential recovery areas are an extension of distribution of bull trout in the Big Creek subwatershed, including Deadwood Creek; in upper Big Boulder Creek and Badger Creek in the Big Boulder subwatershed; other streams include Vinegar Creek, Davis and Butte Creek which have been identified as historical habitat and where incidental sightings have occurred. There are several other smaller tributaries that may have some potential as recovery areas. (The John Day basin bull trout technical working group—an interagency group, will be working on identifying criteria and recommendations for critical habitat and recovery areas.)

Chinook Salmon

Spring Chinook (*Oncorhynchus tshawytscha*) salmon of the Middle Columbia ESU utilize the watershed in the Middle Fork John Day subbasin for spawning and rearing. Yearly return of adults to the John Day basin range from 400 to 3,000 Chinook. Spring Chinook salmon runs are considered to be the healthiest wild runs remaining in the ESU. Chinook generally spawn in the MFJD River but have been documented in the lower reaches of larger tributaries. During the summer months, when water temperatures are high in the MFJD River, both adult and young Chinook seek cooler waters of some tributaries near their confluence with the MFJD River or cool water sinks within the main river channel. Rearing occurs for one to three years and outward migration begins with annual increased flows from snowmelt. Spring Chinook salmon in this ESU remain on the Regional Forester's sensitive species list. The Forest Service consults with NMFS on Essential Fish Habitat for Chinook salmon under the Magnuson Stevenson Act.

Columbia Spotted Frog

The spotted frog is on the Regional Forester's sensitive species list. Spotted frogs are highly aquatic and are rarely found far from permanent water. Breeding habitat is usually in shallow water in ponds or other quiet waters along streams. Breeding may also occur in flooded areas adjacent to streams and ponds. Adults may disperse overland in the spring and summer after breeding. Habitat has been degraded by past management activities, such as livestock grazing, road construction along streams, and timber harvest adjacent to streams, lakes ponds, springs, and marshes

The spotted frog is considered present in all subbasins on the Malheur National Forest. It is assumed this species is widely distributed in the Planning Area. Limited habitat surveys have been conducted specifically for spotted frogs; however, habitat probably exists along most perennial and some intermittent streams. Fish surveys records incidental sightings of frogs but most do not differentiate species. During 1996 fish surveys, spotted frogs were reported in the Davis/Placer subwatershed, along Davis and Placer Creeks. The TES Wildlife Database for the Blue Mountain Ranger District also lists the Middle Fork John Day River, Crawford Creek and Squaw Creek for sightings of spotted frog. In addition, some spotted frog surveys were conducted by Forest Service personnel in 2003 and 2004; personnel found spotted frogs near the Mouth of Camp Creek, in the Middle Fork John Day River near Camp Creek, Crawford Creek. Personnel also found eggmasses for spotted frogs in a pond near Bridge Creek and Highway 26.

Overview

The quantity and quality of aquatic habitat is directly related to stream channel morphology which is dependent on geology, soils, hydrology and vegetation (both upland and riparian). Fish habitat can be generally broken down into pools (slower water) and riffles (faster water). Stream channel habitat parameters important for fish include pool habitat quantity/quality and spacing, riffle depth and substrate composition, bank angle, bankfull and wetted width to depth ratios. Amphibian habitat is located along stream margins and includes alcoves and side channels. Connected floodplains can also provide ponded areas important for breeding.

The following paragraphs describe habitat parameters more fully and how they relate to conditions in the MF AMP area.

Stream Channel Morphology (Sensitive Stream Reaches)

The majority of streams in the Planning Area contain Sensitive Stream Reaches. These reaches are commonly in stringer meadows with wide valley bottoms, low valley and channel gradient and are composed of smaller substrate. Lengths vary from 100 yards to over a mile. Likely locations for Sensitive Stream Reaches have been designated (see Figure 10, Map Section); however, this map is a preliminary assessment. Currently, Sensitive Stream Reaches are comprised mainly of Rosgen “B”, “C” or “F” channel types, with some small sections of “G” or “E” channel types. Hardwood shrubs and/or deep-rooted hydric herbaceous vegetation (i.e. sedges and rushes) are vital for providing shade maintaining stream temperatures and to preserve bank stability as well as channel profile (width to depth ratios). Riparian vegetation also provides habitat for insects which are an important food source for fish and wildlife. Streambed and banks are made up of fine substrates (gravel and sand) and are therefore susceptible to bank damage and erosion. Pool habitat is commonly found in the meanders or bends in the streams. Analysis of a Level II stream survey conducted in Vinegar Creek in 2001 determined at least 50% of pools in low gradient sections were created by meander.

Sensitive Stream Reaches are important for fish spawning habitat as many have appropriate gravels for steelhead, redband and bull trout. Undercut banks are important hiding cover for fish, particularly spawning adult steelhead. Pool frequency and quality created by stream meander is important for summer and winter rearing habitat for fish.

Stream channels that have been heavily disturbed have a specific order of events for recovery. The riparian vegetation (with appropriate herbaceous and woody species) must be late seral to accommodate high flows without causing excessive erosion or sedimentation. Conversion of seral stage may take decades. Stream morphology can move toward natural or desired conditions only after vegetation is appropriate. Large woody debris (LWD) is necessary to control stream gradient, capture sediment and create pools. Finally, fish habitat quality and quantity can reach potential when all previously-mentioned parameters are appropriate for the site; this may also take decades to occur. See the hydrology section for further details on stream channel evolution.

Sensitive stream reaches are also important for monitoring effects of range management activities on streams. These areas are the focus of current range monitoring on the Malheur National Forest. The Interagency Implementation Team (IIT) Monitoring Guide (2003) states that these Designated Monitoring Areas (DMAs) are useful because:

- DMAs are among the most sensitive from the standpoint of fish habitat conditions
- Contain impacts that result principally from livestock grazing
- Represent areas used by livestock
- Have the potential to respond quickly to and measure changes in grazing management

Historic Conditions and Disturbance Regimes

Salmonids such as the John Day spring Chinook and summer steelhead, bull trout, and redband trout were well distributed throughout the watershed; the various age classes of these fish likely utilized a majority of the available stream habitat. Evidence suggests that bull trout were once common throughout the Middle Fork John Day subbasin (Wissmar et al. 1994). ODFW surveys show that Chinook salmon and steelhead were once present throughout all the Middle Fork John Day subbasin; Columbia River redband trout still occupy a significant portion of their historical range. However, Behnke (1992) noted that the original genetic diversity of resident and anadromous stocks of redband trout have been depressed by land and water use practices.

Instream habitat conditions have been altered by land management activities from pre-European settlement conditions. It is likely that stream channels within the watershed area were narrower and deeper during pre-settlement times (pre 1850). Deep pools were more numerous due to the quantity of LWM providing velocity breaks and scour areas. Beaver activity played a role in stream function. Beaver dams raised water tables and flooded riparian areas which provided ground water recharge areas resulting in more water being available during the low flow period of late summer. Beaver dams captured sediment and created deep pool habitat that benefited fish. Higher water tables resulted in larger (wider) riparian areas with appropriate vegetation associations present and showing plant reproduction and vigor.

Streams reaches in lower gradient, wide valley bottoms were less confined, with greater sinuosity, higher water tables and connected floodplains. Riparian hardwoods, sedges, and conifers provided bank stability and potential large woody debris (hardwoods and conifers only); undercut banks were common, providing hiding cover for both anadromous (steelhead and Chinook) and resident salmonids (redband and bull trout) that occupied the streams. Sediment transport and deposition processes were pulse events, likely related to stand replacement fires that periodically occurred in the headwaters of the streams and periodic intense storm events that occurred in localized areas. Water quality probably reflected the lack of major disturbances within the watershed; there likely was little or no sediment/turbidity problems beyond what would have occurred naturally. The narrow, shaded stream courses had cooler summer water temperatures than what is now present, and there was little non-point source pollution generated by large ungulates. Additional spawning gravel was available for both resident and anadromous salmonids; salmonid numbers were higher as there were likely greater numbers of streams that provided all the habitat needs for the various salmonid life histories.

Historically, Sensitive Stream Reaches were mainly Rosgen “C” or “E” channel types, exhibiting greater meander with extensive floodplains and vast woody and herbaceous (sedges, rushes and riparian grasses) riparian vegetation. These areas had extensive water storage capacity, holding water during peak or high flows and releasing water during base or low flows. The stream segments were originally depositional reaches where smaller sediment and bedload materials settled out during high or peak flow levels. Therefore, channel substrate was comprised of smaller diameter particles such as gravel and sand. Undercut banks were common in the small bank substrate on the outside of bends in the streams. The greater stream meander also equated to greater pool frequency and quality. Beaver heavily utilized these reaches, creating dams that raised water tables, lowered stream gradient and slowed water movement though the system.

Patterns of fire on the Malheur National Forest, prior to European Settlement, served as a major influence on vegetative patterns, which ultimately affected watershed processes. Fire suppression has caused changes in the distribution, size and frequency of fires. It has also resulted in vegetative changes throughout the Forest, which has influenced the hydrology of the watershed. Overstocked stands as a result of fire suppression have led to increased susceptibility to insect mortality and subsequently increased fuel loading in some areas. The Summit Fire of 1997 burned 27,000 acres of both managed stands in general forest and scenic designated management areas. Many of the streams within the fire had available shade and large wood consumed by the fire. Fish species were temporarily displaced by high chemical/nutrient releases and temperature fluctuation but have recolonized to original occupied reaches.

Vegetation associations along stream channels were composed of riparian shrubs, sedges, rushes and grasses were present. Alder and willow were more common, providing shade, bank stability from roots, and nutrient input into the streams as well as hiding cover for fish. Deep-rooted riparian vegetation stabilized banks; allowing undercut banks and narrower channel profiles to be common in meadow reaches of streams. Aspen were more prevalent along those portions of streams that had fairly open forest canopies. Hardwoods and herbaceous vegetation provided nutrient input to streams in the form of terrestrial insects which fall into streams and become food for fish as well as leaf detritus that aquatic insects need to survive (Meehan 1991). Cottonwood trees were likely the major overstory component along larger streams and rivers such as the Middle Fork John Day River where spring flows created gravel bars suitable for seed germination.

Previous Effects of Management Activities on Aquatic Species and Habitat

Past and present management activities affecting aquatic species and habitat include logging, roading, mining, suppressing wildfires, and domestic livestock grazing. These management activities have altered stream bank stability, riparian and upland vegetation communities, water temperatures, and ultimately, overall stream channel morphology and fish habitat. Logging, mining, and road construction may produce sediment that can cause adjustments in the channel (Rosgen, 1996). Channel width/depth ratios have increased, pool quality and quantity (habitat complexity) has decreased, and available spawning gravels have become embedded or are unavailable due to reduced stream flows. In addition, water diversions for agricultural purposes decrease streamflows and increase summer water temperatures.

Recently, increased numbers of hatchery strays from other river systems have been found downstream in the John Day River system, and pose genetic and ecological problems to the natural fish stocks. Oregon Department of Fish and Wildlife (ODFW) identify the John Day stocks as “wild run” since no hatchery fish are planted in the John Day River system.

Placer, dredge and to a lesser extent hardrock mining, has impacted streams within the watershed. Most streams show evidence of some mining activity with extensive placer operations mostly north of the MFJD River. Impacts have been increased amounts of sediment introduced into the streams from mine tailings, resulting in pool habitat filling, changes in channel morphology, and disruption of normal floodplain function. Overall degradation of affected stream channels has resulted in less salmonid rearing and spawning habitat. Current regulations limit the impacts to aquatic resources and much of the historic mining activity has stabilized even though the disturbances are still evident.

Timber harvest and associated road building have produced the most significant changes to streams within the watershed. Logging activities that removed forest biomass likely altered hydrologic processes. Research has shown that peak snowmelt flows increase when openings are created within the forest (Chamberlin et al 1991). Logging, narrow gauge railroad grades, and road building within riparian areas has introduced sediment into streams, and removed shade/canopy, resulting in decreased water quality as sediments have clouded streams and the increased sun exposure has warmed stream waters. Riparian roads and railroad grades have restricted floodplains and caused channel adjustments which affect present habitat quality and quantity. The Galena Watershed Analysis (USDA 1999) identified road densities ranging from 2.4 miles per square mile to 6.3 miles per square mile with the majority of subwatersheds having over 3 miles of road per square mile and up to 30% of roads in riparian areas. Riparian roads and railroad grades have restricted floodplains and caused channel adjustments which affect present habitat quality and quantity. Stronghold populations of salmonids are associated with higher-elevation forested lands and the proportion declines with increasing road densities (Quigley et al. 1996). The higher the road density, the lower the proportion of subwatersheds that support strong populations of key salmonids. Specifically, Quigley shows a strong correlation with road densities of 2 miles/mile2 or higher and reduction of strong populations of salmonids. Further reductions of strong salmonid populations were identified at densities of 3 and 4 miles/mile2 or greater. Surface erosion activity likely increased as a result of logging activities (mainly ground-based) that create compacted, bare soils where skid trails were located in draws; ultimately eroding downhill into adjacent streams. Railroad logging removed trees in the riparian zone that were potential large Woody Debris (LWD). Instream LWD was removed where railroad grades and roads were built in the landscape. Deficiencies in large wood are primarily the result of past logging and roads located within the floodplain which has limited the recruitment.

The majority of the Sensitive Stream Reaches have been grazed, railroad logged and/or mined. These activities directly or indirectly straightened stream channels and increased stream gradient often causing the stream to downcut (through fine stream bed and bank substrate). Downcut channels cause water tables to become lower and disconnect historic floodplains. The area able to support true riparian vegetation has been greatly reduced in this process. This also caused the smaller substrate (gravel and sand) in the channel to be transported downstream so that existing substrate (cobble) is actually larger than what was historically in a depositional reach. The loss of meander reduced pool frequency and quality.

Reduced base flows degraded summer rearing habitat quantity and quality for all fish. They also drastically reduced potential spawning habitat quantity and quality for fish that spawn in the fall (bull trout and Chinook salmon) during the low flow period. Steelhead and redband trout can be affected if flow levels drop earlier in the year drying out redds and causing direct mortality of eggs or young fish before emerging from gravels.

Grazing Effects

Grazing can affect bank stability with the removal of riparian vegetation. Livestock may cause mechanical damage of stream banks from hoof or head shear (Platts 1991). Undercut banks that reduce stream exposure to sunlight to maintain water temperatures and provide hiding cover for fish can be destroyed under the weight of cattle; this is exacerbated where deep-rooted, late seral vegetation has been replaced with more shallow-rooted, early seral species. This increase in bank instability can lead to changes in channel profile by increasing width and decreasing depth, modifying bank angle as well as increasing sediment input to the stream. Stream channel profiles (both bankfull and wetted width to depth ratios) are wider than expected in the Planning Area. Extreme cases of overgrazing may cause stream channels to downcut, lowering water tables and disconnecting floodplains.

Cattle commonly use Sensitive Stream Reaches because the low gradient and wide valley bottoms makes access easy, herbaceous vegetation is available in meadows and water is nearby. This easy accessibility as well as available food and water make these reaches highly desirable to domestic livestock. The sensitivity of these reaches increases the potential for degradation of the stream channel, modification of water tables and floodplains as well as associated riparian areas.

Cattle may impact fish directly by trampling redds where fish eggs/embryos are buried by adult fish. Redd trampling is less likely to occur with spring spawning species when stream flows are higher and palatable forage is abundant in riparian areas and uplands. Redd trampling is more likely to occur with fall spawning fish because stream flows are low, upland vegetation is less palatable and cattle tend to congregate more in riparian areas.

Livestock management practices have produced changes to some riparian areas. Monitoring of grazing historically focused on drier upland areas while data and analysis in riparian areas was limited (Platts 1991). It is unknown as to the extent that past or historic grazing activities have contributed to degradation of the watershed compared to other management activities. However, the Upper Middle Fork WA (pp. 4-16) stated that historically most areas were overgrazed, even when allowable use management objectives were set at 60%.

Concerns for the aquatic resources in the past 30 to 40 years have led to changes in the grazing strategy and produced dramatic improvements in most riparian areas throughout the subbasin. However, issues such as lowered water tables, disconnected flood plains and reduced riparian vegetation remain. Rates of recovery have depended on the current riparian vegetation condition/seral stage, stream condition, stream channel type, livestock grazing management, site potential and big game use.

Total exclosures that keep out deer, elk and domestic ungulates in Summit Creek and Camp Creek are reference areas to display site potential of similar areas. Livestock exclosures on Summit Creek and upper Camp Creek indicate a natural rate of recovery with wildlife presence. This may be somewhat misleading as wildlife can use both shrubs and herbaceous vegetation more heavily in livestock exclosures in winter range areas where little forage is left after grazing by cattle outside the exclosure. Unfortunately, many of the exclosures have little or no information on site conditions when built to compare with grazed areas.

Livestock grazing has impacted fish habitat in less obvious ways. Components of native plant associations have been reduced or eliminated, allowing for the establishment of exotic plant species or conversion to early seral stage vegetation. In some cases intentional seeding of grasses that were adapted to grazing caused degraded riparian areas; Kentucky bluegrass and redtop were highly productive and resilient species introduced to the MFJD River. These species have shallow root systems that contribute little to stream bank stability compared to native, deep-rooted aquatic vegetation. They can also form mats that crowd out other species. Native grass and sedge species such as tufted hairgrass, wooly sedge, and Nebraska sedge were reduced due to their sensitivity to grazing. Riparian hardwood browsing may reduce quantity and vigor of plants that shade streams and maintain water temperatures. Browsing of hardwood seedlings and saplings can reduce or eliminate replacement of existing hardwoods, leaving only older plants which may be susceptible to blight or disease. This can indirectly reduce instream Coarse Woody Debris (CWD) quantities over the long term. Deep-rooted vegetation is essential to maintain stream bank stability, building of stream banks and creation of undercut banks. As stated in channel morphology in the fisheries section and in the hydrology section, channel evolution must have components of late seral vegetation and LWD to create high quality fish habitat.

Summary

Historic management activities have changed stream and riparian areas leading to degraded quality and reduced quantity of fish habitat. The loss of fish habitat complexity and quality has impacted TES fish (bull trout, steelhead, redband trout and Chinook salmon) and reduced fish populations in the Planning Area and downstream in the Middle fork John Day River. These changes have also reduced habitat and likely populations of Columbia spotted frog.

Analysis Methods

The analysis area consists of 18 subwatersheds, in 4 watersheds of the Middle Fork John Day sub basin. Information was compiled from the Upper Middle Fork Watershed Analysis (USDA 1995d), The Galena WA (USDA, 1999), the Southeast Galena WA Supplement (USDA 2002), stream survey reports and data, as Proper Functioning Condition (BLM 1994) assessments and Winward (2000) greenline vegetation surveys. Region 6 Level II stream and riparian habitat surveys were conducted on most Planning Area fish-bearing streams between 1992 and 2001. This survey quantifies fish habitat within reaches that are based on gradient, valley width, or topographic features that make the stream reach somewhat homogeneous. This survey is driven by a focus on core attributes critical to fish habitat. The inventory generates quantitative estimates of habitat attributes that are statistically valid and repeatable across time and boundaries. The survey represents an integrated approach between USFS watershed and fisheries disciplines in defining aquatic resource conditions.

Level II stream survey data is displayed at the “reach” level. Reaches are commonly a mile or more in length. This means that some detail is lost at this scale. Smaller areas, such as “Sensitive Stream Reaches,” may contain Rosgen channel type, shade, stream bed and bank substrate, bank instability, slope and entrenchment that are overall very different from the average parameters of the overall survey reach.

Stream survey information is compared with management objectives and guidelines from the Malheur National Forest Land and Resource Management Plan (1990) including Amendment 29 stream habitat objectives to determine relative “health” or condition of the riparian areas, streams and the effects to fish and fish habitat. Existing stream channel conditions were compared to expected conditions to provide fish habitat based on geomorphology characteristics of hill slopes, valley bottom width/gradient, substrate parent materials and riparian vegetation communities.

The aquatic species section builds on analysis and conclusions from soils, vegetation and watershed sections of this EIS to determine direct, indirect and cumulative effects on fish habitat and populations. Direct, indirect and cumulative effects of all alternatives are disclosed for Sensitive Species (USDA 2000) and Management Indicator Species. A Biological Evaluation (Appendix F) was prepared for Aquatic Sensitive Species as directed by the Malheur National Forest Plan (USDA 1990) as amended.

Amendment 29 of the Malheur National Forest *Land and Resource Management Plan* specifies management objectives for habitat elements measured as part of Level II stream surveys. Headwater and tributaries that are not fish bearing are important for water quality to occupied downstream reaches but are not surveyed under the Level II protocol. The section below describes Planning Area hydrologic, riparian and stream habitat indicators most relevant to fish and fish habitat. Reaches that do not meet *Forest Plan* management objectives or Desired Conditions are likely affecting fish populations.

Analysis of the list of indicators associated with the “Matrix of Pathway Indicators” for National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS) is completed in the Biological Evaluation and Assessment. The Biological Evaluation is part of the NEPA process to determine effects to all fish species in the Planning Area and downstream where affected. The Biological Assessment is associated with formal consultation with the NMFS and USFWS on ESA-listed species.

Pool & Riffle Habitat

Areas of high water velocity create pool habitat during peak flows then become depositional areas during low flows (Chamberlin et al. 1991). This habitat is important for all life stages of salmonids as pools during summer when this habitat is important as a slow water sanctuary and temperatures in the deeper section of pools tend to be lower than ambient stream temperatures (Reeves et al 1991). Pools are also important for winter rearing habitat when small fish move into the interstitial spaces of gravels (Bjorn and Reiser 1991). Timber harvest, road activity, mining and grazing activities can increase the supply of fine sediments, which settle in pools, creating riffles and reducing usefulness as fish habitat. Pool frequency can be reduced by land management activities that increase sediment input, removal of deep-rooted riparian vegetation or increases bank instability. Reduction of hardwood vegetation that can form aggregates of woody debris can also reduce pool frequencies.

The *Forest Plan* management objective for pools is based on stream channel width at high flows (bankfull). The relevant ranges of pool frequencies are shown in the table below.

Bankfull Channel Width (feet)	5	10	20	25	50
Forest Plan management objective (pools/mile)	151-264	75-132	38-66	30-53	15-26

Overall, pools in Planning Area streams are reduced in quantity and quality and do not meet *Forest Plan* management objectives (Amendment 29) for pools per mile. Many streams contain pool frequencies about 10-40 % of the expected number based on stream type and size. Surveys identified few large pools (greater than 1 meter in depth). The majority of streams surveyed are small second and third order streams that do not have flows sufficient to produce and maintain numerous large pools.

Large Woody Debris (LWD)

LWD is important for creation and maintenance of fish habitat (Reeves et al. 1991). It creates velocity breaks during high flows and slow water resting areas for fish at low flows. LWD is a common pool creator. Livestock grazing in valley bottoms has reduced riparian hardwood reproduction and vigor, particularly seedlings and saplings. These trees may have eventually become aggregates of LWD. LWD is defined as wood 12 inches in diameter and 20% greater than 20 inches and at least 35 feet long or 1½ times bankfull width of the stream channel. The latter definition is appropriate for most tributaries to the Middle Fork John Day River because of small stream width. The *Forest Plan* management objective for LWD is 20-70 pieces per mile in ponderosa pine ecosystems and 80-120 pieces per mile in mixed conifer ecosystems.

Many streams failed to meet the *Forest Plan* management objective for LWD, which is commonly present at about 25-35% of the *Forest Plan* management objective.

Coarse Woody Debris (CWD) is composed of materials smaller than LWD and may come in the form of aggregates of shrubs or materials incorporated into beaver dams.

Bank Angle

Bank angle is important for fish habitat. Undercut banks (greater than 90 degree angle) provide hiding cover for juvenile and adult salmonids as well as reduce the amount of water exposed to direct sunlight. The Malheur National Forest Plan management objective for lower bank angle is 90 degree angle or greater (undercut) on 50-75% of banks. Banks with less than 90 degree angle appear "dished out" and provide less hiding cover for fish which can result in higher predation and more exposure of the stream to solar radiation which can result in higher summer water temperatures. Late seral, deep-rooted vegetation (both herbaceous and woody) is critical in the creation and maintenance of stream banks. While data is lacking for estimation of stream bank angle, professional opinion and observations show undercut banks are under-represented in tributaries to the Middle Fork John Day River, especially in Sensitive Stream Reaches.

Width to Depth Ratios

Wetted width to depth ratios above the *Forest Plan* management objective of less than 10 may be caused by sediment loads beyond the transport capacity of the channel, bank instability problems or effects of previous disturbance. Wetted width to depth ratios under 10 provide more habitat depth and accessibility to habitat. Excessive width to depth ratios reduce quality and quantity of fish habitat for summer rearing and particularly spawning habitat for fall spawning fish such as bull trout and Chinook salmon. Width to depth rations are affected by Rosgen channel type. Rosgen F and widened C/E channel types tend to have higher width to depth ratios. Stream channels with little or no defined thalwag and reduced sinuosity tend to have higher width to depth ratios. Late seral, deep-rooted riparian vegetation (both herbaceous and woody) is essential in reducing both bankfull and wetted width to depth ratios. It is estimated that between 51% and 87% of stream reaches in the Middle Fork John Day subbasin exceed the *Forest Plan* (Amendment 29) management objective for wetted width to depth ratios.

Average wetted width to average wetted depth ratio was not calculated in Level II stream surveys prior to 2001. Instead average wetted width to maximum depth ratio was calculated in earlier surveys. A correlation to both of these ratios was identified during data analysis of this project. Conversion factors were created using data from 2001 surveys (9 streams, covering 36 miles and including 32 reaches) and extrapolated across the remainder of streams (85 reaches) in the Planning Area (see specialist report for details).

Shade

Shade provided by riparian hardwoods or conifers aids in maintaining stream temperatures. In summer, riparian vegetation helps keep temperatures lower than areas with direct exposure to sunlight. Conversely, riparian vegetation tends to keep streams warmer in the winter, reducing formation of anchor ice that can cause fish mortality. Riparian hardwoods also act as hiding cover for fish, reducing mortality from terrestrial and avian predators. Riparian vegetation contributes shade, leaf detritus and terrestrial insects (food for fish) to the aquatic ecosystem (Murphy and Meehan 1991).

Fish bearing and perennial streams in and around the Planning Area were surveyed for shade in the early and mid 1990s. A preliminary analysis indicates that about 70% do not meet *Forest Plan* management objectives for shade (*Forest Plan* Amendment 29). Most of the surveyed streams that meet this management objective are in Ponderosa pine ecosystems (Dry Forest), not in mixed conifer (Moist Forest) ecosystems. Potential shade in Ponderosa pine ecosystems is believed to be greater than shown in the management objective. The riparian hardwood shrub component that would be expected under an open canopy is not incorporated into the management objective. Riparian hardwoods are believed to be reduced in abundance, vigor and diversity due to past resource utilization and changes in stream channel and valley bottom conditions (Upper Middle Fork WA). Consequently, shade in ponderosa pine ecosystems (Dry Forests), is reduced. The 2001 supplement to the 1999 *Galena Watershed Analysis* suggests that hardwood shrub ecosystems are underrepresented in the Planning Area. It is estimated that over 90% of the streams in the Planning Area do not meet *Forest Plan* management objectives for shrub ecosystems.

Temperature

Excessive water temperatures can modify fish behavior (Bjorn and Reiser 1991). Elevated temperatures at sublethal levels can reduce fitness, ability to compete with other fish, ability to avoid predation, as well as modify growth rates. Changes in aquatic insect community numbers and species can change potential food sources for fish (Swanston 1991). Excessive water temperatures can act as a thermal barrier to fish reducing access to usable habitat upstream.

Temperatures can be influenced by past land management as well as stream orientation within the watershed. Other parameters that can modify stream temperatures include shade provided by riparian hardwoods or conifers, stream channel profile (width to depth ratio), bank angle, and base flow levels.

Stream temperatures are influenced by water temperature where it emerges from groundwater, streamside shade, base flow conditions and channel dimensions. Seventeen streams (and their tributaries) in the Planning Area are listed on the Oregon Department of Environmental Quality 303 (d) list (2002) for temperature and the majority of streams in the Planning Area have elevated summer water temperatures. The Middle Fork John Day River is listed on the 303(d) list for temperature and flow modification. Summaries of stream temperature data collected show excessive stream temperatures for steelhead and bull trout in many streams.

Sediment

Cobble embeddedness is the product of in-channel fines filling in the interstitial spaces of channel substrates. This is a product of sediment levels exceeding transport capabilities of the stream. Level II stream surveys identified numerous reaches where embeddedness was in excess of the *Forest Plan* managemeent objective. Sediment has filled in pools in Planning Area streams, creating long contiguous riffles and reducing fish habitat complexity (see discussion on pools above). Sediment can also reduce quantity and quality of spawning habitat or suffocate eggs while still in redds. Sediment can fill interstitial spaces between stream substrate that juvenile salmonids use for winter rearing. Excessive sediment loads can also increase bank instability, reduce bank angle and cause stream channel widening or downcutting.

Bank Instability

The Malheur National Forest Plan management objective for bank stability is 90%. Bank instability can increase sediment levels to streams (Chamberlin et al., 1991). Unstable banks also play a role in channel dimensions often increasing width to depth ratios. See relevant sections above. This instability can also reduce undercut banks (bank angle) that fish use for hiding cover and are important for maintaining stream temperatures, degrading overall fish habitat quality.

Level II stream surveys over estimate bank stability in Sensitive Stream Reaches because information is described at the Survey Reach level which may be several miles long. Sensitive stream reaches commonly are only a portion of the survey reach and are more susceptible to bank instability because banks are composed of smaller substrate than the remainder of the stream.

Other parameters & Survey Data

Proper Functioning Condition (PFC) analyses were completed on some streams. The PFC assessment was designed to give a consistent approach for considering hydrology, vegetation, and erosion/deposition attributes and processes to assess the condition of riparian-wetland areas (Prichard, 1998). The results are listed below within Allotment Summaries. Winward vegetation condition surveys (Winward, 2000), Interagency Implementation Team (IIT) grazing monitoring results, as well as Condition & Trend surveys are included.

Existing Condition for Aquatic Species on Streams by Range Allotment and Pasture

Bear Allotment

There are approximately 3 miles of fish bearing (steelhead/redband, Chinook salmon) streams including the Middle Fork John Day River and Mosquito Creek in the Bear Allotment. Results of Level II stream surveys listing stream channel parameters and fish habitat are listed in Table FI-2.

Table FI-2. Level II Stream Survey Data for Bear Allotment

Stream - Date Surveyed & Reaches	Pools Per Mi	Length	Ave. Wetted Width To Ave. Depth Ratio*	Bankfull Width To Depth	Med Wood per Mi	Large Wood per Mi	Bank Stability	High Temp	Embedded Y Or N

Stream - Date Surveyed & Reaches	Pools Per Mi	Length	Ave. Wetted Width To Ave. Depth Ratio*	Bankfull Width To Depth	Med Wood per Mi	Large Wood per Mi	Bank Stability	High Temp	Embedded Y Or N
MOSQUITO 7/13/92 Start To: 2	78	3.7	>10♠	9.34	136	23♠	100	63	Y♠

♠Fails to Meet Forest Plan Amendment 29 management objective; *Wetted width to depth ratios listed as <10 or >10 are based on extrapolation

Some pastures within this allotment contain only upland habitat. Pastures A, B, and B-1 have riparian areas, streams or fish; The B-1 pasture has an irrigation ditch running through the pasture.

C1 Pasture & C2 Pasture

The MFJD flows through both C1 and C2 pastures while a small portion of Mosquito Creek flows through the C2 Pasture. The reduced level of fish habitat complexity and quality as well as the fact that Mosquito Creek is no longer connected channel to the MFJD has resulted in reduced productivity and thereby populations of TES fish in this pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “suspected” in these pastures.

Middle Fork John Day River

The Middle Fork of the John Day River, a 303(d) listed stream for temperature, flows through the C-1 and C-2 pastures and is considered to be steelhead spawning and rearing habitat, Chinook spawning and rearing habitat and bull trout migratory habitat. A spawning survey conducted in May 2002 noted that the majority of substrate was too large for steelhead spawning; however, some small inclusions of potential spawning habitat were available. The Middle Fork John Day River is mainly winter rearing habitat for steelhead as most steelhead utilize smaller tributaries for spawning activities and summer water temperatures are excessive for steelhead in the Middle Fork John Day River. Chinook salmon spawn in this section of the Middle Fork John Day River.

Stream surveys were completed on Middle Fork of the John Day River by the Oregon Department of Fish and Wildlife. Reach 3 of the survey encompasses the portion of the Middle Fork of the John Day River that is in pastures C1 and C2 of the Bear allotment. This reach extends from the confluence with Armstrong Creek upstream for approximately 1.4 miles. This section of the Middle Fork is a Rosgen “C3” channel type. Riparian vegetation is composed of grasses and deciduous trees averaging 1 to 6 inch Diameter at Breast Height (DBH). Dominant habitat is pools (55%). There are a high percentage of actively eroding stream banks (40%) Average stream gradient is 0.4%. Artificially placed rock sills and log weirs create the majority of pool habitat.

Both pastures contain sensitive stream reaches for their entire length along the Middle Fork John Day River. In 1999, it was determined that shrubs, a key component on these pastures, along the banks of the Middle Fork John Day River on Pastures C1 and C2 were being impacted by late season grazing. This is a concern for shade, streambank stability as well as hiding cover and insect prey potential for fish. The grazing season was moved earlier in the year in an attempt to reduce pressure along the riparian area. Herbaceous and shrub conditions have improved; however, riparian shrub use is still a concern.

Mosquito Creek

Mosquito Creek flows through the C2 pasture. Historically, there was likely access to fish from the Middle Fork John Day River. Currently, the stream is intercepted by an irrigation ditch in this pasture about 600 feet before entering the Middle Fork of the John Day River. The irrigation ditch has been breached and the creek is flowing into a flat meadow area creating a marshy area of several acres with no defined channel that drains into the Middle Fork of the John Day River. Salmonids, unknown as to whether of steelhead or redband trout descent, do occur in the lower 2 miles of the stream. The stream provides spawning and rearing habitat for redband trout; however, little substrate appropriate for steelhead spawning was identified during Level II stream surveys. The stream may have historically provided summer rearing habitat and some spawning habitat for steelhead. Information from Level II Stream surveys on Mosquito Creek is listed in Pasture E.

D Pasture

Mosquito Creek runs through pasture D for about 30 feet all of which is part of a livestock water gap. The water gap is used quite heavily. The remainder of the pasture is upland habitat. The short length of Mosquito Creek in this pasture makes it irrelevant for fish, fish habitat or Columbia spotted frog.

E-F (Hill) Pasture

The reduced level of fish habitat complexity and quality as well as the fact that Mosquito Creek is no longer connected channel to the MFJD has resulted in reduced productivity and thereby populations of TES fish in this pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Mosquito Creek

Currently this stream provides spawning and rearing habitat for redband trout. The Level II stream survey described the dominant riparian vegetation is comprised of grass-forbs, dogwood, and grand fir with some ponderosa pine in the upland areas. The riparian cover vegetation consists of 99% grass-forb, 80% shrub, and 17% tree crown. The gradient of Mosquito creek is about 6% and bankfull width-depth ratio is 9.52. Banks are sand and gravel and are 95% stable. The substrate is sand/silt dominant with cobble subdominant. Cobble embeddedness is 35%. The stream contains 36% pools, 61% riffles. Instream cover was 6-20%. Mosquito Creek is listed as a 303(d) stream for temperature but does meet *Forest Plan* management objective for shade. This stream does not meet *Forest Plan* management objectives for wetted width to depth ratio, LWD frequency, and cobble embeddedness. There are two road crossings on Mosquito creek. Forest Road 2000893 influences Mosquito Creek. This valley bottom road limits the recruitment of large wood, restricts the floodplain and is a source for fine sediment. No sensitive stream reaches have been identified in Mosquito Creek.

Armstrong Creek

Armstrong Creek is an interrupted intermittent stream in pasture G that flows through private ground and into the Middle Fork of the John Day River. Armstrong Creek is not occupied by steelhead or bull trout and so no level II surveys have been completed on this stream. No information is available on the portion of Armstrong Creek in this pasture.

Pasture G (Gibbs)

Armstrong Creek is an interrupted intermittent stream (portions have defined channel then no channel) in pasture G that flows through private ground and into the Middle Fork of the John Day River. Armstrong Creek is not occupied by steelhead or bull trout and so no level II surveys have been completed on this stream. A Sensitive Stream Reach was identified for Armstrong Creek on Forest Service land in a low gradient valley with no conifer canopy. This reach contains some Nebraska sedge and Baltic rush in and alongside the channel but herbaceous vegetation is mainly composed of the same non-hydric species present in the surrounding uplands. This vegetation is likely due to the small amount of water and short duration of flows. The shrub component, where present, is comprised of small thickets of hawthorn.

Pasture H (Horse)

This is an upland pasture containing no streams or fish.

Camp Creek Allotment

There are less than 2 miles of Camp Creek, a 303(d) listed stream (for elevated summer temperature), that contain steelhead/redband trout within the allotment. A major storm event occurred in January of 1997 that downcut the lower mile of Camp Creek (a Sensitive Stream Reach) to where it flows into the Middle Fork John Day River, vastly changing habitat parameters from those measured in 1994. A stream survey was contracted in 2004 but analysis and reports are not yet complete. Riparian vegetation is limited on the lower segment because of the entrenched channel, narrowed floodplain and lowered water table. Summer water temperatures regularly exceed 75 degrees on Camp Creek. Pool habitat is limited from past management activities and the 1997 storm event. Large pools should be present in this portion of Camp Creek due to stream flows and large drainage area of the watershed.

Fish habitat in Camp Creek is limited mainly to migratory habitat for adult steelhead using tributaries or the headwaters of Camp Creek to spawn. Excessive embeddedness and the lack of pools limit winter rearing habitat for juvenile salmonids and high summer water temperatures reduce habitat available for summer rearing of salmonids.

Chinook salmon use the Middle Fork John Day River for spawning and rearing habitat. Steelhead use this river mainly for winter rearing habitat but some potential spawning habitat exists. Steelhead mainly use tributaries to the Middle Fork John Day River for spawning. Bull trout (fluvial life history) use the Middle Fork John Day River for migratory habitat. Fish habitat parameters measured during Level II stream surveys are listed in Table FI-3.

Table FI-3. Level II stream survey data for streams in Camp Creek Allotment

Stream - Date Surveyed & Reaches	Pools per Mi	Length (miles)	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/ Mi	Large WD/Mi	Pct. Bank Stability	High Temp	High Temp Time	Embedded Y or N
CAMP 6/29/94 Start to: 2	26♠	0.6	>10♠	36.67	13.2	1.5♠	93	68	1100	Y♠
CAMP 6/29/94 Reach 3 to 4	23♠	1.8	>10♠	21.2	8.2	5.5♠	99	77♠	1600	N

♠ parameter does not meet *Forest Plan* Management objective;*extrapolation of wetted width to depth ratio—2004 survey analysis pending

Lower Camp Pasture

Lower Camp Creek does not meet *Forest Plan* management objectives for stream channel parameters listed in table FI-3. The Middle Fork John Day River is described below with actively eroding banks. This reduced level of habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in this allotment. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have negatively impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Middle Fork John Day River

The Middle Fork of the John Day River runs through both the Middle pasture and the Lower Camp Creek pasture. The Middle Fork functions as winter rearing habitat for steelhead and redband trout, rearing and spawning habitat for Chinook salmon and migratory habitat for bull trout. The Middle Fork John Day River is a Sensitive Stream Reach in these pastures. This stream is on the State of Oregon 303(d) list for elevated summer temperature.

In 1992 the Oregon Department of Fish and Wildlife conducted a stream survey for the Lower Middle Fork of the John Day River. In their description, reach 5 includes the parts of this river that are located in the Middle pasture and the Lower Camp Creek Pasture of the Camp Creek Allotment. This reach begins at Jungle Creek and extends for 2.9 miles upstream. The stream is unconstrained with multiple channels, and the broad valley contains multiple terraces. Riparian vegetation is composed of grasses and deciduous trees averaging 12 to 20 inch DBH. Dominant habitat is riffles (72%) and dominant substrate is gravel (51%). There is a high percentage of actively eroding stream banks (69%). Average gradient is 0.5%. Most of the pools were created artificially using rock sills and log weirs.

Field surveys conducted in January 2005 showed a lack of mature shrubs and little new recruitment of shrubs. Riparian herbaceous vegetation appeared to be in late seral condition and included wooly sedge, Nebraska sedge, Baltic rush as well as redtop and Kentucky bluegrass in some locations.

Camp Creek

Camp Creek runs through the Upper Camp Pasture, the Lower Camp Creek Pasture, the Campground Pasture and is adjacent to the Road Pasture. Camp Creek functions as winter rearing habitat for juvenile steelhead and redband trout and as migratory habitat for adult steelhead trout that use the headwaters and tributaries for spawning habitat. The portions of Camp Creek in this allotment are Sensitive Stream Reaches.

The portion of Camp Creek located in the Lower Camp Creek pasture and the Campground pasture is described by a Level II stream survey completed in 1994. Reach 1 of Camp Creek is a moderate sized stream. The stream flows through a moderate to steep greater than 600 feet, flat floored valley. The floodplain supports a mixed conifer forest ecosystem. The floodplain cover was 2% tree crown cover, 36.3% shrubs and 91% grass-forb ground cover. Stream shade averaged 3.8%. The dominant and subdominant substrate materials were cobble and gravel. The stream averaged 18.8 feet wide (wetted width) and had a volume of flow of 4.4cfs on June 29, 1994. Fish cover averaged 6 to 20% and large woody materials were not abundant. Water temperatures ranged from 62.6 degrees F. to 68 degrees F. There was a runoff event on January 1, 1997 that caused 2-3 feet degradation of Camp Creek channel. Fish habitat and riparian shrub cover was greatly reduced in the lower reach of Camp Creek.

The major fish habitat problems appear to be high maximum temperatures and excessive fines. This stream does not meet *Forest Plan* management objectives for pool frequency, LWD frequency, wetted width to depth ratio, cobble embeddedness and excessive summer temperatures. Log weirs were installed in 1982 in this reach to increase pool habitat, however these structures may be maintaining a wide, shallow channel. Redband/steelhead trout, speckled dace and sculpin were identified. There is a water gap about 25 feet long located above the bridge and below O'Rourke's private land. This water gap serves the Road pasture and is the only portion of Camp creek in the Road pasture. The Road pasture and the Lower Camp Creek pasture have irrigation ditches.

End of year range monitoring in the riparian zone of the Lower Camp Pasture showed shrub utilization did not meet management objectives 2 out of 3 times they were grazed (from 1999-2001). However, a field review conducted in summer 2004 showed numerous young willows (1-3 feet tall) showing uninterrupted growth form in and along the stream channel.

Middle Pasture

This pasture contains the Middle Fork John Day River (described in the Lower Camp Pasture) and small segments (less than 50 feet) of Gibbs Creek and Jungle Creek (both described in the Gibbs Pasture).

Middle Fork John Day River is described in the Lower Camp Pasture section. The reduced level of habitat complexity and quality as well as reduced shrub community has resulted in reduced productivity and thereby populations of TES fish in this pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have negatively impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Road Pasture

This pasture contains a water gap for approximately 25 feet on Camp Creek. The water gap is used quite heavily. This is the only stream in the pasture. The remainder of the pasture is upland habitat. The short length of Camp Creek in this pasture makes it irrelevant for TES fish, fish habitat or Columbia spotted frog.

North Pasture

The North pasture contains Cress Creek, an intermittent stream. There are no stream survey data for this stream because there are no fish in this stream. A field review conducted in January 2005 identified a static riparian condition with early seral riparian herbaceous vegetation; this was likely due a strong shrub component and conifer overstory as well as the limited amount and duration of flows. The stream turns into an ephemeral draw about ¾ mile up from the confluence with the Middle Fork John Day River.

Cress Creek is too small and due to its intermittent nature provides no appreciable water for TES fish in the Middle Fork John Day River. It is unknown if past management activities have impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Gibbs Meadow Pasture

The Gibbs Pasture does not contain any fish-bearing streams. The pasture does contain riparian habitat upslope of the Middle Fork of the John Day River, Gibbs Creek and Jungle Creek. There are no stream survey data for streams in this pasture. There is a nonfunctional water diversion in this pasture.

These small streams go dry in the pasture and do not provide appreciable amounts of water to the John Day River during low flows. TES fish in the Middle Fork John Day River are not affected by streams in this pasture. It is likely that habitat for Columbia spotted frog which are "suspected" in this pasture has been reduced because the pasture has not been irrigated for over 5 years and is converting to dry site species.

Gibbs Creek

Gibbs Creek is an interrupted intermittent stream that flows into the Middle Fork John Day River. The stream channel is present on most of the pasture but some areas were found with no defined channel or evidence of water. No Level II streams surveys have been conducted on this stream because it is not fish-bearing. A field review conducted in January 2005 identified mainly upland species near this stream with some sections with seeps containing Nebraska sedge. Hawthorn was present the only shrub species found. Vegetation is composed mainly of upland species likely due to the small amount of water and duration of flows.

Jungle Creek

Jungle Creek is an interrupted intermittent stream that flows into the Middle Fork John Day River. No Level II streams surveys have been conducted on this stream because it is not fish-bearing. Vegetation is composed mainly of upland species likely due to the small amount of water and duration of flows.

Upper Camp Pasture

This pasture contains no fish-bearing streams; there is an intermittent channel but no surveys have been conducted.

Campground Pasture

The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in this pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Camp Creek

This pasture contains a short segment (less than ¼ mile) of Camp Creek. Level II streams surveys from 1992 (see Table FI-3) identified that Camp Creek failed *Forest Plan* management objectives for pools, wetted width to depth ratios, LWD frequencies and temperatures. A field visit in January 2005 identified riparian herbaceous vegetation as mainly late seral with wooly sedge and Nebraska sedge present and numerous species and age classes of riparian shrubs present; however, the uppermost portion of Camp Creek in the pasture (approximately 100 yards) was composed mainly of bluegrass and redtop with cobble abundant.

Lower Middle Fork Allotment

There are approximately 89 miles of fish bearing streams (steelhead/redband trout, bull trout and Chinook salmon) in the Lower Middle Fork Allotment. Big Creek, Deadwood Creek, Coyote Creek, Big Boulder Creek and Granite Boulder Creek are 303(d) listed for excessive temperature. These same streams contain Sensitive Stream Reaches. Level II stream surveys have been conducted on many streams in the allotment. Results of these stream surveys are listed in Table FI-4 and identify where *Forest Plan* 29 management objectives were not met.

Valley bottom roads influence many of the streams from the confluence with the Middle Fork upstream. These roads limit the recruitment of large wood, restrict the floodplain and are a source for fine sediment. A 50,000 acre high intensity wildfire (Summit) burned portions of most subwatersheds of the allotment in 1996. Riparian vegetation was completely removed in many areas. High sediment (embeddedness), low quantities of Large Woody Debris and low pool frequency reduce fish habitat complexity and quality in nearly every stream in the allotment. About 2/3 of the allotment was affected. As a result, the Malheur Forest decided not to graze the burned portion through 2002.

Table FI-4. Level II stream survey data for streams in Lower Middle Fork Allotment

Stream - Date Surveyed & Reaches	Pools per Mi	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/ Mi	Large WD/Mi	Pct. Bank Stability	High Temp	Embedded Y or N
BADGER 7/29/92 Start To: 4	77♠	5.4	>10♠	11.29	71	128	94	14.0	71.2♠
BALANCE 7/3/93 Start To: 1	40♠	1.7	>10♠	14.86	15	19♠	89	52.0	100♠
BIG 2001 Start To 10	30♠	10.6	14.7♠	18.9	39	17♠	99	62.4	DATA GAP
BIG BOULDER 7/13/92 Start To: 5	36♠	7.4	>10♠	12.48	44	28♠	94	15.0	77.4♠
BADGER CREEK 2001 Reach 1-2	11♠	2.5	11.2♠	14.4	35	32♠	56♠	72.0	DATA GAP
WRAY CREEK 2001 Reach 1-2	14♠	2.6	10♠	12.7	49	36♠	87♠	66	DATA GAP
COYOTE 8/6/92 Start To: 3	69♠	3.5	>10♠	9.08	195	18♠	100	22.0	39.1♠
DEADWOOD 8/1/93 Start To: 2	27♠	3.0	>10♠	8.53	37	11♠	84♠	59.0	Y♠
DEEP 92 7/6/92 Start To: 2	61	3.5	>10♠	6.18	149	22♠	100	59.0	Y♠
DUNSTON 7/3/93 Start To: 2	28♠	1.5	<10	5.97	16	18♠	95	58.0	Y♠
E F BIG 8/12/93 Start To: 1	11♠	2.6	<10	7.21	30	5♠	95	63.0	Y♠
ELK 7/22/92 Start To: 3	107	3.0	>10♠	6.97	172	2♠	DATA GAP	55.0	Y♠
GRANITE BOULDER 2001 Reaches 2-4	14♠	4.64	16.2♠	15.8	19	21♠	99	64.0	1993 Y♠
LITTLE BOULDER 7/1/93 Start To: 2	23♠	5.8	>10♠	10.06	35	16♠	89♠	53.0	Y♠
MOSQUITO 7/13/92 Start To: 2	78♠	3.7	>10♠	9.34	136	23♠	100	61.0	Y♠
MYRTLE 2001 Start To: 3	20♠	4.2	11♠	12.5	31	11♠	97	69.8	DATA GAP
N F ELK 8/4/92 Start To: 2	95♠	3.8	>10♠	8.39	249	27♠		61.0	Y♠
SUNSHINE 7/2/93 Start To: 2	50♠	2.9	<10♠	5.30	23♠	25♠	87♠	51.0	Y♠

♠ parameter does not meet *Forest Plan* 29 Management objectives;*Wetted width to depth ratios listed as <10 or >10 are based on extrapolation

Balance Pasture

Malheur National Forest data indicates that Balance Creek, the only stream in this pasture, contains steelhead/redband trout. All or portions of the stream failed to meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, cobble embeddedness, bank stability and LWD frequency.

The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Balance Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Sunshine Pasture

Sunshine Creek runs through the Balance Lake pasture and contains steelhead redband trout. No steelhead/redband trout were found in Dunston Creek on Malheur National Forest land.

The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in Sunshine pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Sunshine Creek:

Sunshine Creek below the 2045 road is considered to be spawning and rearing habitat for redband/steelhead trout. This area is also considered to be a sensitive stream reach. A level II stream survey was completed in July 1993. The stream survey report stated that the shrubs were heavily grazed, although it was unclear as to whether this was due to cattle or wildlife. The report also stated, "A rest from livestock grazing is necessary to allow riparian shrubs to recover and streambanks to heal." All or portions of the stream failed to meet Forest Plan management objectives for pool frequency, LWD frequency, wetted width to depth ratio, cobble embeddedness, shade and bank stability. Dominant stream bed substrate is cobble and gravel. Stream discharge was measured as 0.62 cfs. Dominant stream bank substrate is sand. All 32 riffles sampled had cobble embeddedness greater than 30%. Perhaps sand from unstable stream banks is the source of the embeddedness.

Dunston Creek

Steelhead/redband trout were observed only on private land, downstream of the allotment in Dunston Creek. The lower ½ mile to the confluence with the Middle Fork John Day River upstream of private land was determined to be a sensitive stream reach. A level II stream survey was completed in July 1993. The survey stated that the stream failed *Forest Plan* management objectives for cobble embeddedness, shade, bank stability and woody debris. The survey also noted, "A rest from livestock grazing may be necessary to increase shade." Stream discharge was measured as 0.45 cfs. Stream Gradient averaged 11%. Dominant/subdominant substrate was gravel/sand. Stream shade was 36%

Granite Boulder Pasture

Granite Boulder Creek, Beaver Creek, Dry Creek, Big Boulder Creek and its tributaries (Wray Creek, Badger Creek, and Myrtle Creek), and other streams run through the Granite Boulder pasture.

Data from 1993 Level II stream survey indicated embeddedness was high in most reaches of streams in this pasture. Embeddedness was high even in upper reaches, which are in a Scenic Area with limited disturbance. The embeddedness may be a natural consequence of granitic soils, although management activities, especially mining and roading, may have contributed fine sediment.

Streams in the Granite Boulder Pasture do not meet state temperature standards or *Forest Plan* management objectives for stream channel parameters listed in table FI-4. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Granite Boulder Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “suspected” in this pasture.

Granite Boulder Creek:

Granite Boulder Creek is a 303(d) listed stream for excessive temperature. The lower four miles of Granite Boulder Creek, below a waterfall, contain bull trout and steelhead/redband spawning and rearing habitat. The segment below section 28 contain Chinook salmon spawning and rearing habitat.

Granite Boulder Creek, failed *Forest Plan* management objectives for cobble embeddedness and shade in the 1993 survey. Cobble embeddedness exceeded 30% in riffles but is likely due to decomposed granitics from the geology of the watershed. Reaches surveyed in 2001 failed Forest Plan management objectives for pool frequency, wetted width to depth ratio and LWD frequency. The dominant streambed substrate is gravel or cobble in Granite Boulder Creek. Dominant stream bank substrate is sand, bedrock, and small boulders. Stream shade averaged between 34 and 40%. Shade was reduced in some places by road 4559 being adjacent to the stream, along with a high percentage of overstory conifers that were dead or dying due to insect infestations. Shrub cover was 47 to 61% on the lower reaches. Overstory conifers limit shrub growth.

Granite Boulder Creek contains a Sensitive Stream Reach from the Forest Service Boundary going upstream; the most sensitive portion is that area below the crossing with road 4559 where it moves to the west of the stream. Granite Boulder Creek and the associated riparian areas are in an improving trend based on stream survey information and field visits analyzing shrub and channel conditions in 2000-2004.

Beaver Creek:

Beaver Creek is considered to be redband/steelhead spawning and rearing habitat below section 17. It is considered to be Chinook salmon rearing habitat below the 4550 road.

Dominant streambed substrate is cobble on all reaches. Dominant stream bank substrate is gravel on the three lowest reaches and sand on the highest reach. The reach below the 4550 road was not embedded; all other reaches were embedded. Bank stability was 99% - 100%.

The Summit fire reduced stream shade and shrubs on the reaches of Beaver Creek above the 4550 road. Before the fire, shade ranged from 49 to 73%. Shrub cover ranged from 54 to 65 % on fish bearing reaches.

Dry Creek:

The lower half-mile of Dry Creek is considered to be redband/steelhead spawning and rearing habitat. It has not been surveyed, so no information on habitat conditions is available.

Big Boulder Creek:

Big Boulder Creek contains spawning and rearing habitat for redband/steelhead trout. Big Boulder Creek below the Myrtle Creek confluence is considered to be spawning and rearing habitat for Chinook salmon.

Dominant streambed substrate is cobble and bedrock in Big Boulder and Badger, gravel or sand in Wray, and sand in Myrtle. Dominant stream bank substrate is cobble or bedrock in Big Boulder, gravel in Wray, and sand in Badger and Myrtle. 1993 Surveys showed all reaches are >35% embedded. Stream bank stability varied from 91% to 99%.

The Summit fire radically reduced stream shade and shrubs on most parts of the Big Boulder watershed. But before the fire, stream shade on the lower reach of Big Boulder was 45%; this is probably because much of this reach is in stringer meadows on private land. Shade on other fish bearing stream reaches varied from 61 to 74%. Shrub cover varied from 23% to 76%. The reasons for this variation are unknown.

PFC analyses were completed in 1999 on Big Boulder Creek to determine riparian conditions in the area of the Summit fire. The summary determination was Functional at Risk with an upward trend. Limiting factors listed were the lack of a diverse age-class distribution of vegetation and lack of adequate vegetative cover to protect stream banks as well as weeds in the riparian zone.

Wray Creek

Wray Creek contains spawning and rearing habitat for redband/steelhead trout. Wray Creek does not meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio and bank stability.

Badger Creek

Badger Creek contains spawning and rearing habitat for redband/steelhead trout. Badger Creek does not meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio and bank stability.

PFC analyses were completed in 1999 on Badger Creek, with a summary determination of

Nonfunctional (with an upward trend) due to a debris torrent from a recent 100+ year event.

Myrtle Creek

Myrtle Creek contains spawning and rearing habitat for redband/steelhead trout. Myrtle Creek does not meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio and LWD frequencies.

Susanville Pasture

Big Creek (and tributaries including Deadwood Creek), Coyote Creek, Elk Creek, and Deep Creek run through the Susanville pasture.

Embeddedness is high in most reaches of most streams. Embeddedness was high even in upper reaches of Big Creek, which, are in a Scenic Area and a Wildlife Emphasis Management Area, which have little disturbance. The embeddedness may be a natural consequence of granitic soils, although management activities, especially mining and roads, may have contributed sand.

Sensitive Stream Reaches were designated on Big Creek (Pizer Pasture), Deadwood Creek (Pizer Pasture), Onion Gulch (Susanville Pasture) and Rock Creek (Susanville Pasture). However, field verification showed large channel substrate (cobble) on Big Creek limiting sensitivity to disturbance by domestic livestock.

Streams in the Susanville Pasture do not meet state temperature standards or *Forest Plan* management objectives for stream channel parameters listed in Table FI-4. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Susanville Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “suspected” in this pasture.

Big Creek

Big Creek is considered to be bull trout, redband, and steelhead spawning and rearing habitat. The lower mile of Big Creek, not on National Forest System land, is considered Chinook salmon spawning and rearing habitat. Bull trout spawn and rear throughout the Big Creek drainage within the Susanville Pasture. A biological survey for fish conducted in 2001 found the lowermost presence of bull trout approximately ¼ mile downstream of Deadwood Creek. There is the potential that bull trout summer rearing habitat may be limited due to excessive water temperature from Deadwood Creek.

Big Creek failed *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, and LWD frequency. The Summit fire reduced stream shade and shrubs on the upper reaches of Big Creek. But even before the fire, shade varied from 21% to 43% on the National Forests. The low amount of shade was due in part to (1) a relatively wide stream (17-25 feet bankfull, except the upper two reaches); (2) low tree productivity on the lower two reaches on the National Forest and the uppermost reach; (3) mine tailings in Reynolds Meadow; (4) riparian logging; (5) meadows and wetlands with little tree cover; (6) about 30% of the trees were dead or dying; and closeness of road 2090 to the creek. Shrub cover ranged from 40% to 60%.

Deadwood Creek

Portions of Deadwood Creek are considered to be potential spawning and rearing habitat for bull trout and steelhead/redband trout although no bull trout were identified during the 1993 stream survey. Most steelhead spawning and rearing probably occurs in the lowest, low gradient reaches. In Deadwood Creek and Swamp Gulch, steelhead may also rear above the 4560 road, but falls, chutes, and low flows probably prevent most steelhead from spawning above the road.

Dominant streambed substrate in Deadwood Creek is gravel, while sand is the dominant substrate in Swamp and Onion Gulches. The dominant stream bank substrate is sand. Deadwood Creek is not considered to be steelhead habitat. Above the 4560 road, dominant stream bed substrate ranges from sand to small boulders. The dominant stream bank substrate is gravel and sand. Cobble embeddedness, much of which was decomposed granites, was greater than 30% on all riffles observed. Stream bank stability ranged from 83% to 98%.

The 1993 stream survey measured flow at the mouth of Deadwood Creek as 5.5 cfs, nearly 1/3 of Big Creek total flow. The survey also reported that Deadwood Creek failed *Forest Plan* management objectives for shade, streambank stability, cobble emeddedness, wetted width to depth ratios, LWD frequency, pool frequency and temperature. The temperature of Deadwood creek would have direct impacts on Big Creek which is 303(d) listed for temperature. The survey report went on to state, “stream temperatures could be decreased with riparian plantings (protection from wildlife and livestock may be necessary in reach 1).” The Summit fire further reduced stream shade and shrub cover above the 4560 road. Stream surface shade ranged from 15% to 41% below the 4560 road, partly due to (1) meadow vegetation with scattered trees; (2) historic browsing of alder by wildlife and livestock; and (3) aggradation. Above the road shade ranged from 38% to 71%, partly due to tree mortality. Shrub cover ranged from 25 to 28% below the 4560 road. Above the road, shrub cover ranged from 26 to 44%. A biological survey of fish conducted in 2001 identified the lowermost distribution of bull trout in Big Creek to be ¼ mile below the confluence with Deadwood Creek. The temperatures of Deadwood Creek may be limiting potential rearing habitat for bull trout in Big Creek.

Swamp Gulch

A stream survey was completed in August 1993 and found steelhead or redband trout in the lower 0.3 miles below a series of barriers caused by high stream gradient. The stream failed *Forest Plan* management objectives for shade, streambank stability, stream temperature, LWD, and cobble embeddedness and pool frequency. The streamflow of this 6 foot wide stream (baseflow) was 1.8 cfs, or approximately 1/3 of the flow of Deadwood Creek which then flows into Big Creek. Big Creek is 303(d) listed for temperature and contains bull trout that require cold water temperatures. Survey information identified that shrub cover was particularly low in the lower 0.7 miles of stream in a 600+ foot wide valley bottom (sensitive stream reach) and recommended riparian planting and protection to improve conditions.

Onion Gulch

A stream survey was completed in August 1993 and found steelhead or redband trout in the lower 0.3 miles below a series of barrier falls caused by high stream gradient (21%). The stream failed *Forest Plan* management objectives for shade, streambank stability, stream temperature, LWD frequency, and cobble embeddedness and pool frequency. The streamflow of this 3 foot wide stream (baseflow) was 0.12 cfs. This stream contributes a small percentage of water to Deadwood and then Big Creek which contain bull trout that require cold water temperatures. Survey information identified that shrub cover was particularly low in the lower 0.3 miles of stream in a 100 foot wide valley bottom and recommended riparian planting and protection to improve conditions.

Deep Creek

Deep Creek through section 31 is considered to be spawning and rearing habitat for redband/steelhead. But the presence of fish migration barriers in all reaches indicates these may be mostly redband trout.

The dominant streambed substrate was sand. The dominant stream bank substrate is sand. The substrate is more than 35% embedded. Bank stability on the fish-bearing reaches is 100%. The Summit fire did not directly affect the fish-bearing reaches of Deep Creek, though shade and shrubs on the upper reaches were greatly decreased. Shade was 67% and 69% on the two fish-bearing reaches. Shrub cover was 68 and 82%.

PFC analysis was completed in 1999 on Deep Creek. The summary determination was Functional at Risk with an upward trend. Limiting factors listed were modified floodplain and the lack of a diverse age-class distribution of riparian vegetation.

Elk Creek

Elk Creek (below road 4560) and North Fork Elk Creek (slightly above road 4560) are considered to be spawning and rearing habitat for redband/steelhead. This creek has been affected by mining, including mining on private land around Susanville. The dominate streambed substrate is cobble and sand. The dominant stream bank substrate is sand for all reaches. Cobble embeddedness was greater than 35% on all stream reaches. Bank stability varied from 99 to 100%.

The Summit fire radically reduced shade and shrubs on the upper reaches of these streams. But before the fire, shade varied from 53% on the lower reach of Elk Creek to about 67% on the other four fish bearing reaches. Shrubs varied from 52% on the lower reach of Elk Creek to about 69% on other fish bearing reaches.

PFC analyses were completed in 1999 on North Fork Elk Creek to determine riparian conditions in the area of the Summit fire. The summary determination was Functional at Risk with an upward trend. Transport of fines and lack of riparian shrubs were listed as limiting factors.

Coyote Creek

During the stream survey in 1992, the only fish seen in Coyote Creek were below county road

20, on private land, and the surveyors thought the stream above the road was too small and shallow to provide usable fish habitat, especially deep pool winter habitat. But the Malheur National Forest 1985 fish distribution map shows fish up to near Crockett Knob, probably based on ODFW information. Also, fish passage at county road 20 has been improved since 1992, so there may be habitat for redband/steelhead in Coyote Creek.

The following description of habitat conditions is for the potential fish-bearing reach on the National Forest. Dominant streambed substrate is sand. Dominant stream bank substrate is sand. The substrate is >35% embedded. Bank stability is 100%.

The Summit fire reduced the shade and shrubs on Coyote Creek. Shade was 64% and shrub cover was 41% before the fire.

Pizer Pasture

Big Creek, Pizer Creek, Lost Creek, East Fork Big Creek and Deadwood Creek flow through the Pizer Pasture. All 5 streams contain steelhead/redband trout while Big Creek also contains bull trout.

Streams in the Pizer Pasture do not meet state temperature standards or *Forest Plan* management objectives for stream channel parameters listed in Table FI-4. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Pizer Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “suspected” in this pasture.

Big Creek

Big Creek failed *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, and LWD frequency. This stream is described further in the Susanville Pasture.

Pizer Creek

Pizer creek failed to meet *Forest Plan* management objectives for cobble embeddedness, LWD frequencies, pool frequencies, and wetted width to depth ratios. A portion of Pizer Creek contains a Sensitive Stream Reach.

Lost Creek

Lost Creek failed to meet *Forest Plan* management objectives for cobble embeddedness, LWD frequencies, pool frequencies, and wetted width to depth ratios. A portion of Lost Creek contains a Sensitive Stream Reach

East Fork Big Creek

East Fork Big Creek failed to meet *Forest Plan* management objectives for cobble embeddedness, LWD frequencies, and pool frequencies. A portion of East Fork Big Creek contains a Sensitive Stream Reach.

Deadwood Creek

Deadwood Creek failed *Forest Plan* management objectives for shade, streambank stability, cobble emeddedness, wetted width to depth ratios, LWD frequency, pool frequency and temperature. This stream is described further in the Susanville Pasture.

Chickenhouse Pasture

The pasture contains 2 perennial, non fish-bearing tributaries to Big Creek that cattle can access. Big Creek has corridor fence along most of the boundary of this pasture which excludes domestic livestock. There is a water gap approximately 200-300 feet long at the northeastern boundary but substrate in and along the channel of Big Creek is large cobble which is resilient to use by cattle. There are no Sensitive Stream Reaches in this pasture.

Upper Middle Fork Allotment

There is approximately 51.3 miles of fish bearing (steelhead/redband) streams in the Upper Middle Fork Allotment. Some of these streams support bull trout. Valley bottom roads influence many of the streams from the confluence with the Middle Fork upstream. These roads limit the recruitment of large wood, restrict the floodplain and are a source for fine sediment. The majority of fish bearing streams are 303(d) listed for temperature. Many of the streams contain sensitive stream segments that have downcut, lowering water tables, disconnecting floodplains and reducing riparian vegetation and consequently shade. Shrubs in the sensitive stream reaches of tributaries near the Middle Fork John Day are commonly utilized by livestock.

Low pool and Large Woody Debris (LWD) frequencies, high cobble embeddedness (sediment) and high water temperatures reduce fish habitat complexity and quality in streams on the allotment. Large pool frequencies are lower than expected in some of the larger tributaries such as Vinegar, Davis, and Butte Creeks.

Table FI-5. Stream survey data for Upper Middle Fork Allotment

Stream Date Surveyed and Reaches	Pools per Mi	Residual Pool Depth	Large Pool Mi	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Bank Stability	High Temp	High Temp Time	Embedded Y or N
DAVIS 7/16/96 Start To: 5	93	0.72	0.00Ψ	6.2	>10♠	13.89	20	11♠	Data Gap	72.00	1510	Y♠
BEAVER 8/7/94 Start To: 4	47♠	0.83	0.00	5.9	DATA GAP	10.02	28	18♠	99	66.00	1400	N
BENNETT 7/22/92 Start To: 1	46♠	0.58	0.00	2.3	>10♠	5.7	39	21	93	62.00	1500	Y♠
BUTTE 7/13/92 Start To: 3	24♠	0.96	0.16Ψ	6.3	>10♠	8.66	44	30	89♠	57.00	1800	Y♠
CARIBOU 6/24/93 Start To: 2	43♠	0.83	0.00	3.6	>10♠	11.51	13	14♠	93	65.00	1600	Y♠
DEERHORN 6/26/93 Start To: 2	30♠	0.64	0.00Ψ	2.1	>10♠	11.97	23	9♠	84♠	59.00	1449	Y♠
LITTLE BOULDER 7/1/93 Start To: 2	23♠	1.03	0.00	5.8	>10♠	10.06	35	16♠	97	53.00	1615	Y♠
LITTLE BUTTE 7/29/93 Start To: 2	22♠	0.71	0.00	3.0	>10♠	7.95	26	23	Data Gap	51.00	1330	N
M F SUNSHINE 7/3/93 Start To: 1	60♠	0.71	0.00	1.3	>10♠	10.34	80	70	87♠	58.00	908	N
PLACER GULCH 1997 8/26/97 Start To: 5	102	0.71	0.00Ψ	4.3	>10♠	15.92	20	16♠	Data Gap	64.00	1334	Y♠
RAGGED 7/13/92 Start To: 3	80	0.61	0.00	5.3	>10♠	7.23	8	15♠	91	55.00	1000	Y♠
RUBY 6/22/93 Start To: 3	40♠	1.00	0.00	4.8	>10♠	11.68	41	29	94	55.00	1400	Y♠
SULPHUR 7/24/92 Start To: 1	52♠	0.53	0.00	2.2	>10♠	7.18	63	35	94	64.00	1500	Y♠

Stream Date Surveyed and Reaches	Pools per Mi	Residual Pool Depth	Large Pool Mi	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/ Mi	Large WD/Mi	Bank Stability	High Temp	High Temp Time	Embedded Y or N
SUNSHINE 7/2/93 Start To: 2	50♠	0.69	0.00	2.9	<10♠	5.30	23	25	87♠	51.00	1210	Y♠
VINCENT 7/13/92 Start To: 3	75	0.66	0.00	6.8	DATA GAP	15.17	24	9♠	Data Gap	63.00	1400	Y♠
VINEGAR 8/5/91 Start To: 15	13♠	1.31	0.19Ψ	10.4	>10♠	13.81	55	30	Data Gap	50.00	937	Y♠
W F RUBY 6/24/93 Start To: 1	17♠	0.68	0.00	1.7	<10♠	6.52	27	30	100	58.00	1500	Y♠
TINCUP 8/2001 Start To: 1	13♠	0.4	0.00	1.1	17♠	7.6	2	1♠	100	53.60	1300	Data Gap
WINDLASS 6/27/93 Start To: 2	27♠	0.65	0.00	3.2	<10♠	5.15	22	14♠	Data Gap	50.00	1100	Y♠

♠ parameter does not meet *Forest Plan* Management objective; Ψ parameter does not meet Matrix Pathways of Indicators criteria where potential exists;*Wetted width to depth ratios listed as <10 or >10 are based on extrapolation

Butte Pasture

Ragged Creek, Ruby Creek, Butte Creek and Little Butte Creek, run through the Butte Creek Pasture; all streams contain steelhead/redband spawning and rearing habitat. Butte Creek is historic bull trout habitat (Buchanan et al 1997).

Streams in the Butte Pasture do not meet state temperature standards or *Forest Plan* management objectives for stream channel parameters listed in Table FI-5. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Butte Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Butte Creek and tributaries:

Butte Creek (to about the middle of section 19), Bennett Creek, and the lower few hundred feet of Sulphur Creek and an unnamed tributary are considered to be redband/steelhead trout rearing habitat. Butte Creek is the only stream with spawning habitat. The lower 1/2 mile is considered to be Chinook salmon spawning and rearing habitat. However, the lower portion of Butte Creek on private ground is highly disturbed and mouth of Butte Creek has a 3 foot vertical drop to the

Middle Fork John Day River making access to Chinook salmon at lower flows unlikely. Butte Creek is historic bull trout habitat (Buchanan et al 1997). An individual fluvial adult bull trout was found in Butte Creek in 1995 during snorkel surveys conducted by McIntosh et al (1995) as part of a Chinook salmon study.

While Butte Creek is not 303(d) listed for temperature, stream temperature data shows elevated summer water temperatures. A level II stream survey was conducted in 1992. This stream failed *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, bank stability and cobble embeddedness. Dominant stream bed substrate was cobble and gravel. Dominant stream bank substrate was sand. Cobbles were more than 35% embedded on all reaches. Bank stability ranged from 87 to 93%. Shade varied from 41 to 55%. Shrub cover varied from 30 to 52%.

Numerous log weirs were constructed on the lower portion of Butte Creek. Some of these structures are creating good pool habitat below and spawning habitat above. However the majority of log weir structures are widening the stream and creating barriers to upstream movement by juvenile salmonids.

The Sensitive Stream Reaches on Butte Creek have received intense use when grazed intermittently in recent years. Portions of the Sensitive Stream Reach containing segments of channelized stream with little or no shrubs and low recruitment by new woody vegetation that could provide bank stability, shade and hiding cover for fish near the mouth of Butte Creek has sustained intense utilization in the recent past. Stream width to depth ratios are wider than expected due to past management and channelization in this section. Another portion of this Sensitive Stream Reach contains numerous shrubs in the riparian area. The Sensitive Stream Reach on Butte Creek between Bennett and Sulfur Creek contains a segment of unstable, braided stream caused by channel aggradation from high bedload movement.

Little Butte Creek and tributary

Little Butte Creek (to about 1/2 way through section 15) and an eastern tributary (through section 16) are considered to be historic bull trout habitat (Buchanan et al 1997) and redband/steelhead trout spawning and rearing habitat. The three important fish-bearing reaches are described here. Dominant streambed substrate is gravel. Dominant stream bank substrate is sand. On Little Butte Creek, none of the 13 riffles sampled had embedded cobbles; on the tributary, 22 of 27 riffles had embedded cobbles. Bank stability ranges from 90 to 99%. Shade on Little Butte Creek was 31%, due to browsing of shrubs, riparian logging, and dead and dying trees. Shade on the tributary varied from 48 to 56 %. Shrub cover varied from 1% to 53%, partly due to excessive browsing. Stream survey data recorded in 2000 noted the lack of defined channel at the confluence with the MFJD River. The water spreads out into a wet meadow and may be a barrier to anadromous species.

Little Butte Creek and the eastern tributary contain Sensitive Stream Reaches. A walkthrough survey conducted in 2002 from the confluence with the MFJD to the forks of the stream noted heavy browsing by wildlife this year had removed terminal buds but numerous age classes of alder from 1 foot to 10+ feet tall were present and vigorous. Banks showed no instability by ungulates and herbaceous vegetation (sedges) were nearly ungrazed on the greenline and greenbelt. This survey also noted little potential steelhead spawning habitat but good summer rearing habitat in the reach surveyed. The lack of a single, defined channel flowing into the alluvial fan at the MFJD reduces the potential of this stream for access by steelhead.

Ragged Creek

Ragged Creek contains redband/steelhead trout spawning and rearing habitat, up to 1/2 of the way through section 11. The two important fish bearing reaches are described here. The stream fails *Forest Plan* management objectives for wetted width to depth ratios, LWD frequency and cobble embeddedness. There is a Sensitive Stream Reach designated on Ragged Creek.Dominant streambed substrate is sand and gravel. Dominant stream bank substrate is sand. Cobbles were more than 35% embedded. Bank stability was 86%. Shade varies from 49% (in a meadow reach) to 66%. Shrub cover varied from 18% (in the meadow reach) to 29%.

Ruby Creek

Ruby Creek contains spawning and rearing habitat for redband/steelhead trout. Redband/steelhead were also found a few hundred feet up some tributaries to this stream. Ruby Creek was surveyed for spawning habitat on April 27, 2001. No spawning activities were found. There were good spawning gravels and habitat present. Water temperature was 44°F.

Level II surveys were completed in June of 1993. The stream failed to meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio and embeddedness. There is a Sensitive Stream Reach designated on Ruby Creek. Dominant stream bed substrate was gravel. Subdominant substrate on two reaches is cobble and gravel on one. Embeddedness exceeded 30% on all three reaches. Stream bank stability ranged from 91 to 96%. Most erosion was due to small mining operations, and a failure at a road crossing. Shade ranged from 23 to 64%. Grass-forb cover ranged from 46 to 84%. Shrub cover ranged from 26 to 50%. Tree crown cover ranged from 23 to 61%.

Caribou Pasture

Little Boulder Creek, Tincup Creek, Windlass Creek, Murdock Creek, Caribou Creek, and Granite Boulder Creek all flow through the Caribou Pasture. Steelhead/redband trout spawning and rearing habitat is present in all these streams. Granite Boulder Creek also contains bull trout spawning and rearing habitat.

Streams in the Caribou Pasture do not meet state temperature standards or *Forest Plan* management objectives for stream channel parameters listed in Table FI-5. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Caribou Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “suspected” in this pasture.

Little Boulder Creek

A steelhead spawning survey was conducted on Little Boulder Creek on July 12, 2001. The stream has a moderate gradient in the mid reaches and the upper reaches have a steep gradient. The lower end has ample steelhead spawning substrate with stable banks, good ground cover, and ample shade/cover.

Little Boulder Creek was surveyed in 1993. The stream did not meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. Bank stability for reaches 1, 2, and tributary 1 were 95%, 82%, and 97% respectively. Stream surface shade ranged from 23 to 28%, tree crown cover ranged from 31 to 44%. Shrub cover was from 0 to 19% and grass-forb cover from 84 to 98%. The dominant substrate in Little Boulder creek is cobble. Gravel is the subdominant substrate.

The main tributary to Little Boulder Creek (on the east side of Little Boulder Creek) was also surveyed. Stream bank stability ranged from 96% to 100%. Stream surface shade ranged from 15 to 27% with a grass forb cover of 80 to 83%. Shrub cover was 1-34% and tree crown cover ranged from 25 to 37%. Dominant substrate was gravel in reach 1 and sand in reach 2, in both reaches almost all samples showed cobble embeddedness exceeding the *Forest Plan* management objective of 30%.

Windlass Creek

Windlass Creek and a non fish bearing tributary were surveyed in June of 1993. Redband/steelhead trout and sculpin were observed in the lower 2.13 miles. The quality and quantity of spawning habitat was not documented. The stream failed *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. Stream flow was measured as 0.7 cfs on June 24, 1993. Riparian habitat survey indicated an average of 94 and 99% stream bank stability in the two stream reaches measured. Stream surface shade was 50% and 43% and tree crown cover was 38% and 34%. Grass-forb cover was measured at 90% and 97%, tree crown cover was 38% and 34%. Cobble embeddedness exceeded the *Forest Plan* management objective of 30% in two of the twenty-three samples in reach 1 and 30% was exceeded in one of the three observations in reach 2. The dominate substrate in both reaches was gravel. Reach 1 had cobble as the subdominant substrate and reach 2 had sand as the subdominant substrate. Windlass Creek tributary was assessed with one transect that indicated 100% bank stability with a stream surface shade of 53%. Grass-forb cover was 88% and shrub cover was 2%. Tree crown cover was 70%. The dominate substrate is cobble with a subdominant substrate of gravel. Embeddedness exceeded 30% in one of two observations.

The stream survey noted heavy use of riparian shrubs by cattle. This was evidenced because there was little use of shrubs below a fence in Reach 1, but heavy use above.

A spawning habitat survey was completed on Windlass Creek on July 12, 2001. The water flow was a small “trickle” and the water temperature was 65°F at 1245. There is a considerable amount of sediment. There is very little steelhead spawning gravel and some redband gravel in isolated pockets.

Caribou Creek

Caribou Creek was surveyed in June of 1993. Redband/steelhead trout was the only fish species present. This stream failed *Forest Plan* Management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. Stream bank stability ranged from 89 to 99% while stream surface shade was 18 to 38%. Grass-forb cover ranged from 74% to 91% and the shrub cover was 3% to 31% and the tree crown cover ranged from 13 to 32%. The dominant substrate is gravel with a substrate of cobble or sand. The stream failed *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness.

There is a striking difference in the abundance, size and vigor of woody vegetation (mostly alder) on this stream above and below the pasture division fence near County Road 20. There is a nearly contiguous mass of shrubs over 10 feet tall with recruitment of younger plants armoring banks and shading the stream on Caribou Creek downstream of the Caribou Pasture. There are some shrubs ranging from 1-4 feet tall spaced 10-20 feet apart on Caribou Creek at the fence line and going upstream inside the pasture. Some riparian planting and protection has been completed in on Caribou Creek in the pasture.

A spawning survey completed in May 2003 and identified 10 steelhead redds in the lower 2.7 miles of Caribou Creek. A Sensitive Stream Reach was designated on Caribou Creek (see Figure 10, Map Section).

Granite Boulder Creek

The lower four miles of Granite Boulder Creek below a barrier waterfall is bull trout and steelhead spawning and rearing habitat. Portions of Granite Boulder flow through the Caribou pasture. This stream failed *Forest Plan* Management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. The dominant streambed substrate in Granite Boulder Creek is gravel or cobble. Dominant stream bank substrate is sand, bedrock and small boulders. Cobble embeddedness exceeded 30% in all 38 riffles observed during the 1993 stream survey. Embeddedness was high even in upper reaches, which are in the Scenic Area with limited disturbance. The embeddedness may be a natural consequence of granitic and sandstone soils, although management activities especially mining and roads, may have contributed sand. Bank stability was 91-100%. Stream shade averaged between 34% and 40%. Shade was affected by road 4559 being adjacent to the creek along with a high percentage of over story conifers that were dead or dying due to insect infestations. Shrub cover was 47% and 61% on the lower reaches. The lower 5 miles of Granite Boulder Creek is in the Lower Middle Fork Allotment.

Granite Boulder Creek was surveyed for steelhead spawning habitat on April 27, 2001. High spring flows and steep gradient limit steelhead and redband spawning habitat quality and quantity.

There is no Sensitive Stream Reach designated for this stream in the Upper Middle Fork Allotment.

Tincup Creek

Level II surveys were completed in September 2001. The stream was designated as a Rosgen channel type "B5a." Flows were too low to measure. Sixty-seven percent of the substrate was sand smaller than 2 millimeters in diameter. Average bankfull width and depth were 3.8 feet and 1.2 feet while average wetted width and depth were 2.8 feet and 0.3 feet. Gradient was 7%. The lowermost 450 feet of Tincup Creek (to the confluence with the Middle Fork John Day River) were dry at the time of the survey. No fish were observed during the survey but fish have been observed in the lower mile of Tincup Creek as recently as 2000. This stream failed to meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, LWD frequency.

Use by livestock was noted in the stream survey report. There is a Sensitive Stream Reach designated on Tincup Creek in this pasture (see Figure 10, Map Section).

Murdock Creek

No survey information is available for Murdock Creek. This stream is not fish bearing but does contribute a small amount of water to the Middle Fork John Day River.

Deerhorn Pasture

Placer Gulch, Davis Creek, Deerhorn Creek, and portions of Little Butte Creek are located within this pasture. All streams contain steelhead/redband spawning and rearing habitat. Davis Creek is historic bull trout habitat (Buchanan et al. 1997).

Streams in the Deerhorn Pasture do not meet state temperature standards or *Forest Plan* management objectives for stream channel parameters listed in Table FI-5. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Deerhorn Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Placer Gulch

A Level II stream survey of Placer Gulch was conducted in 1997. Placer Gulch did not meet *Forest Plan* management objectives for wetted width to depth ratio and LWD frequency. The survey indicated that the substrate has a dominant bed of gravel with the upper reach having a subdominant bed of cobble. The lower reach has a subdominant bed of gravel. Placer Gulch is considered as fish bearing in all reaches. Average shade on Forest Service managed portion of the stream was 34%.

Davis Creek

Davis Creek contains steelhead/redband trout spawning and rearing habitat. Davis Creek is historic bull trout habitat (Buchanan et al. 1997). Davis Creek was surveyed for spawning habitat on April 27, 2001. No redds or adult fish were found but good spawning gravels and habitat were present.

A Level II stream survey of Davis Creek was conducted in July 1996. Davis Creek does not meet *Forest Plan* management objectives for wetted width to depth ratio, LWD frequencies and cobble embeddedness. The survey indicated Rosgen "B" and "A" channel types in the lower portions of Davis Creek. Mapped channel gradients ranged from 4% in lowermost surveyed reach to 8% in the highest reach. Davis Creek also lacked large pools (greater than 3 feet deep) which would be expected in this stream due to size and drainage area.

Deerhorn Creek

Deerhorn Creek contains spawning and rearing habitat for steelhead and redband trout. Deerhorn Creek was surveyed for spawning habitat on April 27, 2001. No redds or adult fish were found. The channel is open to the MFJD River so fish can migrate upstream. There is a Sensitive Stream Reach designated on Deerhorn Creek in this pasture (see Figure 10, Map Section).

A Level II stream survey was completed on 4 miles of Deerhorn Creek in June 1993. Stream flow on June 24 was 2.21 cfs. Deerhorn Creek failed *Forest Plan* management objectives for shade and LWD frequency in 2 of the 3 surveyed reaches and bank stability, embeddedness and pool frequency in all reaches. There is a 4-acre wetland on the east side of Deerhorn Creek in Section 23 at the end of Road 452. In reach 1, the stream survey report noted, "livestock grazing had reduced woody riparian vegetation to a very low level." Reach 2 also mentioned heavy browse on alder in the riparian area.

This stream did not meet range utilization in thresholds for shrub browse or residual herbaceous greenline stubble height when monitored.

Little Butte Creek

Stream survey information is discussed under the Butte Creek Pasture as the mainstem of Little Butte Creek is located within that pasture. There is a Sensitive Stream Reach designated on Little Butte Creek and the east fork in this pasture (see Figure 10, Map Section).

Upper Vinegar Pasture

Streams in the Upper Vinegar Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-5. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Upper Vinegar Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Vincent Creek:

Vincent Creek contains spawning and rearing habitat for redband trout and potential rearing habitat for steelhead. Vincent Creek was surveyed for spawning habitat on April 27, 2001 above and below the closed road of Forest road 2010. No spawning activity was observed. There is an undefined channel near the confluence with the Middle Fork John Day River that likely acts as a barrier to migration. Steelhead may be able to navigate this section of Vincent Creek in a high water year. Even still, there is little available spawning habitat for steelhead in this stream.

Vincent Creek is 6.6 feet wide and had a flow rate of 0.11 cfs in mid-July. The stream has a gradient of 2% and flows through a moderate v-shaped valley with moderate side slopes and a valley floor of <100 feet wide, a narrow flat-floored valley with >30% side slopes and a 100-300 foot wide valley floor, and wide flat-floored valley with a valley floor > 600 feet wide. The stream flow is from a spring at the upper end and several marshy areas along the bank. The substrate is primarily sand, gravel and cobble and is embedded. The channel is moderately entrenched with gravel-sand banks. The riparian vegetation cover is comprised of 94% grass-forbs, 31% shrubs, and 14% tree crown. Stream shade is from 0 to 63%. In reach 1 the bank stability is 90%. Bank stability is 100% in reach 2 and reach 3.

Vinegar Creek:

Vinegar Creek contains spawning and rearing habitat for steelhead, redband and potentially bull trout. Vinegar Creek is considered historic bull trout habitat (Buchanan et al 1997). A single bull trout was found in Vinegar Creek during electroshocking surveys conducted by ODF&W during summer 2000. It is currently unknown if this was part of an isolated population or just a stray fluvial fish. Spawning surveys on Vinegar Creek identified adult fish and redds from the mouth for 8.3 miles in 2002 and 2003. A portion of Vinegar Creek, above and below Forest road 618, Vinegar Creek was surveyed for bull trout spawning activites and habitat in September 2001. No adult bull trout or redds were observed.

A Level II stream survey was conducted in August 2001 on Vinegar creek. This stream failed to meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, and in lower reaches LWD frequency. Ten of 17 reaches in the 1991 survey were observed to have >35% embeddedness which fails the *Forest Plan* management objective. There were 3 reaches described as having 0 to 25% cover, 7 reaches described as having 26 -50% cover, and 6 reaches with 51-75% cover. There was no information available on stream shading. Several Sensitive stream reaches are located on Vinegar Creek (see Figure 10, Map Section).

Lower Vinegar Pasture

Streams in the Lower Vinegar Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-5. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Lower Vinegar Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Vinegar and Vincent Creek Level II stream survey parameters are described under the Upper Vinegar Pasture description.

DMA monitoring on Vinegar Creek in the Lower Vinegar Pasture in 2004 identified early seral stage riparian vegetation. Early seral vegetation makes stream banks sensitive to alteration. Shallow-rooted species such as redtop and Kentucky bluegrass create false banks and cause large areas of instability where 1 hoof from a cow may cause 6 feet of bank to collapse. Shrubs were heavily used, likely by wildlife and the only young shrubs were those planted by Forest Service and Oregon Trout in 2003. Banks are still eroding (channel widening) as evidenced from markers associated with planting have fallen into the stream.

Austin Allotment

This allotment has been treated as a pasture used in grazing the Upper Middle Fork Allotment. Only a small portion of Mill Creek (less than 400 yards) runs through this Allotment. Stream parameters are listed in the Blue Mountain Allotment as the majority of the stream is located within it. Redband trout and dace were the only fish found on National Forest land above a stream diversion. Mill Creek was dry below the Forest Boundary due to water diversions during stream surveys conducted in 1993. This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, and cobble embeddedness. The perennial portion of Mill Creek begins in a wetland at about 4,300 feet elevation. Stream surface shading was an average of 40%. Shrub cover was 12% and tree crown cover was 20%.

The reduced level of habitat complexity and quality has resulted in reduced productivity and thereby populations of Sensitive fish (redband trout) in this allotment. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have impacted habitat for Columbia spotted frog likely resulting in reduced populations in this allotment.

Blue Mountain Allotment

There are approximately 23 miles of fish bearing (steelhead/redband trout and bull trout) streams in the Blue Mountain Allotment. Valley bottom roads influence many of the streams from the confluence with the Middle Fork upstream. These roads limit the recruitment of large wood, restrict the floodplain and are a source for fine sediment.

The majority of streams are 303(d) listed for temperature and also contain Sensitive Stream Reaches. Low pool frequencies, high cobble embeddedness (sediment) and high water temperatures reduce fish habitat complexity and quality in streams on this allotment.

Squaw Creek and Summit Creek and the Middle Fork John Day River in this allotment downcut over 3 feet during a large spring runoff event in 1997. Floodplains were disconnected and water tables were lowered from this event. Currently, there are no riparian shrubs providing shade to maintain stream temperatures, creating cover for fish or stabilizing raw banks for several hundred yards in each of these streams. Grasses, sedges and rushes are extremely limited on and above the greenline. Most of the impacted area was fenced to exclude cattle, but over two hundred yards of Squaw Creek which is downcut are still being grazed.

Table FI-6. Stream survey data for Blue Mountain Allotment

Stream Date Surveyed & Reaches	Pools per Mi	Residual Pool Depth	Large Pool Mi	Trib Count	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Pct. Bank Stability	High Temp	High Temp Time	Embedded Y or N
CLEAR, 7/29/91 Start To: 6	7♠	1.22	0.49	7	8.2	11.86♠	34.86	155	36	Data Gap	51.00	1350	Y♠
CRAWFORD 7/9/93 Start To: 2	15♠	0.89	0.24	4	4.2	>10♠	8.44	5	2♠	99	64.00	1400	Y♠
FLY 7/27/92 Start To: 1	51♠	0.56	0.00Ψ	0	1.4	>10♠	9.04	33	40	99	57.00	1400	Y♠
IDAHO 7/16/92 Start To: 3	62♠	0.69	0.00Ψ	8	4.1	>10♠	9.49	20	28	98	55.00	1200	Y♠
MILL 93 7/7/93 Start To: 1	32♠	1.06	0.00	4	1.1	>10♠	6.08	0	0♠	91	70.00	1600	Y♠
ROAD T2 OF SUMMIT 7/28/92 Start To: 1	59♠	0.44	0.00Ψ	0	2.0	>10♠	8.57	40	35	82♠	55.00	1700	Y♠
SQUAW 7/3/91 Start To: 14	7♠	1.66	0.23Ψ	8	8.6	-1.00	10.58	41	25		51.00	1500	Y♠
SUMMIT 7/11/92 Start To: 4	53♠	0.92	0.12	3	8.1	10.46♠	10.75	22	26	93	64.00	1530	Y♠

♠ parameter does not meet *Forest Plan* Management objective; Ψ parameter does not meet Matrix Pathways of Indicators criteria where potential exists;*Wetted width to depth ratios listed as <10 or >10 are based on extrapolation

End of year monitoring data associated with grazing (IIT) was collected for pastures in this allotment. Crawford Creek, Idaho Creek and the Middle Fork John Day River did not meet all IIT management objectives when data was collected.

Squaw Creek Pasture

This pasture is used only at the beginning of the season for a day or two as a place to turn cattle into before going into the larger pastures.

Streams in the Squaw Creek Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-6. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Squaw Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Middle Fork John Day River

No Level II stream survey information is available for this stream in the Squaw Creek Pasture.

This portion of the Middle Fork John Day River downcut during a high spring flow event in 1997. The stream is now a recovering Rosgen "F6" channel type with some point bars developing. The stream is almost entirely riffle or glide habitat. The water table dropped several feet when the channel downcut. This stream currently contains very little steelhead and redband trout spawning and rearing habitat in the pasture. The entire length of the Middle Fork John Day River is designated as a Sensitive Stream Reach (see Figure 10, Map Section).

A PFC analysis was conducted in 2004 and was rated as Functioning at Risk with an upward trend. Riparian herbaceous vegetation, mainly Nebraska sedge and Baltic rush, are beginning to recolonize the stream banks but the shrub component is lacking; elk use is a concern in this pasture.

Squaw Creek

A Level II stream survey was conducted in 1991, but information is no longer valid in this pasture as this portion of Squaw Creek downcut during a high spring flow event in 1997. The stream is now a recovering Rosgen "F6" channel type with some point bars developing. The stream is almost entirely riffle or glide habitat. The water table dropped several feet when the channel downcut. Squaw Creek stopped flowing in 2002 and 2003. Juvenile and adult steelhead were observed in this stream in 2002. This stream currently contains very little steelhead and redband trout spawning and rearing habitat in the pasture. The entire length of Squaw Creek is designated as a Sensitive Stream Reach (see Figure 10, Map Section).

A PFC analysis was conducted in 2004 which determined this segment of Squaw Creek to be rated as Functioning at Risk with an upward trend. Riparian herbaceous vegetation, mainly Nebraska sedge and Baltic rush, are beginning to recolonize the stream banks but the shrub component is lacking; elk use is a concern in this pasture.

Summit Creek

A Level II stream survey was conducted in 1991, but information is no longer valid in this pasture as this portion of Summit Creek downcut during a high spring flow event in 1997. The stream is now a recovering Rosgen "F6" channel type with some point bars developing. The stream is almost entirely riffle or glide habitat. The water table dropped several feet when the channel downcut; however it did not downcut as deeply as Squaw Creek. Summit Creek maintained base flows in 2002 and 2003 when Squaw Creek stop flowing. This stream currently contains very little steelhead and redband trout spawning and rearing habitat in the pasture. The entire length of Summit Creek is designated as a Sensitive Stream Reach (see Figure 10, Map Section).

A PFC analysis was conducted in 2004 which determined this segment of Summit Creek to be rated as Functioning at Risk with a strong upward trend (because it is not downcut as deeply as Squaw Creek). Riparian herbaceous vegetation, mainly Nebraska sedge and Baltic rush, are recolonizing the stream banks but the shrub component is lacking; elk use is a concern in this pasture.

Crawford Creek Pasture

Streams in the Crawford Creek Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-6. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Crawford Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Crawford Creek

Crawford Creek runs through the Crawford Creek pasture and provides steelhead spawning and rearing habitat. Crawford Creek failed to meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. The entire length of Crawford Creek is designated as a Sensitive Stream Reach (see Figure 10, Map Section).

Crawford Creek originates from large wetlands at 5000 feet elevation (meadows and wetlands are common along the entire stream). Measured flow at the mouth of Crawford Creek was 0.57 cfs on July 10, 1993. The upper portion of the stream is perennial and the lower portion is intermittent. Average stream gradient is about 3 percent. Upland vegetation includes lodgepole pine. Some lodgepole pine forests along the stream may have been converted to grasslands (meadows). An abandoned logging mill was found with a system of abandoned railroad beds. This is evidence of past railroad logging in RHCAs.

The lowest part of the stream (stream reach 1) is in the flood plain of the Middle Fork John Day River. Average shade was 29 in reach 1 and 16% in reach 2 which failed the *Forest Plan management objective* for lodgepole pine sites and mixed conifer sites respectively. Average shade in reach 3 was 13% which faild the *Forest Plan* management objective for meadow habitat. Stream banks were 97 percent stable, which passed the forest management objective (90% stable). Stream bank failure was the common erosion type reported. However, numerous locations of valley bottom roads impact this stream.

Sixteen Gulch

Sixteen Gulch is not a fish-bearing stream. However, it does contribute to the base flows and downstream water quality.

Idaho Creek Pasture

Streams in the Idaho Creek Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-6. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Idaho Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Idaho Creek

Idaho Creek is a tributary to Summit Creek, which is a direct link to the Middle Fork John Day River. Idaho Creek flows through the Idaho pasture and is considered as steelhead spawning and rearing habitat. This stream did not meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratios and cobble embeddedness. Idaho Creek contains a Sensitive Stream Reach (see Figure 10, Map Section).

The Level II stream survey of Idaho Creek was done in July of 1992, the seventh year of a drought. The streams were abnormally low and the range and riparian areas are drier than normal. The survey began at the confluence with Summit Creek for about 4.1 miles upstream to 1/4 mile above stream flow. Idaho Creek was 5.4 feet wide and had a flow rate of 0.16 cfs in mid July. The stream flow is from a spring at the upper end and several marshy, possible spring areas along its banks.

Fly Creek

Fly Creek is a perennial non fish-bearing tributary of Idaho Creek. The stream failed to meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio and cobble embeddedness. From the junction of Fly Creek with Idaho Creek it proceeds upstream about 1.4 miles. The stream averaged 3.1 feet wide and was 65.3% shaded with a water temperature of 57 degrees F. at 2 pm. The stream contained 22.9% pools, 71.2% riffles, 0 glides, and 5.9% side channels. The substrate is sand and is >35% embedded.

East Summit Pasture

Streams in the East Summit Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-6. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the East Summit Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Summit Creek

Summit Creek runs through East Summit pasture and contains steelhead and redband trout spawning and rearing habitat. This stream failed to meet *Forest Plan* management objectives for pool frequency, wetted width to depth ratio and cobble embeddedness. The entire length of Summit Creek is designated as a Sensitive Stream Reach (see Figure 10, Map Section).

The survey data for Summit Creek was collected during 1992, which was the 7th year of drought on the Malheur National Forest. The streams were abnormally low and the range and riparian areas were drier than normal. The habitat survey results must be considered in light of the possible influence of the existing drought. Summit Creek was surveyed in July from the confluence with the Middle Fork John Day River for about 7.4 miles upstream to 1/4 mile above the stream flow. Summit Creek is 7.2 feet wide and had a flow rate of 0.43 cfs in mid-July. The channel is moderately entrenched with dirt banks

West Summit Pasture

Streams in the West Summit Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-6. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the West Summit Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Middle Fork John Day River

The Upper Middle Fork John Day River runs through the West Summit pasture and contains steelhead spawning and rearing habitat. The Middle Fork John Day River was surveyed by Oregon Department of Fish and Wildlife in 1992. This reach is 47% riffle and 46% glide. Substrate is composed primarily of gravel (54%) and cobble (23%). Stream banks are 91% vegetation stabilized and 38% shaded.

While no data were collected, observations of this stream suggest wetted width to depth ratios and pool frequency do not meet *Forest Plan* management objectives. The entire length of the Middle Fork John Day River is designated as a Sensitive Stream Reach (see Figure 10, Map Section).

Clear Creek

This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness. Bank stability and riparian condition surveys done in May of 1994 found the stream channels in the area to be generally stable. Surveys showed 94 percent stream bank stability. Shading from vegetation averaged about 28 percent. Low shade readings (using a densiometer) were due to State highway 7 being adjacent to Clear Creek. Grass and forbs were the dominant vegetative cover and appeared to be in a healthy condition. The shrub and tree component was well represented by all age classes indicating that grazing was not suppressing reproduction and growth and that site potential was being met.

Approximately 1/4 mile of Clear Creek flows through this pasture and contains and steelhead spawning and rearing habitat and bull trout migratory habitat. Clear Creek was surveyed for steelhead spawning on May 29, 2001. No redds or adult fish were observed but numerous salmonid fry and fingerlings were observed.

Sullens Allotment

There are approximately 43.6 miles of fish bearing streams (steelhead/redband trout and bull trout—only in Clear Creek) in the Sullens Allotment. Valley bottom roads influence many of the streams from the confluence with the Middle Fork upstream. These roads limit the recruitment of large wood, restrict the floodplain and are a source for fine sediment.

Clear Creek, Squaw Creek and Lunch Creek are 303(d) listed for temperature. All streams contain Sensitive Stream Reaches. Low pool frequencies, high cobble embeddedness (sediment) and high water temperatures reduce fish habitat complexity and quality in streams on this allotment. Width to depth ratios (both wetted and bankfull) are very high, reducing usable fish habitat and exacerbating high stream temperature problems in the summer.

Table FI-7. Stream survey data for Sullens Allotment

Stream Date Surveyed & Reaches	Pools per Mi	Residual Pool Depth	Large Pool Mi	Trib Count	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Bank Stability	High Temp	High Temp Time	Embedded Y or N
BRIDGE93 7/26/93 Start To: 9	51♠	1.02	0.15	5	6.6	Data Gap	Data Gap	13	14♠	Data gap	53.00	1130	Data Gap
CLEAR, Pcity 7/29/91 Start To: 6	7♠	1.22	0.49	7	8.2	>10♠	34.86	155	36♠	Data Gap	51.00	1350	Y♠
DRY FORK CLEAR 7/19/91 Start To: 4	20♠	1.78	0.32	3	6.2	>10♠	11.35	49	34♠	Data Gap	71.00	1600	Y♠
LUNCH 7/2/93 Start To: 2	9♠	1.09	0.00	5	4.2	>10♠	15.74	28	5♠	Data Gap	56.00	1335	N
SQUAW 7/3/91 Start To: 14	7♠	1.66	0.23	8	8.6	>10♠	10.58	41	25♠	Data Gap	51.00	1500	Y♠

♠ parameter does not meet *Forest Plan* Management objective; $^{\Psi}$ parameter does not meet Matrix Pathways of Indicators criteria;*Wetted width to depth ratios listed as <10 or >10 are based on extrapolation

PFC analyses were conducted on several streams in 2000. These analyses were done at the reach level; each stream has from 3-12 reaches depending on total stream length. Determinations, trends and comments for each reach on these streams are listed in the table below. Nineteen reaches were rated as Functioning at Risk (with no apparent trend or a downward trend) or Not Functioning. Livestock use was listed as a problem on some of these reaches.

Bridge Creek Pasture

Streams in the Bridge Creek Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-7. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Bridge Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "Suspected" in this pasture.

Bridge Creek

This stream contains steelhead spawning and rearing habitat. Adult steelhead have been seen in this stream since the fish ladder was installed at Bates Pond. This stream failed to meet management objectives for pool and LWD frequency. No data was available for wetted width to depth ratio and cobble embeddedness. Much of this stream parallels Highway 26, which narrows the valley bottom and floodplain of this stream.

Lunch Creek

This stream contains steelhead spawning and rearing habitat. Adult steelhead have been seen in Bridget Ceek since the fish ladder was installed at Bates Pond. There is no known barrier between Bridge Creek and Lunch Creek. This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

Easy Creek

This is an intermittent, non fish-bearing tributary to Lunch Creek. No Level II stream surveys have been conducted.

Clear Creek

Clear Creek contains steelhead and bull trout spawning and rearing habitat within this pasture. This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, cobble embeddedness and wetted width to depth ratio.

Dry Fork Clear Creek

Dry fork Clear Creek contains steelhead spawning and rearing habitat. This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

Savage Creek Pasture

Streams in the Savage Creek Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-7. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Savage Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations which are "suspected" in this pasture.

Dry Fork Clear Creek

Dry fork Clear Creek contains steelhead spawning and rearing habitat. This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

Squaw Creek

Squaw Creek contains steelhead spawning and rearing habitat. This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

Olmstead Creek

This is an intermittent, non fish-bearing tributary to Lunch Creek. No Level II stream surveys have been conducted.

Savage Creek

This is an intermittent, non fish-bearing tributary to Lunch Creek. No Level II stream surveys have been conducted.

Highway Pasture

Streams in the Highway Pasture do not meet *Forest Plan* management objectives for stream channel parameters listed in Table FI-7. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Highway Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “Suspected” in this pasture.

Clear Creek

Clear Creek contains steelhead spawning and rearing habitat and bull trout migratory habitat in this pasture. This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, cobble embeddedness and wetted width to depth ratio.

Dry Fork Clear Creek

Dry Fork Clear Creek contains steelhead spawning and rearing habitat in this pasture. This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

Squaw Creek

This stream failed to meet *Forest Plan* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

26 Pasture

There are no fish-bearing streams in this pasture.

End of year monitoring data associated with this allotment was rarely completed as there has been no grazing since 1994. Management objectives were met when monitoring was completed.

Environmental Consequences

This section builds on the conclusions from vegetation, soils and watershed analyses and determines direct, indirect and cumulative effects on fish habitat and populations of steelhead, redband trout, and bull trout.

Direct and Indirect Effects

Alternative 1 (No Grazing)

No grazing by domestic livestock would occur with this alternative. Riparian areas and streams would recover at a natural rate with current climatic conditions.

As described in the Riparian Vegetation and Watershed sections, herbaceous hydrophytic vegetation such as sedges and rushes would increase in abundance and vigor, moving toward late seral stage where currently at early or mid seral condition. Table FI-8 shows an increase in percentage of DMAs with riparian vegetation in late seral condition. This would improve bank integrity thereby reducing stream channel width to depth ratios (both bankfull and wetted) and allowing the formation of undercut banks; both changes would improve fish habitat. The expected timeframe of observable or measurable changes in width to depth ratios may be as short as 2-3 years in locations on sensitive stream reaches with late seral riparian vegetation conditions but longer in areas of early seral conditions which would likely need to move to a later seral condition before measurably changing width to depth ratios. Changes in width to depth ratios would continue for 50 years or more depending on climate, rainfall levels, etc. as stream channels evolve to expected Rosgen channel types.

Table FI-8. Percent of DMAs with Riparian Vegetation in Late Seral Condition

Existing Condition	Alternative 1	Alternative 2	Alternative 3
60%	Increase	Increase	Increase

Streamside shrubs (riparian hardwoods) shade streams and therefore are a significant factor in the regulation of stream temperature (Platts, 1991). Shade provided by riparian shrubs would increase as young shrubs (seedlings/saplings) increase in abundance and grow to a height that would cover the majority of stream surface on sensitive stream reaches of tributaries to the Middle Fork John Day River. A study in Camp Creek showed a lag time of up to 7 years before the appearance of shrubs when no seedlings were present at year one. Once small shrubs are present, 20-30 years are necessary before plants provide maximum shading capability. Some reduction in water temperature is expected within 5-15 years of shrub emergence. This would help maintain lower stream temperatures during summer low water flow conditions by reducing the amount of radiant energy from the sun reaching the stream. Improvement of the riparian shrub community would provide hiding cover for adult and juvenile fish from predators such as belted kingfishers. In smaller stream systems and headwaters, shrubs provide the same function as large woody debris capable of creating pool habitat. Improvement of the shrub community would also improve bank integrity thereby reducing stream channel width to depth ratios (both bankfull and wetted) and allowing the formation of undercut banks; both changes would improve fish habitat.

The reduction of wetted width to depth ratios increases fish habitat quantity at low flows by creating deeper instream habitat and improves fish habitat quality by reducing the stream surface area exposed to sunlight thereby maintaining lower water temperatures during summer low flows.

Improvement of the herbaceous and hardwood hydrophytic vegetation community would benefit fish by providing habitat for terrestrial insects which fall into the stream and are an important food source (Murphy and Meehan, 1991). Reduced summer water temperatures would create favorable conditions for aquatic insects which are also an important food source for fish.

Biological studies conducted on Camp Creek by Oregon Department of Fish and Game comparing the "fish pasture" with other areas showed a direct correlation between habitat improvement and salmonid distribution. Specifically, it showed higher densities of steelhead/redband trout and lower densities of dace with areas of greater fish habitat quality and quantity.

Fish habitat quality and quantity would improve on streams at "near natural" rates in the Planning Area. Timeframes of riparian and instream habitat recovery would vary from 2 years to decades depending on current riparian vegetation seral stage, abundance/condition of shrubs, and existing stream channel characteristics compared to stream potential. Most streams will not meet Riparian Management Objectives (RMOs) in the next 20 years; it is questionable as to whether there is potential to meet RMOs on all streams. Carrying capacity of fish habitat would increase with improved cover from riparian shrubs, decreased width to depth ratios, lower summer water temperatures and greater terrestrial and aquatic insect (food) abundance. This would improve populations of MIS fish and Columbia spotted frog in the Planning Area.

Action Alternatives 2 (Existing Grazing) and 3 (Proposed Action Grazing)

PACFISH Enclosure B (Appendix G) states that some environmental effects are inherent with the presence of livestock. It goes on to state that if condition thresholds (or endpoint indicators) are not exceeded, there will be an acceptable level of carryover effects for riparian areas and streams.

The Malheur National Forest Riparian Monitoring Strategy (Appendix D) will be used to determine condition and trend of riparian areas for sensitive stream reaches in pastures in the Planning Area. This information will be used to recommend allowable use levels, appropriate move triggers, endpoint indicators, and long term, site specific objectives for riparian areas. The current integrated riparian monitoring sets endpoint indicators of up to 20% bank alteration by domestic livestock, a residual stubble height of at least 3-6 inches for herbaceous riparian vegetation and less than 50% incidence of use of riparian shrubs. The riparian monitoring strategy includes implementation and effectiveness monitoring with feedback to ensure Near Natural Rates of recovery (as defined in PACFISH Enclosure B) will occur. It is realized that survey methods, analysis tools and endpoint indicators will continue to evolve during the life of this project.

Move triggers and endpoint indicators will be met in most years. When move triggers or endpoint indicators are not met and result in potential for impacts to riparian areas, streams or fish, appropriate administrative actions will be taken using adaptive management to adjust livestock management strategies (timing, intensity, frequency and duration) as needed to achieve riparian management objectives as directed in PACFISH (GM-1). Intermittent failures to meet endpoint indicators in localized areas would not meaningfully affect recovery processes of riparian areas or streams at a landscape scale in the Planning Area.

There is the potential to cause negative impacts by domestic livestock to individual fish or Columbia spotted frogs with these alternatives by implementing deferred rotation strategies which place cattle in pastures where TES species occur. Specifically, trampling of steelhead, redband or bull trout redds, or chinook salmon (which contain eggs/embryos) or egg masses of spotted frogs by domestic livestock could result in direct mortality of MIS/TES aquatic species. Species that propogate prior to July 15 (steelhead, redband trout and spotted frogs are less likely to be effected by livestock because stream flows are higher and upland forage/water is more available earlier in the year which reduces livestock pressure on riparian areas and streams. The Chinook salmon and bull trout spawning and incubation period occurs after August 15 which is when stream flows are low, upland water is less available and upland vegetation may be less palatable to livestock which increases livestock pressure on riparian areas and streams. Table FI-9 shows number of pastures by Alternative where livestock grazing could trample redds or egg masses. Appropriate mitigation measures would be taken to minimize potential for these impacts. Specific measures which may be used include: grazing during periods when cattle seldom use riparian areas, riding/herding, electric fencing, moving cattle out of the pasture to keep cattle away from redds/eggmasses, etc. Populations of aquatic species would not be negatively affected from trampling.

Table FI-9. Number of pastures where Domestic livestock grazing could trample Redds or egg masses.

Alternative 1	Alternative 2	Alternative 3
0	50	50

Specific conditions of riparian areas and streams may be different from the No Grazing alternative (as described in the paragraphs below). However, the effects of grazing would limited to result in “near natural rates” of recovery as defined in PACFISH Enclosure B (Appendix G). Grazing of domestic livestock would not result in retarding attainment of Riparian Management Objectives (RMOs).

Residual stubble height of herbaceous vegetation may be lower with livestock grazing than without livestock grazing. However, the riparian monitoring strategy (Appendix D) is designed to determine appropriate move triggers, thresholds and objectives that allow for ample growth to maintain health and vigor in plants, expanding hydrophytic plant communities where not currently at desired condition and maintaining plant communities where at desired condition. Additionally, deferred grazing management strategies allow herbaceous vegetation to set seed on a regular basis. The riparian monitoring strategy also determines minimum residual stubble height necessary to trap sediment during high flows which is necessary to build streambanks. The resulting height may be lower than where domestic livestock grazing has not occurred but is ample to move toward objectives.

The riparian monitoring strategy (Appendix D) determines allowable bank alteration levels by livestock. The level of allowable bank alteration may be higher than from wildlife alone but will not negatively impact stream channel integrity/stability, parameters (such as width to depth ratios and streambank angle) or recovery processes such as building point bars and streambanks and the ability of the stream to handle high flow events.

The riparian monitoring strategy (Appendix D) determines allowable riparian shrub browsing by livestock. The overall level of shrub browse with livestock may be higher than from wildlife alone but will result in the same growth forms (i.e. released, uninterrupted), life stages (i.e. seedling/sapling, young, mature), species composition and density of riparian shrubs for the potential of the site as would occur without grazing of livestock.

Some riparian areas where livestock congregate such as fencelines and water gaps will receive more impacts but will be limited in space and the level of impact so as not to impact the stream system and aquatic species as a whole.

Potential effects from livestock injuring or killing individual fish or frogs would not impact populations as a whole. While specific direct and indirect effects to riparian herbaceous and shrub vegetation, bank alteration, would be different from the No Grazing alternative, the response of the habitat for MIS fish and Columbia spotted frog would be the same as the No Grazing alternative. Aquatic habitat quality and quantity would improve on streams at near natural rates in the Planning Area. Improving habitat is a greater benefit to populations of TES species than the potential of impacting individual fish or spotted frogs. Timeframes of riparian and instream recovery would vary from 2 years to decades depending on current riparian vegetation seral stage, abundance/condition of shrubs, and existing stream channel characteristics compared to stream potential. Most streams will not meet Riparian Management Objectives (RMOs) in the next 20 years; it is questionable as to whether there is potential to meet RMOs on all streams. Carrying capacity of aquatic habitat would increase with improved cover from riparian shrubs, decreased width to depth ratios, lower summer water temperatures and greater terrestrial and aquatic insect (food) abundance. This would improve populations of MIS fish and Columbia spotted frog in the Planning Area.

Cumulative Effects

The past, present and foreseeable future actions listed in Appendix A of the Middle Fork DEIS were analyzed in conjunction with direct and indirect effects of project activities to determine cumulative effects on fish, spotted frogs and aquatic habitat in Planning Area streams and downstream in the Middle Fork John Day River. Effects of past actions on aquatic species and habitats were described in the existing condition portion of the Fisheries Section

All Alternatives

Cumulative Effects are the same for all alternatives because there would be a near natural rate of recovery of aquatic habitat quality and quantity as well as populations of fish and spotted frog.

Existing roads, particularly those within RHCAs and riparian areas would continue to reduce potential for shade, stream channel meander, and overall stream function and increase sediment input to streams. Implementation of regular road maintenance activities are designed to reduce sediment delivery to streams by clearing blocked culverts and blading road surfaces to reduce erosion/sedimentation and potential for road failure. Stream crossings of roads will maintain stream channel entrenchment, reducing floodplain connectivity and keeping water tables at lower levels than natural and providing potential for direct sediment input to streams. However, the Blue Aquatic project modified 11 stream crossings in Vincent/Vinegar and Granite Boulder Creeks to allow for fish passage of all age classes at all flows, handle 100-year flow events and allow some channel aggradation which could reconnect floodplains to currently entrenched stream channels. Additional foreseeable future culvert projects associated with the Camp Watershed Oxbow Culvert Replacement, Bridge/Lunch Creek Culvert Replacements and Butte Creek Culvert Replacement have the same objectives and effects as the Blue Aquatic project.

The Crawford Vegetation Management project activities will reduce overall negative effects of roads by completing maintenance on the existing road system and relocating roads out of the riparian areas into uplands. Harvest activities are expected to move vegetation towards the historic range of variability and reduce potential for catastrophic wildfires while the use of default PACFISH RHCAs is expected to protect riparian resources.

Riparian shrub planting and protection along the Middle Fork John Day River (on both private and National Forest System lands), in the Camp Creek and Big Creek watersheds, the Southeast Galena and Summit Fire Recovery, the Long Creek Allotment Improvement Project has accelerated and will continue recovery of riparian vegetation communities, provide shade, improve stream channel parameters and maintain lower summer water temperatures. Floodplain and mine tailing restoration activities on Confederated Tribes of Warm Springs is expected to reconnect the floodplain to the stream channel, accelerate riparian recovery and improve aquatic habitat on the Middle Fork John Day River. This project will also improve fish access to Butte Creek at the confluence with the Middle Fork John Day River. Future activities on the Dunston property are designed to increase channel sinuosity, improve riparian vegetation and accelerate recovery of aquatic habitat in the Middle Fork John Day River.

Livestock grazing on private lands along the Middle Fork John Day River and Clear Creek is expected to maintain current riparian and stream conditions along these locations.

Water withdrawal for irrigation would occur on Camp Creek (Camp Allotment) and the Middle Fork John Day River (Bear Allotment) associated with Forest Service water rights and Camp Creek, Vinegar Creek and the Middle Fork John Day River associated with private water rights. This would remove some water from streams during summer low flows.

No grazing on pastures in areas of Malheur National Forest System lands affected by future wildfires for a minimum of 2 growing seasons (Malheur National Forest post-fire grazing guidelines) would reduce potential for cumulative effects of wild and domestic ungulate browsing and grazing pressure to allow hardwoods to re-establish and herbaceous vegetation to recover in riparian areas. The effects would be similar and additive to hardwood planting and protection. Re-initiation of grazing by domestic livestock within Forest Plan and Interagency Interdisciplinary Team (IIT) management objectives would not retard attainment of Riparian Management Objectives (RMOs) in planning area streams.

Range infrastructure improvements which include water developments, spring protection and fence construction implemented through Categorical Exclusions on the Long Creek and Lower Middle Fork Allotments are designed to improve cattle distribution and reduce pressure of domestic livestock on riparian areas.

Riparian conditions, aquatic habitat quality and quantity would continue to improve on streams at near natural rates in the Planning Area. Timeframes of riparian and instream recovery would vary from 2 years to decades depending on current riparian vegetation seral stage, abundance/condition of shrubs, and existing stream channel characteristics compared to stream potential. Most streams will not meet Riparian Management Objectives (RMOs) in the next 20 years; it is questionable as to whether there is potential to meet RMOs on all streams. Carrying capacity of aquatic habitat would increase with improved cover from riparian shrubs, decreased width to depth ratios, lower summer water temperatures and greater terrestrial and aquatic insect (food) abundance. This would improve populations of MIS/TES fish and Columbia spotted frog in the Planning Area and potentially downstream in the Middle Fork John Day River.

Determination of Effects on Threatened Endangered and Sensitive Species or Habtat

Mid-Columbia Summer steelhead and Columbia basin bull trout are listed as Threatened under the Endangered Species Act of 1974. Redband trout, Chinook salmon and Columbia spotted frog are designated as Sensitive Species by the Regional Forester (USDA 2000). Chinook salmon have habitat Listed as Essential Fish Habitat.

Potential determinations for Listed Species are as follows:

NE	No Effect
NLAA	May Affect—Not Likely to Adversely Affect
LAA	May Affect—Likely to Adversely Affect
BE	Beneficial Effect

Potential determinations for Listed Habitat are as follows:

NE	No Effect
NLAM	Not Likely to Adversely Modify
LAM	Likely to Adversely Modify
UAA	Unlikely to Adversely Affect

Potential determinations for Sensitive Species are as follows:

NI	No Impact
MIIH	May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species
WIFV	Will Impact Individuals or Habitat with a Consequence that the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species
BI	Beneficial Impact

The following is a summary of effects determinations for alternatives documented in the Biological Evaluation of the Middle Fork AMP DEIS.   Table FI-10 lists determinations for all alternatives.

Table FI-10: Threatened Endangered and Sensitive (TES) species biological evaluation summary

Aquatic Species	Effects Determination Alternative 1 No Grazing	Effects Determination Alternative 2 Ongoing Grazing	Effects Determination Alternative 3 Proposed Action
Mid-Columbia Summer Steelhead	NE	LAA	LAA
Columbia Basin Bull Trout	NE	LAA	LAA
Interior Redband Trout	NI	MIIH	MIIH
Mid-Columbia Spring Chinook Salmon	NI	MIIH	MIIH
Mid-Columbia Spring Chinook Salmon Essential Fish Habitat (EFH)	NE	NLAM	NLAM
Columbia Spotted Frog	NI	MIIH	MIIH

Alternative 1, No Grazing:

Direct, indirect and cumulative effects would result in riparian conditions, aquatic habitat quality and quantity improving at natural rates in the planning area with no potential for direct effects to individual TES fish or Columbia Spotted Frog. This would improve populations of TES fish and Columbia spotted frog in the Planning Area and potentially downstream in the Middle Fork John Day River.

Alternatives 2 and 3

Adaptive management using the Malheur National Forest Riparian monitoring strategy (implementation and effectiveness monitoring) is designed to result in a near natural rate of recovery of riparian areas and streams. Implementing deferred rotations would put livestock in pastures concurrent with breeding/spawning and incubation activities of TES fish and Columbia spotted frog in some years.

There is the potential to have negative effects on individual fish or frogs from direct impacts of domestic livestock stepping on redds/eggmasses or disturbing/harassing adult TES species during breeding activities (prior to July for steelhead, redband trout and spotted frog, and after August 15 for bull trout and chinook salmon). Mitigation measures would reduce potential for direct effects to TES species and therefore would not have negative impacts on populations as a whole. However, grazing cattle during breeding/spawning and incubation periods creates the potential for direct take or impacts to individuals resulting in LAA and MIIH effects determinations for TES species.

Implementing deferred rotations, utilizing early season grazing and limiting hot season grazing duration in pastures would benefit riparian areas and streams thereby improving TES habitat and populations. Improving habitat is a greater benefit to populations of TES species than the potential of impacting individual fish or spotted frogs.

Consistency With Direction and Regulations

The alternatives are consistent with Forest Plan direction. None of the potential combined effects are expected to adversely affect movement toward PACFISH RMOs or population viability. Application of PACFISH direction is expected to continue to improve aquatic conditions in the Planning Area. Stream channel conditions are expected to improve with all alternatives and actions listed in Appendix A.

Recreational fishing opportunities are limited in the Middle Fork AMP planning area by water quality and habitat degradation. All alternatives include aquatic conservation and restoration actions that would improve the quantity, function, sustainable productivity, and distribution of recreational fisheries as directed under Executive Order 12962, Recreational Fisheries.

Irreversible and Irretrievable Commitments of Resources

No irreversible effects are expected. Reduced fish population viability for redband trout could be an irretrievable commitment of resources, but the possibility is not expected. PACFISH established explicit goals and objectives for anadromous fish habitat condition and function. By following PACFISH management objectives and guidelines as well as mitigation measures specific to this project, it is believed that irretrievable commitment of this resource can be avoided. The goal is to achieve a high level of habitat diversity and complexity through a combination of habitat features.

Soil

Regulatory Framework

Malheur National Forest Plan Forest-Wide Standards state:

125. Evaluate the potential for soil displacement, compaction, puddling, mass wasting, and surface soil erosion for all ground-disturbing activities.

126. The total acreage of all detrimental soil conditions shall not exceed 20% of the total acreage within any activity area, including landing and system roads. Consider restoration treatments if detrimental conditions are present on 20% or more of the activity area. Detrimental soil conditions include compaction, puddling, displacement, and severely burned soil, and surface erosion.

127. Minimum percent effective ground cover following land management activities:

Soil Erodibility	First Year %	Second Year %
Very High	60-75	75-90
High	50-60	65-75
Between Moderate & High	45	60
Moderate	38	50
Between Low & Moderate	30	40
Low	20	30

128. Seed all disturbed soil that occurs within 100-200 feet of a stream or areas further than 200 feet that could erode into a stream.

Forest-Wide Standard 126 was developed for timber projects, and the project soil scientist and the Regional Soil Scientist believe it does not fit range projects well. Reasons for this belief include the following:

- The term "activity area" is undefined for range projects.
- Standards were developed for response of trees to detrimental conditions, but response of forage may be different.
- Any decrease in plant production from grazing due to compaction and puddling is likely to be small compared to the decrease due to defoliation and other direct damage to plants (Greenwood & McKenzie 2001).
- Little scientific information is available on compaction and puddling by livestock, as managed on these allotments, in environments similar to these allotments.
- Compaction is defined in terms of bulk density of undisturbed soil, and in areas heavily impacted by cattle in the past, bulk density of undisturbed soil is unknown.
- Sampling for bulk density is prohibitively expensive.

- Rangeland soil quality has commonly been described in terms of erosion (ground cover amount and distribution, rilling, pedestaling, erosion pavements, sediment deposition, trampling) rather than compaction and puddling (USDA Forest Service 1984, section 254.1)

Because of the poor fit between Forest Wide Standard 126 and rangelands, and because potential aquatic resource effect is an issue in this Environmental Impact Statement, this analysis will focus on erosion, rather than Forest Wide Standard 126. The desired condition is that effects, of livestock compaction and puddling, on soil erosion would be negligible, in terms of water quality, fish habitat, and soil quality. In this analysis, "soil" means soil outside stream channels.

Analysis Methods

Some people believe that compaction caused by cattle decreases infiltration capacity enough that it increases runoff and erosion from soil. In order to check on how common this process is, the soil scientist visited the allotments, examining selected areas for signs of erosion and overland runoff on four days between September 10 and 20, and on November 23, 2004. The following tables (SO-1) shows the visits.

Table SO-1. Soil Examinations

Allotment	Pasture	General Area
Lower Middle Fork	Susanville	Pizer and Reynolds Meadows and nearby areas
Bear Cr.	C1, C2, G	meadows near the Middle Fork, Gibbs Mdw.
Camp Cr.	Middle	about 1/4 mile from northern fence
Upper Middle Fork	Caribou, Lower Vinegar, Deerhorn	lower Caribou Cr., lower Vinegar Cr, Placer Gulch near the road
Blue Mountain	Squaw, Upper Phipps Mdw., East Summit, Idaho	upper Phipps Meadow Summit Cr, near where it exits East Summit pasture, Idaho Cr, near the 172 road.

Sullens Allotment and the area of the Summit Fire were not visited because they have not been grazed for several years, and so effects of cattle grazing would not be visible.

At the same time, the soil scientist examined the following upland, shallow soil areas.

Table SO-2. Shallow Soil Examinations

Allotment	Pasture	General Area
Lower Middle Fork	Susanville	north of Big Creek, just east of Forest boundary
Upper Middle Fork	Lower Vinegar	near southwestern corner of pasture
Blue Mountain	Upper Phipps Mdw., East Summit,	north of the east end of Phipps Meadow

In addition, data from Condition and Trend (C&T) transects were examined for estimates of existing ground cover and moss.

Soil condition of areas outside the allotments, such as private land, do not affect soil condition within the allotments, so the allotments constitute the analysis area for soils

Existing Condition

Introduction

On forested uplands, current cattle impacts to the soil are minor because of the abundant ground cover. For instance, data from the C&T transects indicate a maximum of 7% bare ground in ponderosa pine forest (Appendix H). The majority of land in the allotments is forested (Figure 11). Two areas that cattle could detrimentally affect are non-forest, shallow upland soil, and grassy riparian areas and meadows.

Non-Forest, Shallow Soil Uplands - "Shallow Soils"

Soil Types

The Malheur Soil Resource Inventory (SRI) (Carlson 1974) is the best source of information about soils at the scale of this project. Figure 11 in the Map Section is a simplified version of the SRI for the allotments. The terms "Mostly Forest" and "Shallow ...& forest" are used to show that the polygons have complexes and inclusions of other soil types.

Shallow soils tend to occur in two environments: 1) high elevation, subalpine environments in Vinegar Hill - Indian Rock Scenic Area and on Dixie Butte, and 2) relatively low elevation, relatively dry environments with shallow, rocky soils. These include soils that support juniper woodland, as well as stands of shrubs or herbaceous plants. The most abundant low elevation shallow soils weathered to cobbly and gravelly loam from andesite, basalt, and argillite parent material. One of these loamy shallow soil areas (Caribou Cr. scablands) is described in the Vegetation/Range Specialist Report Affected Environment, Upper Middle Fork Allotment, Lower Vinegar Pasture. The second most abundant low elevation shallow soils weathered to cobbly and gravelly clay loam to clay from the volcanic breccia of the Clarno Formation. Some of these clayey shallow soil areas are described in this EIS in the Vegetation/Range Specialist Report Affected Environment, Upper Middle Fork Allotment, Butte Pasture section and the Lower Middle Fork Allotment, Sunshine Pasture section. Some shallow soils are found on serpentine parent material near the boundary between the Caribou and Upper Vinegar Pastures of the Upper Middle Fork Allotment.

Soil Erosion

The USDA Forest Service (1990) noted "Many of the adverse ... grazing impacts occurred before the Malheur became a National Forest. Early sheep and cattle grazing was particularly damaging to meadows and upland range sites, many of which were compacted and eroded." (p. III-4) Also "Early sheep and cattle grazing practices have accelerated erosion over a good portion of the range and more open timber types." (p. IV-5). These generalizations apply to the planning area. The "grazing practices" were unregulated over-grazing that severely reduced ground cover.

Some shallow soils have not recovered from the historic erosion, and still violate Forest Plan ground cover standards. They continue to erode at rates greater than prior to grazing. In places like these, plant production and resultant ground cover probably was decreased for hundreds of years. In practical terms, little can be done to accelerate recovery.

This accelerated erosion was particularly severe on the high elevation shallow soils, which were grazed by sheep. For instance, the "Vegetation/Range Specialist Report," "Affected Environment," "Lower Middle Fork" and "Upper Middle Fork Allotment" sections also describe damaged conditions for the high elevation shallow soils. Also, the USDA Forest Service (1999) says of shallow soils of the Vinegar Hill - Indian Rock Scenic Area "The 'A' soil horizon was lost following intensive sheep grazing about 100 years ago." (p. 3-13)

Low- and mid- elevation areas were also affected. For instance, C&T transects show bare ground as high as 58%, in at least small areas (Appendix H). As another instance, the "Watershed," "Affected Environment," "Hillslope Condition and Upland Watershed Processes," section of Chapter 3 of this EIS indicates early 1900s cattle grazing started erosion that still continues on some slopes just above the Middle Fork, despite the development of forest. Most, but not all, of the sediment produced by erosion from low- and mid-elevation shallow soil is deposited as it enters forested areas below. Some shallow soils show only minor signs of accelerated erosion; either they were never heavily impacted, or they have recovered. For instance, see the "Vegetation/Range Specialist Report," "Affected Environment," "Lower Middle Fork Allotment," "Sunshine Pasture," Dunstan Cr. scab section. For the C&T clusters, all areas were rated "Soil movement slight and local." However, the C&T clusters were placed on areas that produce forage, not on the least vegetated, lowest productivity shallow soils, that produce little forage and have little ground cover, and so have the greatest potential to erode.

Impacts from current grazing on uplands generally are minor. Cattle avoid shallow soils because of the lack of palatable forage in the summer and fall, the lack of water, the heat, and often the steepness. However, it is possible that cattle are keeping shallow soil bare where it is adjacent to good forage and water, as on the shallow soil area immediately north of Phipps Meadow. In addition, the USDA Forest Service (1999 p. 4-2) noted "Unauthorized grazing by cattle assigned to a Umatilla NF allotment to the north routinely graze on part of the Upper Middle Fork Allotment, retarding recovery of the steppe." ("Steppe" is a term denoting the non-forest vegetation, in this case on high elevation shallow soil.) Most of the lower elevation shallow soils do have some damage from small and large hoof prints. The large hoof prints are probably from elk, because elk are present in winter and spring, when the soil is wet and soft and when exposure to the sun is desirable. The importance of elk and deer impacts is also indicated by the severe hedging of bitterbrush. Burrowing mammals also decrease ground cover on some soils, including shallow soils, as may have happened at the Twin Ponds C&T cluster. The soil scientist found no sign of soil damage from cattle on shallow soil uplands, other than adjacent to Phipps Meadow. These observations are similar to other undocumented observations by the soil scientist on Malheur National Forest.

Biological Soil Crusts

It is unknown how much biological soil crust was present on shallow soils before the unregulated grazing. Crusts were probably less abundant in the Planning Area than in drier, hotter arid and semi-arid areas which have less plant and litter cover and less frequent fires (Belnap and coworkers 2001, pp. 14, 42). Crusts were probably less abundant in the Planning Area than in flatter areas, where the surface may be more stable (Belnap and coworkers 2001, pp. 17, 19). So it is difficult to know which, if any, reports of biological soil crusts can be extrapolated to the Planning Area.

Crusts were probably variable, and covered perhaps between 0% and 50% of the ground on various shallow soil areas. For instance, Kaltenecker and coworkers (1999) reported between 5% and 60% ground cover by moss and lichens in sagebrush communities. On the other hand, on desert sites Hansen, Ostler, & Hall (1999) found only 31 to 50 % of the stands had visible crusts. The present planning area may have had less, because it had more plant and litter cover, and more fires. In areas that may be similar to the high elevation shallow soils, Johnson (2003) found moss covered 8-9% of the surface at two sites, but no moss was found at a third site. Despite their probable relative scarcity, biological soil crusts probably contributed to erosion control.

The unregulated sheep grazing decreased the amount of biological soil crusts. Appendix H displays the amount of moss on the C&T transects. Moss was present on 43% of the "Dry Meadow" and "Edge of Forest" transects, and was greater than 10% of the surface on 24% of these transects, reaching a maximum of 25% of the surface. Recovery after unregulated grazing has not been complete, due to erosion where ground cover was reduced. In addition, in some places crusts were never abundant. For instance, on the grasslands north of Big Creek, just east of the Forest Boundary, moss cover appears to be less than 1 % during the soil scientist's examination. This low amount of crust probably results from shade and litter from the abundant grass. The existing crust is moss, with some exceptions. The Vegetation/Range Specialist Report Affected Environment, Upper Middle Fork Allotment, Butte Pasture and Caribou Pasture sections of this EIS note lichen occurrence on low elevation, shallow soil areas. Lichens occur in addition to moss at Placer Gulch. As noted above, current cattle grazing probably has little effect on shallow soils, where crusts are most important.

Meadows and Grassy Riparian Areas

Locations of the larger meadows are shown in Figure 11 in the Map Section. Grassy riparian areas broadly overlap the sensitive stream reaches shown in Figure 10 in the Map Section.

Soil Types

Soils in meadows and riparian areas are highly variable, often over distances of a few feet. In riparian areas, the parent material has been deposited from adjacent slopes by colluvial transport or from upstream by alluvial transport. In some riparian areas, volcanic ash is important. The SRI is mapped at too coarse a scale to show the variation. These soils vary from wet to dry, and from clayey to sandy. In comparison to upland soils in the area, they are usually less steep, usually with thicker, darker, more root-filled topsoil, usually with more organic matter, usually with fewer coarse fragments, and often deeper. They vary greatly in these and other properties. Stream channels in meadows and grassy riparian areas are often more erodible than other stream channels, because of the relatively few coarse fragments and greater depth. However, most of these soils are not steep, often less than 5% slope. Consequently the erodibility is low for soil outside stream channels.

Soils in upland meadows can be deep to shallow, grading into non-forest, shallow soil areas. Biological soil crusts also exist in meadows, such as Reynolds meadow and Placer Gulch. Appendix H shows the amount of moss on C&T transects in certain "dry meadows" and moist meadows.

As described in the "Watershed" section, several meadows are drier now than in the 1800s. Seasonal water tables in dried meadows probably are lower. Soil indicators of wetness, such as mottling and gray color, probably have changed or are changing, as oxygen reacts with the soil.

Soil Erosion

Cattle can reduce ground cover, but under current grazing, ground cover meets Forest Plan standards. So soil erosion is minor. For instance, working in north-eastern Oregon, Kauffman and coworkers (2002 p.20) found an average of 16% and a maximum of 36% bare ground (64% ground cover). This ground cover meets the Forest Plan ground cover standard of 40% for low erodibility soils and 60% for moderate erodibility soils. Burrowing mammals greatly decrease ground cover in some areas, usually well under an acre in size. Cattle severely decrease ground cover in small areas (for instance where they bed down in shade). Ground cover is strongly affected by soil moisture. The soil scientist's field inspection indicates that where the soil is moist, even heavily grazed areas often have 90% or more ground cover, although data from the C&T transects in moist meadows indicate bare ground can be as high as 37% (Appendix H). The soil scientist's field inspection indicates that some spots in dry parts of meadows and riparian areas have ground cover less than 40%. The high ground cover in moist or wet parts of meadows compensate for areas where burrowing mammals or concentrated cattle use decreased ground cover, so the total area meets ground cover standards. In the soil scientist's field examinations, no violations of ground cover standards by cattle grazing were seen. Even where ground cover is near the standard, erosion is limited by the small size of the bare patches, which prevents any runoff from building up an erosive velocity. For the C&T clusters, all areas were rated "Soil movement slight and local."

Cattle can compact and puddle soil, which decreases infiltration capacity. (For brevity, in the following discussion, compaction and puddling will be called "compaction.") However, compaction by cattle is light enough that weak platy structure has developed in only two of the sites examined by the soil scientist, although some sites, such as Pizer and Reynolds Meadows, were heavily grazed (1-2 inch stubble height). The places with weak platy structure are parts of upper Phipps Meadow and Idaho Creek near the 172 road. In these two places, it is possible much of the platy structure was due to old logging, instead of cattle. Because the compaction is light, infiltration capacity has not been decreased enough to produce visible sign of runoff or erosion. For instance, Kauffman and coworkers (2004) found that at the Summit Cr. cattle exclosure (Blue Mountain Allotment), cattle grazing decreased infiltration rates from 14.2 to 2.4 inches of water/hour. However, an infiltration rate 2.4 inches of water/hour is high enough to absorb water from snowmelt or thunderstorms, because they apply water to the soil at rates less than 2.4 inches of water/hour. In the soil scientist's field examinations, no signs of runoff or general soil erosion were seen. So compaction is not heavy or extensive enough to affect aquatic resources. These observations are similar to other undocumented observations by the soil scientist on these and other allotments on Malheur National Forest.

In special situations, cattle do increase soil erosion slightly. One example is near Pizer Meadow, where cattle in a road ditch increased sediment delivery to the stream, a small fraction of a cubic yard. Another example may be some small parts of wetlands, where tramping may cause some erosion, as near the mouth of Lost Creek. The amount of sediment from these special situations is probably negligible. Another example is cattle concentration (due to salting), in conjunction with road 2010-159, was and still may be contributing to erosion in an intermittent stream that flows into the Middle Fork John Day River immediately west of Vincent Creek (USDA Forest Service 1999, p. 3-13).

Miscellaneous Conditions in Meadows and Grassy Riparian Areas

Working in a few areas on private and National Forest land along the Middle Fork John Day River, Kauffman and coworkers (2004) found compaction by livestock may have increased bulk density in bluegrass meadows by 19% (from 0.84 g/cm^3 to 1.00 g/cm^3) and in wet meadows by 48% (from 0.67 g/cm^3 to 0.99 g/cm^3). These figures indicate that more than 20% of the ground in similar areas may be compacted more than the 15% increase in bulk density allowed under Forest Wide Standard 126. Although the Kauffman and coworkers study is the one most applicable to the Middle Fork Allotments, it may not be widely applicable the meadows and riparian areas in the Allotments. It may not be applicable because 1) the low bulk density for ungrazed land in that study may not be typical, 2) the scarcity of information in the report, on grazing intensity and timing, and 3) it is possible the grazed areas and ungrazed areas have different bulk densities naturally. Two of the three study sites were grazed from July 1 to September 15 most seasons, which may indicate heavier grazing than in the Middle Fork Allotments. To the extent that the Kauffman and coworkers study is applicable, it would apply to areas such as Pizer and Phipps Meadows, and small grassy pastures such as C1 and C2. The Kauffman and coworkers (2004) study indicates that, if a pasture is the "activity area" for Forest Wide Standard 126, then this Standard may or may not be violated in small, grassy, productive pastures: C1 and C2 in Bear Allotment; Middle, Gibbs Meadow, and Lower Camp Pastures in Camp Cr. Allotment, and Phipps Meadow in Blue Mountain Allotment. The project soil scientist observations in C1 and C2 are similarly equivocal: platy soil structure was not found, but grass less than 4 inches tall may indicate compaction and puddling (or simply may indicate mechanical damage). The amount of compaction is unknowable in the grassy pastures because comparable ungrazed areas are not available, and because detection of bulk density increases of 15% to 20% require expensive bulk density sampling; probing with a shovel is not sensitive enough to detect increases of this magnitude.

Compaction probably decreases plant production in relatively heavily used areas. The magnitude of this decrease has not been well studied. However, this decrease is probably smaller than the decrease caused by direct mechanical damage to plants by livestock (Greenwood & McKenzie 2001). The cumulative effect of decreased production probably is not large enough to significantly affect ecosystems.

Cattle grazing has altered nutrient cycles. Nutrients are removed from the allotments when the cattle are removed from the allotments. In addition, cattle affect decomposition and nutrient cycling because they remove nutrients from some patches where grass is consumed, and deposit these nutrients in small patches with feces and urine, which are more easily decomposed than the grass. No scientific studies exist to determine if these nutrient cycling effects are significant; in our professional judgement, these nutrient cycling effects are not significant.

Environmental Consequences

Direct and Indirect Effects

Alternative 1- No Grazing

Shallow Soils

Ground cover, productivity, and biological soil crusts would continue their slow recovery on shallow soil that were degraded by early 20th and late 19th century grazing.

Meadows and Grassy Riparian Areas

Along incised stream channels, water tables and riparian soil moisture would slowly increase (and oxygen decrease) as streams build wider flood prone zones, where flood waters recharge soil moisture. This increase would greatly accelerate where beaver build long-term dams.

Ground cover and infiltration rates would increase above current levels. Erosion of soil from outside stream channels would continue to be negligible.

Compaction would decrease back to natural levels within 8 years (Kauffman and coworkers 2004), as root growth, animal burrowing, and soil freezing loosens the soil.

Alternative 2

Shallow Soils

Effects would be similar to Alternative 1, because livestock are having negligible impacts on shallow soils.

Meadows and Grassy Riparian Areas

Effects on riparian water tables and soil moisture would be similar to Alternative 1, because livestock grazing would be conducted so as to permit near natural rate of recovery.

Ground cover would remain at about current levels. Infiltration rates would remain at about current levels, or perhaps decrease on pastures grazed earlier in the season. Compaction would remain at about current levels, or perhaps increase on pastures grazed earlier in the season. Erosion of soil from outside stream channels would continue to be negligible.

Alternative 3

Shallow Soils

Effects would be similar to Alternative 1, because livestock are having negligible impacts on shallow soils.

Meadows and Grassy Riparian Areas

Construction and reconstruction of water developments and fences would have negligible effects on soil compaction. Otherwise, effects would be similar to Alternative 2.

Cumulative Effects

All Alternatives

Cumulative effects from past and on-going activities, including past logging, and on-going recreation and ATVs, are described in the Existing Condition section.

Shallow Soils

None of the future actions described in Appendix A, Cumulative Effects, will take place on shallow soils, so no additional effects are expected.

Meadows and Grassy Riparian Areas

Water redevelopment projects and fence building projects would compact a negligible amount of soil. No other ground impacting future actions described in Appendix A will take place in meadows or grassy riparian areas, so no additional effects are expected.

Consistency With Direction and Regulations

All alternatives would be consistent with Forest Plan soil protection standards, because all the Forest-Wide Standards mentioned above under the "Regulatory Framework" section would be met.

Irreversible and Irretrievable Commitments

None of the Alternatives result in irreversible or irretrievable effects to soil.

Terrestrial Wildlife

Introduction

This section is provided as a descriptive analysis of terrestrial species and habitats described as Management Indicator Species (MIS) or Featured Species (FS) in the Malheur National Forest Land and Resource Management Plan (Forest Plan 1990), as amended, and Neotropical Migratory Birds (NTMB)s. Additional discussion is included in the Wildlife Specialist Report, which is available in the project record. Threatened, endangered, and sensitive (TES) terrestrial wildlife species effects are summarized in this section of the DEIS and analyzed in detail in the Middle Fork John Day Range Planning Analysis Terrestrial Wildlife Biological Evaluation (Appendix I).

The existing condition is described for each species, group of species, or habitat. Direct, indirect, and cumulative effects of alternatives are identified and discussed.

Regulatory Framework

The three principle laws relevant to wildlife management are the National Forest Management Act of 1976 (NFMA), the Endangered Species Act of 1973 (ESA), and the Migratory Bird Treaty Act (MBTA) of 1918. Direction relative to wildlife is as follows:

NFMA requires the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native wildlife species and conserve all listed threatened or endangered species populations (36CFR219.19).

ESA requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the US Fish and Wildlife Service if a proposed activity may affect the population or habitat of a listed species.

MBTA established an international framework for the protection and conservation of migratory birds. This Act makes it illegal, unless permitted by regulations, to "pursue, hunt, take, capture, purchase, deliver for shipment, ship, cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird . . ."

Forest Service Manual Direction provides additional guidance: identify and prescribe measures to prevent adverse modifications or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species (FSM2670.31 (6)). The Forest Service Manual directs the Regional Forester to identify sensitive species for each National Forest where species viability may be a concern.

The principle policy document relevant to wildlife management on the Forest is the 1990 Malheur National Forest Land and Resource Management Plan, referred to as the Forest Plan for the remainder of this section. The Forest Plan provides standards and guidelines for management of wildlife species and habitats. Standards and guidelines are presented at the Forest level (Forest Plan, pp. IV-26 to IV-33) or Management Area level (Forest Plan pp. IV-50, IV-53, IV-56 to IV-57, IV-95, IV-105 to IV-107, and IV-108). Management Areas include General Forest (MA-1), Rangeland (MA-2), Anadromous Riparian Area (MA-3B), Research Natural Area (MA-9), Old Growth (MA-13), Visual Corridor (MA-14) and Wildlife Emphasis Area (MA-21).

The 1995 Regional Forester's Eastside Forest Plans Amendment #2 amended Forest Plans for the National Forests in Eastern Oregon and Eastern Washington, including the Malheur National Forest. Amendment # 2 established interim wildlife standards for old growth, old growth connectivity, snags, large down logs, and northern goshawks. The Regional Forester has periodically distributed letters clarifying direction in Amendment #2 (Regional Forester, October 2, 1997; October 23, 1997; June 11, 2003).

Additional management direction is provided for migratory landbirds. Concern for declines in population trends has led to the creation of an International Partners in Flight (PIF) network and program. In 1992, an Oregon-Washington Chapter of PIF formed, with a separate Oregon subcommittee for assessing conservation needs at the state level. In 1994, the Forest Service, Region 6, signed a Memorandum of Agreement with 14 other agencies and non-agency entities to develop a program for the conservation, management, inventory, and monitoring of neotropical migratory birds. Executive Order 13186 (66 FR 3853, January 17, 2001) directs the Forest Service to consider the conservation of landbird species in the design, analysis and implementation of activities on federal lands administered by the US Forest Service.

The Forest Plan includes two Forest-wide standards for unique and sensitive habitats (Forest Plan, p. IV-31, Standards 56 and 57). Unique habitats include aspen stands, meadows, rimrock, talus slopes, cliffs, animal dens, wallows, bogs, seeps and springs. Each special habitat has at least one animal species that is highly adapted to it as a place in which to live (Thomas et al. 1979, Johnson et al. 2001). Many of these habitats are often fragile environments and little or nothing can be done to replace them. The management strategy for these habitats (except aspen) is to provide protection in the form of cover buffers to maintain the intrinsic values that make them unique. Aspen stands are to be enhanced by removing encroaching conifers and using prescribed fire to induce regeneration.

Wildlife/Habitat To Be Addressed

Effects on terrestrial wildlife will be assessed for the Planning Area, focusing on the interactions between livestock and wildlife and their habitats. Consequently, effects discussion will focus on changes to forage, hardwood and riparian habitat conditions. The existing condition is described for each species, group of species, or habitat. Direct, indirect, and cumulative effects of alternatives are identified and discussed.

Rather than addressing all wildlife species, the Forest Plan focuses on three categories of wildlife: Management Indicator Species (MIS), Featured Species (FS), and Threatened, Endangered and Sensitive (TES) species. In addition, interest has been raised for Neotropical Migratory Birds (NTMB). Categories and wildlife species are summarized below:

- ***Management Indicator Species (MIS)***

The Malheur Forest Plan, as amended, identifies 15 Management Indicator Species and their associated habitat requirements. MIS habitat requirements are presumed to represent those of a larger group of wildlife species, and act as a barometer for the health of their various habitats. Rocky Mountain elk represent big game species, primary cavity excavators (mostly woodpecker species) represent dead wood habitats, and pine marten, pileated woodpecker, and northern three-toed woodpecker represent old growth habitats. Effects to MIS species will be discussed in the Big Game, Primary Cavity Excavator Habitat – Snags and Down Wood, and Old Growth sections respectively.

- ***Featured Species (FS)***

The Malheur Forest Plan defines a featured species as a wildlife species of high public interest or demand. The featured species associated with the planning area are the pronghorn (antelope) and northern goshawk. Effects to antelope will be discussed as part of the Big Game section. Effects to northern goshawk will be discussed in the Northern Goshawk section. Although the Forest Plan does not identify the beaver as a featured species or management indicator species, some publics have raised concern over the effects that livestock grazing can have on this species. Therefore, effects to beaver will be discussed in the Beaver section.

- ***Threatened, Endangered and Sensitive (TES) Species***

An endangered species is an animal or plant species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range. A threatened species is an animal or plant species listed under the Endangered Species Act that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. A sensitive species is an animal or plant species identified by the Forest Service Regional Forester for which species viability is a concern either a) because of significant current or predicted downward trend in population numbers or density, or b) because of significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. Threatened, endangered, and sensitive (TES) terrestrial wildlife species effects are summarized in this section of the DEIS and analyzed in detail in the Middle Fork John Day Range Planning Analysis Terrestrial Wildlife Biological Evaluation (Appendix I).

- ***Landbirds including Neotropical Migratory Birds (NTMB)***

Landbirds, including neotropical migratory birds, are discussed because many species are experiencing downward population trends. Discussion can be found in the section Species of Concern – Landbirds including Neotropical Migratory Birds (NTMB).

Analysis Methods

Species presence/absence determinations were based on habitat presence, wildlife surveys, recorded wildlife sightings, observations made during reconnaissance, aerial photos, Geographical Information databases, and status/trend and source habitat trend documented for the Interior Columbia Basin. Formal wildlife surveys were not conducted for most species.

There is a high confidence level that species discussed in this document are either currently present in the area and/or their habitats are present in the area. Four sources of information: the Middle Fork John Day Watershed Analysis (USDA 1998), Galena Watershed Analysis (USDA 1999), Galena Watershed Analysis Supplement (USDA 2002), and Summit Fire Recovery Project Final Environmental Impact Statement (USDA 1997) provide the basis for much of the habitat information presented here.

Effects on habitats are discussed, with the assumption that if appropriate habitat is available for a species, then that species occupies or could occupy the habitat. This strategy is based upon science that demonstrates connections between species populations and viability and the quantity and condition of habitat at appropriate scales of analysis (Baydack et al.1998). Effects on species will be determined by assessing how alternatives affect the structure and function of vegetation relative to current and historical distributions. The Forest Vegetation section of the DEIS and the Vegetation Report defines the historical vegetation patterns and structure within the Malheur National Forest.

Some wildlife habitats require a detailed analysis and discussion to determine potential effects on a particular species. Other habitats may either not be impacted or are impacted at a level which does not influence the species or their occurrence. The level of analysis depends on the existing habitat conditions, the magnitude and intensity of the proposed actions, and the risk to the resources.

Elk habitat was evaluated using a Habitat Effectiveness Index (HEI) model (Thomas et al. 1988), marginal and satisfactory cover percentages, and open road densities. Cover and forage acres were estimated using stand exams conducted in the 1990's and extrapolated over the remainder of the Planning Area using a 2004 Most-Similar-Neighbor (MSN) analysis. Open road densities were calculated using the District access travel management database. Values were calculated at the subwatershed level and include lands on the Malheur, Umatilla and Wallowa-Whitman National Forests as well as Bureau of Land Management and private lands. Oregon Department of Wildlife (ODFW) biologists provided annual estimates of elk and deer populations, bull/cow ratios, calf/cow ratios, as well as information on big game movement and concentration areas. Field reconnaissance provided additional information on big game movement and forage use.

Old growth estimates were derived from Watershed Analyses and the Forest's Old Growth GIS coverage. The Blue Mountain and Prairie City wildlife sightings databases were reviewed for wildlife observational data. Discussion focused on the effects of livestock grazing on forest succession and old growth MIS species.

For northern goshawks, active territories were identified using the Forest's GIS Goshawk Post-Fledging and Nest coverages and the Blue Mountain and Prairie City wildlife sightings databases. Discussion focused on the effects of livestock grazing on prey habitats.

Snag and down logs estimates were derived from Watershed Analyses. The Blue Mountain and Prairie City wildlife sightings databases were reviewed for wildlife observational data. Discussion focused on the effects of livestock grazing on hardwood habitats and primary cavity excavators that use these habitats.

Landbirds, including neotropical migratory birds (NTMB), were analyzed based on high priority habitats identified in the Oregon-Washington Chapter of Partners in Flight, Northern Rocky Mountains Bird Conservation Plan (Altman 2000). While the Forest has not conducted official NTMB surveys in the Planning Area, the Oregon Breeding Bird Atlas (Adamus et al. 2001) includes observational data for this area. Much of the data for the Malheur National Forest was obtained from local biologists and ornithologists. Most NTMB species that are expected in the Planning Area were recorded within the atlas' hexagons for the area. Based on a review of the District's wildlife database and observations made during reconnaissance of the fire area, there is a high confidence level that species discussed in this report are either currently present in the area or were prior to the fire.

Unique habitats include aspens, meadows, rimrock, talus slopes, cliffs, animal dens, wallows, bogs, seeps and springs. Livestock have little to no effects on rimrock, talus slopes and cliffs as these features are essentially inaccessible to cattle; no additional analysis will be discussed. Grazing effects on the other unique habitats are discussed throughout the various wildlife sections, and are specific to the wildlife species being analyzed.

Cumulative effects were analyzed in respect to past, ongoing and foreseeable future activities listed in Appendix A. These effects were first analyzed within the context of the Planning Area. If there were no contributions to negative or positive cumulative effects at that scale, then no further analysis was conducted. If there were contributions to effects at that scale, then the analysis scale was broadened to a larger land base scale.

Assumptions for Effects Analysis

The Malheur National Forest Riparian Monitoring Strategy (Appendix D) would be used to determine condition and trend of riparian areas along sensitive stream reaches. This information would be used to recommend allowable use levels for livestock, appropriate move triggers, endpoint indicators, and long-term, site-specific objectives for riparian areas. The riparian monitoring strategy includes implementation and effectiveness monitoring with feedback to ensure that "near natural rates" of recovery as defined by PACFISH Enclosure B (Appendix G) would occur. It is realized that survey methods and analysis tools would continue to evolve during the life of this project.

Move triggers and endpoint indicators would be met in most situations. Where move triggers or endpoint indicators are not met and result in potential impacts to riparian areas, appropriate administrative actions would be taken to adjust management strategies as needed to achieve desired riparian objectives.

Livestock management strategies described above would ensure better distribution of livestock across both riparian and upland areas. Although livestock use of uplands is expected to increase, Forest Plan standards for forage utilization are expected to be met. Upland forage utilization will be monitored.

Effects of grazing would be limited to those that do not carry over to the following grazing season and would result in a "near natural rate" of recovery of both riparian and upland areas.

Sufficient forage will be retained in both riparian and uplands areas to provide for wildlife species.

Big Game Habitat

Existing Condition

Rocky Mountain elk (*Cervus elephus nelsoni*) and mule deer (*Odocoileus hemionus hemionus*) are the two primary big game species present within the Planning Area. An incidental number of white-tailed deer (*Odocoileus virginianus*) use the area. Mountain goat (*Oreamnos americanus*) and pronghorn antelope (*Antilocapra americana*) are occasional visitors to the Planning Area. The primary impacts livestock grazing can have on big game relates to 1) competition for forage, 2) displacement of deer and elk due to livestock presence and competition, 3) loss of hiding cover, particularly within riparian areas, and 4) degradation of fawning and calving habitat.

Rocky Mountain Elk were selected as a Management Indicator Species (MIS) due to their economic and social value, and their response to changes in forest cover, forage quality and open road density. As a Management Indicator Species, elk will be used in this analysis as an indicator for deer as well, unless otherwise noted. Mountain goat and antelope presence is low, and habitat is sufficiently limited; therefore, the effects to these species from livestock grazing are considered minimal and will not be discussed in any detail.

Elk and deer are considered widely distributed across the District, Forest and the Blue Mountain Region. Currently, elk numbers are high and the species are relatively well distributed. Mule deer numbers are depressed, a common element of much of the Blue Mountains, and is attributed to a variety of reasons including reduced forage, reduced security cover and increased predation. The Oregon Department of Fish and Wildlife (ODFW) is currently considering modifying Management Objectives for mule deer to better reflect land capability.

Elk and deer occupy all subwatersheds within the planning area. Deer are primarily mule deer although there are some white-tailed deer along the Middle Fork of the John Day River. Species use the Planning Area primarily in the spring, summer and fall, although animals do concentrate in the winter along the western boundary, primarily in the lower elevations around Big and Mosquito Creeks (Darren Bruning, George Keister, ODFW biologists 2005).

The Forest Plan establishes management direction for deer and elk via Forest-wide standards (pp. IV-27 to IV-32) and Management Area direction (pp. IV-69 to IV-73 and IV-131 to IV-133). The Forest Plan goal is to provide for the maintenance and enhancement of big game habitat so as to sustain elk and deer populations at levels identified by ODFW. The Planning Area is divided into summer range (123,880 acres of 67% of Planning Area), winter range (54,592 acres or 29% of the Planning Area) and wildlife emphasis areas (7,416 acres or 4% of the Planning Area). See Figure 9 in the Map Section (summer range is all but MAs 4A and 21) for boundaries. Forest Plan standards for big game vary by management area.

Summer range is predominately in mixed conifer stands above 4,600 feet in elevation, and during periods of high temperatures both deer and elk most likely utilize northern aspects and stands with high canopy closure. All fifteen subwatersheds in the Planning Area include summer range.

Winter range is primarily at lower elevations, less than 5200 feet, where forested areas are interwoven with non-forested grasslands and brush fields. Portions of eight subwatersheds are actively managed for winter range, although wintering animals appear to concentrate at lower elevations along the western boundary and beyond and may be using most of the designated winter range as transition range in the spring and fall. Management Area 4a – winter range – establishes higher management standards for cover, open road density and habitat effectiveness than standards for summer range (Forest Plan, pp. IV-69 to IV-73).

Both the Dixie Butte and Jumpoff Joe Wildlife Emphasis Areas are within the Planning Area. Much of these areas are roadless. Management Area 21 - wildlife emphasis area without scheduled timber harvest – establishes higher management standards than both summer and winter range (Forest Plan, pp. IV-131 to IV-133). Portions of five subwatersheds are managed as Wildlife Emphasis Area; management focuses on a variety of wildlife species, including deer and elk. Elk likely favor these higher elevation areas because of greater thermal cover during high summer temperatures, fewer roads, and consequently better security.

Historically, habitat for elk and deer was probably better than today because there were more open stands with native grasses and shrubs for forage, plus a good distribution of cover for thermal regulation. Roads and associated human access were much more limited and so elk and deer were not impacted by human disturbance as greatly as today.

Populations – Big game management on the Malheur National Forest is a cooperative effort between the Forest Service and the Oregon Department of Fish and Wildlife (ODFW) where the Forest Service manages habitat while ODFW manages populations. The agencies cooperate by managing big game according to pre-established Management Objectives (MOs) for each big game management unit. The Planning Area includes portions of the Northwest Beulah, Desolation, Northside and Sumpter Big Game Management Units. ODFW provided Management Objectives for elk populations, bull to cow ratios, and calf to cow ratios by Management Unit. Table 1 of the Wildlife Specialist Report displays annual estimates from 1995 to 2004, although earlier data was also reviewed.

Data indicates (Table 1 in the Wildlife Specialist Report) that wintering elk populations have generally met population MOs except for 2004. ODFW Biologists Darren Bruning and George Keister (personal communication, 2004 and 2005) stated that although 2004 animal numbers fell below MOs in Desolation and Sumpter, the lower values are considered insignificant and adjustments in hunting permits in future years is expected to bring the population back up quickly. In Northwest Beulah, the 2004 population decline was more dramatic; however, Darren Bruning suspects the estimate is overly conservative and attributes any real reduction primarily to hunting pressure (ODFW Biologist 2005).

Bull to cow ratios have generally exceeded MOs in the Northside and Sumpter Management Units and dropped below MOs in the Beulah and Desolation Management Units. As bull/cow ratios decline below 10 bulls/100 cows, breeding dynamics within a herd also change, and there can be a corresponding reduction in cow/calf ratios (ODFW 2003). Bull to cow ratios are influenced by a number of factors including numbers of hunters, length of hunting seasons, including the rutting period in the hunting season, lack of restrictions of antler class in harvest, lack of hiding cover, and high open road densities (Wisdom and Thomas 1996, Irwin et al 1994, Schommer and Johnson 2003).

Calf recruitment is the number of sub-adult animals added to the population each year. Recruitment levels are expressed as the number of calves per 100 cows. ODFW does not establish MOs for calf to cow ratios because the level of recruitment necessary for population maintenance varies annually depending on the rate of adult mortality. The average number of calves needed to sustain elk populations ranges between 20 to 40 calves per 100 cows, depending on the annual adult mortality. Since the 1960's, there has been a general decline in calf to cow ratios in many of the Management Units in eastern Oregon. Several ODFW biologists feel predation by bears, cougars, and coyotes is the main reason for poor calf survival (Communication with Darren Bruning and George Keister 2004). Another factor affecting the low calf survival may be the lack of hiding cover especially in riparian areas which contributes to increased predation. ODFW is currently conducting a three-year study in the northern Blue Mountains to investigate the potential causes of calf mortality.

Big Game Habitat – The Malheur National Forest defines elk and deer habitat by four broad categories based on vegetative conditions: satisfactory cover, marginal cover, hiding cover, and forage. These categories, as listed, generally reflect the gradation of forests from a late structural stage to an early structural stage. A mosaic of cover and forage areas with adequate water is preferred. Definitions follow:

Satisfactory cover is a stand of coniferous trees 40 or more feet tall with an average canopy closure equal to or more than 50% for ponderosa pine and 60% for mixed conifer. Satisfactory cover must be at least 10 acres in size and 600 feet wide, and must be comprised of at least two layers. Satisfactory cover is considered superior to marginal cover.

Marginal cover is a stand of coniferous trees 10 or more feet tall with an average canopy closure equal to or more than 40%. As with satisfactory cover, marginal cover must be at least 10 acres in size and 600 feet wide. Marginal cover and satisfactory cover are also sometimes referred to as thermal cover. Deer and elk use this thermal cover to moderate harsh weather conditions. Under thermal cover, animals need to expend less energy for thermal regulation, i.e., to keep cooler on hot days and to keep warmer on cold days. Often, but not always, thermal cover also provides hiding cover.

Hiding cover, also referred to as security cover, is vegetative cover that hides at least 90 percent of an adult elk at 200 feet. Hiding cover provides a visual barrier between big game animals and potential predators or sources of disturbance, and is especially important during hunting season when big game alter their travel patterns to avoid humans.

Forage consists of all woody and non-woody plants that are available to livestock or wildlife as a food source. Browsing refers to foraging on woody plants, typically hardwood shrubs or trees. In general, deer prefer browse forage such as shrubs and forbs while elk prefer forage dominated by grasses.

Cover – Cover comprises 69 percent of the Planning Area with 30 percent in satisfactory cover and 39 percent in marginal cover. Cover analysis for the Planning Area included stands 10 acres and greater. Forest Pan standard #31 directs that stands of this size can be used in winter range and elsewhere if they are providing effective use by big game. Cover is fairly well distributed throughout the Planning Area, with the exception of the 1994 Indian Rock Fire (2,500 acres), the 1994 Reed Fire (2,300 acres) 1996 Summit Fire (30,000 acres), and 2002 Easy Fire (3,500 acres) where cover was reduced to almost nothing in areas that burned intensely.

Hiding cover is plentiful, although difficult to quantify. Many stands classified as satisfactory or marginal cover provide hiding or security cover. Even in non-thermal cover stands, small thickets of saplings/seedlings 1 to 2 acres in size can offer security. Generally, hiding cover is more prevalent in the Moist Forest types at the higher elevations and less prevalent in the Dry Forest types at lower elevations. In recent years, commercial thinning, precommercial thinning, and prescribed burning in the Dry Forest types have shifted stands back to more historic conditions, reducing hiding cover. Much of the Dry Forest type is in relatively gentle terrain with higher road densities, further reducing the value of these areas for elk security cover. In addition, this topography and infrastructure make these areas more conducive to livestock grazing, potentially increasing competition between livestock and big game populations.

Forage – Forage and grassland habitat comprise approximately 31% of the Planning Area. For purposes of this analysis, forage areas include areas ranging from grasslands to forested stands with less than 40 percent canopy cover. Forage also generally applies to upland and riparian shrubs, particularly with respect to wintering deer. Shrubs such as sagebrush, mountain mahogany, bitterbrush, huckleberry, snowberry, serviceberry, elderberry and scouler's willow occur in the uplands. In the riparian areas, shrubs tend to include alder, dogwood, willow, mountain maple, and chokecherry. Cottonwood and aspen are also favored browse species, although these species are very limited on the landscape.

Growing conditions for forage plants are less favorable on many sites compared to historical conditions. This is largely a result of fire suppression, which allowed conifers to increase and shade out understory grass and shrubs. Also, fire no longer acts as a rejuvenating agent, which invigorates many shrub and grass species and is vital for some species, such as ceanothus. Aspen and cottonwood stands are very limited, in poor condition and continuing to decline. Grazing and browsing pressure by big game and livestock has been high. Field reconnaissance indicates that hardwood shrubs and trees are getting heavily browsed in some localized areas even in the absence of domestic livestock. See the Vegetation and Rangeland Resources Section for information on hardwood shrub and tree condition.

In the Summit, Indian Rock and Reed Fire areas, grass seeding immediately after the fires increased forage dramatically as grass and shrubs responded favorably to the newly open stand conditions. These burn areas now classify as transitory rangeland with high quality and high quantity forage for both wild and domestic ungulates. ODFW biologists suspect that the large increase in forage from fires have helped sustain elk populations in the Northside and Desolation Management Units whereas elk populations in many other management units in Oregon have decreased in recent years (communication with ODFW biologists Darren Bruning and George Keister 2004). The Easy Fire burned in 2002, and new growth is still emerging post-fire, but forage is expected to increase rapidly over the next several years in response to the changed growing conditions.

Forage competition between big game and livestock is often of greater concern in winter range or transition range. Transition range is typically used in the late fall and early spring as migratory elk move between summer and winter ranges. Aerial surveys completed by ODFW have indicated most of the winter range in the Planning Area is being used as transition range (communication with Darren Bruning 2005). Wintering animals appear to concentrate at lower elevations along the western boundary and beyond. Within the Planning Area, wintering animals appear to concentrate primarily in the areas surrounding Big and Mosquito Creeks. Downstream of the Planning Area, wintering elk are using private land disproportionately to Forest Service lands. This trend is common in much of the Blue Mountains. There is a desire to improve habitats on National Forest lands to shift elk use off the private lands.

In the Planning Area, recent timber harvest and prescribed burning in the Dry Forest types has helped increase upland forage quality and quantity, but recent timber management is still occurring at a much lower rate compared to management in the 1980's. As described in the Vegetation and Rangeland Resources Section, vegetation in the lower elevation lands is improving, but localized areas of concern still remain, particularly in regards the shrub component. If adequate forage on National Forest lands is not maintained or enhanced, it is expected that winter use will remain concentrated in Big Creek and Mosquito Creek areas and on the public and private lands further downstream.

In Management Area 4a (Winter Range) and Management Area 21 (Wildlife Emphasis Area), forage utilization is to be managed between livestock and big game in favor of big game based on levels derived in consultation with ODFW (Forest Plan, p. IV-71, #13). Big game forage needs are to be considered in the late fall when preparing or updating allotment management plans and when considering seasonal extensions of livestock grazing (Forest Plan, p. IV-71, #13). Although ODFW biologists stated that recent livestock grazing has generated few conflicts with elk, they would be concerned if future livestock grazing frequently failed to meet standards for forage and shrub utilization (communication with ODFW biologists Darren Bruning and George Keister 2004). The Vegetation and Rangeland Resources Section describes our variable success in meeting standards in the past.

Cover/Forage Ratio – Due to past timber harvest and fragmentation, cover and forage patches are interspersed and distributed across the landscape. Specific movement patterns of animals can only be conjectured, but current vegetative conditions provide north-south and east-west corridors to facilitate daily and seasonal movements. Connectivity is provided in areas where stand density is moderate to high; however, breaks in connective corridors occur in some areas as the result of past timber harvest, fire, insect and disease outbreaks, and natural openings.

Optimal forage to cover ratio is considered to be 60/40. The current forage to cover ratio is 31/69, again suggesting that forage may be a limiting factor in habitat effectiveness.

Calving/Fawning Habitat – Optimum calving and fawning habitat includes a combination of thermal cover, hiding cover, and quality forage located in close proximity to water (USDA, 1979). Habitat is provided primarily within riparian areas where high quality succulent vegetation and water are readily available. Hardwood shrubs, thickets of conifer saplings and seedlings, and down logs provide hiding/security cover. Typically calving and fawning habitat is located in spring/fall range where slopes are gentle – usually less than 15% - and is often located on benches in steep topography (USDA, 1979).

In the Planning Area, untreated, riparian areas at mid-elevations probably provide some of the best calving and fawning habitat, at least where open roads have not been constructed directly in the riparian areas. Typically conifer and hardwood stocking are higher and stand structure more complex than in adjacent upland areas where trees have often been thinned. Although hardwood shrubs are generally in an upward trend, it is suspected that species composition, distribution and vigor are lower than potential throughout much of the watershed. In some areas, hardwood shrubs and trees are old and decadent and not reproducing well. A stated previously, fire suppression, conifer encroachment, stream channel and floodplain modification, and big game and livestock browsing continue to limit recovery of hardwoods to their historic highs.

Hardwood vegetation could be increased along many stream reaches: Butte Creek, Caribou Creek, Davis Creek, Deadcow Gulch, Dearhorn Creek, Flat Creek, Granite Boulder Creek, Little Butte Creek, Little Boulder Creek, Murdock Creek, Placer Gulch, Tincup Creek, Vincent Creek, Vinegar Creek and Windlass Creek. The presence of roads in riparian areas may reduce the effectiveness of calving and fawning habitat, not only because roads convert habitat to non-habitat, but also because road traffic during the spring and early summer may disturb animals and their young.

Disturbance – Deer, and especially elk, are quite vulnerable to human disturbance. Open road densities and the corresponding human disturbance play a key role in determining whether elk will remain in an area (Leptich and Zager 1991). Scientific research shows that higher open road densities reduce deer and elk habitat effectiveness (Thomas 1979). Roads open to motorized traffic allow people easy access to big game habitat. Motor vehicles and associated human activities can stress big game animals, causing them to avoid use of available habitat and unnecessarily expend energy. Researchers have reported decreased use of areas within ½ mile of roads. This can lead to poor distribution of animals within available habitat. Easy access on forest roads also leads to reduced deer and elk escapement during hunting seasons and facilitates illegal taking of game animals. Road closures can be used to reduce access and consequently, the potential for disturbance.

The Forest Plan states that open road densities will generally not exceed 3.2 miles of road per square mile in summer range, 2.2 miles per square mile for winter range , and 1.5 miles per square mile for wildlife emphasis areas. Summer range comprises approximately 72% of the analysis area and has an existing open road density of 2.8 miles per square mile. Winter range comprises 25% of the analysis area and has an open road density of 3.0 miles per square mile. Wildlife emphasis area comprises 3% of the area and has an open road density of 0.36 miles per square mile. Including all Management Areas, the open road density in the Planning Area is 2.8 miles per square mile. At the landscape scale, only the winter range fails to meet Forest Plan standards; high open road density may be limiting use of this habitat in some areas.

Security areas are defined as those blocks of cover that are at least 0.5 miles from an open road and are at least 250 acres in size (Hillis et al. 1991). Although security areas are scattered throughout the entire Planning Area, most areas are associated with the Wildlife Emphasis areas at higher elevations.

Habitat Effectiveness Index – Habitat Effectiveness Index (HEI) for elk is a measure of the interspersion and juxtaposition of critical habitat attributes (Thomas et al 1988). The model essentially evaluates the habitat components described previously. HEI incorporates four variables or indices: cover quality (HEc), size and spacing of cover (HEs), density of roads traveled by vehicles (HEr), and quality and quantity of forage (HEf). Values range from 0 to 1.0, with higher values being more beneficial to elk. The Malheur Forest Plan establishes minimum standards for these indices. Quality and quantity of forage are difficult to estimate and as stated previously, believed to be below potential; therefore, the HEI model may not reflect forage condition as well as the other indices.

The Forest Plan also identifies minimum standards for retention of satisfactory cover (%S), marginal cover (%M), and total cover (%S+M). The Forest Plan also establishes standards for open road density. These standards vary by summer range, winter range and wildlife emphasis areas.

Table 2 in the Wildlife Specialist Report displays existing HEI values, cover percentages and open road densities for summer range, winter range and wildlife emphasis area. The following section summarizes the data.

Summer Range - In summer range, HEI values meet or exceed Forest Plan standards in all subwatersheds, except in the Big Boulder Creek subwatershed. In Big Boulder Creek, total cover exceeds Forest Plan standards, as does marginal cover (%M), but satisfactory cover (%S) is below standards This deficiency in cover is of minimal concern given the overall abundance of cover in the subwatershed.

Forest Plan standards require a maximum of 3.2 miles of open road per square mile. The Bridge Creek, Clear Creek, Dry Fork, Lower Camp Creek, and Squaw Creek subwatersheds exceed open road density standards for summer range, degrading habitat effectiveness for deer and elk. Four of five of these subwatersheds overlap with the Sullens Allotment. Displacement of elk and deer may reduce concerns of competition between big game and livestock for forage, but it also may concentrate big game elsewhere. The ten remaining subwatersheds meet the road density standard.

Winter Range – In winter range, HEI values meet or exceed Forest Plan standards in all subwatersheds except in the Big Boulder Creek subwatershed. In Big Boulder Creek, total cover exceeds Forest Plan standards, as does marginal cover (%M), but satisfactory cover (%S) is below standards As with summer range, this deficiency in cover is of minimal concern given the overall abundance of cover in the subwatershed.

Forest Plan standards require 2.2 miles of open road per square mile. Seven of eight subwatersheds in winter range do not meet Forest Plan standards for open road density: Big Boulder, Coyote/Balance Creek, Granite/Boulder Creek, Lick Creek, Little Boulder/Deerhorn, Lower Camp Creek, and Mosquito Creek/Bear Creek subwatersheds. The HEI model suggests that cover quality and cover/forage distribution is sufficient to mitigate some of the negative effects of high open road densities.

Wildlife Emphasis Areas- In the Dixie Butte and Jump Off Joe Wildlife Emphasis Areas, overall HEI values do not meet standards in all subwatersheds. The HEI model may not be compatible with managing these landscapes for Historic Range of Variability (HRV) or for species that require large blocks of unfragmented habitat; rather, the model assumes that an ideal landscape is one fragmented by a checkerboard pattern of cover and forage stands.

In Dixie Butte, large, unfragmented blocks of cover habitat have resulted in low cover spacing (HEs) values. The Dixie Butte area is in high elevation, cold and moist forests. A natural fire regime of low frequency/high intensity fires allows for the development of large, contiguous blocks of cover habitat, exactly the condition of the area today. Eventually, a stand replacement wildfire may convert large areas to forage habitat, but even in this situation HEs values would remain low unless such a fire burns in a mosaic of burned and unburned patches. This is the scenario that occurred in Jump Off Joe; in much of the 1996 Summit Fire area, the fire burned severely over large areas rather than in the desired mosaic of burned and unburned patches.

Although current conditions may not provide the ideal distribution of cover and forage, deer and elk use of the Dixie Butte Wildlife Emphasis Area may still be high during the summer due to cooler temperatures and higher stand densities that afford decreased human access and increased big game security. Despite the Summit Fire, the Jump Off Joe Wildlife Emphasis Area provides prime calving and fawning areas due to the natural meadows and streams, combined with lodgeploe thickets and open ridge tops.

The open road density standard for this management area is 1.5 miles per square mile. This standard is met in all subwatersheds except the Mosquito Creek/Bear Creek subwatershed, i.e., the Jump Off Joe Area. Values are skewed here by the small number of MA-21 acres (76 acres) in the subwatershed. If open road densities were calculated for the entire Jump Off Joe Wildlife Emphasis Area independent of subwatershed boundaries, the open road density standard would be met.

Because competition for forage is of greater concern in big game winter range, discussion will focus on this management area. Table WI-1 displays by pasture the amount of area allocated to winter range and the distribution of forested and forage areas. Pastures that contain a good mix of forage and forested area and a high proportion of allocated winter range are particularly important for elk.

Table WI-1: Area allocated to Management Areas 4a (Winter Range) and Acres of Forage and Forestland by Pasture.

Allotment	Pasture	Pasture Area (acres)	MA-4a (acres)	% in MA-4a	Cover Area (acres)	Forage Area (acres)
Austin	Austin	670	0	0%	0	0
Bear Creek	Antler (A)	118	118	100%	73	45
	Bear (B1)	12	12	100%	9	3
	Bend (B)	54	54	100%	13	41
	Cole (C1)	40	40	100%	2	38
	Corral (C2)	63	63	100%	3	60
	Def (D)	172	172	100%	134	38
	Gibbs (G)	323	323	100%	35	288
	Hill (EF)	299	299	100%	144	155
	Horse Pasture (H)	450	450	100%	113	337
Blue Mountain	Crawford	8,426	0	0%	0	0
	East Summit	1,196	0	0%	0	0
	Idaho Creek	10,360	0	0%	0	0
	Squaw Creek	124	0	0%	0	0
	Upper Phipps Mdw	100	0	0%	0	0
	West Summit	2,320	0	0%	0	0
Camp Creek	Campground	40	40	100%	20	20
	Gibbs Meadow	56	56	100%	13	43
	Lower Camp	90	90	100%	3	87
	Middle	46	46	100%	0	62
	North	99	99	100%	56	43
	Road	124	124	100%	51	73
	Upper Camp	338	338	100%	240	98
Elk	Elk	210	0	0%	0	0
Lower MiddleFork	Balance	2,033	0	0%	1,077	956
	Big Boulder	13,449	4,362	32%	1,540	2,822
	Chicken House	728	728	100%	378	350
	Coyote	5,103	3,781	74%	9530	2,828
	Deadwood	8,501	1,594	19%	1,071	523
	Granite Boulder	9,341	2,449	26%	1,007	1,442
	Pizer	9,037	4,228	46%	2,863	1,365
	Sunshine	4,574	3,182	70%	2,144	1,037
	Susanville	6,307	5,002	79%	2,870	2,132

Allotment	Pasture	Pasture Area (acres)	MA-4a (acres)	% in MA-4a	Cover Area (acres)	Forage Area (acres)
Upper Middle Fork	Austin	670	0	0%	0	0
	Blackeye	666	0	0%	0	0
	Butte	13,328	4,151	31%	2,806	1,345
	Caribou	9,593	4,035	42%	2,106	1,928
	Deerhorn	13,854	0	0%	0	0
	Lower Vinegar	7,002	0	0%	0	0
	River	111	4	4%	1	3
	Shop	313	58	19%	5	53
	Tailings	47	0	0%	0	0
	Upper Vinegar	5,555	0	0%	0	0
Sullens	Bridge Creek	26,116	0	0%	0	0
	Highway	3,061	0	0%	0	0
	Savage	16,790	0	0%	0	0
	Squaw Meadows	98	0	0%	0	0
	26 Unit	563	0	0%	0	0
Administrative Use Pastures	Bear Creek	300	300	100%	150	150
	Blue Mountain	30	0	0%	0	0
	Sunshine	150	150	100%	100	50

Environmental Consequences

The following effects discussion describes the direct and indirect effects of livestock grazing on forage habitat, hiding and security cover, calving and fawning habitat, and deer and elk disturbance. The HEI model was not rerun for the action alternatives because no changes in satisfactory and marginal cover percentages or open road densities would be expected. Livestock have minimal effects on forested canopy closure and no effects on open road densities; therefore, effects to these habitat components will not be discussed in detail. Alternatives could effect forage quality and quantity, but existing data is not refined enough for the HEI model to adequately display differences. Changes in forage will be discussed qualitatively. Cumulative effects are discussed in the context of this project when combined with other past, present and reasonably, foreseeable future activities.

Direct and Indirect Effects

Alternative 1 – No Grazing

In the absence of livestock grazing, vegetation would be expected to recover at a natural rate. Forage plants would increase. Elk and cattle have a high overlap of preference for the same forage; without cattle there would be more available forage for elk, deer, and other wildlife species. Previous livestock grazing and fire suppression have both been important factors for increased canopy closure in parts of this Planning Area and has likely reduced the quantity and quality of available forage within these habitats. Removing livestock would partially offset this reduction in forage.

This alternative would increase fine fuels from grasses and forbs; wildfires and prescribed burns would carry through more of the area affected. Fire can improve both forage quantity and quality although increased quality from any single fire event often lasts only 1 to 3 years. In the long-term, restoring historic, high frequency fire regimes would be beneficial to forage.

Removing livestock can have negative effects on forage quality. Studies have confirmed that grazing by domestic livestock can provide a positive contribution to range management for elk if properly planned (Lyon and Christensen 2002, Anderson and Scherzinger 1974). Even though forage would increase in the short-term (approximately 5 years), forage palatability and eventually quality may decline without livestock grazing, at least in the absence of other management activities or natural events that can enhance forage quality.

Without livestock grazing, available hiding cover, especially in riparian areas, would be expected to improve. Over the next 5 to 20 years, restoration and maintenance of healthy vegetation in riparian areas, particularly the hardwood components, would provide improved browse and forage for big game as well as hiding cover and calving/fawning habitat. This alternative would reduce grazing, browsing and trampling in unique habitats, improving habitat conditions in meadows, aspens stands, seeps, springs and wallows, to the benefit of deer and elk as well as other species that use these habitats. No grazing of livestock would reduce one of the vectors for introducing and spreading noxious weeds and other exotic invasive species that can displace native forage species.

Without livestock grazing, activities such as salting, moving livestock between pastures, and moving livestock off forest would not occur. This could reduce road travel and reduce human harassment to elk, although livestock management contributes only a small portion of the total vehicle traffic that occurs in the area. This alternative would not change the HEI value or forage to cover ratios as they currently exist.

By improving forage, hiding cover, and calving/fawning habitat, the no action alternative could improve big game distribution or even increase populations, although other factors such as weather, wildfires, hunting, open road densities, hiding cover, and predation would factor into survival.

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Livestock management strategies in Alternatives 2 and 3 would be adjusted annually to ensure herbaceous and shrub utilization standards in the Forest Plan are met. Appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery. Proposed management strategies would promote better utilization of upland sites and decrease pressure in riparian areas. Better livestock distribution would help move vegetation towards desired conditions.

Occasionally, utilization standards may not be met in some locations; therefore, distinguishing one difference between a near natural rate of recovery under the action alternatives as compared to a natural rate of recovery under the no action alternative. The Forest would use the adaptive management strategy to respond quickly to situations where we do not meet standards.

Livestock grazing can have both negative and positive effects on forage for elk depending upon season, duration, and intensity of use (Thomas et al 1988, Toweill and Thomas 2002). Elk and cattle often make similar dietary choices; as a result, there is high dietary overlap (Wisdom and Thomas 1996).

Elk and cattle often distribute themselves spatially in a manner that minimizes competition and that may or may not restrict their grazing choices (Wisdom and Thomas 1996). Elk may respond to cattle grazing by moving into areas that cattle have not entered (Leege 1984, Wisdom and Thomas 1996). Depending on the time of year, elk will often move into a pasture shortly after the livestock leave, in order to take advantage of the succulent regrowth of vegetation, (Krausman 1996, Toweill and Thomas 2002).

Potential for competition is highest on winter and spring-fall ranges where either forage quantity or quality is limited and both ungulates share compressed habitats at low elevations. On high elevation, summer range, potential for competition increases during late summer and fall, especially in drought years (Wisdom and Thomas 1996). Competition can be high at a given time and place during one year and low or nonexistent in the same place and time in subsequent years (Wisdom and Thomas 1996).

In the Planning Area, forage competition is of greatest concern in designated winter range. Here, forage availability is best evaluated around October 1. To allow ample forage for elk through the winter, approximately 50 to 60 percent of the plant material of these key species should be available on October 1 (Schommer 2003, Wisdom 2003, Thomas et al 1988, Henjum 2003). If livestock grazing lowers forage availability below this, winter forage resources could be degraded, and elk could move to other areas including private lands, or in extreme cases die-off could occur. South exposures and windswept ridges provide a major portion of winter forage consumed by elk and deer. Forage inside forested stands is also important to elk where deep snow covers many of the open areas (Thomas et al 1988).

Current utilization standards for elk winter range are prescribed by the Forest Plan, which requires retention of at least 55 to 65 percent of the residual plant material in forested areas and 45 to 50 percent in grasslands. Proposed livestock management strategies under Alternatives 2 and 3 have been developed to ensure that these utilizations standards are met in most situations. ODFW biologists do not believe that current grazing systems are limiting the availability of forage for over-wintering big game (communication with ODFW biologists Darren Bruning and George Keister 2004). Implementation of grazing systems under Alternative 2 or 3 would maintain the current balance of forage between livestock and elk use. As directed by the Forest Plan, livestock use in designated winter range would be monitored and adjusted to ensure that conflicts with big game do not arise. Monitoring points would be established to measure residual plant material before fall grazing concludes.

Early summer grazing by livestock could improve elk forage over the winter period by removing decadent growth and allowing succulent new growth to occur. Numerous studies have demonstrated that using livestock grazing to remove dead herbate to prevent formation of wolf plants will improve the quality of forage regrowth (Thomas et al 1988). These benefits are noted, provided livestock grazing is not repeated at the same time every year to the point that range condition is compromised (Anderson et al 1990, Krausman 1996, Cook 2002).

Competition between elk and cattle for forage resources also has the potential to occur in riparian areas. Cattle have grass-dominated diets but will consume forbs and shrubs if green grass is unavailable or has cured and thus provides less available protein. Research indicates that cattle preference for forage will shift as stubble heights drop below 3 inches. When stubble height reaches 3 inches, it is too short to be pulled in by the tongue of cattle. At this time cattle will shift to more quickly eaten and less palatable forage. The forage preference will also change as vegetation dries. Even if stubble height is greater than 3 inches, their preference may shift to shrubs if grasses are drying and loosing protein value (Halls and Bryant 1995).

When other factors do not limit grazing distribution, distance from drinking water ultimately controls the limit of vegetation utilization. Cattle often heavily graze forage plants near water rather than traveling moderate to long distances to better forage. This pattern results in deterioration of forage resources near the water supply and under-utilization of forage at long distances from water. Elk use of riparian vegetation also increases in the late summer due to palatability and quality of forage available (Coe et al. 2001). Elk and cattle both select some of the same resources during that period (Coe et al. 2001, Krausman 1996, Leege 1984, Toweill and Thomas 2002). At stubble heights below 3 inches and particularly at ¾ inch, livestock and elk together can quickly cause damage to the riparian ecosystem, often within a few days (Hall and Bryant 1995).

In some areas, palatable shrubs have been overused by over-wintering deer and/or livestock to the point that shrubs have an evident browse line and regeneration is being inhibited. Aspen and cottonwood regeneration is also often browsed. Livestock management strategies in Alternatives 2 and 3 would ensure hardwood utilization standards are met and that succession and development of hardwood shrubs and trees would continue at a near natural rate of recovery. Monitoring would be used to validate assumptions on vegetation recovery. Restoration and maintenance of healthy vegetation in riparian areas would provide improved browse and forage for big game as well as hiding cover and calving/fawning habitat.

Livestock grazing could potentially impact conditions in unique habitats such as meadows, aspens stands, seeps, springs and wallows. Impacts from browsing, grazing and trampling has impacted some of these areas by loss of seedlings, compaction of soil, introduction of noxious weeds, and changing of grasses and hardwoods from climax to seral communities. Some habitats are fenced to reduce impacts, but others are still accessible. Again, maintaining a near natural rate of vegetation recovery would be expected to minimize impacts to these habitats.

One of the historic impacts from grazing is the perpetuation of noxious weeds and other exotic invasive species. Livestock grazing increases opportunities for the establishment and spread of exotic species through moving, feeding, and trailing. Where trampling of the soil crust churns the soil, weed seeds are better able to establish (Irwin et al 1994, Belsky and Blumenthal 1997, Sallabanks 2001, Vander Haegen 2001). Refer to the noxious weed section of the analysis for further discussion of the effects of livestock grazing on weed spread. Prevention strategies would be used to limit the invasion and spread of noxious weeds. Within the Planning Area, noxious weed presence consists of isolated populations that are under a treatment strategy. Generally, noxious weed populations are currently not limiting the availability of big game forage.

Livestock management requires activities such as construction and maintenance of fence and water developments, salting, riding, and moving livestock between public and private lands or between allotment pastures. Many activities require road use as well as off-road use by ATV. Such activities can increase potential disturbance to elk, and alter movement and distribution. Disturbance from such activities would be considered minimal given the other uses of public lands, particularly by hunters.

Under Alternatives 2 and 3, vegetation would continue to recover at near natural rates. Overall improvements to range condition would be anticipated, and as a result, these improvements would be beneficial to deer and elk. Under Alternative 3, fence and water development improvements coupled with new pasture design would be expected to make it easier for permittees to meet Forest Plan standards with less herding.

Cumulative Effects

All Alternatives

Big game habitat has been affected by a variety of management activities and conditions including livestock grazing, timber management, hardwood planting, prescribed burning, wildfires and drought. All of the activities in Appendix A (Cumulative Effects) have been considered for their cumulative effects on big game habitat and elk and deer distribution.

The existing condition section of this report describes the conditions of cover, forage and open road density, and their effects on habitat effectiveness for big game. Habitat values reflect the effects of past management activities as well as natural events such as wildfire. Most of the Planning Area is well above Forest Plan standards for big game cover; however, open road densities are high in many locations, particularly in winter range, potentially affecting deer and elk distribution.

Growing conditions for forage plants are less favorable on many sites compared to historical conditions. This is largely a result of fire suppression, which allowed conifers to increase and shade out understory grass and shrubs. Recent timber harvest has helped increase upland forage quality and quantity, but timber management has declined from historic peaks in the 1980’s. In the existing condition section, big game cover values reflect the effects of past timber management activities. The Crawford Vegetation Management and Balance Thinning Projects are projected to harvest an additional 4,100 acres, reducing canopy cover and increasing forage. Although timber harvest can increase forage, it can also reduce hiding cover. In the Planning Area, hiding cover may be a critical habitat component for deer and elk, particularly in the Dry Forest types that overlap with winter range and where open road densities are high. New timber harvest and prescribed burning projects are being designed to retain a portion of the existing hiding cover.

Fires suppression has reduced the availability of fire as a rejuvenating agent, which invigorates many shrub and grass species and is vital for some species. Since 1985, prescribed burning in the Planning Area has begun to address this concern. Prescribed burning has occurred on about 15,000 acres, reducing understory tree stocking and improving forage. In the near future, about 9,500 acres would be burned under the Crawford Vegetation Management Project and an additional 1,200 acres would be burned under the Balance Thinning and Fuels Reduction Project. These projects are also reducing the potential for the extent and intensity of wildfires.

While prescribed burning projects are focused on timber stands, they do burn intervening grasslands. Prescribed burning often improves forage and dietary quality, although these effects typically are short-lived (Cook 2002, Leege 1968, Leege and Hickey 1971). Other studies have shown no increase in forage use, and fire may damage Idaho fescue if burned too hot or burned at the wrong time of the year (Skovlin et al 1983). Idaho fescue is one of the species preferred by elk. Other studies have shown that burning can increase the protein content of grasses. Plants tend to sprout vigorously from their roots if the above ground portions are killed by fire, although it might take 2 to 3 years for grass and forb species and 10 to 15 years for shrubs to return to their pre-fire abundance and volume. Recovery of understroy vegetation tends to be more rapid in grasslands and longer in forestlands. The difficulty with prescribed fires that are conducted at such small scales is that benefits to elk tend to be spatially and temporally limited. The area need to be burned to produce or sustain population effects increases with the size of the big game population and the density of the herd (Cook 2002).

Large-scale wildfires have the potential to alter cover patches so they no longer provide security for elk seeking to avoid humans or predators. The precise effects of future wildfires would depend upon the magnitude, duration, and intensity of those fires. Within the Planning Area, forested and non-forested areas are interspersed throughout. Wildfires may encourage better quality forage for big game, but may reduce hiding cover.

This is exactly what happened in the Summit, Indian Rock and Reed Fire areas. Cover was reduced, but forage has increased. Grass seeding immediately after the fires increased forage dramatically as grass and shrubs responded favorably to the newly open stand conditions. These burn areas now classify as transitory rangeland with high quality and high quantity forage for both wild and domestic ungulates. ODFW biologists suspect that the large increase in forage from fires have helped sustain elk populations in the Northside and Desolation Management Units whereas elk populations in many other management units in Oregon have decreased in recent years (communication with ODFW biologists Darren Bruning and George Keister 2004). The Easy Fire burned in 2002, and new growth is still emerging post-fire, but forage is expected to increase rapidly over the next several years in response to the changed growing conditions. Recent loss of cover from the wildfires may not be a great concern, given the current forage to cover ratio of 31/69.

Under the Forest's Post-fire Grazing Guidelines, livestock grazing would be delayed at least two years post-burn to allow for recovery of ground cover, regardless of whether a fire is the result of prescribed burning or wildfire. When livestock grazing is re-initiated, grazing would be managed to meet Forest Plan and Interagency Implementation Team (IIT) standards as well. Grazing standards have been established at levels to provide sufficient forage to support both wild and domestic ungulate use.

Recent hardwood planting on about 25 miles of streams will increase shrubs in riparian areas, likely improving big game browse, hiding cover, and calving/fawning habitat over the next 5 to 15 years. Past aspen fencing projects in Summit and proposed aspen fencing in Blue will also help maintain habitats that are favored by big game. These restoration activities may still have limited benefits, given the other large scale changes that have occurred to forage habitat.

Ongoing and planned management activities on adjacent National Forests are similar to those occurring on the Malheur; effects would be similar. On adjacent Tribal and private lands, hardwood planting, riparian fencing, and improved grazing systems have all contributed to improved forage conditions, hiding cover, and calving/fawning habitat.

Open road density can affect whether elk remain or leave an area. Roads affect elk by removing plant production and by introducing a disturbance factor (vehicles), which reduces elk use adjacent to these roads (Thomas et al 1988, Toweill and Thomas 2001). Road closures have been the technique most frequently used to increase security for hunted elk populations. Reducing road density in most situations has improved the habitat effectiveness for elk during summer and may increase elk survival during hunting seasons (Leptich and Zager, 1991). The existing conditions section disclosed that open road densities are high in portions of the Planning Area, particularly in winter range. Currently the Forest Plan allows for OHV use to travel on closed roads which reduces or negates the road closure values for wildlife. In the Clear and Bridge Creek subwatersheds, additional road closures are planned. Currently, these subwatersheds do not meet open road density standards; new closures would help reduce potential disturbance effects to big game. Although new road construction is proposed under the Crawford Project, roads would be closed with the timber sale and therefore, most disturbance effects would be short-term.

One of the most significant trends in recent years is the growth of recreation activities. These include hiking, cross country skiing and mountain biking, as well as activities that involve a variety of motorized off-highway vehicles (OHV) (Bunnell et al 2002). OHV users are increasingly attracted to parcels of public lands where access is readily available, this in turn concentrates the use of OHV and the potential damage associated with that use (Toweill & Thomas 2002). Managing human activities to prevent elk harassment on or displacement from crucial summer and winter ranges is a concern (Bunnell etal 2002), which is being addressed through a draft National OHV policy. It has been shown that these disturbances increase home range size, alter feeding patterns and affect reproductive performance (Bunnell etal 2002).

Long hunting seasons combined with high numbers and densities of hunters contribute to cumulative effects by harassing elk and reducing the number of mature bulls, which are important to the health of elk herds. High predator numbers may have an additive effect, reducing calve and recruitment locally. OHV use can cause vulnerability of elk and deer during the archery hunting season and during deer hunting season by allowing hunters to transport their equipment far from standard roads and transport the dead prey relatively easily from areas and distances that would present barriers to those hunting on foot (Toweill & Thomas 2002). Winter activities such as snowmobiles, skiers or hikers will also impact elk on winter range by causing them to flee from human activities. This additional drain of energy may impact survival of elk

(Thomas et al 1988).

ODFW personnel support livestock grazing given the existing design elements, and as long as Forest Plan standards for forage and shrub utilization are met (communication with ODFW biologists Darren Bruning and George Keister 2004). While high open road densities would continue to limit habitat effectiveness, livestock grazing does not affect road densities. Management Units are sufficiently large to provide for existing populations of big game, regardless of the grazing alternative selected here. Additional planned projects as described in Appendix A (Cumulative Effects) would not change these conclusions. ODFW biologists are expecting to revisit elk and deer MOs in 2005. In the future, ODFW biologists recommend closing additional roads to increase habitat effectiveness and improve big game distribution within the respective management units.

Old Growth

Existing Condition

Forest Plan, Management Area 13 (MA-13) provides for the management of old growth habitat through a system of dedicated old growth (DOG) units and replacement old growth (ROG) units. Habitat is to be composed of mature/overmature sawtimber (150 years or older). The goal of MA-13 is to provide suitable habitat for old growth dependent wildlife species, ecosystem diversity, and preservation of aesthetic qualities. Three MIS are used as indicators of the amount and quality of old-growth habitat: pileated woodpecker, pine marten and three-toed woodpecker. Pileated woodpecker and pine marten are used as indicators for OFMS (Old Forest Multiple Strata) habitat. Three–toed woodpeckers are used as an indicator for OFMS lodgepole pine. All three species are believed to reside in the Planning Area.

DOG/ROG areas for pileated woodpecker, pine marten, and a combination of both species have been delineated within the Planning Area. Dedicated old growth is 7 percent (12,546 acres) of the Planning Area, located in 45 territories. Eight DOG/ROGs have been designated for pileated woodpecker management and twenty-three DOG/ROGs have been designated for pine marten management. Fourteen DOGs have been designated for management of both species. No DOG/ROG areas have been established for three-toed woodpeckers.

Approximately 70% of the 12,546 acres located within the DOGs/ROGs currently classify as OFMS (Old Forest Multiple Strata). Most of the remaining acres classify as YFMS (Young Forest Multiple Strata). These latter acres typically provide adequate canopy complexity and high canopy closure, but the number of large diameter trees present fall slightly short of quantities required for OFMS classification. Forested areas located outside DOGs, ROGs and feeding areas can provide additional habitat for pileated woodpeckers and pine martens.

Old growth is deficient in the Planning Area. Although OFMS is within the Historic Range of Variability (HRV) for all Forest Types, OFSS is well outside HRV, particularly in the Dry Forest types. Loss of OFSS is due to a combination of timber harvest and fire suppression activities. Fire suppression allowed tree densities to increase, shifting many stands from OFSS to OFMS. Harvest of large diameter trees then converted these stands to YFMS or younger, even-aged structural stages.

In OFMS and YFMS stands, increased canopy cover in these stands may have made them more suitable for such species as the pileated woodpecker and pine marten, but at the expense of habitat for such species as the white-headed woodpecker and flammulated owl which prefer OFSS. The 1995 Regional Forester's Eastside Forest Plans Amendment #2 recommended the National Forests use timber management and prescribed fire to shift stands back towards OFSS if this structural stage is deficient on the landscape.

Increased tree stocking has also elevated the risk of uncharacteristically severe wildfires. In the last 15 years, large, stand replacement fires such as the Summit, Indian Rock, Reed, Grouse Knob and Easy Fires have destroyed large areas of green forest, including late and old growth stands. Under current conditions, many late and old growth stands may not be sustainable.

Historical timber harvest that focused on large tree removal played a major role in reducing the amount and distribution of old growth habitat and late and old structural stages. To a lesser degree, ongoing livestock grazing has also reduced the number of large trees and large snags. Grazing has reduced the competition of grass versus tree seedlings especially in ponderosa and mixed conifer stands. Coupled with fire suppression, this has allowed dense confer understories to develop and retard growth rates on larger trees, delaying development of old growth.

Livestock and wild ungulates influence forests by selectively suppressing plant taxa and by accelerating the cycling of nutrients. This occurs when herbivores change the trajectory of succession, thereby changing the seral and climax vegetation. Secondly, herbivores can suppress the forest's carrying capacity for fauna linked to shrubs in forest understories. For example predicting avifauna composition would be more difficult since many birds typically nest on the ground and in shrub canopies, rather than in forest overstories (Sallabanks 2001). The forest understory throughout most of the old growth areas has been impacted from past and current grazing. See the Vegetation and Rangeland Resources Section for further details.

All of the old growth areas contain some riparian habitat (streams, springs and ephemeral draws) most of which has been impacted by grazing in the past and currently. Small meadows within old growth areas have also been impacted by grazing. See Vegetation and Rangeland Resources Section for detailed discussion of existing condition of riparian vegetation condition.

Pileated Woodpecker:

Pileated woodpeckers prefer to nest, roost, and (to a lesser extent) forage in mature or old growth forest with high canopy cover (Mellen et al. 1992, Bull and Holthausen 1993). In northeastern Oregon, this species is associated with mature, multi-storied grand fir forests, but can also be found in ponderosa pine mixed conifer as well. Optimum habitat contains at least 4 large (> 20 inches dbh) snags/acre, plus at least 400 lineal feet of down logs to provide nesting, roosting and foraging sites (Bull and Holthausen 1993). A preference is shown for stands with canopy closures greater than 60 percent. Pileated woodpeckers forage mainly by excavating insects from snags and down logs in the summer, and scaling bark for insects in the winter. Forage habitat is most commonly found in grand fir forest types and consists of snags, usually greater than 20 inches dbh, logs larger than 25 inches in diameter, and live trees greater than 21 inches dbh used mostly for scaling.

Pileated woodpeckers are found throughout the Planning Area (old growth surveys, Blue Mountain/Prairie City observation databases). Habitat trend information derived from Interior Columbia Basin studies (Wisdom et al. 2000) indicated that about 60% of the watersheds in the Blue Mountains showed a decreasing trend in pileated woodpecker habitat and 30% showed an increasing trend. Declines in source habitat are primarily attributed to a reduction in late seral forest. Breeding Bird Survey (BBS) data indicated a 7.8% annual decline in populations in Oregon and Washington from 1966 through 1994 (Wisdom et al. 2000).

American Pine Marten:

Martens prefer mature, mesic coniferous forests with a well-developed canopy and high structural diversity in the understory layers (Witmer 1998, p. 16). Structural diversity is contributed by coarse, woody debris, the lower branches of living trees, and shrubs. Martens are extremely susceptible to predation and are reluctant to venture into openings, thus the value of canopy cover provided by older tree stands. Snags and downed woody material are important for winter and summer dens, resting sites, and cover for prey species. Cover and prey species largely determine their distribution and abundance.

Pine martens can be more elusive; although sightings have occurred in the Planning Area, they have been rare (old growth surveys, Blue Mountain/Prairie City Observation databases). The species is expected to reside throughout the Planning Area. Habitat trend information derived from Interior Columbia Basin studies (Wisdom et al. 2000) indicated that about 50% of the watersheds in the Blue Mountains showed a decreasing trend in marten habitat and 35% showed an increasing trend. The distribution of marten within the Interior Columbia Basin has been fairly stable, but population changes are not known (Wisdom et al. 2000).

Three-toed Woodpecker:

The three-toed woodpecker prefers stands where lodgepole pine is either dominant or co-dominant, and uses mostly trees 9” dbh and greater for both nesting and foraging (Goggins et al. 1987). Suitable habitat is tied to existing levels of diseased and decaying trees with heart rot for nesting and roosting, as well as decaying substrate to provide a prey base for wood-boring insects (Goggins et al. 1987). The species forages by scaling and pecking in trees with scaly bark, which include lodgepole pine, Engelmann spruce and western larch. In particular, three-toed woodpeckers are attracted to areas with high concentrations of beetles, such as habitats created by stand replacing burns or blowdown. The Cold Upland Forest and Moist Upland Forest PVGs (Potential Vegetation Types) represent the highest quality habitat for three-toed woodpeckers.

Three-toed woodpeckers are found throughout the Planning Area (Blue Mountain/Prairie City Observation databases). Habitat trend information derived from Interior Columbia Basin studies (Wisdom et al. 2000) indicated that about 70% of the watersheds in the Blue Mountains showed an increasing trend in three-toed woodpecker habitat and 30% showed a decreasing trend. Breeding Bird Survey (BBS) data is insufficient to determine population trends in the Interior Columbia Basin, but data summarized across the West indicates a 0.7% annual decline in populations from 1966 through 1994 (Wisdom et al. 2000).

Environmental Consequences

The following effects discussion describes the direct and indirect effects of livestock grazing on old growth. Effects discussion will focus on the three old growth MIS: pileated woodpeckers, pine marten, and three-toed woodpecker. Cumulative effects are discussed in the context of this project when combined with other past, present and reasonably, foreseeable future activities.

Direct and Indirect Effects

Alternative 1 – No Grazing

With the no action alternative, vegetation removal due to grazing and browsing would be limited to forest wildlife species. Since there would be less browsing and grazing pressure on the understory vegetation, a more developed shrub and herbaceous understory would be expected. Vegetation including grasses, shrubs and forbs would increase in the understory of more open stands and in the small openings of more dense old growth stands, benefiting those old growth species that rely on a developed herbaceous and shrub understory for part of their habitat needs.

Direct and indirect effects to pileated and three-toed woodpeckers would be minimal. These species rely on snags and down wood for nesting and foraging; shrub and herbaceous vegetation play little role. Direct and indirect effects to pine martens would be somewhat higher. Marten prefer high structural diversity in the understory layers. Dense understory provides resting sites, access to prey habitat in winter and greater escape cover. Additionally, denser ground vegetation would provide more nesting sites for ground nesting species and food sources for small mammals that marten rely upon for food.

No grazing can contribute indirect effects on forest succession, but by itself is only likely to help maintain the existing mosaic of open stands and dense stands. In stands that currently classify as OFSS or in younger stands with open canopies, the absence of grazing should help maintain historic conditions. In these stands, grasses and forbs would be allowed to grow and out-compete new pine seedlings. With continuity of ground vegetation, natural occurring fire would be able to carry through these stands in their normal patterns across the landscape (Sallabanks 2001). Such stand dynamics would help sustain more of the open canopied, older pine stands, which old-growth species such as the white-headed woodpecker depend on (Sallabanks 2001, Blair and Servheen 1993). The increase of forbs and shrubs in the forest understory, should provide for better structural diversity and lead to wildlife specie diversity within many of the late and old structure stands including the designated old growth areas.

In the dense, multiple strata stands including OFMS, understory herbaceous and shrub layers are unlikely to develop even in the absence of grazing. Overstory canopy remains too high. Stand dynamics would continue to operate outside of HRV, at least in the Dry Forest types. Dense, multi-storied stands would continue to increase in density. Most stands will decline in vigor, and mortality would increase due to increased competition for water and insect activity. Habitat for species most dependent on OFMS should remain stable until stand replacement events begin to occur. Those species that would benefit include pileated woodpeckers, pine martens and three-toed woodpeckers.

Overall, old growth conditions would remain skewed towards species that prefer OFMS such as pileated woodpeckers, pine martens and three-toed woodpeckers and remain degraded for species that rely on OFSS such as white-headed woodpecker and flammulated owl.

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Livestock grazing would continue to impact the shrub, grass and forb layers of these stands by browsing, grazing, and trampling which can limit old growth wildlife that rely on these habitat components. Riparian areas within old growth stands are also impacted from livestock grazing due to the same reasons as listed above. Livestock management strategies in Alternatives 2 and 3 would ensure herbaceous and shrub utilization standards are met and that succession and development of shrubs would continue at a near natural rate of recovery.

Direct and indirect effects to pileated and three-toed woodpeckers would be minimal. These species rely on snags and down wood for nesting and foraging; livestock changes to shrub and herbaceous vegetation play little role in their life history or habitat needs. In addition, three-toed woodpeckers use dense lodgepole stands with elevated bark beetle activity, habitats that tend to preclude livestock, i.e., high levels of downed trees that restrict access and high canopy cover that reduces understory vegetation.

Direct and indirect effects to pine martens may be somewhat higher. Livestock grazing can affect pine marten by removing understory vegetation that can serve as cover/resting sites for both marten and their prey. A reduction in understory structure may have an indirect effect on marten due to loss of hiding cover, resting areas, and prey habitat alteration. Grazing may remove forage that is important food, nesting, or cover for prey. The amount of utilization would determine the amount of herbaceous and shrubby understory left. Nevertheless, most of the preferred marten habitat has abundant down material and is generally less accessible to livestock; therefore, effects of livestock grazing on marten populations would be minimal.

Livestock grazing has associated activities, such as riding, fence maintenance, use of off-highway vehicles (OHVs), and salt placement that could disturb denning or nesting habitat for these species. Trails created by OHVs may make areas more vulnerable for use by woodcutters. Firewood cutting of snags or large, down logs removes a potential food source or nesting location for pileated woodpeckers and three-toed woodpeckers, and firewood cutting can reduce denning, nesting and cover habitat for marten and its prey species.

As described in the no action alternative, livestock grazing can contribute indirect effects on forest succession, especially in the Dry Forest types. Grazing of grasses and other forbs reduces competition to pine seedlings and hoof action of livestock can also increase the amount of seeds from ponderosa pine into the ground. Pine seedlings and saplings can occur in thick patches in as little as 7-15 years when forbs and grasses are reduced by livestock grazing. In addition, grazing reduces the ability of the grass/forb layer to carry natural fire that helps maintain OFSS conditions. This increase of thick patches of pine stands are at a greater risk to fire, insects and reduction of growth due to competition. Moist and Cold Forest Types are not as susceptible to these livestock pressures because they do not contain as much forage as ponderosa pine stands.

Overall, old growth conditions would remain skewed towards species that prefer OFMS such as pileated woodpeckers, pine martens and three-toed woodpeckers and remain degraded for species that rely on OFSS such as white-headed woodpecker and flammulated owl. Under Alternatives 2 and 3, old growth structural stages would tend to move further from HRV than under the no action alternative. At prescribed forage utilization levels, livestock grazing would contribute little to adverse effects that could degrade old growth habitat and associated species. Populations of old growth MIS would be maintained.

Cumulative Effects

All Alternatives

All of the activities in Appendix A – Cumulative Effects have been considered for their cumulative effects on old growth and associated species. The following discussion focuses on those past, ongoing and foreseeable future activities that may contribute positive or negative effects. Past timber harvest, road building and stand replacement fires have significantly reduced the amount and effectiveness of old growth habitat. Livestock grazing has had only minimal effects.

Old growth is deficient in the Planning Area. Although OFMS is within HRV for all Forest Types, OFSS is well outside HRV, particularly in the Dry Forest types. Loss of OFSS is due to a combination of timber harvest and fire suppression activities. Fire suppression allowed tree densities to increase, shifting many stands from OFSS to OFMS. Removal of large diameter trees then converted these stands to YFMS or younger, even-aged structural stages.

Forest Plan, Management Area 13 (MA-13) provides for the management of old growth habitat through a system of dedicated old growth (DOG) units and replacement old growth (ROG) units; future management activities would be conducted to maintain this system.

Since 1993, the Forest Plan as amended has directed the three Blue Mountain National Forests to conduct timber sales in a manner that moves stands towards OFMS and OFSS structural stages, regardless of whether or not they are in Management Area 13. Timber sales planned since that time have not contributed to loss of late and old growth forest. The proposed Crawford Vegetation Management Project, Balance Thinning and Fuels Reduction Project and Easy Fire Salvage Project would be planned to protect existing old growth, although understory stocking may be reduced to shift stands from OFMS to OFSS to better reflect HRV.

Shifting stands from OFMS to OFSS would reduce habitat for canopy dependent species such as pileated woodpecker and pine marten and improve habitat for species such as white-headed woodpecker and flammulated owl. This shift in old growth type would increase, rather than decrease the wildlife species diversity. Cumulatively, restoring natural vegetation conditions and fire regimes would make these habitats far more self-sustaining for associated wildlife species. Proposed timber management and prescribed burning would contribute positively toward the viability of species that use old growth habitats. Forest Plan standards for snags and down logs would be met to provide critical habitat components for old growth species such as pileated woodpecker, American marten and three-toed woodpeckers.

The Forest's firewood policy prohibits the cutting of firewood in DOG/ROG areas, so prescribed snag and downed wood levels should be maintained. In OFMS outside the DOG/ROG network, snags along roads would continue to be removed as firewood, reducing habitat for pileated woodpeckers, pine martens and three-toed woodpeckers.

Adjacent Tribal and private lands have been intensively managed. In the past, these timber stands appear not to have been managed for old growth habitat and no change in this strategy is expected. These areas are not expected to provide OFMS or OFSS habitat.

Hardwood planting and protection has occurred along streams in old growth areas, increasing understory diversity and enhancing habitats for old growth species that use this component as part of their life cycle.

As discussed previously, livestock grazing can indirectly affect forest succession by allowing higher in-growth of understory trees and a shift of stands from OFSS to OFMS. However, these effects are liked to be countered by an aggressive thinning and prescribed burning program that shifts old growth stands from OFMS to OFSS. At prescribed forage utilization levels, livestock grazing would contribute little to adverse effects that could degrade old growth habitat and associated species. Populations of old growth MIS would be maintained.

Northern Goshawks

Existing Condition

The northern goshawk inhabits conifer-dominated forests. Goshawks utilize a wide range of forest structural conditions, often hunting prey in more open stands, yet relying on mature to old growth structure for nesting and fledging. Goshawks build large stick nests below the upper canopy that are supported by limbs of one of the larger trees within a stand. Nests are commonly on north aspects in drainages with dense canopy (60-80%), in large trees, and near water or other forest "edges" (Reynolds et al. 1992 and Marshal 1992). Foraging occurs within forests with open understories and along small openings (Bull and Hohman 1994, Marshall 1992). Northern goshawks feed on birds and small mammals (Ehrlich et al 1988). Loss of nesting habitat for small birds or forage for small mammals in turn affects the nesting success of northern goshawk (Cooperrider et al 1986).

In the Planning Area, nine known goshawk territories exist and are monitored periodically for active use. Additional goshawk sightings have been made in the Planning Area, but no nest sites have been located (Blue Mountain/Prairie City observation databases). Habitat trend information derived from Interior Columbia Basin studies (Wisdom et al. 2000) indicated that about 50% of the watersheds in the Blue Mountains showed a decreasing trend in goshawk habitat and 35% showed an increasing trend. Breeding Bird Survey (BBS) data suggests stable populations in western North America from 1966 through 1995; trend information derived from a study in the southwest indicated a 4% annual decline in populations (Wisdom et al. 2000).

Grazing activities have little direct influence on goshawks or their habitat. All nesting occurs in mid-size to mature trees, spatially removed from cattle disturbance. Since prey populations can limit raptor populations, grazing can indirectly effect goshawks by altering prey habitat. The majority of the important prey species reside mainly on the ground and in the lower portions of the tree canopy. Therefore, much of the goshawks' hunting activity (prey searching and pursuits) is oriented towards these forest layers. Grazing may remove forage that is important food, nesting or cover for prey. Past and current grazing has reduced the shrub and herbaceous layer in the Planning Area, especially in riparian areas which reduces potential habitat for nesting birds and small mammals. See the Vegetation and Rangeland Resources Section for a more detailed discussion of loss of understory vegetation.

The nine know goshawks territories have been reviewed for their potential for livestock impacts. The Little Boulder, Big Boulder, and Sulphur Creek territories have had reduced impact from livestock grazing due to steep topography and/or high concentrations of down logs that reduce access. The Deep Creek, Deerhorn, Placer Gulch, 16 Gulch, Clear Creek and the Dry Fork Clear Creek territories are more accessible by livestock. In these latter territories, riparian vegetation conditions are degraded due to a variety of management activities, potentially affecting prey habitat for goshawks. Livestock can contribute additional adverse effects if not grazed properly.

Environmental Consequences

The following effects discussion describes the direct and indirect effects of livestock grazing on northern goshawks and their habitats, particularly effects on prey species and their habitats. Cumulative effects are discussed in the context of this project when combined with other past, present and reasonably, foreseeable future activities.

Direct and Indirect Effects

Alternative 1 – No Grazing

Northern goshawks prefer stands that are mature or late seral stage with relatively high canopy closure for nesting and post-fledging areas (DeStefano et al. 1994, Martin et al. 1998). Removal of livestock grazing would increase the shrub and herbaceous layer which in turn can increase small mammal and avian populations. This increase of species would benefit goshawks by providing more prey base. Over-all avian and mammalian diversity should improve with this alternative; possibly increasing the abundance of potential prey species.

As described in the Old Growth Section, no grazing can contribute indirect effects on forest succession, but by itself is only likely to help maintain the existing mosaic of open stands and dense stands. This alternative does not complete any activities within the Planning Area that would maintain or increase late or old structure areas in the short- to mid-term (5-20 years). Habitat quality for goshawks would remain static in the short- to mid-term. The potential to lose dense nesting stands to stand replacement wildfire would remain high.

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

The effects of livestock grazing on northern goshawk mainly involve grazing of prey habitat. If grazing removes major portions of shrubs and low vegetation cover, it could affect reproduction of small mammal and avian species. Livestock management strategies in Alternatives 2 and 3 would be adjusted annually to ensure herbaceous and shrub utilization standards in the Forest Plan are met. Appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery, patricualy for shrub species.

In the Planning Area, forage habitat for goshawks is not considered a factor limiting population viability, and consequently changes to foraging, whether positive or negative, would not contribute to a measurable change in goshawk populations.

As described in the Old Growth Section, livestock grazing can indirectly affect forest succession by allowing higher in-growth of understory trees and a shift of stands from OFSS to OFMS. Stands with dense conifer understories tend to provide better nesting habitat for goshawks, but reduced forage habitat.

Livestock grazing has associated activities, such as riding, fence maintenance, use of off-highway vehicles (OHVs), and salt placement that could disturb nesting habitat for this species. Nesting goshawks are particularly sensitive to disturbance. Construction of new water developments and fences in the vicinity of active nest sites would occur outside the reproduction season. Infrastructure maintenance and cattle herding and movement activities could still occur within the reproduction season.

Cumulative Effects

All Alternatives

All of the activities in Appendix A – Cumulative Effects have been considered for their cumulative effects on northern goshawks and their habitats. The following discussion focuses on those past, ongoing and foreseeable future activities that may contribute positive or negative effects.

Nesting habitat is typically the limiting factor for goshawks. Past timber harvest reduced mature and old growth habitat preferred for nesting and fledging. Stand replacement fires have also destroyed nesting habitat. Since 1993, the Forest Plan as amended has directed the three Blue Mountain National Forests to conduct timber sales in a manner that moves stands towards OFMS and OFSS structural stages, and timber sales planned since that time should not have contributed to loss of mature and old growth forest. Protection of large diameter trees helps provide additional nest trees for goshawks as well as other raptors. The proposed Crawford Vegetation Management Project, Balance Thinning and Fuels Reduction Project and Easy Fire Salvage Projects would be planned to protect existing old growth, although understory stocking may be reduced to shift stands from OFMS to OFSS to better reflect HRV. See the Old Growth cumulative effects section for further discussion.

Nesting goshawks are very sensitive to disturbance and have been recorded both attacking intruders and failing to successfully reproduce when the disturbances are within their nesting groves (Desteffano and Meslow, 1994; Reynolds and Wight 1978). When goshawks are paying attention to human intrusion, it could cause predation of young or eggs by great horned owls, ravens or other raptors. Known raptor nest sites in the Planning Area have been relatively successful in producing young. Nest areas have been protected and seasonal restrictions have been applied to avoid disturbance during breeding seasons.

Timber management on adjacent Tribal and private lands has generally eliminated nesting habitat. These stands are not being managed for old growth conditions or large diameter trees or snags that could support raptor nests, and therefore would not be expected to provide nesting habitat in the future.

Hardwood planting and protection has occurred along streams in old growth areas, increasing understory diversity and enhancing prey habitats. Forage is not considered a factor limiting goshawk population viability, and consequently cumulative changes to foraging habitat, whether positive or negative, would not contribute to a measurable change in goshawk populations.

As discussed previously, livestock grazing can indirectly affect forest succession by allowing higher in-growth of understory trees and a shift of stands from OFSS to OFMS, potentially improving nesting habitat, but reducing the diversity of prey species. However, these effects are liked to be countered by an aggressive thinning and prescribed burning program that shifts old growth stands from OFMS to OFSS.

The main effects of livestock grazing are on prey habitat. As discussed previously, forage habitat in the Planning Area is not considered the limiting factor for goshawks. Therefore, although livestock grazing can have adverse effects on prey species, significant reductions in prey species from this project and other past, ongoing and future projects would not be expected. Goshawk populations would be not be affected.

Primary Cavity Excavators Habitats – Snags and Down Wood

Existing Condition

In the Dry Forest types of eastern Oregon, 66 bird and mammal species are known to use snags for nesting or shelter and 41 vertebrate species make use of downed logs (Mellen et al. 2003). Primary cavity excavators (PCEs), such as woodpeckers, sapsuckers and flickers, are forest dwelling birds that are specialized for nesting and foraging in decayed wood. They require trees with rotted heartwood for excavating nest holes and use both snags and down logs for foraging. Each species, to some extent, utilize different tree species, a range of snag diameters, and excavate cavities at different heights from the ground (Thomas et al. 1979, Mellen et al. 2003). Snag dependent species that do not excavate their own cavities depend on use of vacated cavities made by primary excavators.

The Forest Plan identifies 11 primary cavity excavators as management indicator species (MIS) for the availability and quality of dead and defective wood habitat: black-backed woodpecker, three-toed woodpecker, Lewis' woodpecker, white-headed woodpecker, pileated woodpecker, downy woodpecker, hairy woodpecker, northern flicker, Williamson's sapsucker, red-breasted sapsucker and yellow-bellied sapsucker. The red-breasted and yellow-bellied sapsuckers were formerly classified with the red-naped sapsucker. Neither the red-breasted or yellow-bellied sapsucker are known to occur in eastern Oregon; the red-naped sapsucker does occur throughout the area and will be used as a substitute MIS in this discussion. By providing habitat for these primary cavity excavators, habitat is provided for many other dead wood dependent species as well. Several of the MIS species, including the Lewis' woodpecker, downy woodpecker and the sapsucker species, use hardwood trees and/or shrubs as part of their life cycle.

Snags and down log estimates were extrapolated from the Watershed Analyses (USDA 1998, 1999 and 2002). At the landscape level, existing snag densities are generally below standards established in the amended Forest Plan. Snag distribution is variable, however, with higher densities in the Cold and Moist Forest Types and lower densities in the Dry Forest Types. Existing down log levels generally meet standards. The Summit Fire, Indian Rock, Reed, and particularly the Easy Fire areas have snag and down log levels in excess of standards. In areas with high concentrations of down logs cattle are likely limited by access.

Existing snag and down log levels have been influenced by a variety of management activities including timber harvest, road construction, hazard tree removal, fire suppression, prescribed burning, and firewood cutting, as well as natural events such as wildfire, and forest insect and disease activity.

Habitat trend information derived from Interior Columbia Basin studies (Wisdom et al. 2000) was reviewed. Habitat trends vary across the Blue Mountains with some watersheds experiencing increased habitat and others decreased habitat, but overall, the trend is towards a loss of habitat. Population trends for these species do not reflect the loss of habitats, with only the pileated woodpecker showing large declines (Wisdom et al. 2000).

Livestock grazing has little direct influence on primary cavity excavators based on the nature of grazing activity and the life history of PCEs and their habitat needs. As previously described, ongoing grazing has contributed to intra-tree competition and the resulting delay in achieving larger diameter trees, which several woodpecker species prefer for nesting (Thomas et al 1979, Sallabanks et al 2001).

Livestock grazing has associated activities, such as riding, fence maintenance, use of off-highway vehicles (OHV), and salt placement that could disturb nesting or forage habitat. Trails created by OHVs may make areas more vulnerable for use by woodcutters. Firewood cutting of snags or large, down logs removes a potential nesting location or food source for these species.

Perhaps the greatest impact livestock grazing can have on PCE's comes from reduction of hardwood trees and shrubs. Lewis' woodpecker, downy woodpecker and the sapsucker species are affected the most by the health of hardwood components. The loss hardwood trees and snags can negatively affect populations (Krausman 1996, Johnson & O'Neil 2001, Cooperrider 1986). Currently, utilization is heaviest in riparian areas and the understory has little or no structure in localized areas. See the Vegetation and Rangeland Resources Section for detailed discussion on affected areas.

Other primary excavators prefer burned areas, for example black-backed woodpeckers. No grazing could result in increased fire and more OFSS ponderosa pine habitats, increasing habitat in the long term for such species as white-headed woodpeckers and flammulated owls. Habitat use and population numbers should not be altered by this alternative in the short- to long-term (20+ years) term. If large fires or insect infestations occur it will alter habitat use by pileated woodpeckers both in the short and long term. Whether the effect is positive or negative to the species is difficult to predict.

Environmental Consequences

The following effects discussion describes the direct and indirect effects of livestock grazing on primary cavity excavators. Cumulative effects are discussed in the context of this project when combined with other past, present and reasonably, foreseeable future activities. The Old Growth Section provides additional effects discussion on pileated, three-toed and white-headed woodpeckers.

Direct and Indirect Effects

Alternative 1 – No Grazing

Essentially, there would be no adverse effects on existing snags and dead and downed wood habitat. Those PCE species that prefer hardwood habitat would see increases in this type of vegetation, as there would be no grazing or browsing of seedlings. Hardwood habitats including aspen, cottonwood, and willow are important to several PCEs. Most of the sapsuckers, downy and hairy woodpeckers, northern flicker, as well as white and red breasted nuthatches prefer these habitats for foraging and nesting. Livestock grazing is one of the major factors in reducing this habitat in the past. Under this alternative, these hardwood habitats would improve. As more of this habitat returns, it would provide for higher population levels of the PCE's that are closely associated with this type of habitat.

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

With respect to primary cavity nesters, the effect would be minimal as there would be no adverse effect on existing snags and dead and downed wood and virtually no effect on foraging habitat. The major impacts of livestock grazing are in the hardwood component and ponderosa pine habitats in the Planning Area. These impacts include grazing, browsing and trampling which have reduced many of the hardwood habitats and contributed to dense stands in ponderosa pine forests. There are several species such as downy woodpeckers and red-naped sapsuckers that prefer hardwood stands, and whiteheaded woodpeckers prefer larger diameter ponderosa pine forests.

Livestock management strategies in Alternatives 2 and 3 would be adjusted annually to ensure herbaceous and shrub utilization standards in the Forest Plan are met. Appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery, including hardwood trees such as aspens and cottonwoods. Proposed management strategies would promote better utilization of upland sites and decrease pressure in riparian areas.

Better livestock distribution would help move vegetation towards desired conditions. Under Alternatives 2 and 3, hardwood habitats would improve. As more of this habitat returns, it would provide for higher population levels of the PCEs that are closely associated with this type of habitat.

Livestock grazing has associated activities, such as riding, fence maintenance, use of off-highway vehicles (OHV), and salt placement that could disturb nesting habitat for these species. Trails created by OHVs may make areas more vulnerable for use by woodcutters. Firewood cutting of snags or large, down logs removes a potential food source or nesting location for PCE species.

As stated previously, the main effects of livestock grazing on PCEs are to hardwood habitats. Appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery. Therefore, livestock grazing would not contribute to significant reductions in these habitats. Populations of PCEs would be maintained.

Cumulative Effects

All Alternatives

All of the activities in Appendix A – Cumulative Effects have been considered for their cumulative effects on PCE species. The following discussion focuses on those past, ongoing and foreseeable future activities that may contribute positive or negative effects.

Snags fluctuate in numbers and location across the landscape. Due to past management including overstory removal, salvage harvest, roadside hazard tree removal, firewood cutting, and fire suppression, snag and down wood quantities have declined from historical levels. Snag and down log levels are as described in the Existing Condition section.

Current trends indicate that snag and down wood numbers are increasing due to reduced harvest over the past decade and increased retention levels required by Regional Forester's Eastside Forest Plans Amendment #2. Any future timber harvest or prescribed fire activities would be designed to promote the development of late and old growth habitat and retain a snag and down wood component. Such management strategies are expected to improve habitat for cavity dependent species. Managing for the historic vegetation/fuels conditions at the landscape level would decrease basal area with an increase in diameter and growth expected in the remaining trees. A greater number of large snags may result in the mid-term to long-term (greater than 50 year) once some of those trees died, and a subsequent increase in down log habitats.

Risk of uncharacteristically severe wildfire is elevated in the Planning Area. In the last 15 years, large, stand replacement fires such as the Summit, Indian Rock, Reed, Grouse Knob and Easy Fires have destroyed large areas of green forest, creating large pulses of snags to the benefits of PCE species. Initially, most down logs are consumed by the fires, but as snags fall, down logs levels increase. Fires salvage reduces snag habitats, but even post-salvage, snag levels are still far higher in these areas than in adjacent green areas.

The Forest's firewood policy prohibits the cutting of firewood in Dedicated and Replacement

Old Growth areas and Riparian Habitat Conservation Areas. Elsewhere, snags along roads would continue to be removed as firewood, reducing habitat for PCE species.

Hardwood planting and protection has occurred along Planning Area streams. Increased hardwood vegegtation benefits primary cavity exvacavtor species that use these habitats, such as Lewis' woodpecker, red-naped sapucker and downy woodpecker.

Adjacent Tribal and private lands have been intensively managed. In the past, these timber stands appear to have not been managed for snags and down logs and no change in this strategy is expected. These areas are not expected to provide large quantities of snag and down wood habitat.

The main effects of livestock grazing on PCEs are to hardwood habitats. As discussed previously, appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery. Therefore, livestock grazing would not contribute to significant reductions in these habitats. Populations of PCEs would be maintained.

Beaver

Existing Condition

The elimination of beaver has had large impacts on riparian habitats throughout the West. Beavers influence small-order streams by altering water retention, creating and maintaining wetlands, modifying nutrient cycling and decomposition dynamics, influencing the timing, rate and volume of water and sediment movement downstream, through the creation of pools and backwaters generating new fish and wildlife habitats and sediment trapping capabilities (Ohmart 1996).

Beavers historically occurred in this Planning Area, and are still present in some areas, although their numbers are greatly reduced. Other factors besides lack of vegetation due to grazing have reduced population of beavers, some of these being trapping earlier in the century, current recreational trapping, and roads.

Direct and Indirect Effects

Alternative 1 (No Grazing)

Removal of cattle grazing could result in the eventual return of beaver to some of these systems, which enriches habitat for many other wildlife species. A healthy instream environment is vital for aquatic life forms, as well as for various human needs (Kauffman and Krueger 1984).

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action)

Beaver use of willow occurs late in the plant's growth cycle, often during fall and winter when willow are dormant, resulting in earlier and often rapid and vigorous growth recovery the following spring. This is in contrast to willow use by livestock, which generally occurs during the active growing period of summer, resulting in reduction of subsequent willow regrowth (Kindschy 1985, 1989).

Livestock management strategies in Alternatives 2 and 3 would be adjusted annually to ensure herbaceous and shrub utilization standards in the Forest Plan are met. Appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery. Proposed management strategies would promote better utilization of upland sites and decrease pressure in riparian areas. Better livestock distribution would help move vegetation towards desired conditions. Under Alternatives 2 and 3, hardwood habitats would improve, increasing the potential for beavers to re-colonize some area streams.

Cumulative Effects

All Alternatives

All of the activities in Appendix A – Cumulative Effects have been considered for their cumulative effects on beaver. The following discussion focuses on those past, ongoing and foreseeable future activities that may contribute positive or negative effects.

Many activities contribute to cumulative impacts on riparian habitats. Past trapping, logging, road construction, livestock grazing, mining, wildfires, and fire suppression have all contributed to loss of beavers or degradation of habitat.

Recent timber sales have generally avoided riparian areas, protecting habitats. Hardwood planting and protection has occurred along Planning Area streams. Increased hardwood vegetation benefits beaver. Future management activities are expected to protect or enhance riparian habitats. Protection of infrastructures, such as existing roads, still may preclude opportunities for beaver to occupy all the locations they did historically.

Riparian restoration projects on tribal and private lands, as on public lands, have improved riparian hardwood conditions. Livestock grazing practices have also been adjusted to better protect upland and riparian shrub communities.

The main effects of livestock grazing on beavers are to riparian habitats. As discussed previously, appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery. Therefore, livestock grazing would not further contribute to significant reductions in these habitats.

Threatened, Endangered and Sensitive (TES) Wildlife Species

Existing Condition

Table WI-2 displays the TES wildlife species that have habitat or may disperse in the Planning

Area. There is no habitat present to support the presence of the pygmy rabbit (*Brachylagus idahoensis*), upland sandpiper (*Bartramia longicauda*), tricolored blackbird (*Agelaius tricolor*), or bufflehead (*Bucephala albeola*); they are not addressed in this document.

Direct, Indirect and Cumulative Effects

Table WI-2 displays the overall effects determination for all alternatives. Further information on the effects of proposed activities (direct, indirect, and cumulative) on TES species can be found in the Middle Fork John Day Range Planning Analysis Terrestrial Wildlife Biological Evaluation (Appendix I).

Table WI-2—Terrestrial Wildlife Species. Threatened, endangered and sensitive (TES) species considered in the analysis of the Middle Fork John Day Rangeland Planning Area and the effects determination for the No Action and Action alternatives. Codes are defined in the footnote at the bottom of the table.

Species	Status	Occurrence	Alt. 1	Alt. 2	Alt. 3
Gray Wolf *Canis lupus*	E	HD/N	NE	NE	NE
Northern Bald Eagle *Hailaeetus leucocephalus*	T	HD/D	NE	NE	NE
North American Lynx *Lynx canadensis*	T	HN	NE	NLAA	NLAA
American Peregrine Falcon *Falco perigrinus anatum*	S	HD/S	NI	NI	NI
California Wolverine *Gulo gulo luteus*	S	HD/S	NI	MIIH	MIIH
Pygmy Rabbit *Brachylagus idahoensis*	S	HN/N	-----	-----	-----
Pacific Fisher *Martes pennanti*	S	HD/N	NI	NI	NI
Western Sage Grouse *Centrocercus urophasianus phaios*	S	HD/S	NI	MIIH	MIIH
Gray Flycatcher *Empidonax wrightii*	S	HD/S	NI	MIIH	MIIH
Bobolink *Dolichonyx oryzivorus*	S	HD/S	NI	MIIH	MIIH
Upland Sandpiper *Bartramia longicauda*	S	HN/N	-----	-----	-----
Tricolored Blackbird *Agelaius tricolor*	S	HN/N	-----	-----	-----
Bufflehead *Bucephala albeola*	S	HN/N	-----	-----	-----

E = Federally Endangered
T = Federally Threatened
S = Sensitive species from Regional Forester's list
HD = Habitat documented or suspected with the planning area or near enough to be impacted by project activities
HN = Habitat Not within the project area or affected by its activities
D = Species Documented in general vicinity of project activities
S = Species Suspected in general vicinity of project activities
N = Species Not documented and not suspected in general vicinity of project activities
NE = No Effect
NI = No Impact
NLAA = May Effect, Not Likely to Adversely Affect
MIIH = May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species

Species of Concern - Landbirds Including Neotropical Migratory Birds (NTMB)

Existing Condition

Neotropical migratory birds breed in temperate North America and spend the winter primarily south of the United States-Mexico border. Of the 225 migratory birds that are known to occur in the western hemisphere, about 102 are known to breed in Oregon and about 82 are known to breed on the Malhuer National Forest. They include a large group of species, including many raptors, cavity excavators, warblers and other songbirds, with diverse habitat needs spanning nearly all plant community types and successional stages. Long-term population data on many of these birds indicate downward population trends although not all species populations are declining (Sharp 1996, Saab and Rich 1997, Altman 2000, USFWS 2002). Habitat loss is considered the primary factor in decline of neotropical migratory birds.

Forest Service compliance with the Migratory Bird Treaty Act (MBTA) has been challenged several times with regard to the “take” provision. Recently (July 2000), a United States Court of Appeals for the District of Columbia ruled that the Federal Agencies are subject to provisions of the MBTA.

Current Forest Service policy regarding bird conservation and the MBTA is:

- Permits must be obtained from the U.S. Fish and Wildlife Service (USFWS) for banding, capturing, or any other activity where there is intentional killing of birds, including control of depredating birds.
- The Forest Service must analyze the effects of actions on migratory birds and document such effects in a NEPA document.
- Negative effects to birds should be mitigated to the extent possible and where possible, plans to benefit birds should be incorporated in project or activity design.

There currently is no process for reviewing projects with USFWS or applying for a permit for “unintentional” take. The USFWS will be providing additional guidance regarding the Federal Agencies through the formation of an interagency working group.

In 2000, the Oregon-Washington Chapter of Partners in Flight published its Northern Rocky Mountains Bird Conservation Plan (Altman 2000). The Plan provides conservation recommendations for the various species of landbirds that occupy the Oregon and Washington portions of the Interior Columbia Basin. The Plan identified the following priority habitats for landbird conservation: old-growth dry forest, old growth moist forest, riparian woodland and shrubland, and unique habitats including alpine and subalpine forests, shrub-steppe, montane meadow and aspen habitats. Many of the avian species/habitats identified in the Northern Rocky Mountains Bird Conservation Plan (Altman 2000), are also addressed in the USFWS’s Birds of Conservation Concern (USFWS 2002).

Table WI-3 lists those priority habitats and associated focal species that would be expected in the Planning Area. The table identifies each focal species and their primary breeding habitat.

Existing condition and effects discussions will focus on changes to priority habitats, and less on the individual species that use these habitats.

Table WI-3: Neotropical Migratory Birds – Focal Species found in the Planning Area by Habitat Type.

Focal Species	Primary Breeding Habitat
Dry Forest Types (ponderosa pine and dry mixed conifer)	
White-headed woodpecker	old growth - i.e., old forest single stratum (OFSS)
Flammulated owl	OFSS with interspersions grassy openings and dense thickets
Chipping sparrow	OFSS with regenerating pines
Lewis' woodpecker	Patches of burned OFSS or OFMS
Mesic Mixed Conifer (Late-Successional)	
Vaux's swift	Large Snags
Townsend's warbler	Overstory Canopy Closure
Varied thrush	Structurally diverse stands; multi-layered
MacGillivray's warbler	Dense shrub layer in forest openings or understory
Olive-sided flycatcher	Edges and openings created by wildfires
Riparian Woodland and Shrublands	
Lewis' woodpecker	Large hardwood snags
Red-eyed vireo	Hardwoods - canopy foliage and structure
Veery	Hardwoods - Understory foliage and structure
Willow flycatcher	Hardwoods - Riparian shrub
Unique Habitats	
Hermit Thrust	Subalpine Forest
Upland sandpiper	Montane Meadows
Vesper Sparrow	Steppe shrublands
Red-naped sapsucker	Aspen
Gray-crowned rosy finch	Alpine

Table 5 in the Wildlife Specialist Report lists species identified in the USFWS's Birds of Conservation Concern (USFWS 2002), Bird Conservation Regions (BCR) 10, the Northern Rockies Region, which includes the Planning Area. Effects to these species were analyzed in the context of changes in high priority habitats/focal species listed in Table WI-3.

Past timber management, livestock grazing, wildfire suppression, wildfires and other management activities, and natural processes, have altered the quantity, quality, and juxtaposition of habitat for many species of migratory landbirds. Various portions of the landscape now support different species of birds than it did historically. Management activities and natural processes would continue to affect bird species abundance and distribution over time. Over the long term, these vegetative communities would move into and out of the historic range of variability, favoring different species over others for varying periods of time as forest stands, riparian areas and steppe habitats change.

The Planning Area currently provides a variety of structural stages in a range of biophysical groups across the landscape. As discussed in previous wildlife sections, Old Forest Single Stratum (OFSS) forests and hardwood and grassland habitats are the most degraded. Livestock grazing has minimal effect on forest canopies including OFSS, but can have greater effects on hardwood and grassland communities. The following landbird discussion will focus on these latter habitats.

Cattle grazing impacts the various vegetation types differently. In shrub and grass habitats the effects can be major and immediate by removal of vegetation and structural diversity. Such changes affect the avian species guild, or reduce species diversity (Knopf et al 1988). Historical heavy grazing, in combination with other factors, has removed or reduced the shrub component throughout the west and in some segments within the Planning Area (Knopf 1996, Bull and Skovlin 1982, Sedgwick and Knopf 1987).

Another potential effect of grazing is the increase of brown-headed cowbirds which are nest parasites. Predation rates by other species can also increase when grazing reduces vegetation or isolates nesting habitat, reducing the search time for predators (Kauffman et al. 2001, Knopf 1996). The response of bird species varies with the amount of vegetation removed. The most susceptible to these changes are rare avian species which can become extirpated with lack of nesting habitat. Lack of vegetation will shift to species that are more generalists within these areas (Knopf 1996). Impacts of grazing on game birds seems to be variable with positive or negative influences being noted as to the amount of vegetation removed (Knopf 1996).

Environmental Consequences

The following effects discussion describes the direct and indirect effects of livestock grazing on neotropical migratory birds. Each species has its own special habitat needs. Grazing by livestock or wild ungulates can either directly or indirectly favor populations of some avian species while depressing others. Grazing alters abiotic and biotic relationships within and among local bird species (Knopf 1996, Owens and Myres 1972). Increased vegetation and structural diversity usually provides a larger diversity of avian species (Bull et al. 2001, Knopf et al.1988, Knopf 1996, Taylor 1986).

The Planning Area currently provides a variety of structural stages in a range of biophysical groups across the landscape. Old Forest Single Stratum (OFSS) forests and riparian hardwood habitats are the most degraded. Livestock grazing has minimal effect on OFSS, but can have great effects on hardwood communities. The following landbird discussion will focus on this latter habitat. Cumulative effects are discussed in the context of this project when combined with other past, present and reasonably, foreseeable future activities.

Direct and Indirect Effects

Alternative 1 – No Grazing

This alternative would forgo livestock grazing within the Planning Area. Growth of the hardwoods, shrub and herbaceous plants, would increase both in riparian areas and uplands, eventually providing more nesting and foraging habitat. Population numbers for grass and shrub nesting neotropical migratory birds would be expected to remain stable or increase due to recovery of ground vegetation. In riparian areas, species such as the willow flycatcher red-eyed vireo and western meadowlark would respond favorably. In uplands, species such as the chipping sparrow would benefit. In shrub-steppe or sagebrush habitats, species such as the Brewer's sparrow and Vesper sparrow would increase. In aspen areas, habitat may increase for species such as the red-naped sapsucker.

In Dry Forest Types, forbs, grasses and shrubs would out compete some of the tree seedlings, thus reducing tree density in some forested habitats. In the long-term (20+ years) stand types such as ponderosa pine would increase in size and supply more habitat for species associated with these habitats.

Habitat for migratory landbirds would not be expected to change significantly in the short to mid-term under this alternative. The greatest potential risk to long-term habitat conditions for migratory landbirds is from large scale, stand replacement wildfires and further loss of late and old structure stands. Such wildfires have the potential to eliminate habitat structures that many migratory and other landbird species depend on. Particularly at risk are those species that depend on late and old structure and closed canopy forest stands such as the brown creeper, Townsend's warbler, and red-breasted nuthatch. Species that depend on open areas and early successional vegetation might experience population increases in the Planning Area when such fire events occur. However, overall avian biodiversity would decrease as a result of a large-scale wildfire event for the mid to long-term period.

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Livestock grazing is a widespread and important influence on migratory and other landbirds. Different species have different responses to grazing from positive to negative effects. Those species that are negatively influenced by grazing are those that are dependent on herbaceous ground cover for nesting and/or foraging. These populations are at risk and are most likely below historic population levels (Bock et al 1993, Taylor 1986).

Livestock grazing, especially the season of grazing, affects avian species that prefer riparian, upland or forested landscapes. Direct effects of grazing in riparian areas is reduction of herbaceous, shrub and hardwood components, reduction of cover and width of the riparian zone which further fragments this limited habitat and reduces important nesting and foraging habitat (Bock et al 199, Sedgwick and Knopf 1987, Knopf et al 1988). In forested habitats avian species most affected by livestock grazing are those that are dependent on the herbaceous and shrub ground cover for nesting and foraging within the forest canopy.

Livestock grazing has positive influences on those avian species that prefer more open habitat. Avian species such as killdeers, house wrens, golden eagles and brown-headed cowbirds respond to more open grazed areas. The brown-headed cowbird is directly attracted to livestock, which is detrimental to other avian species because of brood parasite activities. The reduction of riparian habitat decreases the search time for brown-headed cowbirds to find nests and lay their eggs. Brown-headed cowbirds have had serious effects on some avian populations by reducing nesting success of these avian species (Bock et al 1993, Kauffman et al 2001).

Livestock management strategies in Alternatives 2 and 3 would be adjusted annually to ensure herbaceous and shrub utilization standards in the Forest Plan are met. Appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery. Proposed management strategies would promote better utilization of upland sites and decrease pressure in riparian areas. Better livestock distribution would help move vegetation towards desired conditions. Under Alternatives 2 and 3, hardwood habitats would improve.

Various avian species would respond positively to recovery of shrub and herbaceous vegetation. In riparian areas, species such as the willow flycatcher red-eyed vireo and western meadowlark would respond favorably. In aspen habitats, species such as the red-naped sapsucker would benefit. In uplands, species such as the chipping sparrow would benefit. In shrub-steppe or sagebrush habitats, species such as the Brewer's sparrow and Vesper sparrow would increase. Hardwood-nesting species would do better than ground-nesting species, but utilization standards should maintain species populations.

Cumulative Effects

All Alternatives

All of the activities in Appendix A – Cumulative Effects have been considered for their cumulative effects on neotropical migratory birds and other landbird species. The following discussion focuses on those past, ongoing and foreseeable future activities that may contribute positive or negative effects.

Many activities contribute to cumulative impacts on nesting and foraging habitats. Past logging, livestock grazing, fires, and fire suppression have all contributed to degradation of habitat for some of the avian species and have improved habitat for others. Some of these activities have positive effects for those avian species that prefer more open habitat. Habitats that have been reduced or degraded by these activities include OFMS, OFSS, woodlands, riparian areas, and shrub steppe and grassland areas (Johnson et al 2001, Bock et al 1993, Thomas et al 1979).

Past fire suppression, grazing, and logging have contributed to the loss of most fire-maintained old-growth forests. Dry Forest Types have been more heavily impacted by these factors as compared to other Eastside Forest Types. Since 1993, the Forest Plan as amended has directed the three Blue Mountain National Forests to conduct timber sales in a manner that moves stands towards OFMS and OFSS structural stages. Timber sales planned since that time have not contributed to loss of late and old growth forest. The proposed Crawford Vegetation Management Project, Balance Thinning and Fuels Reduction Project and Easy Fire Salvage Project would be planned to protect existing old growth, although understory stocking may be reduced to shift stands from OFMS to OFSS to better reflect HRV. Landscapes would be expected to provide for a wider diversity of old growth avian species.

Recent timber sales have generally avoided riparain areas, protecting habitats. Hardwood planting and protection has occurred along Planning Area streams. Increased hardwood vegegtation benefits landbird species that use these habitats, including such species as the Lewis' woodpecker, red-naped sapucker and downy woodpecker.

Adjacent Tribal and private lands have been intensively managed. In the past, these timber stands have not been managed for old growth habitats nor snags and down logs and no change in this strategy is expected. Riparian restoration projects, as on public lands, have improved riparian hardwood conditions. Livestock grazing practices have also been adjusted to better protect upland and riparian shrub communities.

Today the greatest immediate threats for future viability of Dry Forest Types are high-severity fire occurrences and increased site-specific competition for nutrients and moisture that result in reduced growth in ponderosa pine regeneration and increase mortality over the long-term (Sallabanks et al. 2001). If these forest types were to burn under a high-severity fire, it could eliminate blocks of old growth habitat that could take >200 years to recover (Sallabanks et al. 2001). These habitats have specific and generalist avian species associated with them. Wildfires would reduce possible nesting and foraging habitat for many of these species if the wildfires are large in size.

The main effects of livestock grazing on neotropical migratory birds are to grassland and hardwood habitats. As discussed previously, appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery. Therefore, livestock grazing would not further contribute to significant reductions in these habitats.

Consistency with Direction and Regulations

The Malheur National Forest Plan established standards for cover, forage, open road density, and habitat effectiveness. All subwatersheds meet the cover standard except for the Boulder Creek subwatershed. Much of the Planning Area does not meet standards for open road densities, especially in winter range. Livestock management would not further reduce marginal and satisfactory cover or increase open road densities.

In Management Area 1 (General Forest), Management Area 2 (Rangeland), and Management Area 7 (Scenic Area), big game and livestock numbers are to be managed at levels which utilize available forage while maintaining plant vigor, composition and density (Forest Plan, p. IV-34, #78). Forage utilization in Management Area 4a (Winter Range) and Management Area 21 (Dixie Butte and Jump Off Joe Wildlife Emphasis Areas) is to be managed between livestock and big game in favor of big game based on levels derived in consultation with the Oregon Department of Fish and Wildlife (Forest Plan, p. IV-71, #13). Big game forage needs are to be considered in the late fall when preparing or updating allotment management plans and when considering seasonal extensions of livestock grazing (Forest Plan, p. IV-71, #13). Livestock management strategies have been designed to provide appropriate forage for big game. As directed by the Forest Plan, livestock use in designated winter range would be monitored and adjusted to ensure that conflicts with big game do not arise. Monitoring points would be established to measure residual plant material before fall grazing concludes.

Alternatives would not degrade habitat for primary cavity excavators. Existing snag and large, down log levels vary across the Planning Area with some stands meeting or exceeding Forest

Plan standards while other stands fall below standards. Livestock grazing would have minimal to no effects on snags or down logs. Hardwood habitats are degraded; however, future livestock grazing would be managed to ensure a near natural rate of vegetation recovery.

The Malheur National Forest Plan objective for old growth is to provide suitable habitat for old growth dependent wildlife species, ecosystem diversity and preservation of aesthetic qualities. Regional Forester's Eastside Forest Plans Amendment #2 provided additional direction to protect existing late and old structure (LOS) stands and to manipulate vegetation that currently does not classify as LOS towards LOS. All alternatives are consistent with the Forest Plan, as amended. All alternatives meet old growth connectivity standards in the Regional Forester's Eastside Forest Plans Amendment #2.

For northern goshawks, all alternatives are consistent with the Forest Plan and the Regional Forester's Eastside Forest Plans Amendment #2. Goshawk territories would be monitored annually for nesting activity, and seasonal restrictions applied to management activities around active sites to reduce disturbance during breeding season. Nest sites would be protected. All other raptor nests would be protected, and seasonal restrictions applied during breeding seasons.

All alternatives are consistent with the 1918 Migratory Bird Treaty Act (MBTA) and the Migratory Bird Executive Order 13186. Alternatives were designed under current Forest Service policy for landbirds. The Northern Rocky Mountains Bird Conservation Plan (Altman 2000) and the U.S. Fish and Wildlife Service's Birds of Conservation Concern (USFWS 2002) were reviewed for recommended management strategies and effects disclosure.

All alternatives are consistent with the Endangered Species Act (see Appendix I, Terrestrial Wildlife Biological Evaluation). Alternatives are expected to have No Effect on threatened or endangered species except for the Canada lynx. The US Fish and Wildlife Service will be consulted for the potential effects on the lynx. Action alternatives may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Several sensitive species occupy the Planning Area, including wolverine, western sage grouse, gray flycatcher, and bobolink. Action alternatives could impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

Irreversible and Irretrievable Commitments of Resources

There would be no irreversible or irretrievable losses of resources associated with wildlife or wildlife habitat from the implementation of alternatives.

There would be no irreversible or irretrievable losses of resources associated with wildlife or wildlife habitat from the implementation of alternatives.

Heritage

Introduction

This analysis is meant to provide insight into the overall scope of the heritage resources within the Middle Fork John Day Range Planning Area and the effects that livestock grazing may have on the types of heritage resources (contemporary/historic/prehistoric) found within the planning area.

Cultural resources are fragile and irreplaceable resources that chronicle the history of people utilizing the forested environment. Cultural resources include:

- Historic properties, places eligible for inclusion to the National Register of Historic Places (NRHP) by virtue of their historic, archaeological, architectural, engineering, or cultural significance. Buildings, structures, sites, and non-portable objects (e.g., signs, heavy equipment) may be considered historic properties. Traditional Cultural Properties (TCP's), localities that are considered significant in light of the role it plays in a community's historically rooted beliefs, customs, and practices (Parker and King, 1998), are also considered historic properties. Historic properties are subject to the National Historic Preservation Act's Section 106 review process.
- American Indian sacred sites that are located on federal lands. These may or may not be historic properties.
- Sites of cultural use of the natural environment (e.g., subsistence use of plants or animals), which must be considered under NEPA.

Regulatory Framework

The legal framework that mandates the Forest to consider the effects of its actions on cultural resources is wide-ranging. In this case, Section 106 of the National Historic Preservation Act (NHPA) of 1966 (amended in 1976, 1980, and 1992) is the foremost legislation that governs the treatment of cultural resources during project planning and implementation. The Pacific Northwest Region (R6) of the Forest Service, the Advisory Council on Historic Preservation (ACHP), and the Oregon State Historic Preservation Office (SHPO), signed a programmatic agreement (PA) regarding the management of cultural resources on National Forest system lands in 2004. The 2004 PA outlines specific procedures for the identification, evaluation, and protection of cultural resources during activities or projects sponsored by the Forest Service. It also establishes the process that the SHPO utilizes to review Forest Service undertakings for NHPA compliance. For other pertinent federal regulations see the Middle Fork John Day EIS Heritage Specialist Report (Haynal 2005)

Forest-wide management standards that are pertinent for this cultural resource effects analysis include:

- Conduct a professionally supervised cultural resource survey on National Forest lands to identify cultural resource properties. Use sound survey strategies and the Malheur National Forest Cultural Resource Inventory Survey Design.
- Evaluate the significance of sites by applying the criteria for eligibility to the National Register of Historic Places.
- Consider the effects of all Forest Service undertakings on cultural resources. Coordinate the formulation and evaluation of alternatives with the State cultural resource plan, the State Historic Preservation Office and State Archaeologist, other State and Federal agencies, and with traditional and religious leaders of Native American Indian groups and tribes with historic ties to the project planning area.

Many of the previously described laws, regulations, and directives instruct the Forest Service to consult with American Indian tribes, the state, and other interested parties on cultural resource management issues. The MFJDRPA Interdisciplinary Team and the Blue Mountain Ranger District invited public comment on proposals in the allotment management planning area by submitting a project scoping letter to over 100 organizations and individuals. Executive Order 13175 (EO 13175), Consultation and Coordination with Indian Tribal Governments, November 6, 2000, directs federal agencies to engage in regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications and to strengthen the United States government-to-government relationship with Indian tribes. To date, in consultation with the three American Indian tribes (the Confederated Tribes of the Warm Springs, the Burns Paiute, and the Confederated Tribes of the Umatilla Indian Reservation [CTUIR]) that have rights or interests in the MFJDRPA, two heritage issues have been raised. The CTUIR has requested a project area map showing all heritage sites/TCPs in the project area so that they might evaluate the proposed action in light of that information and the Burns Paiute have requested that traditionally used plants be surveyed for during survey for heritage sites. The CTUIR request is being complied with and the Burns Paiute request is addressed by noting on site records traditional use plants that fall within recorded heritage site boundaries. District botanical surveys also make note of traditional use plants.

Analysis Methods

Cultural resource identification efforts in the vicinity of the MFJDRPA have focused on two primary types of resources: prehistoric archaeological sites and historic archaeological sites. Cultural resource identification efforts that have been conducted include literature reviews and consultation with Native American tribes and other stakeholders that are historically associated with the area, as well as pedestrian survey. Twenty-four previous pedestrian cultural resource inventory surveys adequate to today's standards (as defined in Thomas 1991) have been conducted in the MFJD planning area. See Haynal (2005, Heritage Specialist Report) for a complete listing.

Proposed mitigation measures are discussed in Chapter 2 of the MFJDRPA DEIS under "Mitigation Measures" Heritage sub-section. These proposed mitigations are also covered in Haynal (2005). In addition, a Cultural Resource Inventory Survey Heritage Report that incorporates all known cultural properties will be completed for submission to SHPO in order to satisfy section 106 of the NHPA. Any newly discovered sites located during new survey will be evaluated for NRHP eligibility and submitted to SHPO for concurrence, along with all potential mitigation recommendations. Mitigation measures must be concurred by SHPO prior to the implementation of any range developments that might impact an eligible or unevaluated heritage site or sites.

Existing Condition

The Middle Fork John Day Rangeland Planning Area has a variable topography but is generally dominated by steep slopes, deeply incised drainages, and parts of the narrow southeast-northwest trending Middle Fork John Day River Valley. This valley runs central to the upper reaches of the watershed. Elevations within the MFJDRPA range from 3,400 to 8,131 feet.

Historic Background

The Upper Middle Fork John Day River watershed may have been a scene of human activity for 11,000 years before present. This area is located on the boundaries of two of North America's Native American Cultural Areas: the Columbia Plateau (among them the Umatilla, Cayuse, Walla-Walla and Nez Perce) and the Great Basin. For further discussion see Haynal (2005).

The discovery of gold in 1862 at Canyon Creek, near the confluence of the John Day River, led to an influx of fortune hunters. The major deposits of gold were found downstream of the Upper Middle Fork watershed, but mining took place here and there along the length of the Middle Fork, tailings are quite apparent around the town of Galena (Mosgrove 1980).

The allotments making up the Middle Fork John Day Range Planning Area have historically been grazed by domestic livestock, with intensive sheep grazing in the late 1860's until the 1960's. From the 1940's until the present day, most of the domestic livestock grazing in the area was dominated by cattle. Sheep and cattle utilized available forage in a continuous seasonal grazing regime (UMFJD Watershed Report; 1998). Early grazing was initially unregulated and resulted in significant impacts, some still observable today. During the early part of the century, the Forest Service took significant action to regulate numbers and seasons, and to establish workable grazing seasons and allotments. This action continued into the latter half of the century when emphasis shifted to development of management systems and regulation of specific resources. During the past twenty years, allotment management strategies have increasingly emphasized protection and management of riparian and aquatic habitats (MFJD Range DEIS).

Stock watering facilities have been developed on the allotments; however, some of these have met or exceeded life expectancy and are no longer fully functioning. These improvements now require reconstruction. Records indicating when these improvements were last reconstructed are often lacking. Recent efforts have been made to move facilities that were previously constructed within the riparian area or perennially wet area surrounding the development to more suitable locations that do not impact the spring source or riparian area associated with the spring.

Cultural Resources

Culturally important plant species, such as lomatium, yarrow, wild onion, camas, and various berries, are present in the Planning Area. Game animals include mule deer, Rocky Mountain elk, and smaller mammals. Various species of fish and fowl are also abundant. Thus, the Planning Area offers a variety of microenvironments affording ample warm-season opportunities for hunting, fishing, and the gathering of plants for food and other uses.

To summarize, previous surveys have identified 412 cultural properties recorded as sites inside the MFJDRPA. Of the 412 total sites, 92 are prehistoric sites, 288 are historic sites, and 32 are combination sites. 98 are eligible for the NRHP (one of which, site H645-0103, the Sumpter Valley Railroad, is listed on the NRHP), 165 are unevaluated for NRHP eligibility but are managed as if eligible, and 149 are concurred ineligible for inclusion on the NRHP. Possible significant cattle grazing damage has been reported at 42 eligible/unevaluated sites. All prehistoric and historic isolates in the planning area are ineligible. Appendix A (Heritage Site List) in Haynal (2005) presents the sites within the current Planning Area, principle attribute(s) of each site, and their NRHP eligibility status.

Known prehistoric sites range widely in size, from less than .1 acre to over 160 acres. At this date no large sites with stratified deposits of cultural materials, which might suggest heavy and long-term use, have been identified within the Planning Area.

The majority of the prehistoric sites within the Planning Area are found in meadows characterized by loamy soils. Any range development that tends to congregate livestock around or within heritage sites in one singular area has the potential to produce adverse impacts

Prehistoric sites adjacent to riparian areas are at great risk because livestock tend to congregate in these areas if permitted. When this occurs, especially under saturated conditions, sites can be potentially damaged through trampling that can result in artifact breakage as well as the mixing and deflation of cultural deposits. These sites are often associated with range water developments, further aggravating the problem.

Historic uses of the Planning Area are reflected, archaeologically, in the form of sites related to three historic economic activities: past railroad logging operations, stock grazing, and placer mining. Historic sites tend to be far more fragile than prehistoric sites, as the majority consist of disintegrating wooden structures, corroding iron artifacts, and delicate ceramic and glass artifacts subject to continuing breakage. Cattle rubbing against fragile historic structures or trampling across surface artifacts contribute to the ongoing degradation. These sites are also often located near riparian areas, open meadows, and/or natural water sources such as springs that are or may become range water developments, further aggravating the problem.

A total of approximately 600 medium and high probability acres inside the MFJDRPA have not been adequately surveyed for heritage resources. These 600 acres will be surveyed on various days during May of 2005. The new cultural resource inventory survey will be designed to conform to the standards set in the Malheur National Forest Cultural Resource Inventory Plan, 1991. In addition to the new survey, 42 recorded sites eligible or unevaluated for the NRHP will be monitored since previous heritage inventories have reported possible significant grazing impacts within their boundaries or because they fall within sensitive stream reaches where cows tend to congregate (See DEIS Chapter 2 and 6 and Figure 10, Map Section). 12 of the 42 sites fall within such sensitive stream reaches. Of special concern are historic structures within NRHP eligible or potentially eligible sites that may be subject to cattle brushing up against them if they should be located along a livestock trail and prehistoric lithic scatters concentrated in prime grazing areas and/or near water sources. Of these 42 sites, 12 are in the Lower Middle Fork Allotment, 12 are in the Sullens Allotment, 8 are in the Upper Middle Fork Allotment, 5 are in the Blue Mountain Allotment , 2 are in the Austin Allotment, 1 is in the Bear Administrative Pasture, and 1 is in the Bear Allotment. If monitoring indicates a need for mitigation measures for any or all of the 42 sites, specific mitigation measures will be tailored to meet the conditions at each site in consultation with the Oregon SHPO.

Environmental Consequences

Direct and Indirect Effects

Alternative 1 (No Grazing):

Implementation of the no grazing alternative would eliminate all detrimental effects discussed under alternatives 2 and 3 below with the exception of those that might result from the maintenance of allotment boundary fence lines. The maintenance of these fence lines that might occur within site boundaries can result in impacts; however, these potential effects will be mitigated per Stip. III. A of the 2004 Programmatic Agreement

One unique detrimental effect might occur if this alternative is selected. The elimination of grazing would increase the amount of browse available as fuel, thus increasing fire risk and the potential for such fire to damage the physical integrity of a site or its artifacts and/or features.

Alternatives 2 and 3:

Horne and McFarland (1993) describe potential negative direct affects to archaeological site soil matrices from grazing in the form of livestock chiseling in damp soils and the sloughing and collapse of stream banks. The authors further describe indirect effects to archaeological site matrices from cattle grazing in the nature of the removal or partial removal of on-site vegetation and trampling-induced soil compaction resulting in erosion through the reduction of infiltration and the increase of runoff by a number of well-understood mechanisms.

Horne and McFarland also summarize potential direct and indirect effects on artifacts and features. Direct effects would be the trampling of artifacts resulting in breakage or their compaction into the site's soil matrix and/or their dispersal across the surface by kicking (thus altering an artifact's spatial provenience) and cattle rubbing along or bumping into above ground features (such as historic buildings or rock cairns) resulting in the deterioration of their physical integrity. Indirect effects to artifacts and features resulting from grazing are found with the thinning of ground cover that exposes them to greater visibility and greater risk of observation from artifact looters or from cowboys or other forest users that might describe what they have seen to such looters.

The majority of the potential direct or indirect negative affects to cultural resources covered above for Alternatives 2 and 3 will not occur--provided that avoidance or other mitigation measures for heritage sites that are deemed eligible or potentially eligible and that have been identified as having sustained past negative impacts due to grazing and grazing improvements and/or that are subject to the probability of future impacts (such as fence line construction, trough placement, etc.) are implemented as per Stip. III. A of the 2004 Programmatic Agreement (and see Chapter 2, Management Requirements, Constraints, and Mitigation Measures). However, the potential for grazing to bring about greater visibility of recorded heritage sites or to expose unknown heritage resources could probably not be mitigated until after the fact, thereby potentially resulting in negative impact.

There are also potential positive indirect effects of grazing. Grazing improvement fences constructed to protect water sources from cattle trampling can also serve to protect portions of heritage sites when the water source is within a site’s boundary.

Cumulative Effects

Prior to establishment of the Forest Service Heritage Resource Program, past effects of timber harvest, fire suppression, hazard tree removal, and trail, road, and recreational facility development occurred with little analysis of cultural resource impacts. Adverse effects have also occurred from livestock grazing, irrigation development, and dispersed recreation. Little effort was made to deter private collection of historic or prehistoric artifacts on NFS lands, and losses of cultural resources were extensive in certain locations. These effects have been cumulative in nature and have contributed to the existing condition of heritage resources in the Middle Fork John Day Grazing Planning Area. The adoption and enforcement of federal cultural resource protection legislation and regulations over the past 30 years has reduced the rate of cultural resource deterioration from these past activities through the implementation of appropriate mitigation measures.

Still, concurrent or foreseeable planned future agency actions can continue to cause potential cumulative effects on heritage resources. However, potential impacts that heritage sites might incur from such foreseeable future actions as timber harvests, hazard tree removal, and so-forth would be mitigated as per Stip. III. A of the 2004 Programmatic Agreement.

Alternative 1 (No Grazing)

If grazing is eliminated from the Planning Area browse will increase. This increase will lead to heavier fuels that will increase the likelihood of wildfires. Therefore, as a result of this alternative a higher probability of stand replacing wildfires is possible. While many types of cultural resources can survive low-severity fires with little or no damage, high-severity burns destroy or damage a wide range of heritage sites.

The elimination of grazing under this alternative could foreseeably result in the establishment of additional dispersed camping locations (removal of cattle may make currently unattractive locations more attractive). This could result in impacts on heritage sites.

Alternatives 2 and 3

Fire suppression can have a positive cumulative effect for heritage sites in regards to the grazing that would be permitted in both alternatives 2 and 3. Wildfire suppression can keep the amount of acreage open for grazing at current levels thereby preventing the spread of areas open for grazing and reducing the potential for grazing impacts on heritage sites.

Future grazing improvements such as fences constructed to protect water sources from cattle trampling can also serve to protect portions of heritage sites when the water source is within a site's boundary.

Trampling from cattle across the surface of a site can result in artifact breakage. Based on past experience sites that have been affected in this manner in the past may continue to be so affected in the future in that artifacts that have escaped damage from previous trampling episodes may not escape damage from potential future trampling. Likewise, sites that have suffered episodes of erosion to their soil matricies due to cattle grazing and associated trampling (as discussed above under direct and indirect effects) may also be subject to future episodes making such effects more pronounced. If a site or sites in the project area has subsurface deposits these deposits may have been impacted to a certain depth at present that has so far left deeper deposits intact. If trampling continues in the future these deeper deposits might also became damaged as artifacts are moved spatially; therefore trampling damage to site soil matricies can be potentially cumulative. Mitigation measures discussed above under Existing Conditions/Affected Environment should suffice to prevent such potential cumulative damage.

The potential negative cumulative effects resulting from the reasonably foreseeable actions listed in the opening paragraph of this Cumulative Effects section will be avoided through mitigation. One foreseeable cumulative effect that can not be eliminated through mitigation is artifact looting and site vandalism. Grazing increases the presence of humans in the Planning Area; permittees, members of their families, and hired hands will be present at times to inspect and care for their cattle. Their presence will lead to an increased likelihood that artifacts will be observed and illegally removed. Their presence will also increase the potential for sites to be subjected to vandalism. Grazing also reduces vegetation cover and this further contributes to the potential for artifact looting by making surface artifacts more visible. Regular patrolling by federal law enforcement officers and the prosecution of those found looting or vandalizing heritage resources under the terms of the Archaeological Resource Protection Act of 1979 (Public Law 96-95; 16 U.S.C. 470aa-mm) are the only potential mitigation measures for these types of cumulative effects that might result from grazing.

Consistency with Direction and Regulation

Heritage and Tribal interests are regulated by federal laws that direct and guide the Forest Service in identifying, evaluating and protecting heritage resources. All of the alternatives would comply with federal laws. The Malheur National Forest Plan tiers to these laws, therefore the proposed action alternatives will meet Forest Plan standards. Completion of the Heritage inventory under the terms of the 2004 PMOA and also providing the interdisciplinary team with appropriate input as per NEPA, all relevant laws and regulations have been met.

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments of resources that may result from the alternatives with respect to cultural resources, except for the potential that surface artifacts may be subject to a greater likelihood of looting and surface features may be subject to a greater likelihood of vandalism.

Recreation

Introduction and Analysis Methods

Forest visitors desire or expect specific types of recreational experiences and settings. Recreational opportunities are described in this recreation analysis in relationship to the Middle Fork John Day Range Planning Area. This analysis describes the existing conditions of campgrounds; trails and trailheads; the Vinegar Hill-Indian Rock Scenic Area; and the administrative and dispersed sites in the Middle Fork John Day Range Planning Area. Analysis of the affects of proposed activities on those recreation resources is also provided.

Guidelines from the Malheur National Forest Land and Resource Management Plan 1990 are used to determine the condition of facilities and dispersed campsites.

The Malheur Recreation Strategy defines the "Niche" for the Malheur National Forest as "A Traditional Way of Life". Cattle on the Forest is a traditional way of life.

Recreation Opportunity Spectrum (ROS)

The National Forest System lands encompassed within the Middle Fork John Day Range Planning Area have been inventoried using the ROS system to determine what recreation opportunities and settings are available to visitors. Currently the area meets Roaded Modified, Roaded Natural, Semi-primitive non-motorized in the summer and semi-primitive motorized in the winter in the Scenic area (Indian Rock). Management direction for recreation as outlined in the Forest Plan is to continue to maintain existing ROS settings.

Areas within the roaded natural classification are characterized by predominately natural-appearing environments as viewed from sensitive roads and trails, with interaction between users being moderate. Evidence of human activity varies from area to area and includes livestock grazing and timber harvest. Roads and motorized equipment and vehicles are common.

Areas within the roaded modified classification are characterized by substantially modified natural environments. Roads, landing, slash and debris may be strongly dominant from within, yet remain subordinate from distant roads and highways. There is moderate to heavy evidence of other use on the main road with low to moderate evidence of other use on arterial roads.

Areas within semi-primitive motorized classification are characterized by a predominately natural or natural-appearing setting. Snowmobile use may occur from December 1 to May 1. Concentrated use is low, but there is often evidence of dispersed other use.

Areas within the semi- primitive non-motorized classification are characterized by a natural appearing environment and low interaction between users. Users have a high probability of experiencing solitude and closeness to nature and tranquility. Use of local roads for recreational purposes is not allowed.

The Recreation Opportunity Spectrum (ROS) is a framework for a change in resource management uses, policies, and actions on recreation opportunities so that they can be better identified and, when adverse, mitigated or prevented. Recreation opportunities were defined as the combination of biological, physical, social, and managerial conditions that give recreational value to a place. The ROS gives particular attention to the settings in which these uses and activities have occurred. This has the advantage of focusing attention and action on resource settings and conditions. For example, sound is a physical phenomenon susceptible to objective, quantitative measurement. When either the level of sound, or the particular form of sound, is judged as inappropriate or unacceptable, they are defined as “noise,” a measure of importance. Sound is reflected across different kinds of recreation settings (ranging, for example, from a highly developed campground to a wilderness), where one finds that what constitutes “noise” changes dramatically.

The ROS framework therefore can help managers in thinking about, and developing appropriate management responses for, a particular type of impact. It forces an explicit consideration of assumptions (e.g., the idea of “no impact”), it requires mangers to think across functional and jurisdictional boundaries (e.g., what types of sounds, their origin), and it provides the opportunity for consideration of alternatives (e.g., banning the source, buffering its effects, altering its timing, informing users about it).

Regulatory Framework

The Forest Plan direction is to manage General Forest and Rangeland (MA 1 & 2) to construct, relocate, or protect designated system trailheads and facilities during management activities. To maintain dispersed camping opportunities in a roaded setting and to manage these areas for partial retention and to provide for roaded recreation opportunities. Manage for dispersed recreation ranging from semi-primitive to roaded modified.

Developed Site (MA 12) is to be managed for developed recreation opportunities to meet foreground visual quality objective of retention or partial retention with a ROS classification of Roaded Modified. Manage developed sites as Roaded Modified and Roaded Natural.

Administrative Site (MA 19) is to be managed for administrative needs and to consider these sites’ historic and architectural values. Recreation in MA 3A (Non-Anadromous Riparian) is managed as roaded modified but standards include limiting and distributing recreation use as necessary to protect and/or rehabilitate riparian areas. MA 14 is managed as roaded natural ROS.

Manage Vinegar Hill-Indian Rock Scenic Area (MA 7) to strive to preserve and protect outstanding natural aesthetics. A high SIO is prescribed for the entire area. The Summit fire burned in 1996 with a gradual transition between unburned areas and areas that burned with high intensity. The Summit Fire burned with high intensity across the lower slopes of the Scenic Area, from Sunrise Butte to Jumpoff Joe. Moderate to light intensity fire occurred in the upper slopes. The Vinegar Hill-Indian Rock Scenic Area has a classification of semi-primitive non-motorized in the summer time and semi-primitive motorized in the winter time.

Existing Condition

Developed Recreation Facilities

Developed trailhead sites in the area include Head O'Boulder, Big Boulder, Sunrise Butte, Blackeye/Tempest, and Davis Creek. Trails include Princess #251, Davis Creek #244, Blackeye #243, Tempest Mine #256, Big Boulder #242, and Sunrise Butte #255. Summer weekends and holidays show the most use, with heavy use primarily during fall hunting seasons. Typically trailheads are not fenced to keep out livestock or wildlife.

Campgrounds include Lower Camp Creek, Dixie, Deerhorn, Middle Fork and Head O'Boulder, which are fenced to exclude livestock, except for Head O'Boulder.

Existing conflicts between grazing and recreational uses occur, such as the presence and smell of livestock and manure associated with cattle at developed recreation sites, trails, dispersed campsites, State Scenic Waterway, or scenic resources, because livestock grazing is an ongoing activity, and the Malheur National Forest Plan allows grazing and recreational uses.

Campgrounds

Deerhorn Campground

The Deerhorn campground is used consistently throughout the use season, but use is higher during the big game hunting seasons. Deerhorn campground provides a newer type vault toilet; no drinking water is available. The campground has rustic structures with a very low challenge for access for people with disabilities. All camp sites are developed and fees are charged at this site. The site can facilitate vehicles with trailers, but has limited sites for motor homes with all five camp sites being rocked. No Vegetation Management plan has been done for this campground. Deerhorn is located on County Road 20 approximately 20 miles east of Prairie City OR in T.11S. R34E., Section 11 and 12 and is within the Middle Fork John Day River riparian area with some evidence of impacts to bank stability from human use most evident at the upper campsite. This site is continuing to erode approximately 20 feet of riverbank located near campsite located at the east end of the campground. The campground is fenced with barb wire on two sides and buck and pole along one side for approximately 1315 feet of fence. County road 20 side is not fenced and livestock do get into the campground by this route, creating conflict with some of the recreating public.

Middle Fork Campground

Middle Fork is located on County Road 20 along the Middle Fork John Day River, approximately 21 miles east of Prairie City, OR, in T.11S. R34E., Section 10. The campground has 10 sites with fire rings, picnic tables, and two vault toilets with fees being charged; all 10 are within the Middle Fork John Day RHCA. The Middle Fork campground's use is less than Deerhorn campground during the summer months except during the hunting season, when they are both used similarly. The existing 5000 feet of barb wire fence around the campground is in good shape, and is excluding cattle out of the area.

Dixie Campground

This fee campground is located approximately eight miles east of Prairie City, OR. along U.S. Highway 26 in T.12S., R.24E., Section 11. It consists of 10 camp sites and 2 newer style vault toilets. This campground also has approximately .3 miles of road and approximately 7137 square feet of parking area. The entire campground area is interspersed with springs and small riparian areas which are some of the headwaters for Bridge Creek. The existing 5260 feet of barb wire fence around the campground is in good shape and is excluding cattle out of the area.

Head O'Boulder Forest Camp

Located on Forest Road 4500537 in T.9S. R. 33E., Section 25; the campground is approximately 40 miles northeast of Prairie City, OR. and consists of 3 undeveloped camp sites and one outhouse. Head O'Boulder also serves as the trailhead for Princess Trail. The site is not considered a developed campground in the Forest Plan, but is managed as a Forest Camp which is at a management level higher than a dispersed camp site. A spring is fenced with approximately 900 feet of buck and pole fence for animal use only. The camp is not fenced and there doesn't appear to be any conflicts with users and livestock.

Lower Camp Creek Campground

Located on Forest Road 36 in T.10S. R.32E. Section 25 approximately 25 miles north of Prairie City, OR; the campground is within the Camp Creek riparian area. There are 6 undeveloped camp sites with fire rings and picnic tables and an older style toilet. The campground is fenced with 1660 feet of barb wire and buck and pole with 2 cattle guards at the entrance of the campground. Livestock are excluded from the campground.

Trailheads

Blackeye Trailhead

The west end trailhead is located on the FR 4559 and 283 junction temporarily in T.10S. R.34E., Section 28. The east end trailhead is located on FR 2010219 in T.10S. R.34E., Section 24. The Blackeye and Tempest Mine trails share a common trailhead. About two years ago, Lemon creek blew-out FR 4559 and vehicle access to the trailhead was cut off. The road was blocked at FR 4559 and 4559283 with a green gate. Trail and trailhead access from this point is by foot by traveling up FR 4559 for approximately 1 1/4 mile. The portion of FR 4559 that was converted into part of the trail (just past Lemon Cabin crossing Granite Boulder creek) needs rehabilatation work done to the roadbed to stop the rutting that is occurring and contributing to water quality concerns. The 4559 that was blocked with a green gate is being breached by OHV use into the scenic area. This temporary trailhead is small, provides space for approximately two vehicles and does not provide space for parking and turn-around, especially for vehicles with trailers.

The Eastside trailhead, located on the 2010219 road, is steep and has 12-inch deep ruts in the roadbed. This road is quite difficult to access, especially when pulling horse trailers. The trailhead is in a meadow, is not developed and has one bulletin board.

Davis Creek Trailhead

The east end of this trailhead is located on Forest Road 2614 in T.11S., R. 35E., Section 31, with parking for three or four vehicles including trailers; it has a gravel surface and one bulletin board.

The west end of the trailhead is located on FR 2050032/666 in T.11S. R. 34 E., Section 6. For approximately 1.6 miles the access road is a native surface road with some deep potholes. This is an undeveloped site that is also used as a dispersed camp site. There are two existing trailheads with one on Forest Road 2050 that needs to be dismantled and the other one is on Forest Road 2050791 that also needs to be dismantled due to recent changes to trail configuration.

Head O'Boulder Trailhead

This is the trailhead for the Princess Trail #251 located on Forest Road 4500537 in T.9S., R. 33E., Section 25; approximately 40 miles northeast of Prairie City, OR. It consists of one bulletin board and limited space for trailhead parking with a native surface.

Tempest Mine Trailhead

Tempest Mine and Blackeye share the same temporary trailhead location on Forest Road 4559 and 283 junction. This site acts as the trailhead since Lemon Creek blew out a few years back. A green gate has temporarily been placed on Forest Road 4559 to limit vehicle traffic crossing Lemon Creek. This site is inadequate for a permanent trailhead since it was not designed for a trailhead for vehicles with trailers to get turned around in. This site could become congested if more than one vehicle is parked at the green gate. Currently, the green gate has been vandalized and Off Highway Vehicles have been breaching the closure to access the area behind the gate.

Boulder Butte Trailhead

This trailhead is located in T.10S. R.33E. Section 12 on Forest Road 4550577. This trailhead lies in a meadow that also acts as a dispersed camping area just outside the scenic boundary. The access road and parking lot are graveled. There are no bulletin boards or information boards available. The Summit Fire burned around the meadow leaving the site intact with vegetation in the immediate use area.

Sunrise Butte Trailhead

This trailhead is located at Shoberg's Landing in T.10S. R.34E., Section 17, approximately 35 miles northeast of Prairie City, OR. The site is graveled with one bulletin board and a green gate across the 4555 road.

Trails

Most trails are older and were originally a result of wildlife use. Today, the majority of trails are used most heavily during the hunting seasons for access, have native surfaces, and a lot of times follow a drainage or ridge. Livestock utilize these trails as well for migration.

Since livestock grazing is an ongoing activity, trails are currently being affected by livestock use. The effects from cattle use include, but are not limited to widening of trails from the existing standard; breaking down the edges of trails where construction is benched; kicking out constructed water bars; adding to water run-off from the trail; making new trails where cattle trails leave existing trail treads; knocking down constructed trail markers; and rubbing and knocking down sign posts. In addition, recreational users encounter incidences of high levels of trampled vegetation, “dust bowls,” created when salt areas for livestock are adjacent to trails. The extent of damage to trails is minor.

Blackeye

The Blackeye #243 trail is 2.4 miles long; is “more difficult”; a ROS class of semi-primitive nonmotorized (summer); semi-primitive motorized (winter). This is a designated foot, horse and bicycle trail with undeveloped snowmobile use in the winter. The route lies in the Vinegar Hill Indian Rock Scenic area. The existing trail (not including the existing road) is in fairly good condition and only requires maintenance.

Davis Creek

The Davis Creek trail # 244 trail is 11.8 miles long, with a more difficult level, a ROS class of roaded modified. This is an All Purpose trail designation of foot, horse, bicycle, and 2-wheeled motorbikes. The route lays in general forest with easy access. The trail is in the south half of the Galena watershed in the Davis Ck/Placer Gulch, Little Boulder Ck/Deerhorn, Tincup Ck/Little Butte Ck, and Butte Ck subwatersheds.

Off Highway Vehicles (OHV) currently use the trail. This type of use is high and increasing, but it is not conducive or safe due to inadequate trail width. The entire length does not meet trail guide specifications for OHV use. The entire trail length of 11.8 miles is less than standard and would require major reconstruction to meet the guides for ATV use. The current trail fords Butte Creek three times and has water quality and fish concerns. There is resource damage occurring in other stream crossings along segments of the trail and inadequate bridge crossings.

Princess Trail #251 (Squaw Rock)

This 9.3 mile trail begins at the Head O’Boulder Forest Camp on its west end and on Forest Road 2010148 on the east end. Parking at both ends is inadequate. The trail is a more difficult level for hiker/horse/bicycle use with a Roaded Natural classification.

Tempest Mine Trail #256

Tempest Mine is a more difficult level trail for horse/hiker/bicycle use. It is 3.5 miles long and connects into the Princess Trail. This trail crosses Granite Boulder Creek in several locations.

Big Boulder Trail #242

This 2.0 mile trail begins at Forest Road 4550749. This trail has been user maintained since the

Summit Fire. The majority of the trail was affected by the Summit Fire and provides access to the scenic area. It has a ROS class of semi-primitive non-motorized (summer); semi-primitive motorized (winter).

Sunrise Butte Trail #255

This 4.0 mile trail begins at Forest Road 4555 at a site called Shoberg's Landing; it has a ROS class of semi-primitive non-motorized (summer); semi-primitive motorized (winter). This is a designated foot, horse and bicycle trail with undeveloped snowmobile use in the winter. The entire route lies in the Vinegar Hill Indian Rock Scenic area.

Dispersed Sites

The Planning Area receives low to moderate recreation use, which is spread throughout a six month period starting in early May and running through mid-November. There are approximately 205 established dispersed campsites within the Blue Mountain Ranger District and 48 established dispersed camp sites on Prairie City Ranger District. Dispersed campsites offer the recreationist a more primitive camping experience. Fall hunting season use is moderate to high with use distributed throughout archery, deer and elk seasons. Hunter use of the dispersed sites varies depending on number of hunting tags for a unit and the number of "new" hunters in the area.

The dispersed campsites are rustic in nature with common features of meat poles, rock fire rings and benches. User constructed toilets can be found at some sites. Campsites are concentrated primarily in flat areas off main transportation systems where water can be accessed. The majority of dispersed camp sites are near springs or creeks. There is a wide range in size and amount of disturbance for all the dispersed camps. Camp size ranges from very small to fairly large. Use of these sites varies throughout the year, with the majority of sites showing heaviest use during the fall hunting season.

Where dispersed camp sites are used year after year with concentrated use the ground appears compacted and tends to leave vegetation not as vigorous as non-dispersed use areas; i.e. the concentrated use at the junction of Idaho and Crawford Creeks on Forest Road 2622. Other concentrated use areas are along the Middle Fork John Day River, Lick Creek, Forest Road 45, areas within Big Creek, Granite Boulder, Mosquito/Onion Gulch, Forest Road 2010 and Summit Creek. At dispersed campsites throughout the Planning Area, varied degrees of vegetation and riparian zone damage occurs due to vehicles, sanitation practices, and removal of vegetation in heavily used areas.

Administrative Sites

There are four administrative sites within the Middle Fork John Day Range Planning Area; the Blue Mountain Work Center located on U.S. Highway 26, the Sunshine Work Center on County Road 20, the Bear Administrative Pasture on County Road 20, and the Austin House Special Use Permit on State Highway 26. The Bear Administrative Pasture is not used for recreation; it is discussed under Range.

Sunshine Guard Station

Located on County Road 20, Sunshine Guard Station is not currently open to the public. There are plans to make it available as a recreation rental after some improvements. The Fire Organization does not use this facility to house employees during the fire season. The yard is fenced with poles and this does keep livestock out of the area.

Blue Mountain Work Center

Located on U.S. Highway 26 east of Austin Junction, Blue Mountain Work Center is used primarily as a station for Forest Service firefighters during fire season. Though not currently open to the public, it has been on the Recreation Rental Program in the past with plans to make it available as a recreation rental in the future. The entire site is fenced with barb wire and does keep livestock out of the area.

Special Use Permits-Austin House/Outfitter Guide

Located on U.S. Highway 26 at Austin Junction, Austin House is a private business and residence located on Forest Service land. The permitted area is less than 5 acres and is operated under a Resort Special Use permit with current use as a restaurant, gas station, and post office.

There is one Outfitter Guide adjacent to the Planning Area. The current permit is for the Northside Hunt Unit, with identified hunt areas outside of the Planning Area.

Vinegar Hill-Indian Rock Scenic Area

The Vinegar Hill-Indian Rock Scenic Area has a classification of semi-primitive non-motorized in the summer time and semi-primitive motorized in the winter time. The area is less accessible by roads than other parts of the Planning Area. Human impacts scattered throughout the unroaded area include hiking and bike trails, old jeep trails, prospector holes, mine tailings, scattered cabins, and occasional stumps from past logging activities. Areas within the scenic classification are characterized by a predominately natural or natural-appearing setting, providing a primitive wilderness opportunity. Concentrations of users are low, but there is often evidence of other such users. There is a high opportunity for exploring and experiencing isolation and solitude within the scenic area out away from trails.

The main access into the Planning Area is by U.S. Highway 26 and County Road 20. The public also makes use of these roads to access the Vinegar Hill-Indian Rock Scenic Area. The roads leading off of the main access roads are gravel and native surface one lane road with pull-outs.

Viewing scenery is a popular activity as well as hiking trails within the scenic area. There are approximately 20 miles of hiker/horse trails within the scenic area. These are more difficult native surface trails with the opportunity for solitude with a non-motorized experience during the non-winter months. Vehicle access to these trails ranges from relatively good to extremely rough. The scenic area has fewer roads than other parts of the Planning Area. Human impacts scattered throughout the unroaded area include hiking and bike trails, old jeep trails, prospector holes, mine tailings, scattered cabins, and occasional stumps from past timber harvest activities.

From December 1 to May 1 snowmobile use occurs cross country, there are no designated groomed trails in the scenic area. Livestock grazing is permitted within the scenic area as well as fences.

Middle Fork John Day River

The Middle Fork John Day River flows through the Planning Area. A segment of this river is listed as a State Scenic Waterway. The Middle Fork John Day River and its tributaries provide numerous recreational opportunities, including fishing, camping, and viewing salmon-spawning.

Dixie Snow Park

Dixie Snow Park, located on Dixie Summit, is jointly managed by the Forest Service and the Oregon Department of Transportation. Non-Forest Service developed facilities include the Dixie Ski Bowl, located on private lands in the vicinity of Dixie Summit, served by the Dixie Snow Park. There are 60 miles of snowmobile trails, primarily located on existing roads, approximately 32 miles of designated bike trails and 42 miles of hiker/horse/motor bike trails.

Environmental Consequences

Direct and Indirect Effects

Alternative 1 – No Grazing

Conflicts between grazing and recreational uses would be eliminated under Alternative 1, such as the presence and smell of livestock and manure associated with cattle at developed recreation sites, trails, dispersed campsites, State Scenic Waterway, or scenic resources would be eliminated.

Alternative 1 will prevent damage to trail tread and facilities. The effects from cattle use include, but are not limited to widening of trails from the existing standard; breaking down the edges of trails where construction is benched; kicking out constructed water bars; adding to water run-off from the trail; making new trails where cattle trails leave existing trail treads; knocking down constructed trail markers; and rubbing and knocking down sign posts. This alternative will reduce the incidence of recreational users encountering high levels of trampled vegetation, “dust bowls” created when salt areas for livestock are adjacent to trails.

This alternative would allow fences to fall to the ground, allowing the recreational users to move more freely on the landscape, though this may create a safety hazard with fallen barbed wire.

Water developments would not be operated or maintained and not available for use by recreational horse users. The outfitter guide permit (for guiding big game hunts) will not be affected.

Alternative 2 and 3

These alternatives would provide for continued grazing where the presence and smell of livestock and manure associated with continued grazing near both developed and dispersed recreation sites would continue to affect some visitors.

Continued grazing around Deerhorn and Middle Fork campgrounds would continue to result in livestock rubbing on the fence and within Deerhorn rubbing on tables, signs and facilities. This results in visitor complaints from people using these sites.

The effects from cattle use on trails will continue. The effects from cattle use include, but are not limited to widening of trails from the existing standard; breaking down the edges of trails where construction is benched; kicking out constructed water bars; adding to water run-off from the trail; making new trails where cattle trails leave existing trail treads; knocking down constructed trail markers; and rubbing and knocking down sign posts. This alternative will allow continued incidence of recreational users encountering high levels of trampled vegetation, “dust bowls” created when salt areas for livestock are adjacent to trails.

The risk of unauthorized cross-country travel by motorized vehicles would remain at the same level as today due to no increase in fence construction, except those already being considered under Categorical Exclusions (CEs) under alternative 2. Under alternative 3 administrative changes utilizing physical changes to improve allotment management, such as fence construction could decrease freedom of cross-country travel across the landscape by recreational users.

Under alternative 3 cattle will be utilizing the uplands more, so noise associated with cattle will be seen at these elevations more than at lower elevations.

Water developments would remain functional and available for use by recreational horse users under these alternatives. The outfitter guide permit (for guiding big game hunts) will not be affected.

Cumulative Effects

All Alternatives

Alternative 1 provides no recreation related incremental effect, as it proposes no actions or activities. Removing or allowing existing fences to fall to the ground will create a more natural appearing environment. Removing cattle will not fit the “Niche” that is recognized as a character of the Forest as defined in the Malheur Recreation Strategy.

In alternative 2 and 3 current management practices, including reasonably foreseeable future actions, will have short-term impacts on the ROS classification or the desired future condition. Grazing will continue to have impacts as described in the indirect/direct effects section. The on-going management actions would move towards meeting recreation settings. Continued grazing will fit the “Niche” character as identified in the Malheur Recreation Strategy.

Alternative 2 and 3 will not measurably effect the ROS classification or the desired future condition.

Installation of new fences may displace some dispersed use if opportunities to camp near water are no longer available.

Consistency With Direction and Regulations

The project is consistent with the Malheur National Forest Plan, as amended. Proposed activities in each of these alternatives are allowed for and meet the direction contained in the Forest Plan relative to ROS.

Irreversible and Irretrievable Commitments

The project as described will not result in any irreversible or irretrievable effects to the recreation resource.

Scenery

Introduction

Many factors affect the character of the landscape. Landscape attributes such as landform, vegetative pattern and species makeup, water characteristics, architectural elements, etc. all contribute to the aesthetic experience. To evaluate scenery, the Scenery Management System (SMS) is used in addition to the Visual Management System (VMS) that was used in the Land and Resource Management Plan for the Malheur National Forest (1990). The Malheur National Forest Plan includes forest-wide management area (MA) standards. Existing conditions and effects of proposed activities on the scenery resource will be displayed for both systems.

This report will only address the existing condition and effects of alternatives on vegetation that is affected by the browsing of livestock and does not cover all the scenery components such as conifers. Therefore, the landscape will not be rated as a whole for meeting Visual Quality Objectives or Scenery Integrity Objectives for the existing condition but will describe if grazing has lowered or had no effect on visual or scenic quality.

Visual Management System

The Visual Management System uses Visual Quality Objectives (VQOs), which are Preservation, Retention, Partial Retention, Modification and Maximum Modification. Except for preservation, each describes a degree of acceptable alteration of the natural landscape based on the importance of aesthetics. The degree of alteration is measured in terms of visual contrast with the surrounding natural landscape. Two additional short-term management goals may be required. The first is used to upgrade landscapes containing visual impacts that do not meet the quality objectives set for the particular area. The second is for landscapes having a potential for greater natural appearing variety. These short-term goals are rehabilitation and enhancement. (See Agricultural Handbook Number 462 for a complete explanation of the Visual Management System).

Scenery Management System

The Scenery Management System (SMS) requires an analysis that considers more than effects that impact natural appearing landscapes. The SMS uses terminology called Scenic Integrity Objectives (SIOs) that reflects the goals for the area. The goals for SIOs are Very High, High, Moderate, Low, Very Low, and Unacceptably Low. The terms ecological integrity and scenic integrity are used as general ratings of the existing landscape character. The scenic integrity level is a measure of elements that deviate from the desired landscape character. Ecological integrity is the degree to which all landscape components and their interactions are represented, functioning, and able to renew themselves (See Agricultural Handbook Number 701, Landscape Aesthetics, A Handbook for Scenery Management, 1995, pg. 23.for a complete explanation of the system).

Management Direction – Regulatory Framework

The Malheur NF scenic resource is managed by direction provided in the Malheur NF Plan (1990). Visual Quality is assessed and evaluated under Landscape Aesthetics, USDA Forest Service Handbook Nr. 701, December 1995. The Malheur National Forest Plan includes Forest-wide management area (MA) standards:

Viewshed Corridors (MA14)

Three visual corridors are located in the Middlefork John Range Project. The Malheur Forest Plan prescribes special management for the three corridors, Management Area 14. County Road 20 (Sensitivity Level 2) and Highway 7 and U.S. Highway 26 (Sensitivity 1).

This management area consists of the visible and potentially visible landscapes along major travel routes where the traveling public has a high to medium sensitivity to the scenery. The Level 1 corridors should meet a visual quality objective of retention in the foreground areas and partial retention in the middleground. The Level 2 corridors should meet a visual quality objective of partial retention in the foreground areas and modification in the middleground.

To meet partial retention standards, management activities may be evident to the viewer but must remain visually subordinate to the surrounding landscape. For modification standards, management activities may visually dominate surrounding landscape, but must borrow from naturally established form, line, color, and texture.

The management goal is to manage corridors as scenic viewsheds with primary consideration given to their scenic quality and the growth of large diameter trees. For Highways 7 and 26, the visual condition is to be slightly altered in appearance and it is currently in that condition.

For the County Road 20 Corridor the visual condition is to be moderately altered in appearance. The State of Oregon has designated Middle Fork John Day River as a State Scenic Waterway.

Outside the Viewshed Corridor

The visual management goal for Management Areas 1 & 2 (General Forest and Rangeland) is to manage for maximum modification, which is heavily altered in appearance. Deviations may strongly dominate the landscape character; however, they must blend with the natural terrain so that elements such as fences and water troughs do not dominate the landscape. Riparian areas (MA 3B), Big Game Winter Range (MA 4A), Old growth and Old growth Replacement (MA 13) and Wildlife Emphasis Area (MA 21) are managed for visual management objectives consistent with adjacent lands.

Direction for Vinegar Hill-Indian Rock Scenic Area (MA7) is to preserve and protect outstanding natural aesthetics. Manage the area to achieve retention visual quality level. A high Scenic Integrity Objective is prescribed for the entire area. For Research Natural Areas (MA 9), the area is to be managed to achieve retention visual quality level.

Administrative Site (MA 19) is to be managed for administrative needs and to consider these sites' historic and architectural values. The sites are to be managed to meet the visual quality objective of retention or partial retention. Developed Recreation Sites (MA 12) are to be managed for developed recreation opportunities to meet foreground visual quality objective of retention or partial retention.

Table SC-1: Acres of Malheur National Forest Management Area (MA) and other Ownership by Allotment

Management Area (MA)	Acres per Allotment								MA Total Acres	Percent of Malheur NF Area
	Austin	Bear	Camp Creek	Lower M.Fork	Elk	Blue Mtn.	Upper M.Fork	Sullens		
RHCA & 3B	38	212	155	8,813	7	2,921	8,817	4,948	25,911	14%
7				8,592			1,520		10,112	6%
9							60		60	>1%
14	21	295	185	1,208	51	1907	2055	2614	8,335	4%
1, 2, 4A, 12, 13, 19, 21	98	971	255	35931	14	17,577	41,521	38,869	135,237	75%
Total Malheur NF	157	1478	595	54,544	72	22,405	53,973	46,431	179,655	

Note: This table is a summary of Table 1-1 in the DEIS.

Analysis Method

Management activities such as livestock grazing can affect forest scenic quality by changing the predominant line and texture in a given viewing area. The degree of visibility of these events depends on the interaction of certain elements to the viewers such as:

- Slope and aspect of the land
- Surrounding landscape
- Frequency and duration of view

These factors have been incorporated into the analysis of the effects of each alternative in meeting visual quality objectives (VQOs). VQOs are minimum guidelines for meeting Forest Plan visual goals. The Malheur National Forest's visual resources are managed under the USDA's National Forest Scenery Management System located in Agricultural Handbook Number 701.

Existing Condition

Riparian (MA 3B)

This management area is an important component of the scenery because of the water and the associated vegetation including forbs, grasses, shrubs and hardwood trees that adds visual diversity which changes dramatically with the seasons. As discussed in the vegetation section, the condition of riparian vegetation varies from little impact to severely hedged shrubs as a result of browsing from wildlife and livestock. The FEIS Land and Resource Management Plan, Malheur National Forest (III-74) states "Livestock use of streamside zones usually creates some visual degradation of the landscape." Dense forested conditions in riparian areas have shaded out hardwood trees, shrubs and other riparian vegetation and dead remnants of shrubs and hardwoods are still visible in places. The loss of riparian vegetation from shading is most apparent in areas where the riparian vegetation is narrow in width in the smaller tributaries, seeps and springs. This has reduced the visual diversity. The most concern to scenic quality is where riparian areas are in the management areas with highest scenic integrity objectives (retention and partial retention areas). These management areas are the visual corridors, campgrounds and the Indian Rock – Vinegar Hill Scenic area.

Upland Vegetation (All management areas)

The overstocked forest conditions of present compared to historical conditions has had a big effect on understory vegetation similar to what was described for the riparian vegetation. The amount of shrublands including mountain mahogany stands have been reduced by conifer invasion in addition to loss of hardwood trees. The degree of the reduction is not known. The existing mountain mahogany shrubs and quaking aspen trees over the entire area have been severely hedged by browsing animals including wildlife. The regeneration has been unable to grow in height due to browsing. The reduction of shrubs and hardwood trees has reduced the visual diversity and lowered the scenic quality even though, in most cases, the scenic quality objective is still being met.

Viewshed Corridors (MA 14)

The following description of the viewshed corridors covers specific riparian conditions. The upland portions are as described in the general upland section above.

Highway 26 Viewshed Corridor

This corridor includes portions of the Blue Mountain and Sullens Allotments. At the west side of the corridor, Highway 26 is very close to Bridge Creek for about 5 miles which has a very narrow riparian width much of which is occupied by the highway. There is a buck and pole fenced area less than one acre in size that is protecting shrubs and hardwoods. The riparian vegetation appears to be in a natural, free to grow condition with little hedging of shrubs.

Highway 26 crosses Clear Creek just east of the Blue Mountain Work Center. There are fences that exclude grazing animals from riparian vegetation next to the road. While this allows the vegetation to grow freely there is some negative visual effects from the fences. Grazing has not been adversely affecting riparian vegetation in this area according to the vegetation section.

About one mile of the Middle Fork John Day River is visible from the highway in the Phipps meadow area. Most of the riparian is on private land. The portion that is on public lands is mostly dominated by grasses and sedges and is lacking the amount of shrubs that would be expected here. This is a wet meadow that had been invaded by lodgepole pine which died, were salvaged about 20 years ago leaving many stumps. Some lodgepole pine trees have regenerated, lessening the impact of the stumps. Livestock grazing is reported to be heavy in this pasture and standards have not been met most years. This may account for the lack of shrubs in the riparian area. The lack of shrubs has reduced the diversity and lowered the scenic quality.

Highway 7 Viewshed Corridor

This corridor includes portions of the Upper Middle Fork, Austin and Blue Mountain Allotments. Clear Creek is visible just north of Austin Junction. Riparian vegetation in this section on public lands is diverse with shrubs, conifers, aspens and grasses. The vegetation does not appear to be affected by browsing.

The Middle Fork John Day River is visible from Highway 7 but most of the area seen is on private land except where the highway crosses the river. A large diversion ditch runs parallel to the river which has reduced riparian vegetation. The vegetation section describes the shrub utilization in this section of the river as being above standards and shrub recruitment is limited. The hedged shrubs and lack of recruitment lowers scenic quality.

County Road 20 Viewshed Corridor

This corridor includes portions of the Upper Middle Fork, Lower Middle Fork, Camp Creek, and Bear Allotments and Bear and Sunshine Administrative Pastures. For the first three miles downstream of the former town of Bates, the publicly owned lands have upland vegetation.

The next four miles downstream from Caribou Creek is publicly owned on both sides of the river. Immediately below Caribou Creek is a reclaimed dredge mined area that now looks like a natural meadow with a healthy shrub component. Browsing in this meadow has been light and is not apparent. Likewise, browsing does not appear to have affected the riparian vegetation in this entire section of the river. The scenic quality is high as a result of the diverse and healthy riparian vegetation.

The next section of publicly owned riparian area along the river is about a mile and a half long and is in the vicinity of Sunshine Guard Station at Dry Creek. The vegetation section describes this section of the river as not meeting desired conditions but it is in an upward trend. The scenic quality is therefore lower than when the vegetation is fully recovered from past browsing.

The next sections of publicly owned riparian area along the river include a stretch about a mile long that starts where Camp Creek enters the river and another stretch from Galena to the Forest Boundary. The vegetation section describes this section of the river as having heavy shrub browsing with some lack of recovery. The scenic quality has been lowered due to the shrub utilization.

Vinegar Hill-Indian Rock Scenic Area (MA 7)

This management area is located mostly in the Lower Middle Fork Allotment and in the northwest corner of the Upper Middle Fork Allotment. Viewing scenery from the many trails and the few roads in and around the area is a popular activity within the scenic area. The biggest impact to decrease the scenic quality was the Summit Fire in 1996 and the timber salvage activity that followed. However, recovery of vegetation has already softened the stark appearance of blackened tree snags and started the improvement of scenic quality. Refer to the Recreation Specialist report for a more complete description of the area. The Summit Fire increased forage availability and the area was not grazed for about 6 years following the fire allowing very good recovery of vegetation that is preferred for browsing. Livestock grazing has been light since resumption of livestock grazing due to steep slopes and difficult accessibility caused by heavy amounts of downed tree boles resulting from fire killed trees and thick timber where the fire did not burn. Most browsing and hedging of shrubs and hardwoods has been by wildlife.

Administrative Sites (MA19)

These include Blue Mountain Work Center located on U.S. Highway 26, Sunshine Work Center on County Road 20, and Austin House Special Use Permit on State Highway 26. See the Recreation report for a description of these sites. Livestock grazing does not affect the scenery attributes within these sites with the exception of fences that exclude livestock. Fences around the sites do not detract from scenic quality as they are part of the grouping of man made structures that make up administrative sites.

Range Improvement Structures (All management areas)

Range improvement structures include fences, cattle guards and water troughs. While these structures help control livestock distribution benefiting vegetation, they can also reduce scenic attractiveness. The FEIS Land and Resource Management Plan, Malheur National Forest (III-74) states “Structural improvements such as fences and cattle guards are alterations of a natural-appearing landscape. Most structures can be made compatible through the application of visual design principles.”

Existing conditions relating to fences that are detracting from scenic quality are excessive amounts of fences or fencing very small areas such as for springs and vegetation protection. In some locations, fences have concentrated animals next to them resulting in areas of bare soil, lowering scenic quality. Fences that use trees as posts are unsightly and can eventually kill the tree by girdling. Fences around campgrounds, unless of the wood buck and pole style, are detracting to the natural appearance. See recreation report for the type and amount of fences for each campground.

Existing conditions relating to water troughs are bare soil areas around them due to livestock concentrations. The color is usually an unnatural green which makes them stand out more and the rectangular form is also not natural. However, water troughs have not been placed in visually sensitive areas.

Environmental Consequences

Direct and Indirect Effects

Alternative 1 - No Grazing

Eliminating grazing and allowing interior fences to fall to the ground will create a more natural appearing environment. In areas where shrubs are lacking due to livestock grazing these areas will recover and consequently increase the scenic quality.

Alternative 2 and 3

The proposed activities will not demonstrably affect the VQOs.

Fences can change the lines and color within view sheds. Development of water and new fence construction can increase the scenic impact during the period that they are used. It is assumed that the more miles of fence and acres of water developments built the greater the negative impact on scenic quality. The affect of concentrated animals in some locations, where fences have concentrated animals next to them resulting in areas of bare soil, will lower scenic quality. The use of trees as posts can eventually kill the tree by girdling, which is detrimental to the landscape. Fences around campgrounds, unless of the wood buck and pole style, will continue to detract from the natural appearance.

Current management practices, including reasonably foreseeable future actions, will have short-term impact on the VQOs and the management emphases for Scenery Management. Proposed activities in each of these alternatives are allowed for and meet the direction contained in the Land and Resource Management Plan relative to VQO settings.

Cumulative Effects

Current management practices, including reasonably foreseeable future actions, will have short-term impact on the VQOs and the management emphases for Scenery Management. Proposed activities in each of these alternatives are allowed for and meet the direction contained in the Land and Resource Management Plan relative to VQO settings. The ongoing management actions would move towards meeting the natural character.

Consistency with Direction and Regulations

(VQOs) are minimum objectives and can be managed to a higher level where feasible. Both the proposed project and no action meet Forest Plan Standards for the Visual Quality Objectives.

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments associated with the consequences of the proposed project or no action analyzed to the visual quality or scenic integrity.

Roads

Regulatory Framework and Analysis Methods

Roads Analyses have been completed on portions of the Middle Fork John Day Planning Area. The areas which have Roads Analyses completed include the Crawford Planning area which includes the Blue Mountain Allotment, the S. E. Galena Planning Area which includes part of the Upper Middle Fork Allotment, and the Easy Fire Recovery Planning Area which is within the Sullens Allotment. In addition to these project level Roads Analyses the Forest-wide Roads Analysis included all Level 3 – 5 roads. No further analysis of the roads is necessary under this project because there is no road work being proposed. For this project, the area considered for direct, indirect, and cumulative effects related to roads is the entire Middle Fork John Day Range Planning Area.

Existing Condition

The Middle Fork John Day (MFJD) Range Planning Area encompasses most of the Malheur National Forest which drains into the Middle Fork of the John Day River. This area is located on the northeast side of the forest. The planning area is accessed by US Highway 26 which crosses it in an east-west direction. State Highway 7 leaves US 26 at Austin Junction and goes north across the planning area toward Baker City, OR. Grant County 20 leaves State Highway 7 approximately one (1) mile north of Austin Junction and follows the Middle Fork of the John Day River through the planning area.

The planning area is divided into eight (8) range allotments. There are numerous Forest Service roads throughout the planning area. These include Forest arterials, collectors, and local roads. (See glossary for definition of these terms.) Table RO-1 shows each of the allotments and the number of open and closed roads within them.

Table RO-1: Planning Area Road Status

Allotment Name	Elk	Sullens	Upper Middle Fork	Lower Middle fork	Blue Mountain	Bear Creek	Camp Creek	Austin
Open Road Miles	0.56	320.37	176.66	221.12	65.79	7.33	3.30	2.70
Closed Road Miles	0.00	109.12	204.18	278.14	103.80	9.07	1.45	1.23
Total Road Miles	0.56	429.49	380.84	499.26	169.59	16.40	4.75	3.93

Total Miles = 1,504.82

The Forest roads within the planning area are maintained to different standards ranging from Maintenance Level 4 down to Maintenance Level 1. An example of a Maintenance Level 4 road would be Road 36 which crosses through the Camp Creek Allotment. Maintenance Level 1 roads would include all of the roads which are closed. Surface types are crushed aggregate, grid-rolled or pit run aggregate, and native material.

Cattle guards are used where ever allotment fences cross Level 3 or 4 roads and in some cases Level 2 roads. Additional cattle guards are planned to be installed and have been covered under various Categorical Exclusions. Where allotment fences cross Level 2 or Level 1 roads there are usually gates rather than cattle guards.

The use of roads for heavy haul by allotment permittees is limited to hauling cattle into allotments in the spring and back out in the fall on roads which are currently open. This would amount to several trips per year per allotment. Additional trips are made in light trucks during the year to allow the permittee to check on their cattle. No use of roads which are closed is permitted. Occasional road closure entry permits are issued to permittees for access to range structural improvements, place mineral or feed supplements, monitor livestock distribution or use and to locate livestock.

Environmental Consequences

Direct and Indirect Effects

Alternative 1

The consequences of this alternative would be a minor reduction in the use of Forest roads within the Planning Area. Because the current level of use by range permittees is so minimal there would be no significant change in the status of the road system.

Alternatives 2 and 3

There is relatively little use of roads by grazing permittees. Although the current level of use would remain the same under Alternative 2 and 3, it is at such a low level there would be no significant change in the road system through the adoption of either of these alternatives.

Cumulative Effects

All Alternatives

As described above, past and current impacts to roads of activities related to grazing in the Planning Area are insignificant. There are other activities proposed for the area which could have impacts to the road system. Those activities include timber harvest, replacement of culverts, and closing/decommissioning of roads.

Consistency with Direction and Regulations

Implementation of any of the alternatives will result in no movement in relation to the Standards and Guidelines for roads in the Forest Plan.

Irreversible and Irretrievable Commitments of Resources

Because there are no changes to the road system being recommended by any of the alternatives there would be no irreversible or irretrievable commitment of resources as a result of the implementation of any of the alternatives.

Special Uses

Special uses are authorizations for occupancy or use of Federal lands.

Regulatory Framework/Analysis Methods

The Range Planning Area was used as the analysis area. Malheur National Forest Records were used to determine what special uses are authorized in the Planning Area.

Existing Condition

Water Conveyance Systems:

All of the water conveyance systems are presently in existence and are used to convey water to adjacent private lands, either for irrigation or stock watering.

Generally, these conveyance systems consist of an instream structure, a dam or an infiltration gallery at the point of diversion (p.o.d) that diverts water flow and a ditch to carry the water. Within the ditch is a headgate and fish screen usually located within 100 feet of the diversion. The actual ditch usually follows the contour of the land at grades less than 5 percent.

Table SU-1. Water Conveyance

Allotment	Water Source	Purpose
Camp Creek	Middle Fork John Day River 1 Diversion/1 Ditch	Irrigation
Upper Middle Fork	Middle Fork John Day River- 1 Diversion/1 Ditch Vinegar Creek – 2 Diversion/ 2 Ditch Vincent Creek - 1 Diversion/1 Ditch Clear Creek – Diversion/1 Ditch Granite Boulder Creek – 3 Diversion/4 Ditch Beaver Creek – 2 Diversion/2 Ditch Ruby Creek – 1 Diversion/1 Ditch Butte Creek – 1 Diversion/1 Ditch	Irrigation
Blue Mt.	Middle Fork John Day River 2 Diversion/2 Ditch	Irrigation

Water Rights: The following discussions for water rights owned and maintained by the government are not considered special uses, but relates to water conveyence.

The federal lands located along the Middle Fork of the John River and its tributaries include a number of acres previously used for homestead sites, pasturing of livestock or hay production. These lands were acquired during land exchanges during the 1940’s into the late 1970’s. Associated with these land parcels gained by the federal government are the water rights that were conveyed to the government when the ownership was transferred. The water rights were granted by the State of Oregon to meet the water needs of the user of the property for irrigation or domestic use. Rotary fish bypass screens have been installed and maintained by the Oregon Department of Fish and Wildlife at diversions in streams with anadromous fish. The following is a listing of the water rights maintained by the federal government.

The current agency direction (Forest Service Manual 2541.4) is to "manage water rights to ensure these valuable Unites States properties are not lost."

Table SU-2: Summary Report For Water Rights And Diversions On The Bear Allotment

Certificate #	Water Source	Purpose	Location
# 31049	Cottonwood Springs (Located on Lower Middle Fork allotment)	Domestic	Pasture D, Sec. 3
# 31048	Middle Fork John Day River	Irrigation	Pasture B & Pasture C-1, Sec. 3
# 25504:	Middle Fork John Day River	Irrigation	Pasture C-2, Sec. 34
# 8518:	Middle Fork John Day River	Irrigation	Pasture A and Bird Pasture Sec. 2 & 11
#33055	This is for irrigation of private ground on the North side of the boundary above Pasture C-2 of the Bear allotment (North of Armstrong Creek in Section 34).		

Table SU-3: Summary Report For Water Rights And Diversions On The Camp Creek Allotment

Certificate #	Water Source (In downstream order.)	Purpose	Location
#25664 Proof #1019	"O'Rorke Eastside Ditch -Camp Creek Private diversion and ditch on NFS lands, irrigating 22.6 acres of private lands	Irrigation	Lower Camp Creek Campground: T.10S. R.33E. Section 25, SENE
#25663 #25661 Proof #1008	"Lane Ditch" & "Camp Creek 1–Camp Creek Diversion on private land, ditch on private and NFS lands, irrigates 49 acres of private and NFS lands – Lower Camp Pasture.	Irrigation	T.10S. R.33E. Section 18 SWSW
#25661 Proof #1009	"Camp Creek Ditch #2 –Camp Creek Diversion point and portion of ditch is on private lands, irrigates 35 acres of NFS lands – Lower Camp & Road Pastures.	Irrigation	T.10S. R.33E. Section 19 NWSW
# 25661 Proof #1010	"Camp Creek Ditch #3 –Camp Creek Diversion and ditch on NFS lands, irrigates 40 acres of NFS lands - Gibbs Meadow Pasture.	Irrigation	T.10S. R.33E. Section 18 SWSW

Special Uses:

There are nine uses that are authorized by special use permit in the allotment planning area. There are two spring developments for domestic use, one private road access, a cemetery (at Galena), a water gauging station (in the Camp Creek Allotment), private pasture grazing (T10S, R33E, Sec. 20 along the river), Idaho Power (transmission lines), Oregon Trail Electric Company (transmission lines), and Oregon Telephone (underground lines).

An additional permit in the MFJD Range Planning Area is the Austin House Special Use Permit - it is operated under a Resort Special Use permit and is discussed further under Recreation**.**

Environmental Consequences

Direct and Indirect Effects

All Alternatives

Ditches can be impacted by heavy livestock use along their banks. Alternative 1 would eliminate the potential for livestock impacts to ditches. Alternatives 2 and 3 are designed to meet Forest Plan standards and guidelines and would be expected to minimally impact ditches. If any negative impacts were detected, they would be dealt with through adaptive management of livestock grazing.

The remaining special uses are not expected to be impacted by any of the alternatives.

Cumulative Effects

All Alternatives

None of the alternatives, in combination with the activities discussed in Appendix A are expected to have cumulative impacts to special uses.

Consistency With Direction and Regulations

The alternatives are consistent with the Forest Plan, as amended and other direction and regulations related to special uses.

Irreversible and Irretrievable Commitments

The project as described will not result in any irreversible or irretrievable effects to special uses.

CHAPTER 4. CONSULTATION AND COORDINATION

List of Preparers

The following Forest Service personnel assisted in preparation of this environmental impact statement:

INTERDISCIPLINARY TEAM (IDT) MEMBERS:

Name	Expertise	Education Degree	Years Experience
Linda Batten	District Environmental Coordinator, IDT Leader	BS	24
Sue Burton	Supervisory Rangeland Management Specialist	BS	25
Teri Corning-Sevey	GIS/Data Services	BS	22
Perry Edwards	DEIS Fisheries Biology	BS	14
Patrick Haynal	Archaeology	PhD	26
Nancy Hafer	Botany	BS & BA	27
Robert (Hersh) McNeil	Soil Science	PhD	14
Michelle Putz	DEIS Document Preparation	BS	13
Ken Schuetz	Wildlife Biology	BS & MF	18
Lori Stokes	Fire and Fuels Management	BS	14
Dick Stowers	Transportation Planning	AA	28
Mary Lou Welby	Hydrology	MS	13
Shannon Winegar	Recreation/Visuals	BS	19
Eric Wunz	Silviculture	BS	26
Sue Burton/Bill Supulski (moved)	Social and Economic Impact Analysis	BS	25

AA-Associate of Arts, BA-Bachelor of Arts, BS-Bachelor of Science, MF-Master of Forestry, MS-Master of Science, PhD-Doctorate

Contributors

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes, and non-Forest Service persons during the development of this environmental impact statement:

MANAGEMENT AND REVIEW:

Larry Bright - Threatened and Endangered Species Coordinator
Carole Holly - Forest NEPA Coordinator
Jennifer Harris - Public Affairs, Tribal Relations
Mike Montgomery - Blue Mountain District Ranger

FEDERAL, STATE, AND LOCAL AGENCIES:

Wallowa-Whitman National Forest
Umatilla National Forest
National Oceanic and Atmospheric Administration-Fisheries (NOAA)
U.S. Fish and Wildlife Service
U.S. Bureau of Land Management/Ken Primrose
Oregon Department of Fish and Wildlife
State Historical Preservation Office (SHPO)
Grant County/Judge Dennis Reynolds

TRIBES:

Confederated Tribes of the Warm Springs Reservation
Confederated Tribes of the Umatilla Indian Reservation
Burns Paiute Tribe

Distribution of the Environmental Impact Statement

This environmental impact statement has been distributed to individuals who have responded to past scoping or are involved in the project by being a grazing permittee or an adjacent landowner. In addition, copies have been sent to the following Federal agencies, federally recognized tribes, State and local governments, and organizations representing a wide range of views regarding livestock grazing. Other individuals who did not respond to scoping will be informed of the location

Individuals (including permittees, adjacent landowners, and respondents)

John & Linda	Bastian	L.M.	Mathisen
Deb	Beardsley	Marnie	McConnell
Susan Jane	Brown	Don	Moss
Ron	Burnette	Larry	Olson
Robert & Diana	Burrill	Jan	O'Rorke
Christopher	Christie	John & Susan	Phipps
Bill	Colvin	Russell	Ricco
Rod	Curtis	Greg	Smith
Tim	Lillebo	Rachel	Thomas
Karen	Lillebo		
Michael	Lysne		

Organizations, Industry, and Local Agencies

Karen	Coulter	Blue Mtn Biodiversity Project
Bob	Dale	FSEEE
Linda	Driskill	Grant County Conservationists
Bruce	Eddy	Oregon Dept. Fish Wildlife
Jeff	Fields	The Nature Conservancy
Phillip H.	Kuhl	Birchdale Ranches
Peter "Mac"	Lacy	Oregon Natural Desert Assoc.
Jennifer	O'Reilly	USDI Fish and Wildlife Service
Stephanie	Parent	Pacific Environmental Advocacy Ctr.
Russell	Peterson	USDI Fish and Wildlife Service
Donald	Sampson	Columbia R. Inter-Tribal Fish Comm.
Ronald	Yockim	Grant County Courts

Oregon State Agencies

Department of Fish and Wildlife
Resource Management and Planning Division
Water Resources Department
Division of State Lands
Department of Geology and Mineral Industries
Department of Environmental Quality
Department of Land Conservation and Development
Economic and Community Development
Executive Department
Oregon Department of Forestry
State Capitol

Tribes
Burns Paiute Tribe
Conf. Tribes of the Umatilla Indian Reservation
Conf. Tribes of the Warm Springs Reservation

Federal Agencies
Advisory Council on Historic Preservation
U.S. Department of Agriculture APHIS PPD
U.S. Department of Agriculture National Resource Conservation Service
U.S. Department of Agriculture National Agricultural Library
U.S. Department of Agriculture Forest Service, Region 6 Office, Wallowa-Whitman National Forest and Umatilla National Forest
NOAA Fisheries/Northwest Region
U.S. Army Engineers/Northwestern Division
U.S. Department of Energy Office of NEPA Policy and Environmental Compliance
U.S. Environmental Protection Agency/Office of Federal Activities, EIS Filing Section
Northwest Mountain Region/Federal Aviation Administration
Federal Highway Administration
U.S. Department of the Interior
Northwest Power Planning Council
Environmental Protection Agency, Region 10
U.S. Coast Guard (USCG)/Environmental Impact Branch

Federal, State, and Local Officials
State Representative Ted Ferrioli, Malheur Timber Operators, Inc.
Grant County Judge Dennis Reynolds

CHAPTER 5. BIBLIOGRAPHY

The following is an overall bibliography of references used by specialists to write this EIS. It includes references cited in this document.

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CHAPTER 6. GLOSSARY

A

Abundance - The total number of individuals of a species in an area, population, or community.
Affected Environment – The biological, social, economic, and physical aspects of the environment that will or may be changed by proposed actions.
Allotment - A rangeland and/or forestland area designated for the use of a prescribed number and kind of livestock under one plan of management.
Allotment Management Plan (AMP) - A long-term operating plan for a grazing allotment on public land prepared and agreed to by the permittee and appropriate agency.
Allowable Use - (1) The degree of utilization considered desirable and attainable on various parts of a ranch or allotment considering the present nature and condition of the resource, management objectives and levels of management. (2) The amount of forage planned to be used to accelerate range improvement.
Alternative – A combination of management prescriptions applied in specific amount and locations to achieve a desired management emphasis as expressed in goals and objectives. One of several policies, plans, or projects proposed for decision making. An alternative need not substitute for another in all respects.
Anadromous fish – Those species of fish that mature in the sea and migrate into streams to spawn (e.g., salmon and steelhead trout).
Animal-Month (AM) - A month's tenure upon range by one animal. Must specify kind of class of animal. Not synonymous with animal-unit month.
Animal-Unit (AU) - Considered to be one mature cow of approximately 1,000 pounds, either dry or with calf up to six months of age, or their equivalent, based on a standardized amount of forage consumed.
Animal-Unit-Month (AUM) - The amount of dry forage required by one animal unit for one month based on a forage allowance of 26 pounds per day. Not synonymous with animal-month. The term AUM is commonly used in three ways: (a) Stocking rate, as in "X acres per AUM", (b) forage allocations, as in "X AUMs in Allotment A", (c) utilization, as in "X AUMs taken from Unit B."
Annual Plant - A plant that completes its life cycle and dies in one year or less.
Architecture (shrub) - *Uninterrrupted Growth—type Shrub*: Stem segments were annually added to each shoot to produce an uninterrupted, sequence of height growth. Diverse stem heights. *Arrested-Growth-type shrub:* Shoots are browsed at a uniform height above ground level; the uniform height of browsing indicates that the shrub has experienced intense herbivory since establishment. Shrubs are generally considered to transition into this class with greater than 30% use. *Retrogressed Growth-type Shrub:* An uninterrupted growth-type shrub that has been grazed intensely at whatever height shoots were available -- resulting in death from browsing of a complete set of annual shoots and/or some growth taller than arrest height. *Released Growth-type Shrub:* A formerly arrested or retrogressed shrub with a terminal leader(s) that has (have) grown through and beyond the browse zone. From Kegley and Frisina 1998.
Apparent Trend - An interpretation of trend based on a single observation. Apparent trend is described in the same terms as measured trend except that when no trend is apparent it shall be described as "none." Note: Some agencies utilize the following definition: "An assessment,

using professional judgment, based on a one-time observation. It includes consideration of such factors as plant vigor, abundance of seedlings and young plants, accumulation or lack of plant residues on the soil surface, soil surface characteristics, i.e., crusting, gravel pavement, pedicled plants, and sheet or rill erosion."

Aquatic (and riparian) health — Aquatic and riparian habitats that support animal and plant communities that can adapt to environmental changes and follow natural evolutionary and biogeographic processes. Healthy aquatic and riparian systems are resilient and recover rapidly from natural and human disturbance. They are stable and sustainable, in that they maintain their organization and autonomy over time and are resilient to stress. In a healthy aquatic/riparian system there is a high degree of connectivity from headwaters to downstream reaches, from streams to floodplains, and from subsurface to surface. Floods can spread into floodplains, and fish and wildlife populations can move freely throughout the watershed. Healthy aquatic and riparian ecosystems also maintain long-term soil productivity. Mineral and energy cycles continue without loss of efficiency.

Available Forage - That portion of the forage production that is accessible for use by a specified kind or class of grazing animal.

B

Bare Ground - All land surface not covered by vegetation, rock or litter.

Benchmark - (1) A permanent reference point. (2) In range inventory, it is used as a point where changes in vegetation through time are measured.

Best Management Practice (BMP) - A practice or a combination of practices, that is determined by a State (or designated area-wide planning agency) after problem assessment, examination of alternative practices and appropriate public participation to be the most effective, practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

Biennial - A plant that lives for two years, producing vegetative growth the first year and usually blooming and fruiting in the second year and then dying.

Biological Crust/Biological Soil Crust – Mosses, lichens, fungi, algae, or bacteria (including cynobacteria and actinomycetes) that bind a thin layer of surface soil into a crust that resists erosion.

Biological Diversity – (1) The distribution and abundance of plant and animal communities. (2) The variety of life forms and processes, including a complexity of species, communities, gene pools, and ecological functions.

Biomass - That total amount of living plants and animals above and below ground in an area at a given time.

Biophysical Environment or Bioenvironment – The interaction of climatic factors (moisture and temperature) and soil conditions on the expression of vegetation types and associated habitats. Climatic and soil conditions that result in similar successional pathways, disturbance processes and associated vegetative/habitat characteristics are referred to as a biophysical environment.

Browse - That part of leaf and twig growth of shrubs, woody vines and trees available for animal consumption. (v.) Act of consuming browse.

Brush - A term encompassing various species of shrubs or small trees usually considered undesirable for livestock or timber management.

Bunchgrass - A grass having the characteristic growth habit of forming a bunch; lacking stolons or rhizomes.

C

Canopy - (1) The vertical projection downward of the aerial portion of vegetation, usually expressed as a percent of the ground so occupied. (2) The aerial portion of the overstory vegetation. See also: Canopy Cover.

Canopy Cover - The percentage of ground covered by a vertical projection of the outermost perimeter of the natural spread of foliage of plants. Small openings within the canopy are included. It may exceed 100%.

Categorical Exclusion (CE) – ...a category of actions which do not individually or cumulatively have a significant effect on the human environment and which have been found to have no such effect in procedures adopted by a Federal agency in implementation of these regulations {1507.3) and for which, therefore, neither an environmental assessment nor an environmental impact statement is required. (40 CFR 1508.4)

Channel (stream) — The deepest part of a stream or riverbed through which the main current of water flows.

Climax - (1) The final or stable biotic community in a successional series that is self-perpetuating and in dynamic equilibrium with the physical habitat; (2) the assumed end point in succession.

Closure – A road management term indicating the road cannot be used by motorized traffic. This limitation can be accomplished by regulation, barricade, or blockage devices. The road can be available for emergency use; limited administrative use may be permitted.

Community (Plant Community) - An assemblage of plants occurring together at any point in time, while denoting no particular ecological status. A unit of vegetation.

Compaction, Soil - Compaction increases bulk density and soil strength, and decreases porosity and infiltration rate. Soil compaction is due to forces such as weight and vibration.

Competition - The interaction between organisms as a result of the removal or reduction of a common, required resource from the environment. Resources may include water, nutrients, light, oxygen, carbon dioxide, food and shelter.

Composition - Syn. species composition.

Condition and Trend Studies (C/T) - Monitoring sites with permanent transect lines which can be analyzed and compared to previous years to detect changes in range condition over time. C/T plot data was re-collected in 2003 and 2004, “scored” (to provide comparable current data to historic data), and used to provide a current condition/status of range vegetation, as well as a comparative condition to past range vegetation. The data is reported as a ”Vegetation Condition Rating” (see definition below).

Condition Threshold — Three components currently being monitored to determine riparian condition – mean stubble height, mean bank alteration, and mean shrub use. Stubble height, bank alteration, and shrub use relate to riparian function and are the disturbances expected from livestock use of riparian areas.

Connectivity — The arrangement of habitats that allows organisms and ecological processes to move across the landscape; patches of similar habitats are either close together or linked by corridors of appropriate vegetation. The opposite of a fragmented condition.

Corridor (landscape) — Landscape elements that connect similar patches of habitat through an area with different characteristics. For example, streamside vegetation may create a corridor of willows and hardwoods between meadows or through a forest.

Cover - (1) The plants or plant parts, living or dead, on the surface of the ground. Vegetative cover or herbage cover is composed of living plants and litter cover of dead parts of plants. (2) The area of ground cover by plants of one or more species. The four levels of cover as defined for elk are: *satisfactory cover*; *marginal cover*; *hiding cover*; and *thermal cover*.
Cover type — A vegetation classification depicting a genus, species, group of species, or life form of tree, shrub, grass, or sedge. In effect the present vegetation of an area.
Crust — See Biological Crust.
Cultural Resources - The physical remains (artifacts, ruins, burial mounds, petroglyphs, etc.) and/or conceptual content or context (as a setting for legendary, historic, or prehistoric events, as a sacred area of native peoples, etc.) of an area associated with human use capable of providing scientific or humanistic understanding of past human behavior, cultural adaptation and related topics through the application of scientific or scholarly techniques of investigation, or has spiritual value for memebrs of the affiliated culture.

D

Decommissioned Road –a road permanently removed from the transportation system, i.e. the road is no longer drivable. The management objective of decommissioning is to restore the hydrologic function. Decommissioning includes, as needed: the removal of drainage structures such as culverts, re-contouring cut and fill slopes, subsoiling, and revegetating the old road beds and may include methods described in Chapter 2, Management Requirements, Constraints, and Mitigation Measures under Watershed for decommissioning temporary roads.
Defer - Delay of livestock grazing on an area for an adequate period of time to provide for plant reproduction, establishment of new plants, or restoration of vigor of existing plants. See also: Deferred Gazing, Deferred Rotation, Rest.
Deferred Grazing - The use of deferment in grazing management of a management unit, but not in a systematic rotation including other units.
Deferred Rotation - Any grazing system, which provides for a systematic rotation of the deferment among pastures.
Density (stand) — The number of trees growing in a given area, usually expressed in terms of trees per acre or basal area per acre.
Designated Monitoring Area (DMA) - A relatively small portion of a pasture or management unit selected because of its location, use or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the overall riparian condition and the acceptability of current grazing management in riparian areas. SIMILAR TO KEY AREA.
Designated Old Growth (DOG) – A management area composed of mature/overmature trees (150 years or older) which provides for preservation of natural genetic pools, habitat for plants and wildlife species, contributions to the ecosystem diversity, aesthetic quality, and Native American cultural values.
Desirable Plant Species - Species that contribute positively to the management objectives. A plant may be desirable for one resouce and not desirable for anaother.
Desired Condition – (1) A portrayal of the land or resource conditions that are expected to result if goals and objectives are fully achieved. (2) A description of the landscape as it could reasonably be expected to appear at the end of the planning period if the plan goals, objectives, standards, and guidelines for that landscape are fully achieved.
Detrimental soil impacts – Soil erosion, displacement, compaction, puddling, or burning that exceeds certain thresholds. For instance, displacement is a detrimental soil impact only if more than 50% of the topsoil or humus-enriched A-horizon is removed from an area of 100 square feet

or more, which is at least 5 feet in width. A Forest Plan standard limits the amount of detrimental soil impacts to 20% of an activity area.

Diameter at Breast Height (DBH) – The diameter of a tree measured 4-1/2 feet above the ground.

Dispersed Recreation - Recreation use that occurs outside of developed sites and requires few, if any, facilities other than roads and trails. Dispersed recreation activities include hiking, backpacking, cross-country skiing, hunting, snowmobiling, viewing scenery, and driving for pleasure.

Disturbance — Refers to events that alter the structure, composition, or function of terrestrial or aquatic habitats. Natural disturbances include, among others, drought, floods, wind, fires, wildlife grazing, and insects and diseases. Human-caused disturbances include, among others, actions such as timber harvest, livestock grazing, roads, and the introduction of exotic species

Diversity — The distribution and abundance of animal and plant associations and species within an area. In this document we are referring to native and locally adapted species.

Diversity - The distribution and abundance of different plants and animal communities within an area.

Dominant - Plant species or species groups, which by means of their number, coverage, or size, have considerable influence or control upon the conditions of existence of associated species.

Downed wood — A tree or part of a tree that is dead and lying on the ground.

Drought - (1) A prolonged chronic shortage of water, as compared to the norm, often associated with high temperatures and winds during spring, summer, and fall. (2) A period without precipitation during which the soil water content is reduced to such an extent that plants suffer from lack of water.

Duff — The partially decomposed organic material of the forest floor that lies beneath freshly fallen leaves, needles, twigs, stems, bark, and fruit.

E

Ecological Site - A kind of land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in its ability to produce vegetation and to respond to management.

Ecological Status (seral status) - The present state of vegetation and soil protection of an ecological site in relation to the potential natural community for the site. Vegetation status is the expression of the relative degree of which the kinds, proportions, and amounts of plants in a community resemble that of the potential natural community. If classes or ratings are used, they should be described in ecological rather than utilization terms. For example, some agencies are utilizing four classes of ecological status ratings (early seral, mid-seral, late seral, potential natural community) of vegetation corresponding to 0-25%, 26-50%, 5175% and 76-100% of the potential natural community standard. Soil status is a measure of present vegetation and litter cover relative to the amount of cover needed on the site to prevent accelerated erosion. This term is not used by all agencies.

Ecosystem — A complete, interacting system of living organisms and the land and water that make up their environment; the home places of all living things, including humans.

Effects – Environmental changes resulting from a proposed action. Included are direct effects, which are caused by the action and occur at the same time and place, and indirect effects, which are caused by the action and are later in time or further removed in distance, but which are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and

related effects on air and water and other natural systems, including ecosystems.
Encroach - to advance beyond natural limits, make inroads.
Endangered Species – Any species, plant, or animal that is in danger of extinction throughout all or a significant portion of its range. Endangered species are are identified by the Secretary of the Interior in accordance with with the 1973 Endangered Species Act.
End-point Indicator – Physical features that can be measured as a group to assess cause and effect relationships and determine condition an trend. The timing of measurements is based on the objective – bank disturbance features (such as hoof prints) are best measured at the end of the grazing season, vegetation monitoring is generally conducted at the end of the growing season (or the end of the grazing season-whichever is later).
Environment — The combination of external physical, biological, social, and cultural conditions affecting the growth and development of organisms and the nature of an individual or community.
Environmental Assessment (EA) - A document of an environmental analysis which provides a basis for determining whether to prepare an environmental impact statement or a finding of no significant impact, and includes a discussion of alternatives and their impacts adequate to allow an alternative to be chosen.
Environmental Impact Statement (EIS) – A document prepared by a Federal agency that provides a statement of environmental effects required for major Federal actions under Section 102 of the National Environmental Policy Act (NEPA) and released to the public and other agencies for comment and review.
Ephemeral Draw – Draw bottoms that carry streamflow only as a direct response to rainfall or snowmelt events. They generally have no basefalll ordefined channel with evidence of annual scour or deposition.
Erosion — The wearing away of the land surface (i.e., soil/rock fragments) or stream channel by running water, wind, ice, gravity, or other geological activities. Channel erosion-Removal of stream bed material and/or stream bank material by the stream, resulting in down cutting and/or bank cutting. Soil erosion-Removal of some soil from a site by surface runoff. Erosion leaves rills and/or pedestals
Exclosure - An area fenced to exclude animals.

F

Featured Species — A wildlife species in the Malheur Forest Plan identified to have high public interest or demand.
Fire regime — The characteristics of fire in a given ecosystem, such as the frequency, predictability, intensity, and seasonality of fire.
Fire return interval — The average time between fires in a given area.
Floodplain — The portion of river valley or level lowland next to streams, which is covered with water when the river or stream overflows its banks at flood stage.
Forage - (n) Browse and herbage which is available and may provide food for grazing animals or be harvested for feeding. (v) To search for or consume forage.
Forage Production - The weight of forage that is produced within a designated period of time on a given area. The weight may be expressed as either green, air-dry, or oven-dry. The term may also be modified as to time of production such as annual, current year's or seasonal forage production.
Forb - Any broad-leafed herbaceous plant other than true grasses, sedges, and rushes (those in

the Gramineae or Poaceae, Cyperaceae and Juncaceae).
Forest Plan (Malheur National Forest Land and Resource Management Plan) — A document that guides natural resource management and establishes standards and guidelines for a national forest; required by the National Forest Management Act.
Forest-Wide Standards – An indication of policy or conduct dealing with the basic management of the Forest. Forest-wide management standards apply to all areas of the Forest regardless of the other management prescriptions applied.
Fuel (fire) — Dry, dead parts of trees, shrubs, and other vegetation that can burn readily.
Fuel Treatment – The rearrangement or disposal of natural or activity fuels to reduce the fire hazard.
Full Capacity Range - Terrain that is stable and may be grazed by domestic livestock under any management scheme.
Functional – At Risk – Riparian-wetland areas that are in functional condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

G

Graminoid — Grass-like plants such as grasses and sedges**.**
Grass - A member of the family Gramineae (Poaceae).
Grassland - Land on which the vegetation is dominated by grasses, grasslike plants, and/or forbs. Non-forest land shall be classified as grassland if herbaceous vegetation provides at least 80% of the canopy cover excluding trees. Lands not presently grassland that were originally or could become grassland through natural succession may be classified as potential natural grassland. See also: Rangeland.
Graze - (1) (vi.) The consumption of standing forage by livestock or wildlife. (2) (vt.) To put livestock to feed on standing forage.
Grazing - (vt.) To graze.
Grazing Distribution - Dispersion of livestock grazing within a management unit or area.
Grazing Permit - Official written permission to graze a specific number, kind, and class of livestock for a specified period on a defined allotment or management area. See also: Term Permit.
Grazing Management - The manipulation of grazing and browsing animals to accomplish a desired result.
Grazing Permittee - An individual or other legal entity who has been granted a term grazing permit to graze a specified number of livestock for a specific period on a range allotment.
Grazing Season - (1) On public lands, an established period for which grazing permits are issued. May be established on private land in a grazing management plan. (2) The time interval when animals are allowed to utilize a certain area.
Greenline - The first perennial vegetation from the water's edge. Riparian areas that are in high seral status with stable stream banks will exhibit a continuous line of vegetation at the bankfull discharge level. Rocky stream types may have a significant amount of rock causing breaks in the vegetation. This rock is considered part of the green line. Other breaks may occur in the first perennial bank of vegetation (watercourses or bare ground). The amounts of these (perennial vegetation, roack, and bare ground) should be recorded.

H

Habitat — The natural environment of a plant or animal that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or

population of plants or animals.
Habitat Effectiveness Index (HEI) – index for estimating elk habitat effectiveness on the landscape. Overall habitat effectiveness (HEscr) incorporates three variables or indices for summer range: cover quality (HEc), size and spacing of cover (HEs) and open road density (HEr).
Habitat type — A group of plant communities having similar habitat relationships.
Harvest — (1) Felling and removal of trees from the forest; (2) removal of game animals or fish from a population, typically by hunting or fishing.
Headwaters — Beginning of a watershed; un-branched tributaries of a stream.
Herbaceous - Vegetative growth with little or no woody component. Non-woody vegetation, such as gramminoids and forbs.
Herbicide - A phytotoxic chemical used for killing or inhibiting the growth of plants.
Hiding Cover — Vegetation capable of hiding 90% of a standing adult deer or elk from human view at 200 feet.
Historic Range of Variability (HRV) — The natural fluctuation of ecological and physical processes and functions that would have occurred during a specified period of time. Refers to the range of conditions that are likely to have occurred prior to settlement of the Planning Area by Euro-Americans (approximately the mid 1800s), which would have varied within certain limits over time. HRV is discussed in this document only as a reference point, to establish a baseline set of conditions for which sufficient scientific or historical information is available to enable comparison to current conditions.
Humus - The organic fraction of soil in which decomposition is so far advanced that its original form is not distinguishable.

I

Indicator – See End-point Indicator
Indicator species — A species that is presumed to be sensitive to habitat changes; population changes of indicator species are believed to best indicate the effects of land management activities.
Interdisciplinary Team (IDT) – A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no on scientific discipline is sufficiently broad to adequately solve the problem. Through interaction, participants bring different points of view to bear on the problem.
Intermittent stream — A stream that flows only at certain times of the year when it receives water from other streams or from surface sources such as melting snow.
Invader - Plant species that were absent in undisturbed portions of the original vegetation of a specific range site and will invade or increase following disturbance or continued heavy grazing.
Invasion - The migration of organisms from one area to another area and their establishment in the latter. Inventory (Rangeland) - (1) The systematic acquisition and analysis of resource information needed for planning and for management of rangeland. (2) The information acquired through rangeland inventory.
Inventory (Rangeland) - (1) The systematic acquisition and analysis of resource information needed for planning and for management of rangeland. (2) The information acquired through rangeland inventory.
Irretrievable – Applies primarily to the use of nonrenewable resources. For example, some or all of the timber production from an area is irretrievably lost during the time an area is used as a winter sports site. If the use is hcanged, timber production can be resumed. The production lost

is irretrievable, but the action is not irreversible.
Irreversible – Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors such as soil productivity that are renewable only over long time periods. Irreversible also includes loss of future options.
Issue – A subject or question of widespread public interest identified through public participation relating to management of National Forest System lands.

K

Key Area - A relatively small portion of a pasture or management unit selected because of its location, use or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the overall acceptability of current grazing management over the pasture or unit as a whole.

L

Landscape — All the natural features such as grass-lands, hills, forest, and water, which distinguish one part of the earth's surface from another part; usually that portion of land which the eye can comprehend in a single view, including all its natural characteristics.
Large downed wood — Logs on the forest floor with a large end diameter of at least 21 inches.
Large woody debris — Pieces of wood that are of a large enough size to affect stream channel morphology.
Late and Old Structural (LOS) Forest — Refers to mature forest characterized by a single or multiple canopy layer consisting of large or old trees. Other characteristics of old forests include: variability in tree size; increasing numbers of snags and coarse woody debris; increasing appearance of decadence, such as broken tops, sparse crowns, and decay in roots and stems; canopy gaps and understory patchiness; and old trees relative to the site and species.
Litter — The uppermost layer of organic debris on the soil surface, which is essentially the freshly fallen or slightly decomposed vegetation material such as stems, leaves, twigs, and fruits.
Local Road – Roads constructed and maintained for, and frequented by, the activities of a given resource element. These roads connect terminal facilities with Forest collector or Forest arterial roads or public highways. The location and standard usually are determined by the requirement of a specific resource activity rather than by travel efficiency.

M

Maintenance Burning - The use of prescribed burning to maintain vegetation in a desired condition.
Management Area – An area with similar management objectives and a common management prescription.
Management direction — A statement of goals and objectives, management prescriptions, and associated standards and guidelines for attaining them.
Management Indicator Species – Species identified in the a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish, including those that are socially or economically important.
Management Plan - A program of action designed to reach a given set of objectives.
Marginal Cover – For elk, a stand of coniferous trees 10 or more feet tall with an average canopy closure equal to or more than 40 percent.
Mature – For aspen/cottonwood, trees that are past peak growth.
Meadow - (1) An area of perennial herbaceous vegetation, usually grass or grasslike, (2) Openings in forests and grasslands of exceptional productivity in arid regions, usually resulting

from high water content of the soil, as in streamside situations and areas having a perched water table.
Mitigation – Avoiding or minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact by preservation and maintenance operations during the life of the action.
Monitoring - The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives.
Multiple Use - Use of range for more than one purpose, i.e., grazing of livestock, wildlife production, recreation, watershed, and timber production. Not necessarily the combination of uses that will yield the highest economic return or greatest unit output.

N

National Environmental Policy Act (NEPA) – An act which encourages productive and enjoyable harmony between humans and their environment; promotes efforts to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity; enriches the understanding of the ecological systems and natural resources to the nation, and establishes a Council on Environmental Quality (CEQ).
Native Species - A species that is a part of the original fauna or flora of the area in question.
Nonfunctional - Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, etc., as listed above. The absence of certain physical attributes such as a floodplain where one should be are indicators of nonfunctioning conditions. (Bureau of Land Management Technical Report 1737-9)
Non-use - (1) Absence of grazing use on current year's forage production. (2) Lack of exercise, temporarily, of a grazing privilege on grazing lands. (3) An authorization to refrain, temporarily, from placing livestock on public ranges without loss of preference for future consideration.
Noxious Weed - A plant species that is undesirable because it conflicts, restricts, or otherwise causes problems under management objectives. Not to be confused with species declared noxious by lows concerned with plants that are weedy in cultivated crops and on range.

O

Objective - A specific statement of measurable results to be achieved within a stated time period. Objectives reflect alternative mixes of all outputs or achievements which can be attained at a given budget level. Objectives may be expressed as a range of outputs.
Ongoing actions — Those actions that have been implemented, or have contracts awarded or permits issued.
Open Road – A road, or segment thereof, that is open to use.
Overmature – For aspen/cottonwood, trees that are nearing the end of their life.
Overgrazing - Continued heavy grazing that exceeds the recovery capacity of the community and creates a deteriorated range. See also: Overuse.
Overstory – The uppermost canopy of the forest when there is more htan one level of vegetation.
Overuse - Utilizing an excessive amount of the current year's growth, which, if continued, will result in range deterioration.

P

PACFISH – An amendment to the Forest Plan that prescribes goals, standards, and guidelines, meant to restore and protect native fish habitat. It provides an interagency ecosystem management approach for maintaining and restoring healthy, functioning watersheds, riparian areas, and aquatic habitats within the range of Pacific anadromous fish on Federal lands managed by the USDI Bureau of Land Management and the USDA Forest Service.
Partial Retention – See **Visual Quality Objectives**.
Pasture - A grazing area enclosed and separated from other areas by fencing or other barriers; the management unit for grazing land.
Pedestaling - An evidence of soil erosion, where soil has been eroded from around a piece of ground cover (such as a clump of grass, or a piece of gravel), leaving the ground cover on a pedestal of uneroded soil.
Percent Use - Grazing use of current growth, usually expressed as a percent of the current growth (by weight) that has been removed.
Perennial Plant - A plant that has a life span of three or more years.
Permittee - One who holds a permit to graze livestock on state, federal, or certain privately owned lands.
Phenology - The study of periodic biological phenomena that are recurrent such as flowering, seeding, etc., especially as related to climate.
Pioneer Species - The first species or community to colonize or recolonize a barren or disturbed area in primary or secondary succession.
Planning Area – The area covered by the grazing allotment; a delineated area of land subject to analysis of (1) responses to proposed management practices in the production, enhancment, or maintenance of forest and rangeland outputs and environmental quality objectives; and (2) economic and social impacts.
Planning or Project Record - A system that records decision and activities that result from the process of developing a plan, revision, or significant amendment.
Plant Association Group (PAG) - Broad potential vegetation classes with similar temperature and moisture conditions, and similar structure. For example, the "Hot Dry Upland Forest" PAG includes a variety of ponderosa pine forests with sagebrush or bunchgrass understory. .
Plant Vigor - Plant health.
Potential Natural Community (PNC) -The biotic community that would become established on an ecological site if all successional sequences were completed without interferences by man under the present environmental conditions. Natural disturbances are inherent in its development. The PNC may include acclimatized or naturalized non-native species.
Prescribed burning/fire — Intentional use of fire under specified conditions to achieve specific management objectives for burning a predetermined area.
Prescription — A management pathway to achieve a desired objective(s).
Productivity — (1) Soil productivity: the capacity of a soil to produce plant growth, due to the soil's chemical, physical, and biological properties (such as depth, temperature, water-holding capacity, and mineral, nutrient, and organic matter content). (2) Vegetative productivity: the rate of production of vegetation within a given period. (3) General: the innate capacity of an environment to support plant and animal life over time.
Proper Functioning Condition – Riparian wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy assoiated with high water flows, thereby reducing erosion and improving water quality; filter

sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses and stabilize stream banks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding ,and other uses, and support greater biodiversity. The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water, and vegetation.

Proper Use - A degree of utilization of current year's growth that, if continued, will achieve management objectives and maintain or improve the long-term productivity of the site. Proper use varies with time and systems of grazing.

Proposed action — In terms of the National Environmental Policy Act, a proposal by a federal agency to authorize, recommend, or implement an action hich is the subject of an environmental impact statement or environment assessment.

Puddling, Soil — A decrease in macro-pore abundance and/or a decrease in connections among macro-pores, due to shearing forces. Sol puddling decreases infiltration rates. Soil puddling is usually accompanied by soil compaction, but not always.

R

Range - (n.) Any land supporting vegetation suitable for grazing including rangeland, grazable woodland and shrubland. Range is not a use. (adj.) Modifies resources, products, activities, practices and phenomena pertaining to rangeland.

Range Improvement - Any structure or nonstructural improvement to facilitate management of rangelands or livestock.

Range Readiness - The defined stage of plant growth at which grazing may begin under a specific management plan without permanent damage to vegetation or soil. Usually applied to seasonal range. To be determined by Range Management Specialist with input from IDT.

Rangeland - Land where the vegetation is predominantly grasses, grass-like plants, forbs, or shrubs suitable for grazing and browsing.

Reconnaissance - A general examination or survey of a region with reference to its main features, usually as a preliminary act to a more detailed survey or as a follow-up to a survey.

Record of Decision – A document separate from but associated with an Environmental Impact Statement that states the decision, identifies all alternatives, specifying which were environmentally preferable, and states whether all practicable means to avoid environmental harm from the alternative have been adopted, and if not, why not (40 CFR 1505.2).

Recreation Opportunity Spectrum (ROS) – A system for planning and managing recreation resources. Land delineations that identify a variety of recreation experience opportunities categorized into classes on a continuum from primitive to urban. Each class is defined in terms of the degree to which it satisfies certain recreation experiece needs, based on the extent to which the natural environment ha been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreation use. The settings, activities, and opportunities for obtaining experiences have been arranged along a continuum or spectrum divided into seven classes: Primitive, Semiprimitive Nonmotorized, Semiprimitive Motorized, Roaded Modified, Roaded Natural, Rural, Urban.

Reforestation — Treatments or activities that help to regenerate stands of trees after disturbances such as harvest or wildfire. Typically, reforestation activities include preparing soil, controlling competition, controlling pests, and planting seeds or seedlings.

Regeneration — The process of establishing new plant seedlings, whether by natural means or artificial measures (planting).

Rehabilitate — To repair and protect certain aspects of a system so that essential structures and functions are recovered, even though the overall system may not be exactly as it was before.
Replacement Old Growth (ROG) – Stands that will replace Dedicated Old Growth management areas when they no longer meet old growth requirements
Residual Vegetation/Stubble Height - Residual vegetation/stubble height is that stubble height remaining at the end of the growing season just prior to winter dormancy. A protocol that describes where and how to collect data on residucal vegetation/stubble height to ensure consistency across the PACFISH, INFISH area is included with IIT monitoring protocol, Appendiz D.
Resilient, resilience, resiliency — (1) The ability of a system to respond to disturbances. Resiliency is one of the properties that enable the system to persist in many different states or successional stages. (2) In human communities, refers to the ability of a community to respond to externally induced changes such as larger economic or social forces.
Rest - Leaving an area ungrazed thereby foregoing grazing of one forage crop. Normally rest implies absence of grazing for a full growing season or during a critical portion of plant development; i.e., seed production.
Rest Period - A time period of no grazing included as part of a grazing system.
Rest Rotation - An intensive system of range management whereby grazing is deferred on various parts of the range during succeeding years, allowing the deferred part complete rest for one year.
Restoration — Holistic actions taken to modify an ecosystem to achieve desired, healthy, and functioning conditions and processes. Generally refers to the process of enabling the system to resume acting or continue to act following disturbance as if the disturbances were absent. Restoration management activities can be either active (such as control of noxious weeds, thinning of over-dense stands of trees, or redistributing roads) or more passive (more restrictive, hands-off management direction that is primarily conservation oriented).
Rest-Rotation - A grazing management scheme in which rest periods for individual pastures, paddocks or grazing units, generally for the full growing season, are incorporated into a grazing rotation.
Riparian area — Area with distinctive soil and vegetation between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation.
Riparian Habitat Conservation Areas (RHCAs) – Portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. Riparian Habitat Conservation Areas include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams, (2) providing root strength for channel stability, (3) shading for stream, and (4) protecting water quality.
Riparian Species - Plant species occurring within the riparian zone. Obligate species require the environmental conditions within the riparian zone; facultative species tolerate the environmental conditions, and may occur away from the riparian zone.
Riparian Zone - The banks and adjacent areas of water bodies, watercourses, seeps and springs whose waters provide soil moisture sufficiently in excess of that otherwise available locally so as to provide a more moist habitat than that of contiguous flood plains and uplands.
Road – A motor vehicle travel way over 50 inches wide, unless designated and managed as a

trail**.** A road may be classified, unclassified, or temporary (36 CFR 212.1). See also Classified, Unclassified and Temporary Road.
Road Density – The measure of the degree to which the length of road miles occupies a given land area (usually expressed as mile/sq. mile).
Roadless Area – A National Forest area that (1) is larger than 5,000 acres or, if smaller than 5,000 acres, is contiguous to a designated wilderness or primitive area; (2) contains no roads; and (3) has been inventoried by the Forest Service for possible inclusion in th Wilderness Preservation System.
Rotation Grazing - A grazing scheme where animals are moved from one grazing unit (paddock) in the same group of grazing units to another without regard to specific graze:rest periods or levels of plant defoliation.
Runoff – The total stream discharge of water, including both surface and subsurface flaw, usually expressed in acre-feet of water yield.

S

Salting- Placing salt blocks in specific areas for use by livestock or game; often relocated periodically to achieve improved animal distribution.
Satisfactory Cover – For elk, a stand of coniferous trees 40 or more feet tall with an average canopy closure equal to or more than 50 percent for ponderosa pine, and 60 percent for mixed conifer. Satisfactory cover typically exist as a multi-storied stand and will meet elk hiding cover criteria.
Scenery Management System – Management guidelines based on the premise that land management activities (including construction of facilities) should not contrast with the existing natural appearing landscape. Within a framework of regional landscape, character types, form, line, color, and texture should be used to make activities and structures "fit" within landscapes.
Scenic Integrity Objectives (SIOs) – The degree of direct human-caused deviations in the landscape, such as road construction, timber harvesting, or activity debris. Indirect deviations, such as landscape created by human suppression of the natural role of fire, are not included. The level to which an area meets its SIOs is indicated by the ratings **Very High**, **High**, **Moderate**, **Low**, **Very Low**, or **Unacceptably Low**.
Scoping — An early and poen process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action. Identifying the significant environmental issues deserving of study and de-emphasizing insignificant issues, narrowing the scope of the environmental impact statement accordingly (CEQ regulations, 40 CFR 1501.7).
Season of Use - The time during which livestock grazing is permitted on a given range area, as specified in the grazing permit.
Seasonal Grazing - Grazing restricted to a specific season.
Sediment — Solid materials, both mineral and organic, in suspension or transported by water, gravity, ice, or air; may be moved and deposited away from their original position and eventually will settle out.
Sensitive Species – Those species which (1) have appeared in the Federal Register as proposals for classification and are under consideration for official listing as Endangered or Threatened; (2) are on an official State list; or (3) are recognized by he Regional Forester to need special management in order to prevent the need fo their placement on Federal or State lists.
Sensitive Stream Reach – Generally, stretches of stream that are fairly flat, found in a wide valley bottom, with stream banks or beds composed of dirt/silt/sand - Sensitive stream reaches are often key habitat areas for fish and are those areas most sensitive to change due to

management of domestic livestock. These areas are also more likely to be influenced by livestock management. Sensitive stream reaches would likely be used as Designated Monitoring Areas (DMAs) because of these characteristics. See Figure 10, Map Section, for an estimation of sensitive stream reach location in the MFJD Range Planning Area.

Seral — 1) Refers to the stages that plant communities go through during succession. Developmental stages have characteristic structure and plant species composition. Early seral refers to plants that are present soon after a disturbance or at the beginning of a new successional process (in riparian areas-usually shallow-rooted, weak-stemmed colonizing plants that grow quickly and filter very fine sediment-often grasses); mid seral is often a mix of early and late seral plants; late or old seral refers to plants present during a later stage of plant community succession (in riparian areas-commonly stablizing plants such as sedges and rushes that have strong cord-like rhizomes, deep, fibrous roots, coarse leaves and strong crowns that buffer streambanks against erosion, enhance streambank strength, filter sediments, and with water buil/rebuil eroded banks-Winward 2000). 2) Refers to species or communities that are eventually replaced by other species or communities within a sere.

Seral stage — The developmental phase of rangeland with characteristic structure and plant species composition (see SERAL). Seral stage is a measure of vegetative condition which varies from very early to late seral with potential natural community (PNC) being the latest seral stage. Generally, an area falls into a later seral stage if it has a high percentage of “stabilizers” (usually native, deep-rooted sedges and grasses, and in some places rocks and down wood) and a shrub component. Areas with a higher percentage of “colonizers” (usually short-lived, shallow-rooted plants that respond quickly to change, including non-native plants) and with fewer shrubs are in earlier seral stages (adopted from Winward, 2000). PACFISH (USDA Forest Service 1995) defines seral stage by percent similarity of riparian vegetation to PNC or stream condition: under 25% similarity to PNC or “poor” stream condition equals early seral, over 50% similarity to PNC or “good” or better stream condition equals late seral. In terms of riparian function, later stages provide better stability and function, but in terms of forage, mid- and early seral stages tend to provide more production.

Shade-intolerant — Species of plants that do not grow well in or die from the effects of too much shade. Generally these are fire-tolerant species.

Shade-tolerant — Species of plants that can develop and grow in the shade of other plants. Generally these are fire-intolerant species.

Shallow soils – Highly and very highly erodible, unforested, shallow, rocky soils supporting low amounts of ground cover: also known locally as “scab soils.”

Shrub - A plant that has persistent, woody stems and a relatively low growth habit, and that generally produces several basal shoots instead of a single bole. It differs from a tree by its low stature (generally less than 16 feet) and non-aborescent form.

Silviculture — The practice of manipulating the establishment, composition, structure, growth, and rate of succession of forests to accomplish specific objectives.

Site — A specific location of an activity or project, such as a campground, a lake, or a stand of trees to be harvested.

Slash – The residue left on the ground after felling and other sivicultural operations and/or accumulating there as a result of storm, fire, girdling, or poisoning of trees.

Snag — A standing dead tree, usually larger than five feet tall and six inches in diameter at breast height. Snags are important as habitat for a variety of wildlife species and their prey.

Soil — The earth material that has been so modified and acted upon by physical, chemical, and

biological agents that it will support rooted plants.
Soil Compaction – An increase in soil bulk desnity of 20 percent or moe from the undisturbed level of volcanic ash soils. For other soils, it is an increase in soil bulk density of 15 percent or more from the undisturbed level.
Soil Disturbance — Disturbance, such as displacement or compaction, which may or may not be intense enough to be detrimental soil impact.
Species Composition - The proportions of various plant species in relation to the total on a given area. It may be expressed in terms of cover, density, weight, etc.
Stable - The condition of little or no perceived change in plant communities that are in relative equilibrium with existing environmental conditions; describes persistent but not necessarily culminating stages (climax) in plant succession. Implies a high degree of resilience to minor pertubations.
Stand — A group of trees in a specific area that is sufficiently alike in composition, age, arrangement, and condition so as to be distinguishable from the forest in adjoining areas.
Stock Pond - A water impoundment made by constructing a dam or by excavating a dugout or both, to provide water for livestock and wildlife.
Stocking Rate - The number of specific kinds and classes of animals grazing or utilizing a unit of land for a specified time period. May be expressed as animal unit months or animal unit days per acre, hectare, or section, or the reciprocal (area of land/animal unit month or day). When dual use is practiced (i.e. cattle and horse), stocking rate is often expressed an animal unit months/unit of land or the reciprocal.
Stockwater Development - Development of a new or improved source of stockwater supply, such as well, spring, pond, together with storage and delivery system.
Structural stage — A stage of development of a vegetation community that is classified on the dominant processes of growth, development, competition, and mortality.
Structure — The size and arrangement, both vertically and horizontally, of vegetation.
Stubble - The basal portion of herbaceous plants remaining after the top portion has been harvested either artificially or by grazing animals.
Subwatershed — A drainage area, equivalent to a 6th-field Hydrologic Unit Code (HUC). Hierarchically, subwatersheds (6th-field HUC) are contained within watershed (5th-field HUC), which in turn contained within a subbasin (4th-field HUC). Subwatersheds are shown graphically in Figure 10, Map Section.
Succession - The progressive replacement of plant communities on a site which leads to the potential natural plant community; i.e., attaining stability. Primary succession entails simultaneous successions of soil from parent material and vegetation. Secondary succession occurs following disturbances on sites that previously supported vegetation, and entails plant succession on a more mature soil.
Suitable Range - Land which produces or has the inherent capability to produce 50 pounds or more of palatable forage per acre, can be grazed on a sustained-yield basis, and is or can be feasibly made accessible for use.
Suitability – a determination of the appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone.
Surface Erosion – The detachment and transport of individual soil particles by wind, water, or gravity.
Sustained Yield - Production of specified resources or commodities at a given rate for a

designated unit of time.

T

Temporary Permit - A document authorizing grazing of a certain number of livestock on public lands during an emergency or for a certain period, terminable at the end of such period and with no guarantee of renewal in whole or in part. See also: Grazing Permit.
Term Permit - A document that authorizes grazing on public lands for a stated number of years as contrasted with an annual or temporary permit. See also: Grazing Permit.
Terrestrial — Pertaining to the land.
Thermal cover — Cover used by animals for protection against weather.
Thinning — An operation to remove stems from a forest for the purpose of reducing fuel, maintaining stand vigor, regulating stand density/composition, or for other resource benefits. Although thinning can result in commercial products, thinning generally refers to non-commercial operations.
Threatened and Endangered Species (T&E) — A species or subspecies of animal or plant whose prospects of survival and reproduction are in immediate jeopardy or likely to become so within the foreseeable future. Threatened species are identified by the Secretary of Interior in accordance with the 1973 Endangered Species Act.
Threshold – See Condition Threshold.
Trampling - Treading underfoot; the damage to plants or soil brought about by movements or congestion of animals.
Trend - The direction of change in ecological status or resource value rating observed over time. Trend in ecological status should be described as toward or away from the potential natural community, or as not apparent. Trend in a resource value rating for a specific use should be described as up, down or not apparent. Trends in resource value ratings for several uses on the same site at a given time may be in different directions, and there is no necessary correlation between trends in resource value ratings and trend in ecological status. Some agencies use trend only in the context of ecological status.

U

Unauthorized Use - The grazing of livestock on a range area without proper authority.
Understory — The trees and other woody species that grow beneath the canopy of other plants. Usually refers to grasses, forbs, and low shrubs under a tree or shrub canopy.
Undesirable Species - Species that conflict with or do not contribute to the management
Uneven-aged stand — Stand of trees in which there are considerable differences in the ages of individual trees.
Ungulates - Hoofed animals, including cattle, deer, and elk.
Upland — Ground elevated above the lowlands along rivers or between hillsThe portion of the landscape above the valley floor or stream.
Use - (1) The proportion of current year's forage production that is consumed or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole. (2) Utilization of range for a purpose such as grazing, bedding, shelter, trailing, watering, watershed, recreation, forestry, etc.
Utilization - Syn. Use.
Utilization Standards - The prescribed level of grazing by livestock which will achieve specific objectives including maintenance of vegetation and soil condition. Expressed as the percent of the annual herbaceous production removed by grazing.

V

Vegetation condition rating-A rating for range vegetation from Condition and Trend (C/T) plot data that is calculated by using a model that uses four successional stages (climax, late seral, mid seral, and early seral) mainly determined by percentage of climax vegetation on site. The C/T plots on the Malheur National Forest used ratings of excellent, good, fair, and poor which correlate to climax, late seral, mid seral and early seral and can be substituted in the vocabulary if necessary. With heavy grazing and subsequent defoliation of *decreasers* (palatable productive plants and perennial grasses associated with climax seral stages) comes retrogression to an earlier seral stage resulting in an increase of *increasers* (plants usually of lower productivity and/or palatability associated with early seral stages).
Vegetative - Relating to nutritive and growth functions of plant life in contrast to sexual reproductive functions. Of or relating to vegetation.
Viability — In general, viability means the ability of a population of a plant or animal species to persist for some specified time into the future. For planning purposes, a *viable population* is one that has the estimated numbers and distribution of reproductive individuals to ensure that its continued existence will be well distributed in the planning area.
Vigor - Relates to the relative robustness of a plant in comparison to other individuals of the same species. It is reflected primarily by the size of a plant and its parts in relation to its age and the environment in which it is growing. Syn. plant vigor.
Visual Quality Objectives (VQOs) — A desired level of management based on physical and sociological characteristics of an area. Refers to the degree of acceptable alteration of the characteristic landscape:
Preservation—Allows only ecological changes. Management activities, except for very low visual impact recreation facilities, are prohibited. This objective applies to specially classified areas, including wilderness.
Retention—Provides for management activities that are not visually evident. Management activities are permitted, but the results of those activities on the natural landscape must not be evident to the average viewer.
Partial Retention—Management activities may be evident to the viewer but must remain visually subordinate to the surrounding landscape.
Modification—Management activities may visually dominate the natural surrounding landscape but must borrow from naturally established form, line, color, and texture.
Maximum Modification—Land management activities can dominate the natural landscape to greater extent than in the modification objective, except as viewed from background when visual characteristics must be those of natural occurrences within the surrounding area.

W

Warm-season Plant - A plant which makes most or all its growth during the spring, summer or fall and is usually dormant in winter.
Water Gap - A small part of a unit where the fence crosses a stream for a relatively short segment then recrosses the stream, giving livestock access to the short segment of stream for watering; often a specially constructed fence across a drainage. The fence is easily moved by the forces of a flood, thus preventing damage to the permanent fence.
Watershed — A land area that collects and discharges excess surface water through a single outlet; (1) The region draining into a river, river system, or body of water. (2) a watershed also

refers specifically to a drainage area of approximately 50,000 to 100,000 acres, which is equivalent to a 5th-field Hydrologic Unit Code (HUC). Hierarchically, subwatersheds (6th-field HUC) are contained within a watershed (5th-field HUC), which in turn is contained within a subbasin (4th-field HUC).

Weed - (1) Any plant growing where unwanted. (2) A plant having a negative value within a given management system.

Wetland — In general, an area soaked by surface or groundwater frequently enough to support vegetation that requires saturated soil conditions for growth and reproduction; generally includes swamps, marshes, springs, seeps, bogs, wet meadows, mudflats, natural ponds, and other similar areas. Legally, federal agencies define wetlands as possessing three essential characteristics: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. The three technical characteristics specified are mandatory and must all be met for an area to be identified as a wetland. *Hydrophytic vegetation* is defined as plant life growing in water, soil, or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. *Hydric soils* are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic (without oxygen) conditions in the upper part of the soil profile. Generally, to be considered a hydric soil, there must be saturation at temperatures above freezing for at least seven days. *Wetland hydrology* is defined as permanent or periodic inundation, or soil saturation to the surface, at least seasonally.

Wildfire — A human or naturally caused fire that does not meet land management objectives.

Wildland Urban Interface (WUI) – The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Wildlife - Undomesticated vertebrae animals considered collectively, with the exception of fish.

Y

Yearlong Grazing - Continuous grazing for a calendar year.

INDEX

O

P

R

S

T

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W

Figure 1
Middle Fork John Day River
Range Project Area
Vicinity Map

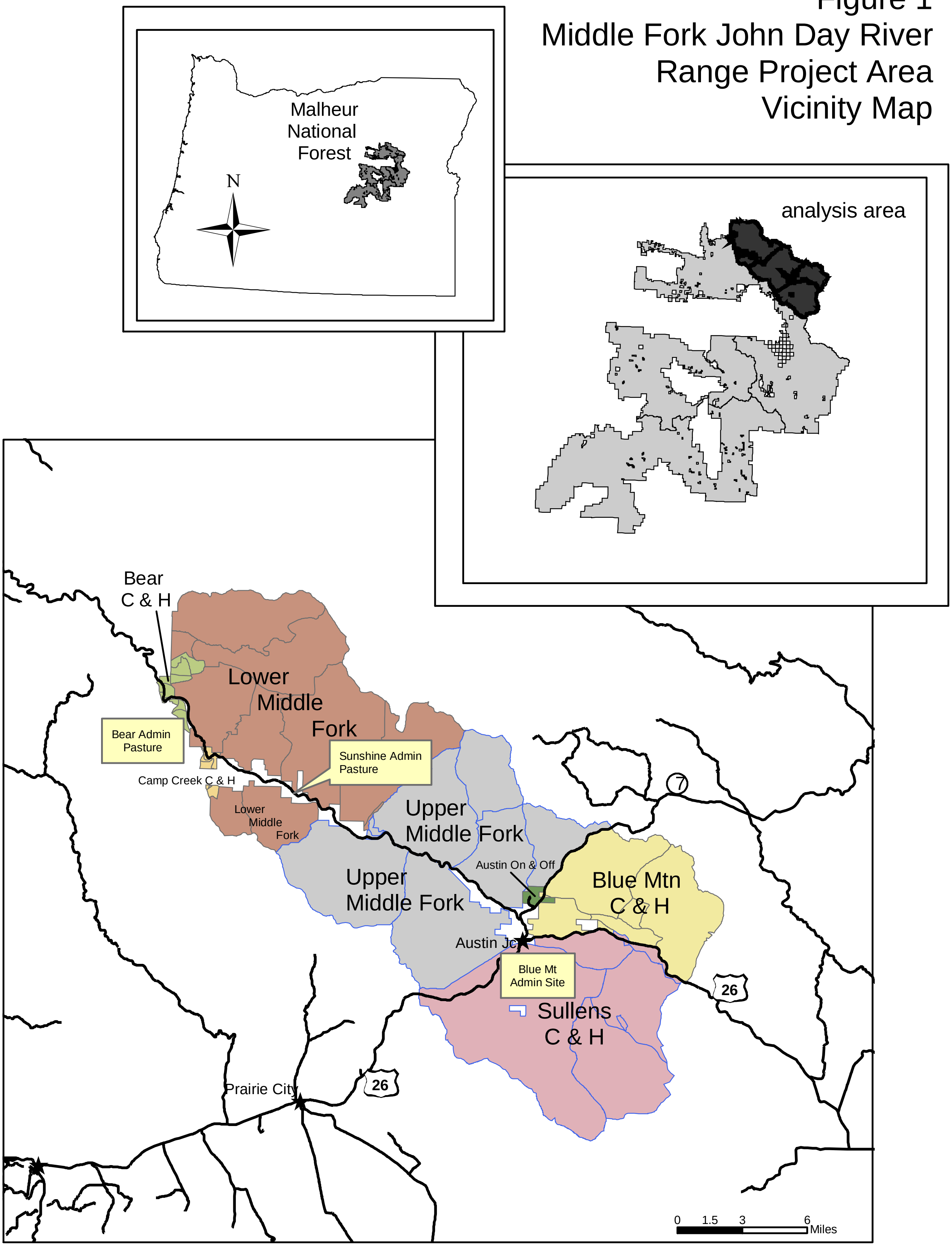
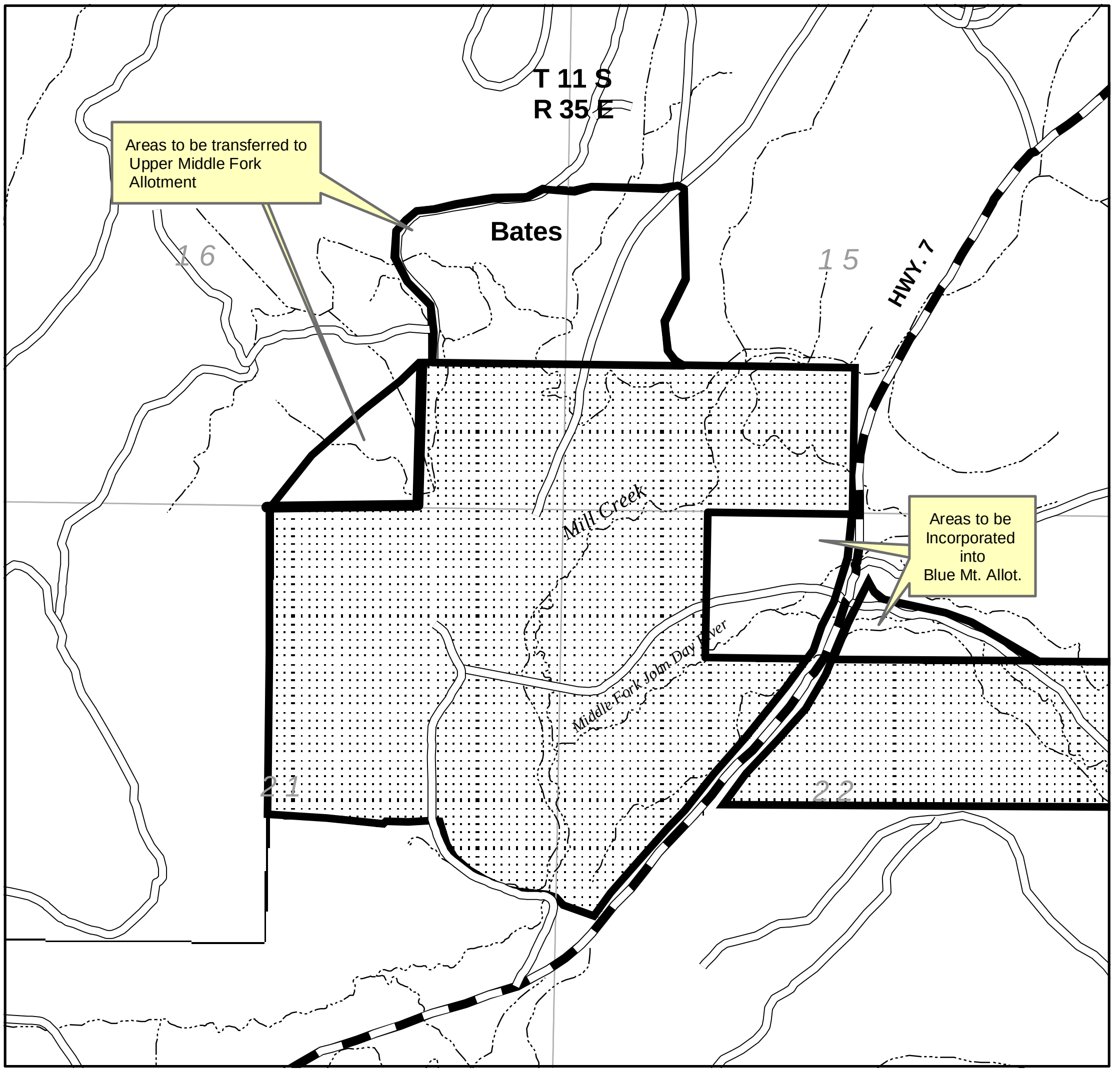


Figure 2

Austin Allotment



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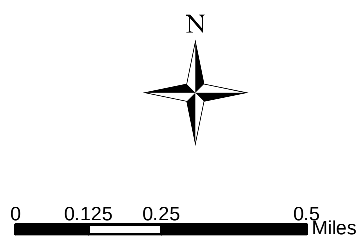
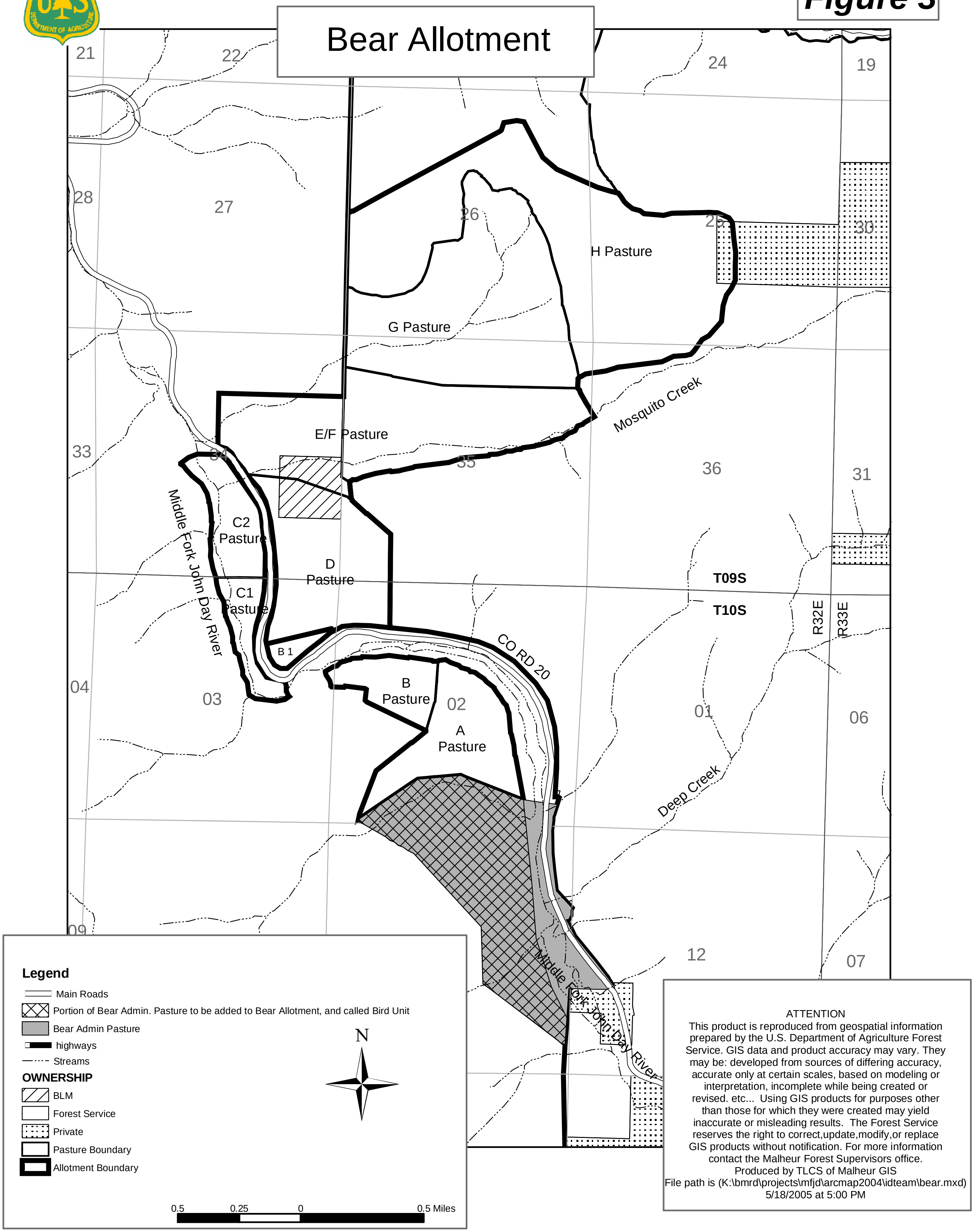


Legend

- Streams
- Private Land
- Roads
- State HWY 7
- Allotment Boundary

Figure 3


Bear Allotment
H Pasture
G Pasture
E/F Pasture
C2 Pasture
C1 Pasture
D Pasture
B 1
B Pasture
A Pasture
Mosquito Creek
Deep Creek
CO RD 20
Middle Fork John Day River
T09S
T10S
R32E
R33E
21
22
24
19
28
27
26
25
30
33
34
35
36
31
04
03
02
01
06
09
12
07
Legend
Main Roads
Portion of Bear Admin. Pasture to be added to Bear Allotment, and called Bird Unit
Bear Admin Pasture
highways
Streams
OWNERSHIP
BLM
Forest Service
Private
Pasture Boundary
Allotment Boundary
N
0.5 0.25 0 0.5 Miles
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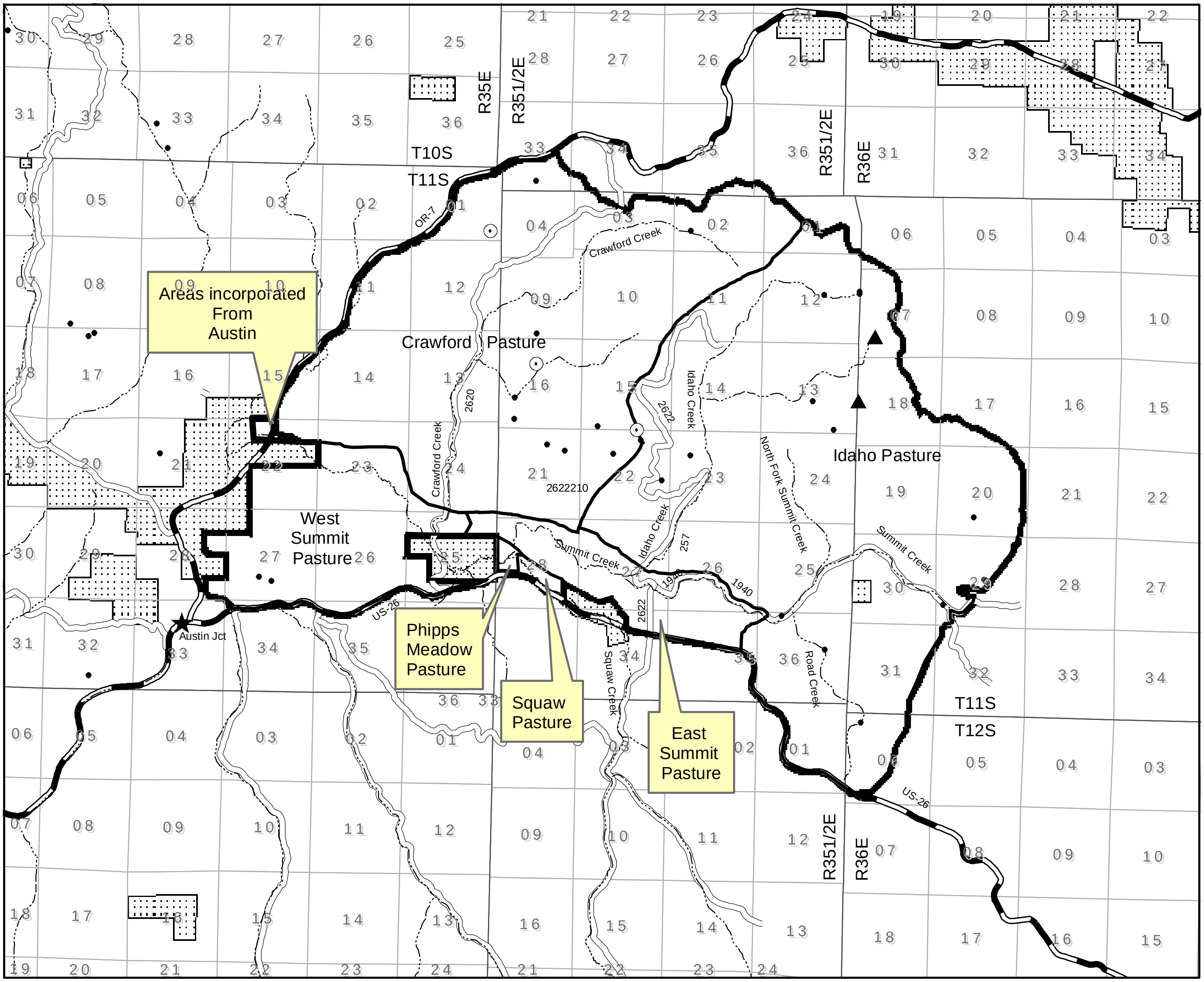
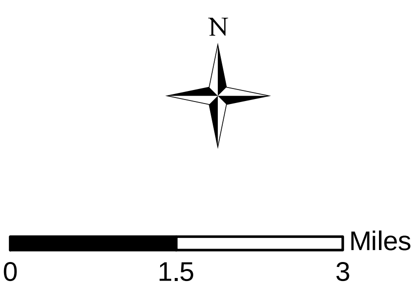
Blue Mountain Allotment

Figure 4





Legend

- Existing Water Sources
- Main Streams
- Highways
- Roads
- Allotment Boundary
- Pasture Boundary
- Private Land
- Existing Water Development that may require reconstruction
- Construct Water Development

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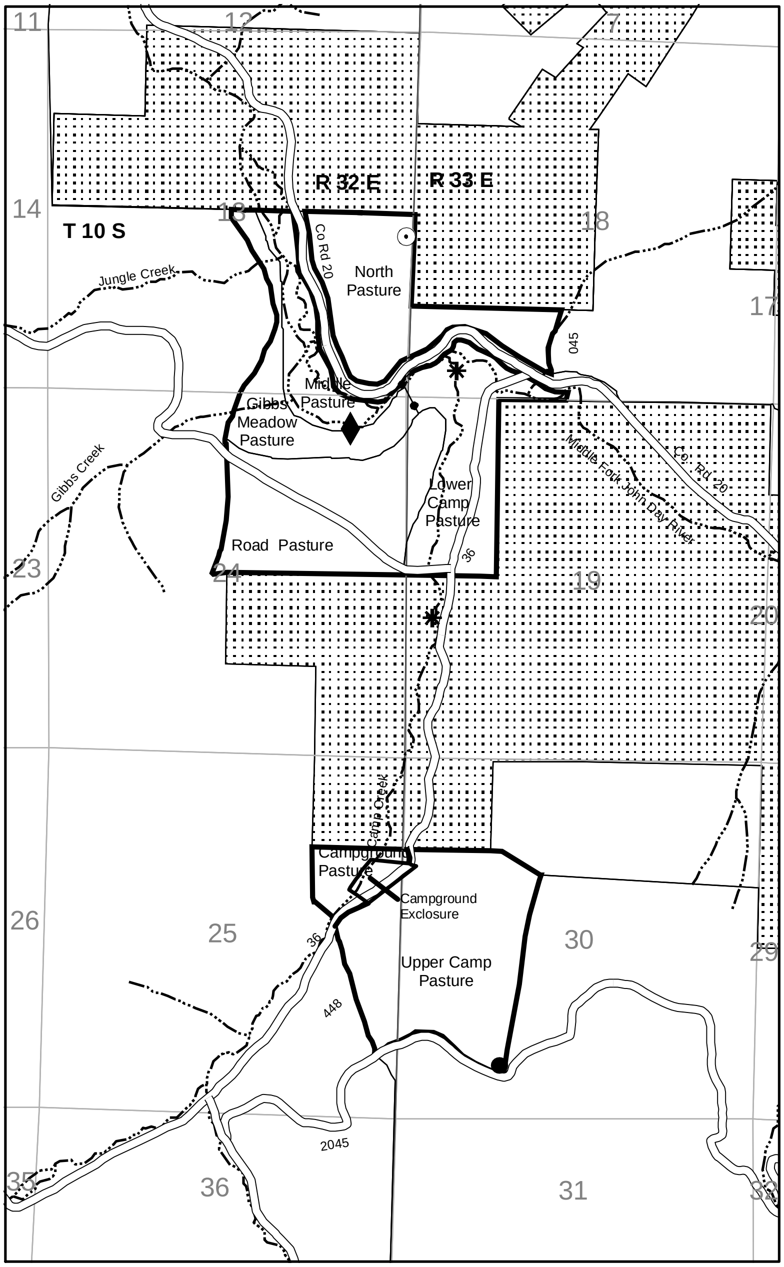
Figure 5

Camp Creek Allotment



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N

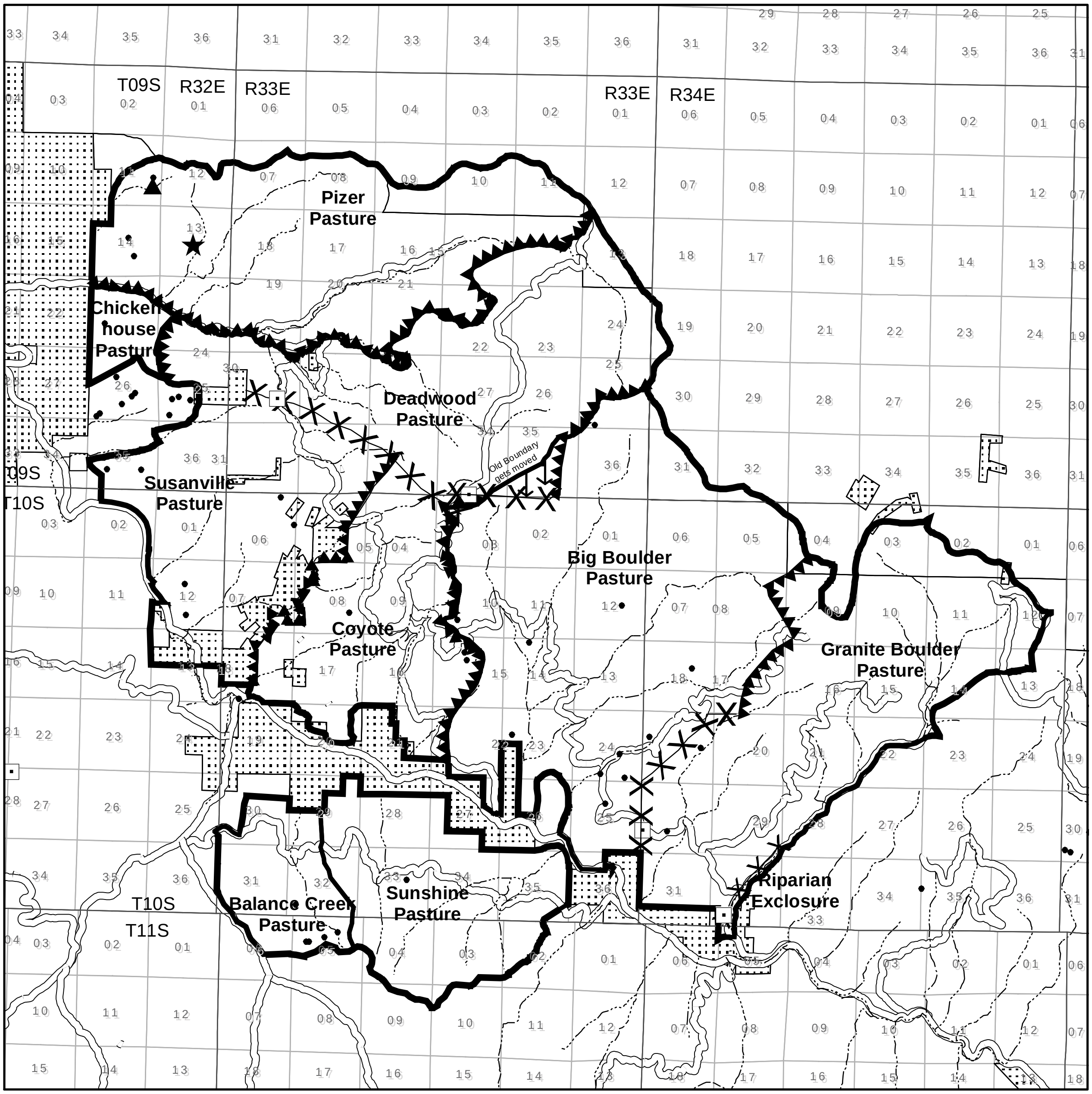
0 0.25 0.5 1 Miles

Legend

- Pasture Boundary
- Existing Water Sources
- Forest Service
- Private
- Campground Exclosure
- Streams
- Water Gap Construction
- Stock Pond Reconstruction
- Ditch Diversion Point

Lower Middle Fork Allotment

Figure 6



0 1 2 4 Miles

Legend

Pasture Boundary

Main Streams

Main Roads

OWNERSHIP

Forest

Private

Allotment Boundary

Existing Water Sources

N

Fence to be built with C.E.

Fenceless Pasture Boundary

Cattleguards to be built with C.E.

Water Developement to be constructed

Spring fence to be built

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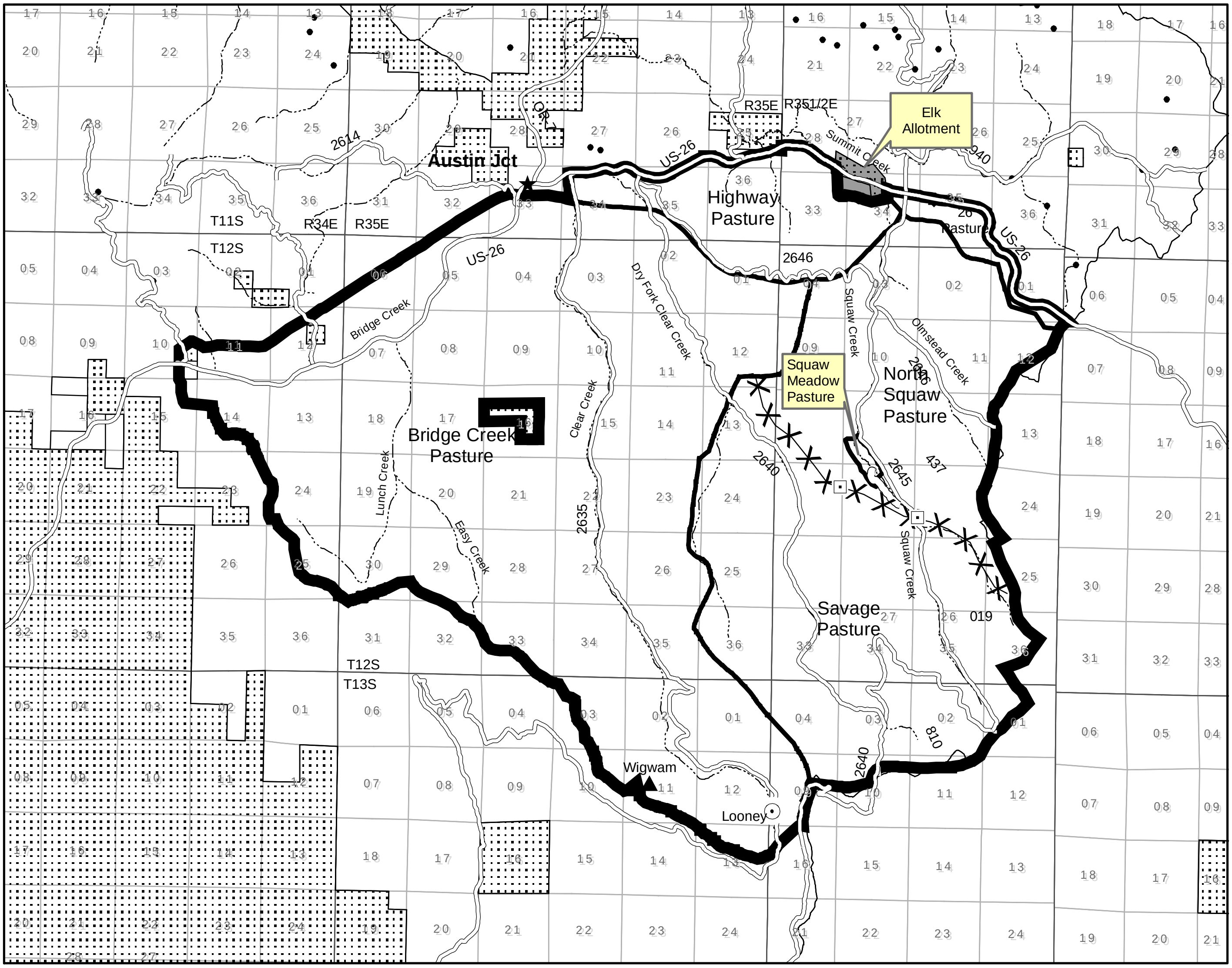
Sullens and Elk Allotments

Figure 7



Legend

- Pastures
- Allotment Boundary
- Main Streams
- Elk Allotment (area outside private to be added to Highway Unit)
- Forest Service
- Private
- Existing Water Sources
- Fence to be Constructed
- Cattleguard to be Constructed
- Reconstruct Water source
- Construct Water source

N

0 1 2 4 Miles

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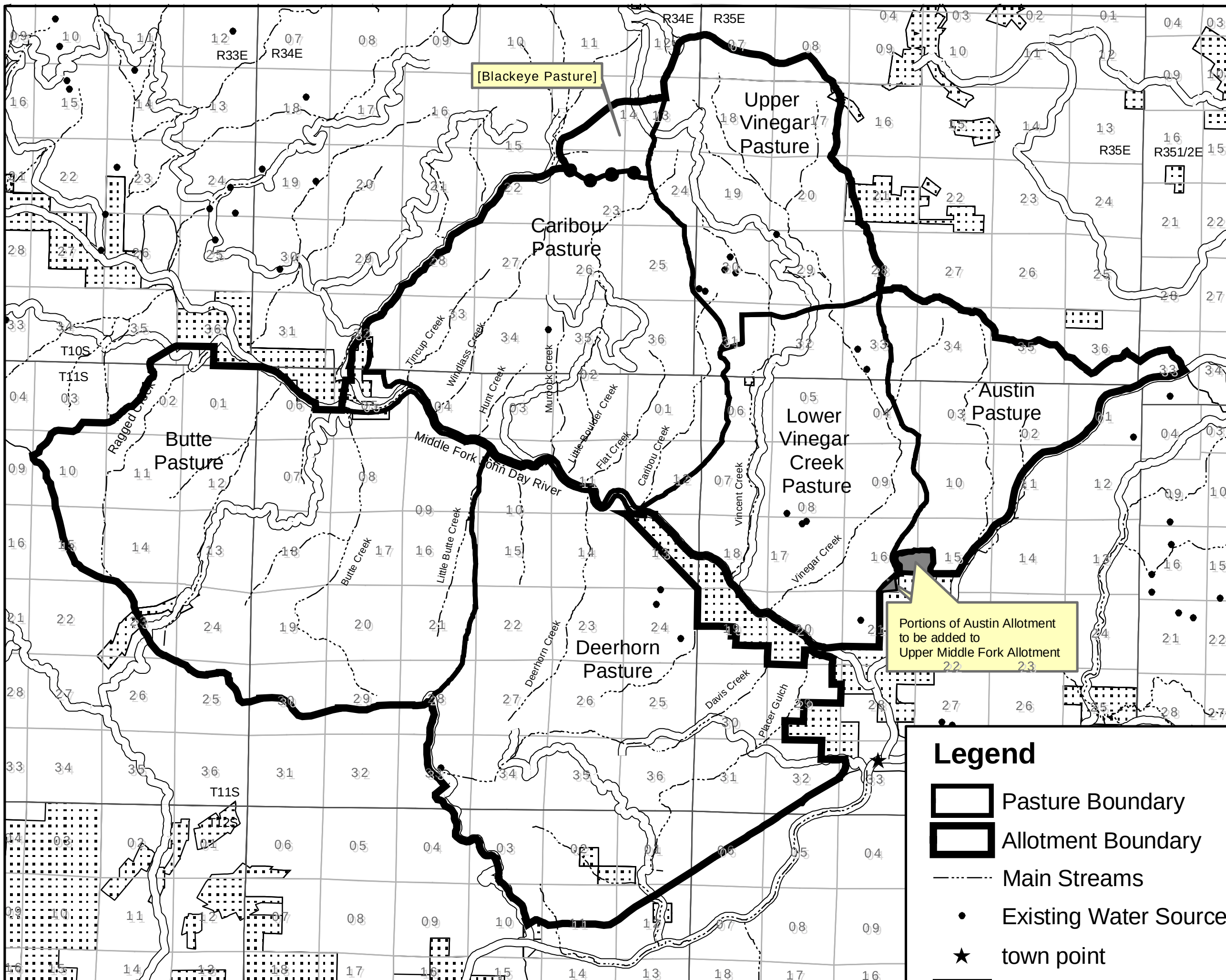
Upper Middle Fork Allotment

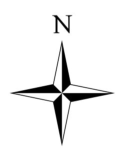
Figure 8



Legend

- Pasture Boundary
- Allotment Boundary
- Main Streams
- Existing Water Sources
- town point
- Forest Service
- Private
- Main Roads
- Fence Removal

0 0.5 1 2 Miles



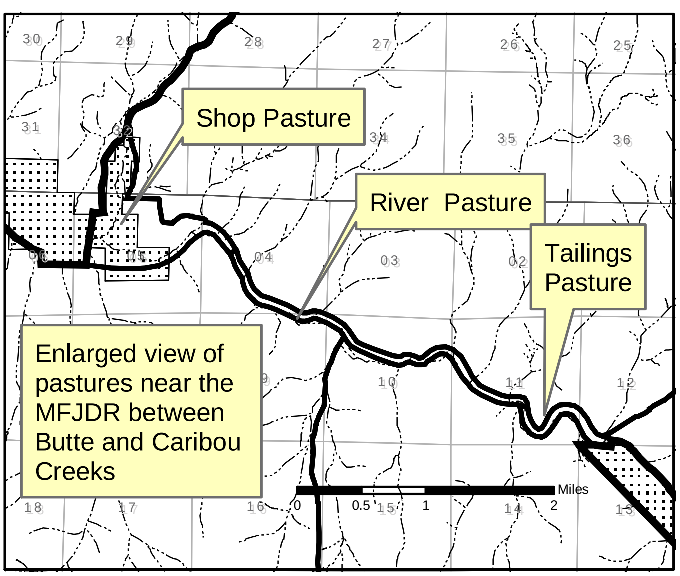


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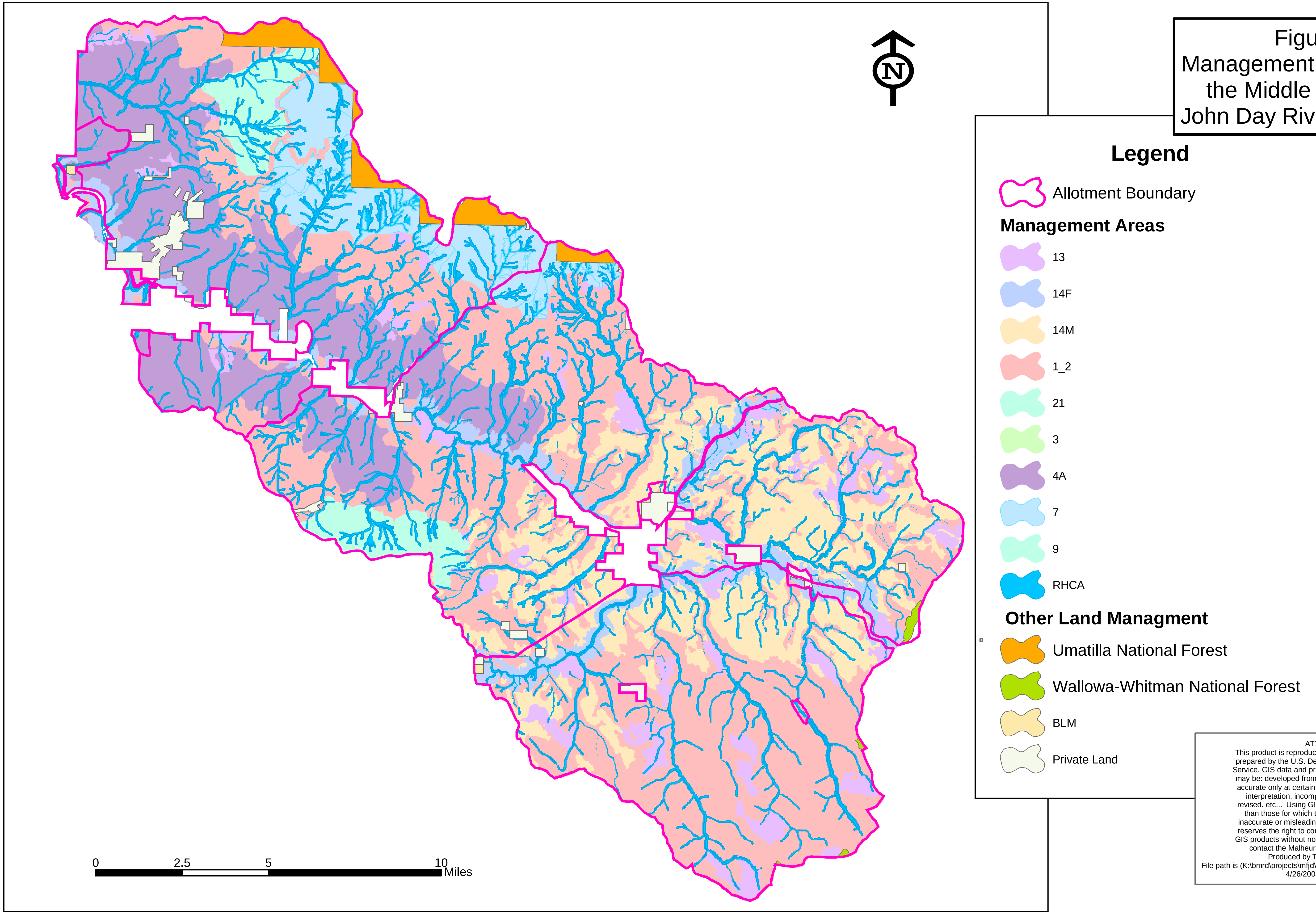
Figure 9
Management Areas within the Middle Fork of the John Day River Watershed



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Appendix A - Cumulative Effects

Introduction

This appendix discloses actions considered in the cumulative effects sections of each resource in Chapter 3. In most cases, past and onoing activities are incorporated into each resource's existing conditions because they help explain the current condition of the resource; past and ongoing activities are also considered in cumulative effects in the context of how past or ongoing actions affect present conditions and how future actions increase, reduce, or do not change these conditions. This list includes all past, ongoing, and reasonably foreseeable projects expected to occur within each resources' defined scope of analysis (includes all projects that overlap each resources cumulative impact area). Range projects in this list are considered reasonably foreseeable only if an action alternative is chosen.

The allotments and administrative pastures are almost fully contained in the Upper Middle Fork John Day, Galena, and Camp Creek Watersheds. An incidental number of acres, totaling 884 acres or less than ½ of 1% of the Analysis Area, fall in other watersheds (N. Fk. And S. Fk. Burnt River, Granite and Middle Fork Granite, Upper Middle Fork and Prairie City watersheds). These acres occur along the outer edges of the project area and allotment boundaries. Some of these acres are private, some are high elevation with little livestock use, and some may be included due to mapping/fence location errors.

Private land inholdings occur within the allotments and in the overall Planning Area; private land in these areas is not included in the term grazing permit, nor is it managed as part of the allotments (see Chapter 1, Management Areas and Objectives). Approximately 3,500 acres of the allotments fall within the Wallowa-Whitman and Umatilla National Forests (see Chapter 1, Management Areas and Objectives). Known localized concerns in these areas are discussed in the EIS.

The effects discussions in this analysis will focus on effects to the Upper Middle Fork John Day, Galena, and Camp Creek Watersheds. Effects to the other watershed will be addressed under cumulative effects. Those watersheds may show negligible improvement from increased livestock control; other effects from livestock grazing and this project would be expected to be minimal.

Table A-1: Actions Considered in Cumulative Effects Analysis for the Middle Fork John Day Range Project DEIS

Past		
Action	**Description**	**Date**
Wildfire, associated fire suppression efforts, and fire line rehabilitation	Records for larger wildfires (over 40 acres) show about 1,600 acres burned in the analysis area between 1919 and 1986. Summit, Reed, and Indian Rock Fires burned about 32,300 acres in the Lower Middle Fork Allotment (1994-1996); Grouse Knob and Easy Fires burned about 3,500 acres in Sullens Allotment (1998-2002). Additionally numerous small fires have occurred and been suppressed throughout the Analaysis Area. Recent large fires have had burned areas rehabilitated	1919-2002

Past		
Action	**Description**	**Date**
Summit Fire Recovery Treatments	In Summit fire area-riparian shrub planting and protection along 40 miles of stream, wood placed in gullies to rehab. 100 ac. of meadow, coarse wood placement in 30 miles of stream, and conifer planting	1997-2000
Timber harvest on National Forest System land and associated activities	Harvest, historic building of and current existence of railroad grades, associated road construction and reconstruction	1974-2003
Historic livestock grazing on National Forest System land	Historic grazing of MFJD Range Planning Area (historic grazing can generally be divided into pre-1950 and post-1950)	Pre-Malheur National Forest to 1990
Past grazing activities on private land	Most of the private land inside the MFJD Range Planning Area is at lower elevations; most had some level of past livestock grazing	1860s to 1990s
Mining	Placer mining in many streams in the analysis area	1930s-40s
Precommercial thinning/fuels reduction	Precommercial thinning/fuels reduction (effects of precommercial thinning done prior to 1995 would no longer be discernible)	1995-2001
Prescribed burning	5,200 acres in Lower Middle Fork since 1985, 8,700 acres in Upper Middle Fork since 1993, 1,200 acres in Blue Mountain in 1997	1985-2001
Aspen fencing	Aspen exclosures built in the Summit fire area	1996-2000
Riparian Enhancement-Crawford Creek area	Coarse wood placement in streams, Crawford Creek, Crawford Cr. tributaries, 16 Gulch	1994-1998
Riparian enhancement – SE Galena area	Hardwood planting and protection (caging/fencing) on about 12 miles of stream in Vinegar, Tincup, Placer and Deerhorn drainages.	2001-2004
Riparian enhancement-at stream crossings along Hwy 26	several culverts/bridges were replaced along Highway 26, and the inlet/outlet to these culverts was planted with shrubs/trees and fenced to exclude livestock and big game	2000-2003
Private Land-Historic thinning, mining, grazing, use of water, agriculture along MFJD River	On Confederated Tribes of Warm Springs properties along Middle Fork of John Day (Forrest and Oxbow Cons. Areas)-tribe information suggests tree thinning/harvest occurred in the past 50 years, dredge mining occurred (~1939-43), channeliztion of the River, and grazing occurred prior to tribal ownership On Nature Conservancy land (Dunstan Homestead)-beaver largely trapped out, and mining of many of the tributaries (Big Boulder and Coyote Creek); pasturing of livestock, and some crop planting (most agriculture centered in the large meadow between the present house and Coyote Creek), select logging of large trees; Sumpter Valley Railroad built down MFJD river, including thru the Dunstan place, channelization of the river, water rights obtained, water diverted for irrigation; Valley meadow vegetation was homogenized - conifers were removed, transition in grass/forbs to those that were best suited to flood irrigation (ie, Kentucky blue grass), pasture grasses were introduced, palatable shrub component decreased in tributary and mainstem MFJD riparian areas -- hawthorne becomes dominant. Riverbank stabilization rock installed in ~75 locations in the 4 miles in the late 1970's. Land leased for cattle grazing in 1980s with less rotational grazing.	1930s and on 1850s to 1990s

Past		
Action	**Description**	**Date**
Private Land-Riparian Enhancement/Channel Restoration on MFJD River and water diversion improvements	On Confederated Tribes of Warm Springs properties along Middle Fork of John Day (Forrest and Oxbow Cons. Areas)-Fencing (cattle exclusion), water trough development, and rock structures (channel restoration) to improve connectivity of streams for fish passage and construction of 2 lay flat diversions on Middle Fk. John Day River (one above Camp Creek, one at Davis Creek), construction of 2 infiltration galleries (to replace push-up dams) on O'Rourke property (on Camp Creek), building of gauging station at Camp Cr. Bridge	1990s to present
	On Nature Conservancy land (Dunstan Homestead)-cattle grazing halted on all acres, water courses no longer diverted, and water rights leased to instream beneficial uses. Weed control (using herbicide spot spray, with some broadcast spray, and mechanical control). Approx. 3000 riparian hardwood seedlings planted -- 1 dozen other sites of cottonwood sprouts protected from deer and beaver. Fire salvage thinning (dead tree sale) conducted on 120 acres in 2000 (post summit fire). Pre-commercial thinning conducted on another 60 acres in 2002. Prescribed fire implemented on ~100 acres (mostly on uplands, south facing slopes). Two high water channels (approx. 1/2 mile total length) were re-attached to the main channel by breaching bank levee's and the railroad grade. Chinook spawning gravels have increased, as has spawning.	1990s to present
Noxious weeds	Treatment of noxious weeds sites near or within the analysis area.	1983 - Present

Present and/or Ongoing		
Action	**Description**	**Date**
National Forest roads*	Use and maintenance of approximately 798 miles of open roads on National Forest System lands in the Analysis Area. Presence of 647 miles of closed road (additional roads have been decommissioned in several places, including the Summit Fire area, since about 1995).	1950's-present
US and State Highway	Use and maintenance of Highway 26 which runs through the Sullens allotment and Highway 7 which lies on the boundary of Blue Mountain and Upper Middle Fork Allotments	Ongoing
County Highway	Use and maintenance of Grant County Road 20 within the Analysis Area (under a Forest Road Development Agreement) and presence of noxious weeds.	Ongoing
Forest trails	Management of forest trails including erosion work, route signing, and maintenance	Ongoing
Recreation use	Hunting; camping at 5 developed campgrounds and numerous dispersed camp sites; hiking on 6 numbered trails and use of f trailheads; mushroom and "horn" hunting, Christmas tree harvest, sight-seeing; recreational use of ATVs, Special Use Permit for Austin House	Ongoing
Personal use firewood	Harvest to occur along open roads while adhering to Forest Firewood restrictions within RHCAs	Ongoing
Noxious weeds	Monitoring and treatment of noxious weeds with mechanical methods in analysis area and other District areas.	Ongoing
Road maintenance	Cleaning culverts, blading existing roads, brushing right-of-ways	Ongoing

Present and/or Ongoing		
Action	**Description**	**Date**
Aspen/wildlife fence maintenance	Replacing wire, broken poles, and broken sections of fence; cutting out fallen trees.	Ongoing
Routine inventory surveys	Surveying existing timber stands, streams, roads, aspen, etc.	Ongoing
Riparian Planting/Protection – Camp/Big Creek watersheds	Native hardwood planting and protection (caging/fencing) on about 12 miles of stream in Deerhorn, Sulphur, and Deep drainages.	Ongoing
Water Rights/Diversions	Currently 9 water rights/diversions providing ability for irrigation/domestic water	Ongoing
Special Use Permits (SUP)	Nine SUPs including permits for a water gauging station, overhead power lines and buried telephone cables, private pasture grazing (by 1 AUM), a cemetery, domestic spring/water developments, and private road access; also 15 diversions/16 ditches used to convey water to adjacent private lands, either for irrigation or stock watering. SUPs permit these facilities as well as maintenance of these facilities	Ongoing
Blue Aquatic culvert replacement	Replace culverts or create rock fords at 11 culvert sites in Granite Boulder Creek, Vinegar Creek, and Vincent Creek to remove existing fish passage barriers and/or address potential erosion problems .	Ongoing (2004-2005)
Mining activities	42 placer claims and 20 lode claims across the area	Ongoing
ATV use	The entire MFJD Range Planning area is currently open to ATV use and is expected to receive low/moderate use; the lower ends of Deerhorn and Davis Cr. receive heavy use at times	Ongoing
Balance Allotment Use	Use of Balance On/Off Allotment by 50 cow/calf pairs (9 on FS) from 6/1-10/30 annually (located in T10S, R33E, Sec. 30-northest of Upper Camp Unit and north of Balance Unit)	Ongoing
Range Development Maintenance	Yearly maintenance (and reconstruction) of boundary, division, and other fences by assigned permittees; yearly maintenance of water developments by assigned permittee	Ongoing
Private land (non-tribal)	Private homes, livestock grazing, private road use, recreation use including camping and hunting. Access is limited. Piling and burning of harvest-produced fuels and non-commercial sized dead trees	Ongoing
Private Land-riparian shrub/tree planting-MFJD River and tribs., irrigation and grazing of pastures, and upland water developments	On Confederated Tribes of Warm Springs properties along Middle Fork of John Day (Forrest and Oxbow Cons. Areas)-Riparian shrub/tree planting along the Middle Fork of the John Day River (from ~2000 to about 2010) till plants are established, planting on tributaries to Davis Cr., Placer Gulch, Dead Cow Cr., irrigation (and use of diversions) of Forrest and Oxbow Conservation Area and grazing on both properties to manage grass-moderate stocking (basic rotation with rested pastures as needed, emphasis on leaving forage for wildlife with no grazing in MFJD riparian and some tributaries), assisting Les Seitz (sp?) on his private land on Big Boulder Cr.-riparian planting, 2 upland water developments	Ongoing
Private Land-Big Boulder Creek	ODFW is placing large debris in Big Boulder Creek-Seitz property	Ongoing
Long Creek Allotment Improvement**	Planting (and some protection of) riparian shrubs along 15 miles of Camp Creek and tributaries, 9 spring developments constructed to reduce use of Camp Cr. tributaries, relocation of fence away from Camp Cr., construction of Coxie Creek corridor fence and exclosure	Ongoing (2004-2006)

Future		
Action	**Description**	**Date**
Lower Middle Fork Allotment Division Fences – CE signed 4/05	In 1996, the "Summit" wildfire burned major portions of the Lower Middle Fork Allotment. Existing fences were burned up or have become nonfunctional. Two pasture division fences and one corridor fence totaling approximately 7 miles will be constructed. The first 3 miles of fence will create a division fence between the Susanville Unit and Big Creek Unit; the second three miles of fence will create a division fence between the Susanville Unit and Granite Boulder Unit; and the final mile of fence would protect one mile of Granite Boulder Creek	2005-2006
Lower Middle Fork Holding Corral – CE signed 4/05	Construction of a corral near the intersection of Forest Service Roads 36 and 3670 (outside the planning area-but will used by the Lower Middle Fork Allotment permittee/s)	2005-2006
Bird Pasture Fence	Fence out the MFJDR to prevent livestock from accessing the river. Fencing along the river would also allow for more flexible use of this pasture.	2005-2006
Invasive plant prevention and management	Treatment of noxious weeds with mechanical methods and with chemicals.	2006
Range Development Reconstruction-Fences	Sullens interior fences maintained and reconstructed	2006
Range Development Reconstruction-Water Developments	The following need to be reconstructed; due to funding, only the highest priority developments will be done (not all will be completed) Bear Creek – Reconstruct 3 water developments Blue Mountain - Reconstruct 5 water developments Lower Middle Fork – Reconstruct 5 water developments Upper Middle Fork - Reconstruct 5 water developments Sullens – Reconstruct 1 water development	2006-2010
Balance Thinning and Fuels Reduction	Up to 3300 acres of thinning and fuels reduction around private land mainly in the LMF allotment, with about 30 ac. in the UMF allotment	2006-2008
Crawford Vegetation Management EIS:	Proposal could include about 3,100 acres of tree harvest (shelterwood and commercial thinning), precommercial thinning in harvest areas, about 9,500 acres of prescribed burning, identification of 3 Replacement Old Growth stands, road management including road manitnance and about 13 miles of new road construction, 5 miles of temporary road construction, 15 miles of road closures, and 24 miles of road decommissioning.	2006-2010
Timber Sales/Road closures-Easy Timber Sale	Completion of timber sale activities and extensive road closures Bridge/Clear Cr. Subwatersheds to reduce open road densities	2010
Camp Watershed Oxbow Culvert Replacement	In the vicinity of the Oxbow Ranch, replace 4 culverts on open roads on Butte, and Beaver Creeks with structures that allow passage of all life stages of fish, passage of 100 year flood events, and meet other criteria provided in R6 guidance.	2005-2007
Bridge/Lunch Creek Culvert Replacement	Replace 5 culverts on Bridge, Lunch and South Fork Bridge Creek (see culvert replacement above)	2005-2007
C.I.P. Project, 8 culverts on UMFJD/HWY 26	State of Oregon Department of Transportation (ODOT) will replace 8 culverts along Bridge Creek on Highway 26 (see culvert replacement above)	2005-2007
Taylor Flat Rock Source	Includes installation of cattleguard at an area on Blue Mountain Allotment where livestock sometimes-State/Oregon Dept. of Transportation Project	2006

Private Land-expansion of riparian fence exclosure and planting, mine tailing restoration, misc. restoration/maintenance - MFJD River	On Confederated Tribes of Warm Springs properties along Middle Fork of John Day (Forrest and Oxbow Cons. Areas)-Enroll in Conservation Reserve Enhancement Program (riparian protection)-103 acres-Oxbow, 150 Forrest-new buffer fences, intensive shrub/tree planting, mainly ODFW restore floodplain on Oxbow by contouring floodplain grade (allowing natural sinuosity) and removing tailings, fish passage restoration on Butte Cr., large woody debris for MFJD, fish passage culvert removal/stream restoration on Dead Cow Creek; Weed control; fish screen replacement on Oxbow Cons. Area	2005-2007
	On Nature Conservancy land (Dunstan Homestead)-expect commercial thinning on approx 100 acres of conifer forest (thin from below), re-open one historic main channel, and remove bank stabilization rock from approx 1/5 of the length of the property, to improve channel sinuosity, restore large woody debris to about 1/5 of the river channel, plant approx. 6000 conifer seedlings on the property, primarily in the floodplain, to enhance future riparian woodlands, continue to control teasel on approx 100 acres annually, and treat all county A and B listed species (only small pockets exist,), either with herbicide or pulling, continue to manage the reed canary grass on the banks, will not graze domestic stock, and the water will remain transferred instream.	2005-2010

*Miles of road as recorded in Forest Service GIS database; limited information on private land is available to the Forest Service.

**Most of these activities occurred outside the MFJD Range Planning Area and are outside most resources' cumulative effects areas. These activities are in the watershed/fisheries cumulative effects area..

Appendix B

Post-Fire Grazing Interim Guidelines
MALHEUR NATIONAL FOREST
December 2, 2003

The Authorized Officer, Forest Supervisor and or District Ranger (this authority can not be delegated), has the responsibility of determining when to resume grazing on areas burned during wildfire or prescribed fire. These guidelines establish the minimum timeframes that an area will be rested from grazing following fire. Other resource concerns may require resting the burned area from grazing for longer periods to allow the area to recover sufficiently.

When making that decision to resume grazing after fire, some factors that should be considered are (list not all inclusive):

- Amount of acres burned (suitable for grazing and non-suitable).
- Amount and spatial arrangement of moderate and high intensity burned areas in relation to the whole burn and surrounding non-burned area.
- History of past grazing use.
- Vegetation community type and its condition prior to the burn. The vegetation community and its condition will influence the amount of time necessary for it to recover from the affects of fire.
- How much effective ground cover is available and are needed to resume grazing.
- Aquatic resource values.
- Condition of range improvements, have they been damaged and, if so, have they been reconstructed.

Resumption of grazing following prescribed fire or wildfire is dependent upon the length of time it takes the vegetation to recover sufficiently to withstand grazing (Sanders 2000). Some vegetation types, such as elk sedge (Carex geyeri)/pine grass (Calmagrostis rubescens); require little or no recovery time after a light burn. Because elk sedge sprouts from underground rhizomes, it has a high degree of resistance to fire, often increasing after a fire; however, severe fire may cause a decrease in elk sedge cover. Burning can improve elk sedge production. Pine grass has rhizomes buried in the top inches of mineral soil, allowing plant survival when the duff is not completely consumed. Low to moderate severity fires are best for pine grass enhancement in Douglas-fir/pine grass associations of the Blue Mountains (information obtained from the Fire Effects Information System).

Other vegetation types, such as bunch grasses, require long recovery periods even after a light burn (prescribed or wildfire) (Brown and Smith 2000, p. 151-152). Carbohydrates manufactured by the plants provide the energy for metabolism and growth (Trlica 1977: in Brown and Smith 2000 p. 28). The underground plant parts that remain after fire usually provide carbohydrates until sufficient growth occurs to allow photosynthesis. Grazing and browsing can delay recovery if the demand on the plant reserves is excessive. Heavy post fire grazing is most likely to cause harm during the first year post fire (Trlica 1977: in Brown and Smith 2000 p. 28). After a light burn by either prescribed fire or wildfire, plant recovery is usually rapid with ground cover returning to pre-burn status in one or two growing seasons (Johnson 1998), but seed production usually doesn’t resume until the second growing season. Because seed production might not occur the first season after a prescribed fire or light intensity wildfire, grazing generally would not resume until after the first year seed was produced, probably the second growing season. Recovery after moderate to severe burning can take three or more years (Johnson, pers. comm. February 2003; Johnson 1998). Therefore, grazing generally would not resume until ground cover had recovered and was near or at its pre-fire condition.

In areas where elk sedge and pine grass are the dominant ground cover and 10% or less of the burned area is occupied by native bunchgrasses, grazing may occur in the same year as a light-intensity (intensity as described in Johnson 1998 or as mapped by the Burned Area Emergency Recovery [BAER] Team) fire if:

- Burning occurs before vegetative green-up, then grazing may occur in the area of the burn without any timing restriction; or
- The burn occurs after vegetative green-up, grazing may occur after range has been determined to be ready and the percent ground cover of elk sedge and pine grass is the same as prior to the burn, or grazing may occur in the fall (Sept./Oct.) without a range-readiness determination.

For a light (or low) intensity fire in areas where bunchgrass occupies more than 10% of the burned area, grazing may occur the second growing season after the burn, but only after seed has set. If the bunchgrass areas can be adequately protected from grazing, such as by electric fencing, then grazing may resume in the remainder of the burned area during the first growing season post burn.

For moderate to high intensity (intensity as described in Johnson 1998 or as mapped by the BAER Team) fire in all areas suitable for grazing, as defined by the Forest Plan, grazing may resume after the vegetation has recovered to the percent ground cover that existed prior to the fire as described for the appropriate plant association type in Plant Association of the Blue and Ochoco Mountains (Johnson and Clausnitzer 1992). A team consisting of at least two resource specialists, such as a range conservationist, botanist, ecologist, silviculturist, or hydrologist, will conduct the monitoring to determine if the percent ground cover has been reestablished. The method and results will be documented and submitted to the authorized official who will decide when to resume grazing. If monitoring is not done, grazing may resume after three full grazing seasons after the fire occurred, because research indicates that vegetation usually recovers within this timeframe (C. G. Johnson, pers. Comm., February 2003). However, grazing would not resume prior to two growing seasons after the fire, even if monitoring verified that the percent ground cover was the same as the pre-fire condition, to allow for plants to set seed.

Brown, J. K. and J. K. Smith, Eds. 2000. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech Rep. RMRS-GTR-42-vol. 2. Ogden, UT: S. S. Dept. of Agric., Forest Service, Rocky Mountain Research Station. 257 p.

Johnson, C. G., Jr. 1998. Vegetation response after wildfires in national forests of Northeastern Oregon. R6-NR-ECOL-TP-06-98. US. Dept. Agric., Forest Service, Pac. Northwest Region.

Johnson, C. G., Jr. and R. R. Clausnitzer. 1992. Plant Association of the Blue and Ochoco Mountains. US Dept. Agric., Forest Serv., Pacific Northwest Region, Wallowa-Whitman National Forest, R6-ERW-TP-036-92

Sanders, K. D. 2000. How long should rangelands be rested fro livestock grazing following fire: a viewpoint. Unpubl. Rep. Rangeland Ecology and Management, University of Idaho.

Appendix C

2541.4 - Managing Water Rights. (Forest Service Manual 2540)

Manage water rights to ensure these valuable United States properties are not lost.

Reserved water rights cannot be lost for nonuse. However, they can be made ineffectual if associated water sources are diverted, polluted, impounded, or otherwise made unavailable or unusable. Be alert to any proposal that will adversely affect water supplies needed to carry out purposes of reserved lands. Make appropriate protests concerning any such proposals.

Study and become familiar with specific State water right laws. Water rights obtained under State law, whether appropriated, acquired by assignment of a deed to land, or acquired by separate purchase or exchange of water rights, may be subject to loss if not exercised in accordance with State water laws. State laws often differ regarding the bases of grounds for possible forfeiture of a right to water use. Maximum allowable periods of nonuse and restrictions on changes in purpose or point of diversion or use, may vary. In managing appropriated water rights and other interests in water acquired under State law:

1. Maintain water rights in accordance with State forfeiture or abandonment laws and regulations. Apply the water to the purposes and in the manner specified in the water right permit, license, or decree. This includes the amount, time, and designated place of diversion and use.

2. Maintain in operable condition, all diversions, impoundments, or other facilities required to exercise the associated water right.

If it becomes necessary for the proper management of National Forest System resources to convert a use of water, secured under state water right, to a water use not adequately recognized and protected under state law, consult with the Washington Office and the Office of the General Counsel as to how adequate protection can be obtained.

2541.41 - Verification of Water Use.
Verify that each water use authorized by a State water right is used according to provisions of the law of the State in which the use occurs. Comply, and verify compliance with all provisions of

permits, licenses, or decrees. Make on-the-ground inspections when necessary where a diversion, impoundment, or other facility is required to exercise the water right.

Verify the existence of water rights on lands or waters to be acquired before taking land adjustment actions. Include documentation that verifies:

1. The water right(s) to be acquired are recognized by the State and areas described by the party from whom they would be acquired. Verify the priority date and the authorized amount, season, period of use, and purpose of use.

2. All State requirements for exercise of the right have been met. Ensure that the water right is not subject to a declaration of forfeiture or abandonment by the State under provisions of State law due to nonuse, unauthorized changes in type of use, place of diversion or use, or other reasons.

3. The water right(s), as described and as recognized under state law, will satisfactorily serve the present and future foreseeable needs of the Forest Service.

2541.42 - Purchase and Exchange of Water Rights.
Acquire water rights needed for National Forest uses through purchase or exchange when waters are fully appropriated and Federal rights are not applicable. Follow these procedures:

1. Include purchase costs for water rights in special use fees when such purchases are made specifically to support the permitted use.

2. Secure any appurtenant water rights with lands acquired by exchange.

3. Follow state procedures for changes in water rights, such as place of use, ownership, or purpose of use. As set forth in 2541.4, if state law impedes or precludes the changes required for the proper management of National Forest System resources, consult with the Washington Office and the Office of the General Counsel.

Appendix D
Malheur National Forest
Riparian Monitoring (Condition & Trend) Strategy
Draft 4/14/2005

[1]Tom Friedrichsen, Brian Hoefling and Alan Miller

There are many accepted methodologies and analytical tools available to monitor rangeland and forest health, both in the short term and long term. The methods and tools chosen are dependent on the specific monitoring objectives as well as constraints such as timing, available funding and personnel, other priorities, and the geographical area to be monitored. Described below are the overall monitoring strategy, as well as methods and analytical tools, which the Malheur National Forest is currently using for determining condition and trend of riparian ecosystems as they relate to grazing activities. The assessments and monitoring used are intended to be an important part of the adaptive management process and are subject to changes or modifications based on new scientific findings and improvements in methodologies as well as changes in definitions and policy.

Below are the key components of the Malheur National Forest Riparian Monitoring Strategy:

1. Information Gathering and Interpretation
    - Proper Functioning Condition (PFC) Assessment – qualitative over a linear reach
    - Multiple Indicator Monitoring (MIM) – quantitative of a site specific location
    - Analysis – interpretation and evaluation of information to asses current riparian condition and trend)
    - Channel cross-section, streambed particle size distribution, and reach description measurements

2. Determinations – demonstrate compliance with PACFISH and INFISH

3. Recommendations
    - Shows linkage between condition, trend, and management activities
        - A process that provides support for decisions
            - Adjust management strategies as needed to achieve desired riparian objectives

[1]Hydrologist, Rangeland Management Specialist, and Fisheries Biologist, Malheur National Forest, 431 Patterson Bridge Road, John Day, OR.

1. Information Gathering and Interpretation

PROPER FUNCTIONING CONDITION ASSESSMENTS

Proper functioning condition (PFC) assessments are a qualitative method for determining the condition of riparian areas. The term PFC is used to describe both the assessment process, and a defined, on the-ground condition of a riparian area. PFC assessments can be an appropriate starting point for determining and prioritizing the type and location of quantitative inventory or monitoring necessities, and has been proven to be an excellent communication tool for bringing a wide diversity of publics to agreement. All PFC assessments are to be conducted with an interdisciplinary team. One purpose of these assessments is to help correlate the findings with the attainment of the Malheur Forest Plan Riparian Management Objectives (RMOs), more specifically, to determine whether grazing practices are retarding attainment of Near Natural Rates of Recovery of RMOs. See Appendix A for the PFC protocol.

MULTIPLE INDICATOR MONITORING

The July 1, 2003 PACFISH/INFISH Implementation Monitoring Program Manual provides the background and direction for monitoring. The Multiple Indicator Monitoring supplement by Cowley/Burton, dated May 2004 with addendums, provides the procedures in use by the Malheur National Forest to monitor streambanks and riparian vegetation. The above documents were created by the Interagency Implementation Team; see Appendix B for these documents. Multiple Indicator Monitoring for grazing activities is designed to determine whether or not livestock grazing management is resulting in "Near Natural Rates of Recovery" as defined by PACFISH/INFISH. Below are the four components, which comprise multiple indicator monitoring. Monitoring is to be conducted by an interdisciplinary professional team trained in riparian plant identification and channel classification. Multiple indicator monitoring consists of implementation (endpoint indicator) monitoring and effectiveness (riparian objective) monitoring at designated locations (i.e. designated monitoring areas).

DESIGNATED MONITORING AREAS

Designated Monitoring Areas (DMA's) are the locations in riparian areas and along streambanks where quantitative monitoring takes place. They are monitored to provide information concerning the management of critical areas. Essentially DMA selection relies on the theory that if proper management occurs in that location, proper management will be occurring throughout the rest of the management unit. See Appendix B for the procedures used to establish DMA's. The goal is to establish twenty or more DMA's each grazing season in order to establish a 5-year re-monitoring schedule and have coverage across the Forest's allotments.

IMPLEMENTATION (ENDPOINT INDICATOR) MONITORING

Implementation (endpoint indicator) monitoring measures indicators to determine if livestock management is being applied, as prescribed, and that effects of management do not carry through to the next year. It provides information to assist with making decisions under adaptive management. Presently, implementation monitoring includes: modified extensive browse utilization (Interagency Technical References, 1996), modified stubble height (Interagency Technical Reference, 1996 and Challis Resource Area, 1999), and streambank alteration

(Cowley, 2004). These procedures provide information that help make the short year-to-year adjustments to livestock grazing management practices necessary to meet management objectives. See Appendix B for sampling procedures used.

EFFECTIVENESS (RIPARIAN OBJECTIVE) MONITORING

Effectiveness (riparian objective) monitoring is designed to address the question of whether or not management practices currently applied to the area are achieving the desired results. These procedures are designed to measure changes in vegetation and streambank stability over time (e.g. trend). The goal is to conduct effectiveness (Riparian Objective) Monitoring every three to five years on riparian areas and streambanks. This period of time is considered to be the minimum necessary to detect changes. Budget and personal constraints may limit the extent in which monitoring of this type will be conducted.

Presently, effectiveness monitoring includes: modified greenline, modified woody species regeneration, and streambank stability. These provide data and information concerning the present conditions and trend of riparian vegetation and streambanks. Monitoring procedures for vegetation include modifications of methods described by Winward (2000) and Coles-Ritchie *et al.* (2003). Streambank stability is a modification of the method described by Henderson *et al* (2003). See Appendix B for sampling procedures used.

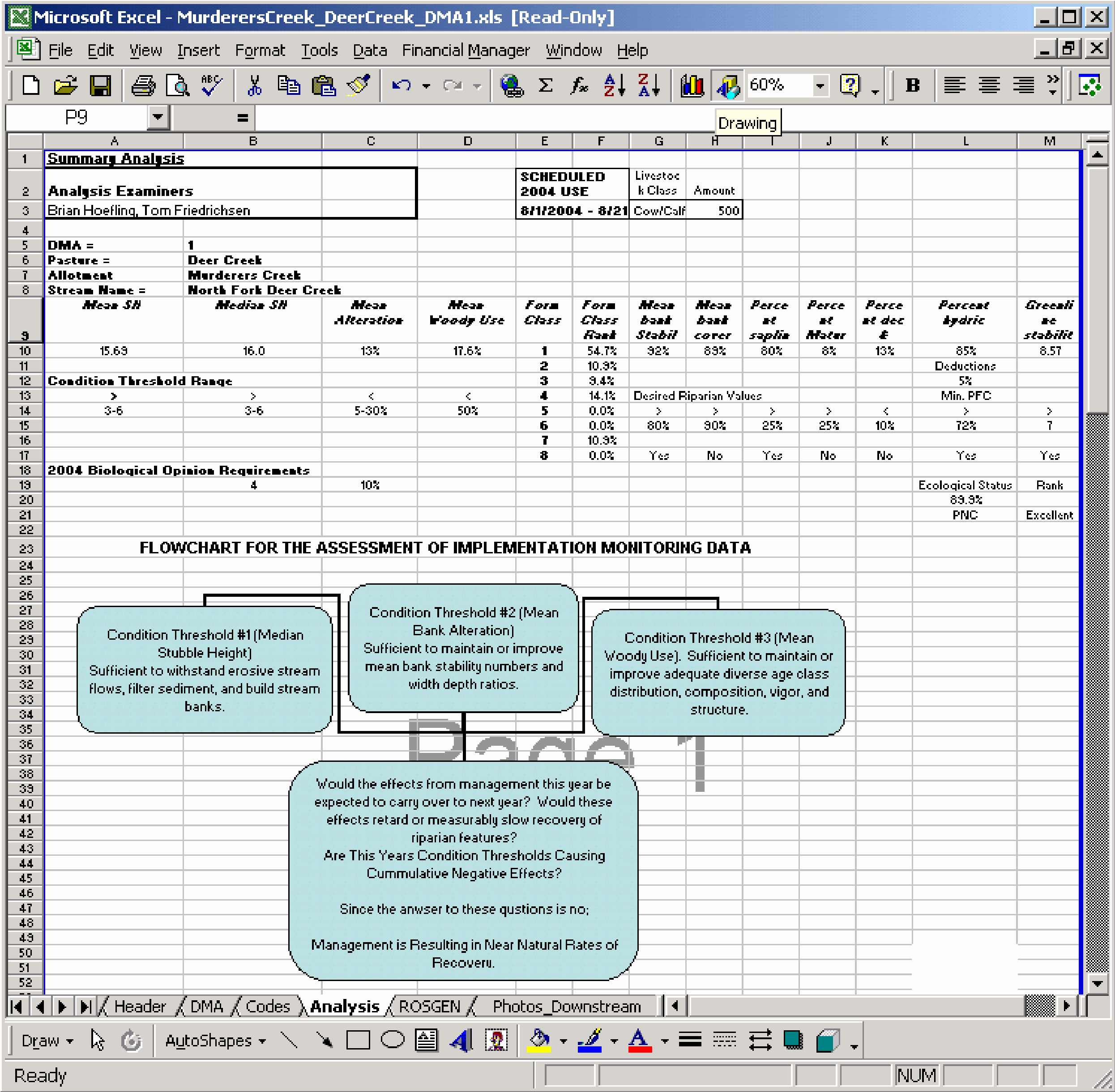
CHANNEL CROSS-SECTION, STREAMBED PARTICLE SIZE DISTRIBUTION, & REACH DESCRIPTION MEASUREMENTS

The objective of the channel cross-section measurements is to be able to quantifiably determine bankfull and wetted widths, width-to-depth ratios and the entrenchment ratio; the objective of the streambed particle size distribution measurement is to be able to determine the percent fines less than 6 mm in diameter (D), D16, D50 (median particle size), and D84; the objective of the reach description measurements is to be able to determine sinuosity and stream gradient (see Appendix C for sampling protocols). This information is essential in determining Rosgen channel type and Winward greenline capability group, both of which are needed in the riparian analysis process as well as interpreting site sensitivity to disturbance for the decision flowchart process. This information is used to determine the direction and rate of change in these physical attributes (primarily channel morphology) over time as a function of management activities (primarily related to livestock management), and to help determine if aquatic systems are being degraded, maintained, or restored across the Malheur National Forest. The Forest is currently working on developing appropriate numerical values for these physical attributes, by Rosgen stream type.

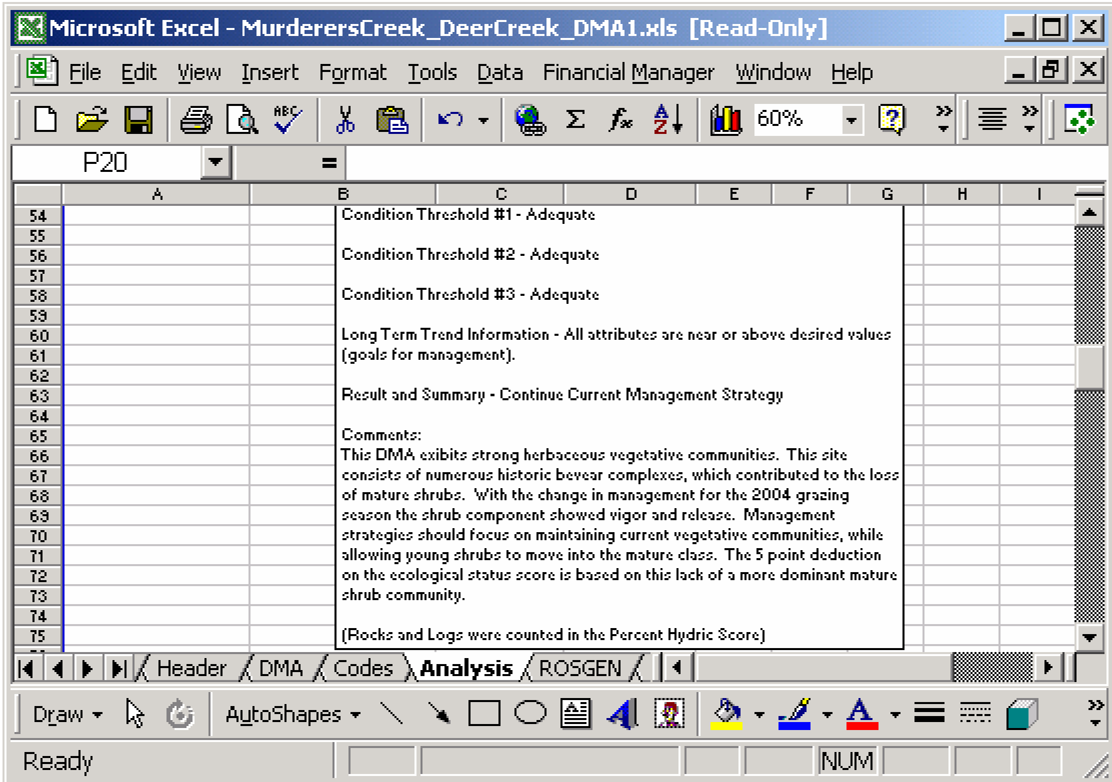
DATA AND ANALYSIS TOOLS

Data collected at each DMA includes six long-term indicators for stream/riparian areas, Rosgen stream classification information and reach description measurements, photographs, universal transverse mercator (UTM) coordinates, and decision flowcharts/summaries. A spreadsheet was developed to analyze implementation (endpoint indicator) and effectiveness (riparian objective) monitoring data in order to determine riparian conditions and compare them over time. The primary purpose of the decision flowchart is to assess implementation (endpoint indicator) and effectiveness (riparian objective) monitoring data and to determine if current grazing management is resulting in “Near Natural Rates of Recovery”, as described in PACFISH Enclosure B. See the following two pages for an example of the decision flowchart.

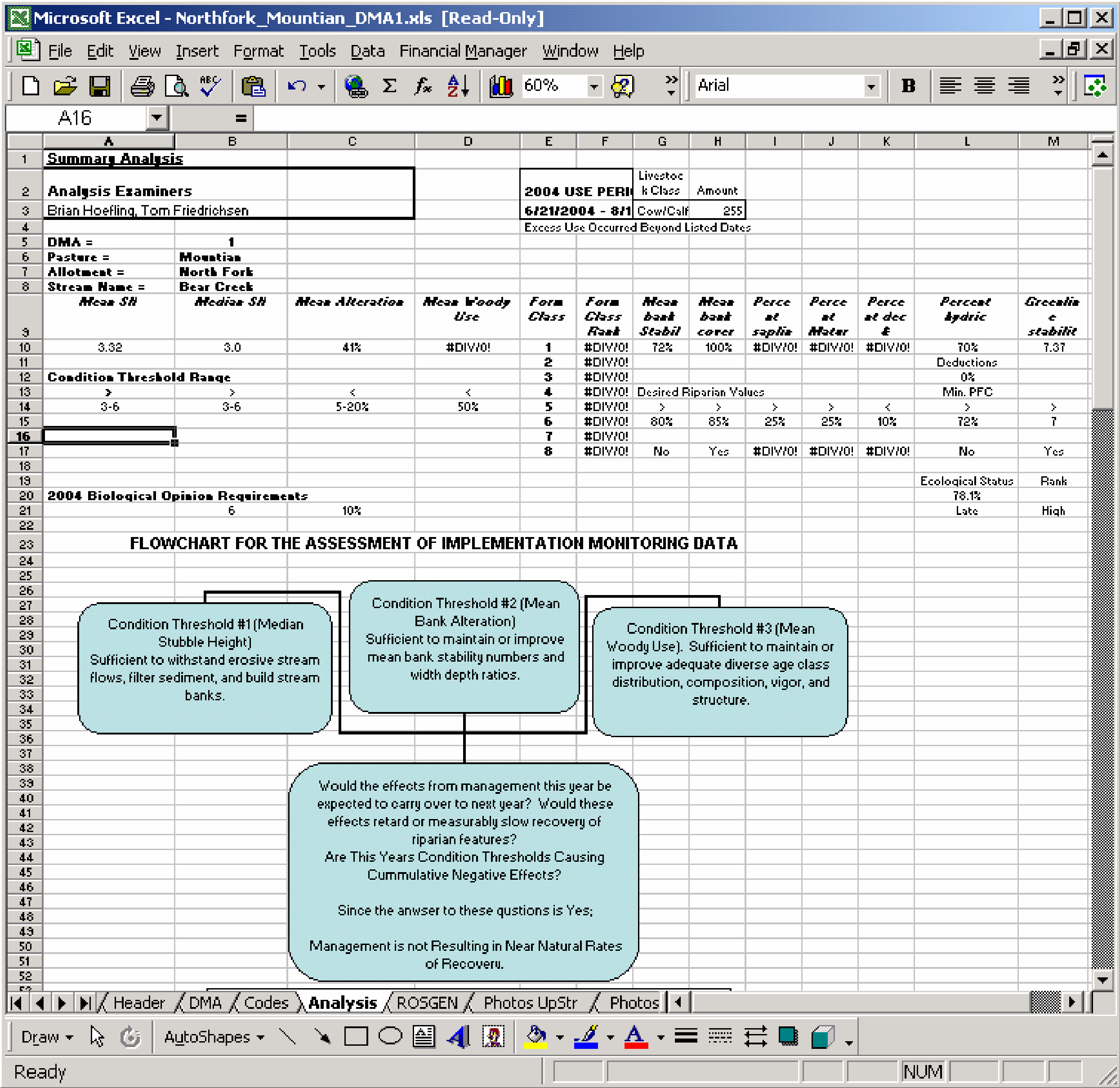
DECISION FLOWCHART EXAMPLE



DECISION FLOWCHART EXAMPLE



DECISION FLOWCHART EXAMPLE

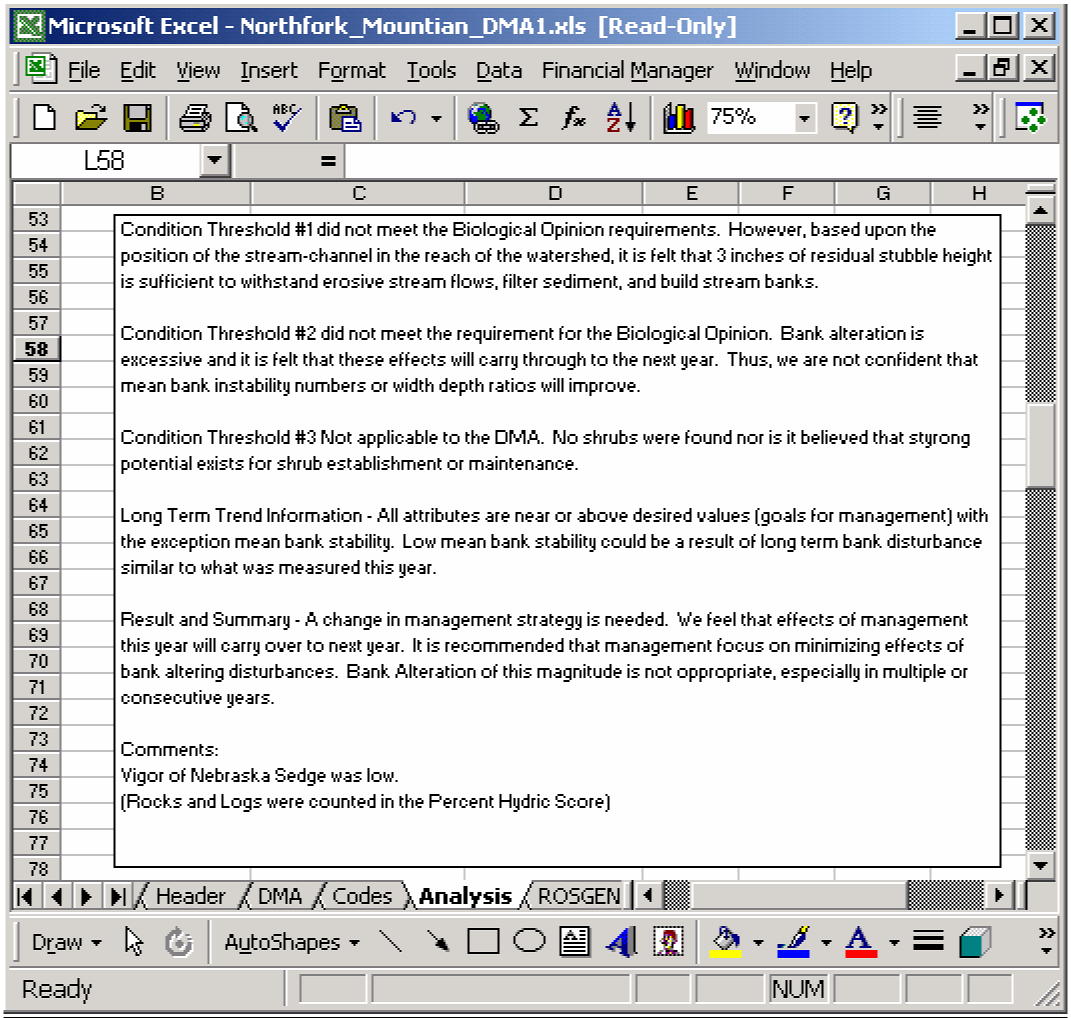


Microsoft Excel - Northfork_Mountian_DMA1.xls [Read-Only]

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Summary Analysis**												
2	**Analysis Examiners**				**2004 USE PERI**		Livestock Class	Amount					
3	Brian Hoefling, Tom Friedrichsen				**6/21/2004 - 8/1**		Cow/Calf	255					
4					Excess Use Occurred Beyond Listed Dates								
5	**DMA =**	**1**											
6	**Pasture =**	**Mountian**											
7	**Allotment =**	**North Fork**											
8	**Stream Name =**	**Bear Creek**											
9	***Mean SH***	***Median SH***	***Mean Alteration***	***Mean Woody Use***	***Form Class***	***Form Class Rank***	***Mean bank Stabil***	***Mean bank cover***	***Percent saplin***	***Percent Matur***	***Percent dec***	***Percent hydric***	***Greenline stabilit***
10	3.32	3.0	41%	#DIV/0!	**1**	#DIV/0!	72%	100%	#DIV/0!	#DIV/0!	#DIV/0!	70%	7.37
11					**2**	#DIV/0!						Deductions	
12	**Condition Threshold Range**				**3**	#DIV/0!						0%	
13	>	>	<	<	**4**	#DIV/0!	Desired Riparian Values					Min. PFC	
14	3-6	3-6	5-20%	50%	**5**	#DIV/0!	>	>	>	>	<	>	>
15					**6**	#DIV/0!	80%	85%	25%	25%	10%	72%	7
16					**7**	#DIV/0!							
17					**8**	#DIV/0!	No	Yes	#DIV/0!	#DIV/0!	#DIV/0!	No	Yes
18													
19												Ecological Status	Rank
20	**2004 Biological Opinion Requirements**											78.1%	
21		6	10%									Late	High

FLOWCHART FOR THE ASSESSMENT OF IMPLEMENTATION MONITORING DATA

DECISION FLOWCHART EXAMPLE



2. Determinations (demonstrate compliance with PACFISH and INFISH)

Assessments/Monitoring as they relate to RMO's
There is a correlation between the PFC assessment attributes and processes and the Forest RMO elements. The RMO elements are represented by quantitative values established by the Malheur National Forest Plan in compliance with PACFISH and INFISH. While the RMOs are largely quantitative and rely on physical measurements taken using appropriate scientific methods, the PFC approach for determining stream/riparian condition is qualitative; relying on highly trained and experienced surveyors to evaluate the PFC assessment elements. Both, however, are designed to evaluate similar attributes and processes. The general areas of comparability are presented in Table 1.

The PFC assessments do not measure individual RMO parameters in the field nor do the teams performing them claim to be conducting a quantitative inventory. During a PFC assessment, the interdisciplinary team examines the RMO parameters to determine if grazing management is retarding their attainment. Many factors and land management practices other than grazing affect stream function and the related RMOs. However, this assessment focuses primarily on the role of grazing management on trend toward or away from attainment of RMOs. The assessment methodology requires evaluating reaches of streams, in all cases more than ¼ mile, using professional knowledge and experience. As noted in the methodology section of the PFC assessment protocol, the determination of trend involves a variety of factors. Vegetation is likely the predominant indicator of trend in most of the reaches surveyed and includes factors, both recent and legacy, in terms of condition. Vegetation trend depends on the kind of species present as well as their vigor, abundance, and age class. Therefore, trends typically represent a longer-term look at the effects of management and response of plants.

Those reaches that have achieved PFC, or are functioning at risk (FAR) with an upward trend, indicate that current management practices are allowing the stream/riparian zone to be maintained at or move toward full ecological potential or the new capability imposed by socio-economic constraints. The natural rate of recovery will depend on the annual variation in climatic conditions that influence moisture regimes and plant growth. Catastrophic events, such as 100-year floods and fire, can also modify recovery rates by setting back ecological conditions to an earlier seral state. Streams having riparian vegetative communities exhibiting presence and abundance of late-seral communities will recover quicker following major disturbance events as compared to those dominated with early-seral communities.

Quantitative measurements such as stream temperature, pool frequency, bank angle and other parameters are used to describe desired characteristics in the RMO's. However, at any given point in time, the measurements may provide very little information to the manager in terms of whether or not management is being successful. By definition, streams that are not at PFC may not be able to sustain their dimension, pattern and profile in a moderately high flow event. Quantitative measurements on several of the parameters are not positively sustainable below PFC, thus lessening their significance (if the dimension, pattern and profile of a stream is a major reason for a stream reach being below PFC, then a RMO measure such as pools/mile is of less importance until the dimension, pattern and profile are in equilibrium at a functional desired state). It is not unusual for streams below PFC to make a series of recovery/degradation progressions that alter important channel characteristics. Some of these may be positive, others negative, in terms of desired characteristics. They are often a necessary part of recovery processes, but nonetheless, they affect the reliability and significance of quantitative measurements over time. They also often fail to take into account the differing pathways streams take towards recovery, even those that may be on similar ecological sites. Upward trend, such as determined during the PFC assessment process, can be a more reliable and meaningful indicator of successful management towards attaining RMOs. While it is qualitative, experienced interdisciplinary teams use processes and principles based in science for the determination.

Table 1. Comparison of PFC Checklist Items with RMO Categories

Malheur Forest RMO Categories	Comparable Attributes & Processes Addressed by PFC Assessment 1/	Applicable PFC Checklist Questions that Address RMO Categories 2/
Pool Frequency/Mile	Hydrogeomorphic	3
Water Quality (Temperature)	Water Quality	3, 4
Large Woody Material (LWM)	Vegetation	12, 13
Bank Stability	Vegetation/Geomorphology	1, 6, 7, 9, 10, 11, 14
Lower Bank Angle	Geomorphology	3, 6, 7, 9, 15
Channel Width/Depth Ratio	Hydrogeomorphic	3, 16
Sediment/Substrate	Erosion Deposition	1, 5, 17
Riparian Vegetation (% of bank cover)	Vegetation	11

1/ Attributes/processes list Page 12, TR 1737-15 1998, A user Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas.
2/ Refer to Appendix I, PFC Assessment Standard Checklist.

PACFISH/INFISH grazing guidelines (Enclosure B Rev. 8/14/95) state that "Influences of grazing must result in riparian restoration at a minimum of *near natural* rates." This same reference, page 7, describes achieving a "near natural rate of recovery", in general, as avoiding effects that "carry over to the next year" so as to prevent the likelihood of cumulative, negative effects (see PACFISH Enclosure B, page 7, for definition of "near natural rate of recovery"). In this light, a primary focus of the Malheur National Forest Riparian Monitoring Strategy in evaluating the effects of current grazing activities/strategies and recommending any modifications for future grazing is on avoiding negative effects, the influence of which, is likely to still be existent at the beginning of the next grazing season to a degree that would meaningfully impede recovery (additionally, riparian ecological condition and site potential are considered when making management recommendations). This should allow for attainment of a "near natural rate of recovery" for riparian systems, as defined by PACFISH/INFISH. In correlating PFC assessment findings with the attainment of Malheur Forest Plan RMOs (designed to meet PACFISH/INFISH requirements), for the specific purpose of determining whether grazing practices are retarding RMO attainment and "near natural rates of recovery", the relevant assumptions and guidelines from Enclosure B, "Recommended Livestock Grazing

Guidelines for Use Within the Range of Anadromy – PACFISH" were considered. These assumptions are shown below:

Key Assumptions

- Influences of livestock grazing must result in riparian restoration at a minimum of "near natural" rates. We recognize that some environmental effects are inherent with the presence of livestock. However, we believe that "near natural" rates of recovery can be provided if we limit environmental effects to those <u>that do not carry through to the next year</u>, thereby avoiding cumulative, negative effects.
- Adverse affect to aquatic habitat associated with livestock grazing can be avoided and riparian restoration provided by controlling:
  - Season of use (tied to plant phenology and soil characteristics rather than calendar dates) and
  - Amount of use.
- Providing for the health, form and function of riparian systems should remain the focus of management efforts.
- Stream gradient, inherent stability characteristics, potential vegetative communities, and type of degradation (i.e., vegetation vs. bank/channel characteristics are important factors in determining restoration potential and guidelines that will lead to restoration.
- Guidelines for developing allotment specific prescriptions can be identified at the programmatic level. However, in general, the prescriptions themselves must be developed to fit "on-the-ground" conditions within the context of those guidelines.
- In some definable cases, avoiding adverse effects can only be accomplished by suspending livestock grazing. These cases include problems related to ecological status.
- Effective monitoring using specific measurement approaches, as well as administration are essential.

Quantifiable techniques like those in Multiple Indicator Monitoring are encouraged in conjunction with the PFC assessment for individual calibration and/or where answers are uncertain. It is rather easy to determine condition of riparian ecosystems at extreme ends of ecological status (e.g. Late and Early Seral); however, it may be desirable to collect quantitative information where ecological status is not as easily defined.

Multiple Indicator Monitoring is divided into two primary parts. First, is implementation (endpoint indicator) monitoring which measures indicators to help determine if livestock management is being applied as prescribed and that effects of management do not carry through to the next year. Second, is effectiveness (riparian objective) monitoring which is designed to address the question of "whether or not management practices currently applied to the area are achieving the desired objectives or values". Together these help determine appropriate condition thresholds over time. A condition threshold is the quantitative measure of selected indicators of impending impacts that could carry over to the next year. The selection of indicators used (e.g. stubble height, bank alteration, incidence of hardwood riparian shrubs) is based on the potential of the site. Determinations made on whether effects of management will carry over to the next year are based on Multiple Indicator Monitoring and PFC assessment results, as well as assessing potential sensitivity and inherent stability of the riparian area.

When Multiple Indicator Monitoring is included to address if management practices related to livestock grazing are meeting near natural rates or recovery (not retarding attainment of RMO's), a discussion of the three condition thresholds is included. These are: Condition Threshold #1 - Median Stubble Height and its ability to withstand erosive stream flows, filter sediment, and build stream banks; Condition Threshold #2 - Mean Bank Alteration and its influence on maintaining or improving mean bank stability values and width depth ratios; Condition Threshold #3 - Mean Riparian Hardwood Incidence of Use and its importance for improving adequate diverse age class distribution, composition, vigor, and structure of shrubs.

It is established that the management of rangelands is both a science and an art. With this in mind, land managers should base decisions on both "quantitative science" and "qualitative experience". This combination of science and art is necessary due to the intricacies and variability of disturbances. There is an inherent link between this science, art, and the methodologies used (in 2004) for determining condition and trend of riparian ecosystems (e.g. Multiple Indicator Monitoring and Proper Function and Condition Assessments). While Multiple Indicator Monitoring is largely quantitative in nature and Proper Function and Condition Assessments are largely qualitative, both are based on sound scientific principles; and when used together, they complement each other extremely well. Where both studies exist in a particular stream reach, the Malheur National Forest utilized the strong correlation between the two methods to make a highly supported determination of riparian condition and trend. Additionally, since a PFC reach is considerably longer than a DMA site, the correlation between them allows for the extrapolation of the quantitative data to the qualitative determinations providing for quality results. Individually, each method can be used to establish riparian condition and trend, and make determinations of near natural rates of recovery, so long as the limitations of each method are understood. Both methodologies are described in appendices A and B, respectively.

The following guidelines for livestock grazing were considered when recommendations were developed. Additionally, an interdisciplinary team considered measured attributes (when available) these are listed below.

Recommended Programmatic Grazing Guidelines

As noted in the Key Assumptions above, the goals, or desired outcomes of management efforts provide the foundation for the recommended programmatic livestock grazing guidelines. The guidelines and resulting site-specific prescriptions are of value only to the extent they contribute to meeting these goals. The Environmental Assessment for PACFISH interim direction provides suitable riparian goals for the land management activities (See PACFISH EA, APPENDIX, pages C-3 and C-4). All management activities implemented, including non-livestock related activities, should contribute to accomplishment of these goals where they can be achieved.

Where these goals are met, the following on-the-ground attributes will be evident (See BLM Technical Reference 1737-9 and 15, Process for Assessing Proper Functioning Condition):

1. Floodplains are inundated by relatively frequent events (i.e., 1-3 years).
2. Stream sinuosity, width/depth ratio, and pool frequency reflect the capabilities of the setting (i.e., landform, geology, and bioclimatic region).

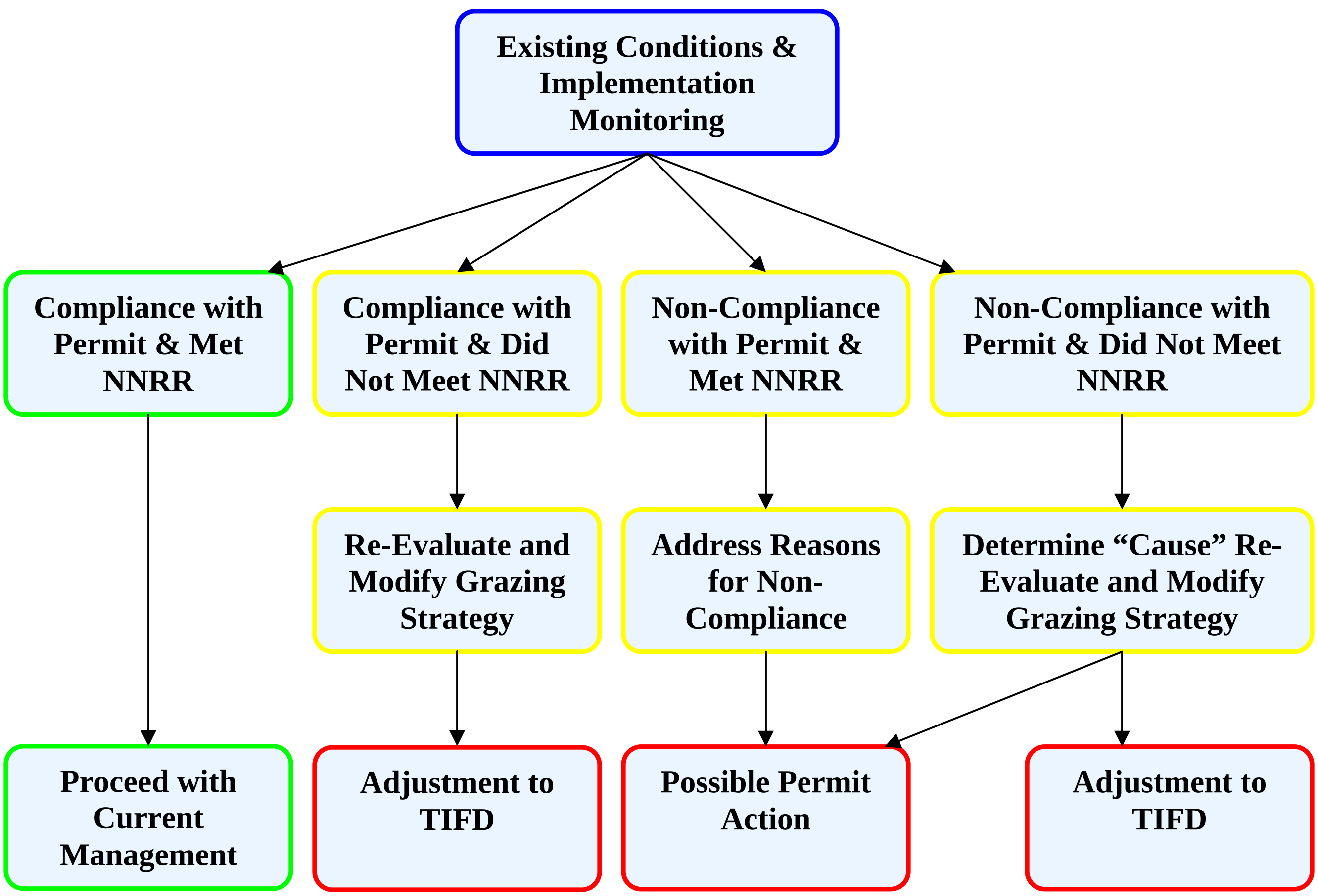
3. Lateral stream movement is associated with natural sinuosity, (i.e., streambank stability reflects the inherent capabilities of the setting).
4. The overall system is vertically stable.
5. Streambank morphology reflects the inherent capabilities of the ecological setting.
6. Upland watershed conditions within the allotment are not contributing to degradation of riparian habitat conservation areas.
7. Riparian vegetation characteristics:
   a. Diverse age structure for woody species (where such species are part of the natural system;
   b. Plants exhibit high vigor;
   c. Species present indicate maintenance of riparian soil moisture;
   d. Streambank vegetation protects stream banks and dissipates energy during high flows (i.e., consider community type composition, rooting characteristics, and plant density); and
   e. Provide an adequate source of coarse and/or large woody debris (where such debris is a part of the natural system)."

All of this information is to be synthesized in an interdisciplinary team environment to determine recommendations for use in development of Annual Operating Instructions (AOI's) with permittees, in order to provide a high degree of assurance that the Forests goals for riparian and stream channel conditions will be met. Line officers are given the opportunity to review all recommendations and use them to help guide the development of future proposed actions. If proposed actions do not incorporate recommendations, then a rational should be provided detailing the reasons for the decision.

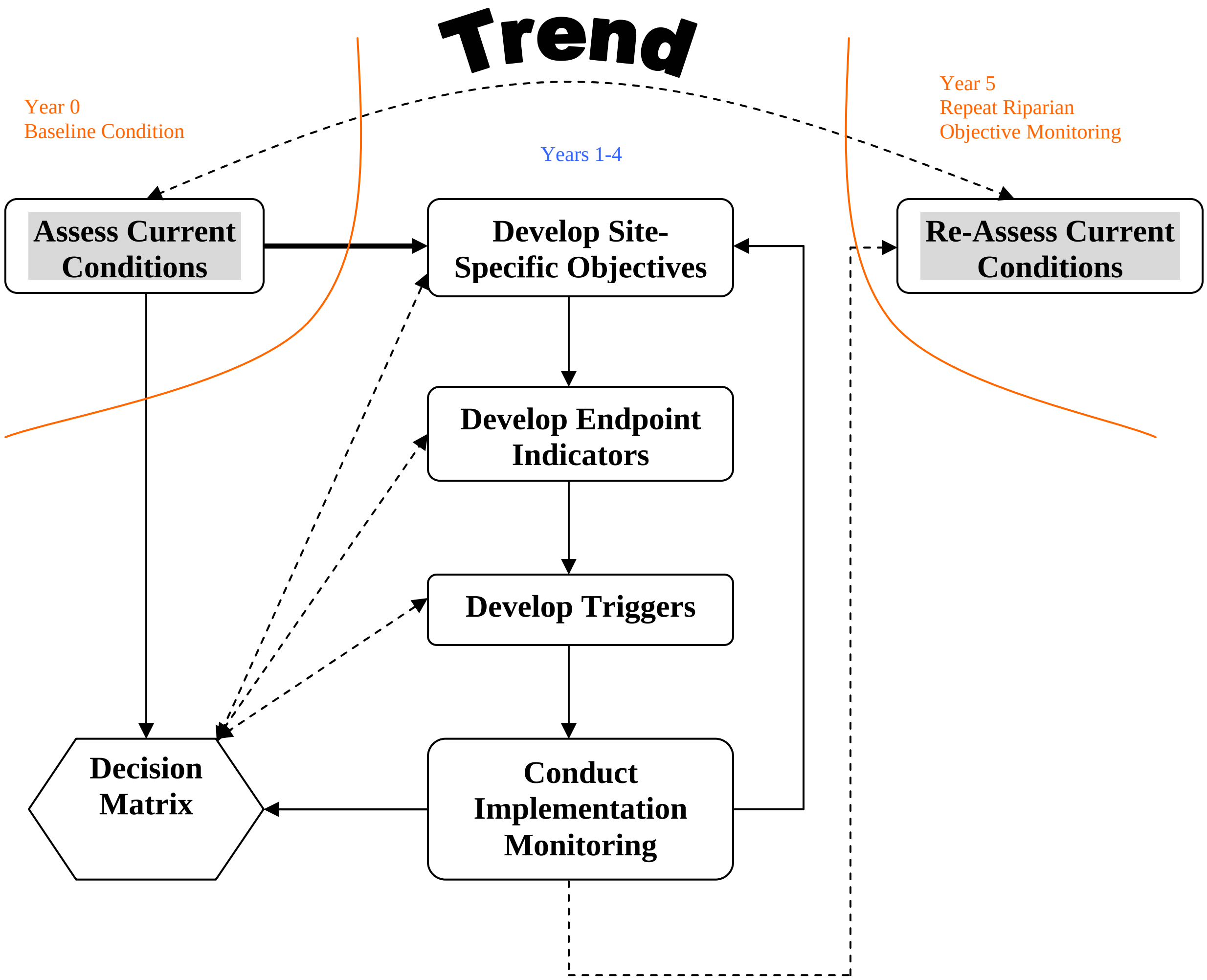
3. Recommendations

Interdisciplinary team recommendations to rangeland administrators rely heavily on quantitative and qualitative information (such as PFC assessments and MIM) that assess characteristics/attributes of riparian function, which indicate riparian condition and trend. Rangeland Management Specialists use these recommendations in combination with range administration monitoring to develop a decision matrix (see below); the end product of which is a roadmap displaying the current ecological condition, a determination of whether on not livestock grazing management is resulting in "Near Natural Rates of Recovery" (NNRR) as defined by PACFISH/INFISH, determining if adjustments to Timing, Intensity, Frequency, and Duration (TIFD) are necessary, and whether or not the Permit was satisfactorily implemented. All of these components are considered together when developing strategies that would move riparian and stream characteristics towards desired values, without negative effects the influence of which is likely to still be existent at the beginning of the next grazing season to a degree that would meaningfully impede recovery.

Decision Matrix



FLOWCHART FOR RIPARIAN MONITORING STRATEGY



Supporting Description of Flowchart

1. Assess Current Conditions
   What?
   Determine condition of riparian vegetative community
   Determine condition of stream channel (physical attributes) and stream banks
   Develop desired vegetation and channel goals for the area based on potential riparian vegetation and channel type.
   Determine if a near natural rate of recovery is being achieved under current management scheme.
   How?
   Use multiple indicator monitoring and/or proper functioning condition assessments, along with stream channel physical attribute measurements to construct an analysis of current conditions at designated monitoring areas. Where possible, overlay multiple indicator monitoring with proper functioning condition assessments to get highly correlated results.
   Who?
   The Forest Monitoring Team will conduct quantitative and qualitative surveys with assistance from District range personal. (Years 0 or baseline and Year 5…..)
   District ID Teams will conduct annual or semi-annual quantitative implementation (endpoint indicator) monitoring to evaluate and determine if near natural rates of recovery are occurring. (Years 1 through 4)

2. Develop Site-Specific Objectives
   What?
   Develop quantitative management objectives based on desired goals for the area.
   How?
   During the baseline year, the Forest Monitoring Team will display individual desired riparian values (riparian vegetation and stream channel attributes) that may be improved for each site surveyed. Additionally, this team will display where and when these resource values are at upper and lower limits. (Have desired conditions been met already? Since vegetative and hydrologic interactions are complex, is it possible to improve certain parameters when certain conditions exist). Districts will use this information as a compass for development of attainable site-specific desired objectives.
   Who?
   District ID Teams

3. Develop End-Point Indicators
   What?
   Based on the goals and objectives, develop quantitative end-point indicator values (condition thresholds). This will generally be a variable range to begin with and accuracy should improve as annual or semi-annual re-evaluation of the End-Point Indicators occurs.

How?

The Forest Monitoring Team will provide an initial range of desired End-Point Indicator values (condition thresholds) during the baseline year. Districts will adjust these desired End-Point Indicator values (condition thresholds) based on reassessments of site-specific information and annual or semi-annual determinations of Near Natural Rates of Recovery.

Who?

District ID Teams

4. Develop Triggers that will meet End-Point Indicators resulting in Near Natural Rates of Recovery towards desired riparian objectives.

   What?

   Develop triggers to ensure end-point indicators are met.

   How?

   Develop triggers based on timing, intensity, frequency, and duration of use and site-specific conditions. (Keep them simple. The goal is a Near Natural Rate of Recovery towards desired objectives, not simply meeting a trigger. The assumption is that if a trigger is set appropriately and met, Endpoint Indicators will be achieved resulting in a Near Natural Rate of Recovery.)

   Who?

   District ID Teams

5. Conduct Implementation Monitoring

   What?

   Conduct Annual or Semi-Annual Implementation Monitoring to determine if Near Natural Rates of Recovery are occurring.

   How?

   Prioritize by needs

   Who?

   District ID Teams

6. Decision Matrix

   What and How?

   Interdisciplinary team recommendations to rangeland administrators rely heavily on quantitative and qualitative information (such as PFC and MIM) that assess characteristics/attributes of riparian function, which indicate riparian condition and trend. Range Management Specialists use these recommendations in combination with range administration monitoring to develop a decision matrix; the end product of which is a roadmap displaying the current ecological condition, a determination of whether on not livestock grazing management is resulting in "Near Natural Rates of Recovery" as defined by PACFISH/INFISH, and whether or not the AOI were satisfactorily implemented. All of these components are considered together when developing strategies that would move riparian and stream characteristics towards desired values without negative cumulative effects.

Who?

District Rangers and Interdisciplinary Teams with support from the Forest Monitoring Team.

7. Re-Assess Current Conditions

What?

All assessments that occurred during the baseline assessment will be repeated. The caveat is that additional analysis will be conducted to determine “trend”.

How?

The Forest Monitoring Team will analyze the information from the baseline line year and compare to the new information in order to quantifiably determine if management is resulting in attaining desired riparian objectives (if management practices related to livestock grazing are maintaining or restoring riparian vegetative structure and function).

Who?

The Forest Monitoring Team

Additional Information

What to do when assessment information is not available?:
Use professional judgment based on knowledge/visual observations of the area and follow IIT procedures for implementation monitoring (PACFISH/INFISH (Forest Plan) direction. Consensus of an interdisciplinary team is necessary to determine compliance with PACFISH/INFISH (Forest Plan) – the "near natural rate of recovery" call. In addition, the Malheur Forest Plan provides standards for upland utilization levels, which may be used in conjunction with IIT procedures.

General starting points for establishing Desired Riparian Values and End-Point Indicators
The following ranges of values are generally accepted starting points for setting desired riparian values and end-point indicator values that will allow for near natural rates of recovery. These values should be, and are expected to be, adjusted as more site-specific information is gathered. End-point indictors should be adjusted for timing, intensity, frequency, and duration.

Desired Riparian Values
Mean bank stability: >80% (Kershner et al. 2004)
Mean bank cover: >80-95% (varies by greenline capability group – see Winward 2000)
Percent saplings (shrubs): >25% (Winward 2000, UI Stubble Height Study Report 2004)
Percent mature (shrubs): >25% (Winward 2000, UI Stubble Height Study Report 2004)
Percent decadent and dead (shrubs): <10% (Winward 2000, UI Stubble Height Study Report 2004)
Percent hydrophytic vegetation: >64-78 (varies by greenline capability group – Winward 2000; 80% of values shown on page 34 is the general desired target value)
Greenline stability rank: >7 (Winward 2000)

End-Point Indicators
Stubble Height: >3-6 inches (UI Stubble Height Study Report 2004, Hall and Bryant 1995)
Bank Alteration: <5-20% (Cowley 2002, Bengeyfield and Svoboda 1998)
Mean incidence of use on woody species: <50% (Winward 2000)

Appendix E-Capable/Suitable Range

Capable Range

Capable upland range within the allotments under consideration comprises approximately 54 percent of the National Forest System acreage within the Planning Area. Capable areas are those areas with physical characteristics conducive to livestock grazing in that they produce forage and are accessible to livestock. Capable range is limited by slope, highly erodible soils, forest canopy cover, and distance to water. In this analysis, the following criteria were used to identify areas not capable of supporting livestock grazing:

- Slopes greater than 60%
- Areas of high or very high surface erosion potential
- Forage production less than 50 lbs/acre of palatable forage
- Areas further than ½ from perennial water
- Areas with more than 56% canopy closure

Areas that met those criteria were identified as capable. Primary range is less steep and within ¼ mile of water. Secondary range is usually more steep and further from water. The following table (Table E-1) summarizes the amount of uncapable and capable range within the Planning Area by allotment, and unit (Map in the Project Record).

The 1990 Malheur Forest Plan FEIS (USDA Forest Service 1990, FEIS V-20, and Appendix B, B-60 and B-71-75) used FORPLAN to estimate Animal Unit Months (AUMs) and range capability/suitability of the Forest, including these allotments. The information was used during development of the Forest Plan. In the Forest Plan FEIS, the definition of capability and suitability appear to be switched from their present definitions. The Forest Planning effort used similar criteria to those described here to determine "suitability" including forage production of 50 lbs/acre, and criteria such as "without damage to vegetation and soil resources." The Forest Plan FEIS provided for a reduction of "capability" and livestock use of 5% Forest-wide and 12% in riparian areas (V-20). This analysis was a Forest-wide estimate that did not provide capability or suitability on a site-specific basis. The IDT performed a capability analysis for the MFJD Range Analysis Area to provide data comparable to the Forest Plan, but on a site-specific basis.

The following acres of capable/uncapable are estimates from a 2002 GIS analysis. There are recognized limitations with this data - only perennial water sources and water developments known at the time of analysis in GIS were used to calculate the distance from water (other potential water sources such as springs or intermittent stream segments that retain water year-round may be available for livestock watering), conversely the condition of water sources was not factored into this analysis so any water sources that have a limited supply, are dry late in the grazing season, or are unusable would have been included in this estimate, additionally fence lines were not taken into account in relationship to water (so water may have been considered available even if it was blocked by a fence line). In addition, canopy cover data in GIS was only available in 10% increments. Areas were considered uncapable if they had more than 60% canopy cover in GIS; this may have slightly over-estimated capable areas. Transitory range was counted as part of uncapable acres because the computer model allowed these areas to be distinguished separately, but the areas fit the definition of uncapable due to high canopy cover and distance from water.

Table E-1: Capable and Uncapable Range by Unit*

Allotment	Unit		Uncapable Acres	Capable Acres		
		Acres of Transitory (part of uncapable)	Total	Primary	Secondary	Total
Austin	Austin	14	30	68	59	127
Elk	Elk	9	0	63	9	72
Bear	Corral	0	0	60	2	62
	Cole	0	0	37	2	39
	Def	4	84 (20)	20 (2)	46	66 (2)
	Antler	1	2	64	52	116
	Gibbs	19	19	265	39	301
	Hill	43	82 (15)	129 (3)	70	199 (3)
	Bend	2	2	49	3	52
	B1	2	1	9	2	11
	Horse Pasture	49	54	273	111	384
TOTAL			244 (35)			1230 (5)
Camp Creek	Gibbs Meadow	10	10	46	0	46
	Lower Camp	8	8	82	0	82
	North	24	42	50	7	57
	Middle	5	5	41	0	41
	Road	30	30	60	33	93
	Upper Camp	7	158	23	0	23
TOTAL			253			342
Blue Mountain	Crawford	1,180	3234	2,594	2,603	5,197
	Idaho Creek	2,239	3,843 (89)	3,246 (8)	3,245 (80)	6,491 (88)
	East Summit	43	77	856	260	1,116
	West Summit	159	760	634	926	1,560
	Squaw Creek	0	0	124	0	124
TOTAL			7,914 (89)			14,488 (88)
Lower MiddleFork	Balance	382	1,745	110	179	289
	Sunshine	1,577	2,369	1,004	1,201	2,205
	Granite Boulder	6,808	9,443 (320)	6,581 (545)	5,415 (556)	11,996 (1,101)
	Susanville	6,947	8,778 (226)	5,476 (93)	3,526 (87)	9,002 (180)
	Chicken House	151	194	171	364	535
	Pizer	3,243	4,685(596)	1,940 (110)	1,364 (341)	3,304 (451)
TOTAL			27,214 (1,142)			27,331 (1,732)
Upper Middle Fork	Butte		7,488	2,762	2,953	5,715
	Caribou		5,183	2,545	1,858	4,403
	Austin		3,133	415	860	1,275

	Deerhorn		5,669	4,326	3,700	8,026
	Lower Vinegar		2,899	2,090	2,002	4,092
	Upper Vinegar		1,486 (17)	2,441 (186)	1,194 (186)	3,635 (372)
	Blackeye		347	115	205	320
	River		106	5	0	5
	Shop		94	40	10	50
	Tailing		21	26	0	26
TOTAL			26,426 (17)			27,547 (372)
Sullens	Bridge Creek	6,021	13,413 (12)	4,676 (17)	7,908 (13)	11,774 (30)
	Highway	285	494	1,454	1,113	2,567
	Savage	2993	8,546 (77)	3,281 (1)	4,886	8,167 (1)
	Unit 26	0	277	50	236	286
TOTAL			22,730 (89)			22,794 (31)

*Numbers in parenthesis are the number of acres on other Forests or BLM.
Administrative use pastures was not estimated

Forage production is usually low in areas of highly erodible soils; therefore these areas are considered incapable of supporting livestock grazing. Where forage exists in those areas, livestock use of these areas should be discouraged to reduce potential for erosion.

Some elements of capability cannot be changed (an area with steep slopes or erodible soils will always remain uncapable). Other elements considered in range capability can be altered to increase (or decrease) capable range acres. Water developments placed in areas considered to be uncapable (due to water) increases the capable range in those areas. Range capability relates strongly to tree density and canopy cover.

Areas of high canopy cover (56% and higher) can be converted temporarily to transitory rangeland; transitory range is useable while forage is present and before the canopy recovers to 56%. Transitory range is created where vegetation management (tree harvest) or stand replacing fires have occurred. Stand replacing fires can cause a delay in forage production, depending on the impacts to soils, but can increase transitory range as forage species repopulate the area. Prescribed fire does not affect capability calculations because it is not generally designed to reduce canopy cover/tree densities below the threshold to produce forage. While prescribed burning may not increase capability, it does likely improve forage and shrub quantity and quality, thereby providing a minor amount of additional high quality forage to ungulates.

Suitable Range

Suitable range is a subset of capable range. Suitable range is the part of capable range where grazing is appropriate considering the economic and environmental consequences of livestock grazing, rangeland condition, and the other uses/values of the area. Rangeland suitability is defined in 36 CFR 219.3 as the appropriateness of applying certain resource management practices to a particular area of land. On the Malheur Natinal Forest, rangelands are termed suitable unless they are developed campgrounds, administrative sites (other than designated horse pastures), exclusive use special use areas, fenced road rights of way, Research Natural Areas (MA 9) where records show grazing is not essential to maintain a specific vegetative type for which the RNA will be established, long-term exclosures, and lands which have been shown to be uneconomical to manage under any reasonable management system. The MFJD Range Analysis Area includes allocations of Management Areas 9, 12, and 19 - the Dixie Butte proposed RNA, a few developed campgrounds along and near the MFJD River, and Sunshine and Blue Mountain Guard stations. These areas as well as several long-term exclosures are considered to be unsuitable. These areas total about 250 acres and are scattered throughout the analysis area; most of the larger areas (over 3 acres) are discussed in Chapter 3 of this EIS. All other areas in the analysis area would meet the definition of suitable land.

Appendix F

BIOLOGICAL EVALUATION

For
THREATENED, ENDANGERED, PROPOSED, AND SENSITIVE AQUATIC SPECIES

found in or affected by the

Middle Fork AMP Planning Area
of the

MALHEUR NATIONAL FOREST, BLUE MOUNTAIN RANGER DISTRICT

6/10/2005

Prepared by: __/s/ J. Perry Edwards______ Date: ___6/9/2005__________
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Fishery Biologist
Blue Mountain Ranger District

Threatened, Endangered, Proposed, and Sensitive Species
Summary Conclusion of Effects (Short and Long-term)

Table 1. Aquatic TES Species Effects Summary

Threatened(T)/Endangered(E)	**Alt 1 (No Grazing)**	**Alt 2 (Ongoing Grazing)**	**Alt 3 (Proposed Action)**
Mid-Columbia River (ESU) Summer-run Steelhead (T)	NE	LAA	LAA
Columbia River Basin Bull Trout (T)	NE	LAA	LAA
Designated Critical Habitat			
Spring Chinook Salmon Essential Fish Habitat (EFH)	NE	NLAM	NLAM
Sensitive Species			
Mid-Columbia River (ESU) Spring Chinook Salmon	NI	MIIH	MIIH
Interior Redband Trout	NI	MIIH	MIIH
Columbia Spotted Frog	NI	MIIH	MIIH

Listed Species:
NE = No Effect
LAA = May Effect – Likely to Adversely Affect
NLAA = May Effect – Not Likely to Adversely Affect
BE = Beneficial Effect

Listed Habitat:
NE = No Effect
NLAM = Not Likely to Adversely Modify
LAM = Likely to Adversely Modify
UAA = Unlikely to Adversely Affect

Sensitive Species:
NI = No Impact
MIIH = May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species.
* WIFV = Will Impact individuals or habitat with a consequence that the action may contribute to a trend toward Federal listing or cause a loss of Viability to the population or species.
BE = Beneficial Impact

* = Trigger for a Significant Action as defined by NEPA

ESU = Evolutionary Significant Unit – a geographically definable landscape area utilized by a distinct taxa or species population unit, considered reproductively isolated from other conspecific population units, and represents an important evolutionary link in the species genetic legacy.

INTRODUCTION

This Biological Evaluation (BE) documents the review and findings of Forest Service planned programs and activities for possible effects on species (1) listed or proposed for listing by the USDI Fish and Wildlife Service (USFWS) and by the National Oceanic and Atmospheric Administration (NOAA) Fisheries as Endangered or Threatened; or (2) designated by the Pacific Northwest Regional Forester as Sensitive. It is prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3, FSM 2672.4, FSM 10.89 R-6 Supplement 47 2670.44, and the Endangered Species Act (ESA) of 1973 (Subpart B; 402.12, Section 7 Consultation).

Proposed, Endangered, Threatened, or Sensitive species considered in this evaluation are those listed in FSM 2670.44, R-6 Interim Directive No. 90-1, March, 1989 as suspected or documented to occur on the Malheur National Forest's Blue Mountain Ranger District.

The following analysis addresses the potential effects of the Middle Fork John Day Allotment Management Plan on threatened, endangered, and sensitive aquatic species. This determination, required by the Interagency Cooperation Regulations (Federal Register: January 4, 1978), ensures compliance with the Endangered Species Act of 1973, P.L. 93-205 (87 Stat. 884) as amended.

Species Considered in this Assessment

The following sources of information have been reviewed to determine if PETS (proposed, endangered, threatened, or sensitive) species and their associated habitats may or may not occur within the project area:

- Regional Forester's Sensitive Species List
- Forest sensitive species database and the current GIS mapping layers
- Project area maps, unique habitat data bases, and any historical records
- Current Regulatory Agency status reports and listed species new releases

Habitats for proposed, endangered, threatened, or sensitive species (PETS) are identified by correlating the physical and biological features found in the project planning area with habitat features in which PETS species are known or suspected to occur. All aquatic Management Indicator Species (MIS) on the Blue Mountain Ranger District of the Malheur National Forest are currently listed as threatened or sensitive. Therefore, MIS species will not be discussed as a separate topic.

Fish species documented to occur in the Middle Fork John Day River Basin are listed below.

Mid-Columbia River Steelhead (*Oncorhynchus mykiss gairdneri*)
Status: Federal – Threatened (24 March 1999)
Global Conservation Status Rank Reasons:

Small breeding range in the middle Columbia River basin, Washington, and Oregon; continued declines in abundance; increasing percentage of hatchery fishes in natural escapements; genetic introgression and detrimental ecological interactions with hatchery stocks are potential problems. The John Day, Deschutes, and Yakima Rivers support the largest native, natural spawning stocks (NMFS 1999) in the Middle Columbia River Evolutionary Significant Unit (ESU).

The total run size for the Columbia River during the pre-1960 era might have been in excess of 300,000. This number was reduced to somewhat below 200,000 by early 1980. The most recent 5 year average run size was 142,000, with a naturally produced component of 39,000. The Middle Columbia River ESU comprises the majority of this run estimate (NMFS 1996). Serious declines have however, occurred in the John Day basin (NMFS 1999).

Environmental Baseline

The Middle Columbia River steelhead are named for the timing of their adult spawning run. The name "summer" refers to the time of year the fish enter the Columbia River for migration to the middle portion of the Columbia River, between Mosier Creek in Oregon and the Yakima River in Washington. First time spawning fish are generally 4-5 years old. Individuals are capable of spawning more than once before they die, though spawning more than twice is rare. Adult steelhead in this ESU spend up to one year in fresh water prior to spawning. These fish can utilize headwater areas for spawning purposes and require clean gravels with nearby resting pool habitat during the three to six week spring spawning period. Steelhead eggs incubate 1.5 to 4 months before hatching which varies with water temperature. Juveniles spend 1-4 (generally 2) years in fresh water before migrating to the ocean as smolts. While in the fresh water rearing stage, young steelhead prefer a water temperature range between 10-13° C, adequate pool habitat, and cover in the rearing streams.

Table FI-2—Steelhead/Redband Trout Bearing Streams in Analysis Area (taken from GIS)

Stream	Miles	Habitat Type
Unnamed Streams	4.6	Rearing, Spawning
Badger Creek	2.0	Rearing, Spawning
Beaver Creek	3.3	Rearing, Spawning
Big Boulder Creek	4.1	Rearing, Spawning
Big Creek	5.0	Rearing, Spawning
Blue Creek	1.2	Rearing, Spawning
Butte Creek	4.4	Rearing, Spawning
Butte Creek	0.6	Rearing, Spawning
Camp Creek	0.9	Rearing, Spawning
Caribou Creek	3.1	Rearing, Spawning
Clear Creek	4.8	Rearing, Spawning
Coyote Creek	1.6	Rearing, Spawning
Crawford Creek	6.1	Rearing, Spawning
Davis Creek	4.3	Rearing, Spawning
Deadwood Creek	2.7	Rearing, Spawning
Deep Creek	3.6	Rearing, Spawning
Deerhorn Creek	2.0	Rearing, Spawning
Dry Creek	0.4	Rearing, Spawning
Dry Fork Clear Creek	4.1	Rearing, Spawning
East Fork Big Creek	2.5	Rearing, Spawning

Elk Creek	3.6	Rearing, Spawning
Granite Boulder Creek	3.8	Rearing, Spawning
Idaho Creek	2.5	Rearing, Spawning
Lemon Creek	1.1	Rearing, Spawning
Little Boulder Creek	3	Rearing, Spawning
Little Butte Creek	1.7	Rearing, Spawning
Lost Creek	1.2	Rearing, Spawning
Middle Fork John Day River	13.7	Rearing, Spawning
Mosquito Creek	1.4	Rearing, Spawning
Myrtle Creek	2.7	Rearing, Spawning
North Fork Elk Creek	1.9	Rearing, Spawning
Onion Creek	0.3	Rearing, Spawning
Pizer Creek	0.7	Rearing, Spawning
Placer Gulch	3.2	Rearing, Spawning
Ragged Creek	1.5	Rearing, Spawning
Ruby Creek	3.3	Rearing, Spawning
Squaw Creek	7.0	Rearing, Spawning
Sulpher Creek	1.1	Rearing, Spawning
Summit Creek	3.8	Rearing, Spawning
Sunshine Creek	0.9	Rearing, Spawning
Swamp Gulch	0.6	Rearing, Spawning
Vincent Creek	4.5	Rearing, Spawning
Vinegar Creek	8.7	Rearing, Spawning
Windlass Creek	2.0	Rearing, Spawning
Wray Creek	2.8	Rearing, Spawning
	138.3	Rearing, Spawning

Mid-Columbia River (ESU) summer run steelhead (threatened). Most steelhead spawning and rearing occurs in the second to fourth order streams in the forested environment. Even when small streams are not accessible to migrating fish because of barriers or steep gradients, they are vitally important to the quality of downstream habitats.

Interior Redband Trout (*O. mykiss gairdneri*)
Status: USFS Region 6 Sensitive
Global Conservation Status Rank Reasons:

Still widespread in interior western North America but with local declines and extirpations. The global range includes the Columbia River basin east of the Cascades to barrier falls on the Kootenay, Pend Oreille, Spokane, and Snake Rivers; the upper Frazier River basin above Hell's Gate; and Athabasca headwaters of the Mackenzie River basin, where headwater transfers evidently occurred from the upper Frazier River system (Benke 1992). In the Columbia River basin, nearly all upriver and many lower river stocks appear to be improving after having declined (Nehlsen et al. 1991). Many stocks in the Columbia River basin are, however, threatened by mainstem passage problems, habitat damage (due to logging, road construction, mining, and grazing, which decrease water quality and increase siltation), and interactions with hatchery fishes (Nehlsen et al. 1991).

Environmental Baseline

There are four different populations of redband trout in the Blue Mountains. These are: 1) sympatric populations with steelhead, 2) isolated allopatric populations in anadromous watersheds, 3) allopatric populations in the Great Basin portion of the Blue Mountains, and 4) allopatric populations in watersheds that formally supported anadromous populations (N.F. Malheur and Upper Malheur Rivers). There is little data on current population trends of the redband, however, the four population types do not face the same level of threats from management activities. Redband populations in this project area are primarily of sympatric origin. Overall, the Interior redband trout have the most extensive area of all game fishes in the Blue Mountains. They are in the smallest headwater areas as well as in the largest rivers of the Blue Mountains.

Interior redband trout (sensitive) are assumed to be the resident form of the anadromous steelhead. Most redband spawning and rearing occurs in the second to fourth order streams in the forested environment. Even when small streams are not accessible to migrating fish because of barriers or steep gradients, they are vitally important to the quality of downstream habitats. Their distribution within the proposed project area (see Table 2), and habitat needs, are similar to the steelhead. However, redband spawning may occur in areas with insufficient flow for steelhead spawning.

Columbia River Basin Bull Trout (*Salvelinus confluentus*)
Status: Federal – Threatened (10 June 1998)
Global Conservation Status Rank Reasons:

> Many populations exist throughout the Columbia River basin, but these have been isolated by dams and expanses of degraded habitat. Many local extirpations have occurred throughout its range with a resulting ongoing reduction in total abundance. Many of the migratory forms of bull trout have been lost, exacerbating isolation.
>
> This distinct population segment of bull trout includes populations residing in the Columbia River and its tributaries, excluding the Jarbridge River, Nevada, and east of the Continental Divide, Montana (USFWS 1998). Bull trout currently occur in 45 percent of the estimated historical range (USFWS 1998). Hydroelectric dams and large expanses of unsuitable habitat have isolated many populations. Factors contributing to isolation include habitat degradation (e.g. from forest management practices, agricultural practices, livestock grazing, road construction and maintenance), water diversion, mining, and residential development (see USFWS 1998 for details). Illegal harvest and introduced brook trout also appear to be having a negative impact on bull trout.
>
> This Distinct Population Segment is significant because of the overall range of the species would be substantially reduced if this discrete population were lost (USFWS 1998).

Environmental Baseline

Bull trout require more specific habitat requirements than other salmonids. Water temperatures below 15° C are required for rearing and reproducing in forested streams (Buchanan and Gregory 1997). In addition, these fish need a "pristine" environment including high levels of shade, high levels of undercut banks, a large woody debris volume, high levels of gravels in riffles, low levels of sediment in riffles, and low levels of bank erosion (Dambacher and Jones 1997). These factors require careful management by landowners to ensure the conditions listed above continue to be in bull trout habitable waters.

Bull trout spawn during the fall months of September and October. Once deposited within the gravels, the eggs develop for 4 to 5 months. The alevins then further develop still within the gravels for three more months, finally emerging into the stream late summer.

Table FI-3. Bull Trout Bearing Streams in Analysis Area

Stream	Bull Trout Fish Bearing Miles	Habitat Type
Big Creek	9.9	Rearing, Spawning
E. Fk. Big Cr.	2.5	Rearing
Lost Creek	1.2	Rearing
Pizer Creek	0.7	Rearing
Deadwood Creek	3.3	Rearing, Spawning
Onion Creek	0.3	Rearing, Spawning
Swamp Creek	0.6	Rearing, Spawning
Granite Boulder Creek	3.8	Rearing, Spawning
Vinegar Creek	Currently, extent of population and habitat use is unknown	
Butte Creek	Currently, extent of population and habitat use is unknown	
Middle Fork John Day River	13.7	Migratory (mainstem)
Clear Creek	10.7	Rearing, Spawning on a portion upstream of highway 26
Total	46.7	

Columbia River Basin bull trout (threatened) are found in varying numbers in the Middle Fork John Day River and tributary drainages listed in the table above. The Middle Fork John Day River is a migratory corridor for bull trout. The upper Middle Fork mainstem (upstream of the Analysis Area) prior to 1990 had bull trout in it however, because of water withdrawal, habitat degradation, and high water temperatures is now considered historic habitat. Individual bull trout have been found in Vinegar Creek and Butte Creek within the last 5 years. It is unknown if these were stray fluvial fish or part of small populations.

Mid-Columbia River Spring Chinook Salmon (*O. tshawytscha*)
Status: USFS Region 6 Sensitive
Global Conservation Status Rank: G5Q

Environmental Baseline

Adult Mid-Columbia River spring Chinook enter natal streams in the spring, several months before spawning. The adult salmon remain in headwater streams, such as the Middle Fork John

Day, throughout the summer then spawn in the fall (Torgerson 1996). Torgerson (1996) also reported 2.4 adult Chinook per kilometer holding in the Middle Fork and 3.0 Chinook per kilometer spawning in the Middle Fork. The distribution of the salmon was clustered in reaches where stream temperature was lower than expected. The status of this species has been under review by NOAA Fisheries which determined in February 1999 that listing was not warranted at that time. Returning adults in the John Day River basin range from 400 to 3,000 with the vast majority spawning in three main areas: the upper North Fork John Day, the upper Middle Fork John Day, and the upper mainstem John Day.

Table FI-4—Chinook Bearing Streams in Analysis Area

Stream Name	Chinook bearing miles	Habitat Type
Big Boulder Creek	1.5	Rearing
Butte Creek	0.6	Rearing
Camp Creek	0.9	Rearing (adults have been observed)
Granite Boulder Creek	1.7	Rearing
Middle Fork John Day River	13.7	Rearing, Spawning
Squaw Creek	6.4	Rearing
Summit Creek	0.9	Rearing
Vinegar Creek	7.1	Rearing (adults have been observed)
Unnamed streams	1.7	Rearing
Total	34.5	

Mid-Columbia River spring Chinook salmon (sensitive) are found within the project area. Spawning within the project area is mostly in the Middle Fork John Day River. There is some very limited potential for spawning in the lower reaches of Granite Boulder Creek and Vinegar Creek. Adult holding and juvenile rearing also occur in these same general areas (see Table 5).

Chinook salmon Essential Fish Habitat (EFH) analysis is also included. Public Law 104-267, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for "Essential Fish Habitat" (EFH) descriptions in Federal fishery management plans and to require federal agencies to consult with NMFS on activities that may adversely affect EFH. "Essential Fish Habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (Magnuson-Stevens Act).

Columbia Spotted Frog (*Rana luteiventris*)
Status: USFS Region 6 Sensitive

Environmental Baseline

The spotted frog is on the Regional Forester's sensitive species list. Spotted frogs are highly aquatic and are rarely found far from permanent water. Breeding habitat is usually in shallow water in ponds or other quiet waters along streams. Breeding may also occur in flooded areas adjacent to streams and ponds. Adults may disperse overland in the spring and summer after breeding. Habitat has been degraded by past management activities, such as livestock grazing, road construction along streams, and timber harvest adjacent to streams, lakes ponds, springs, and marshes.

The spotted frog is considered present in all subbasins on the Malheur National Forest. It is assumed this species is widely distributed in the project area. Limited habitat surveys have been conducted specifically for spotted frogs; however, habitat probably exists along most low gradient (less than 2%) perennial and some intermittent streams. Fish surveys records incidental sightings of frogs but most do not differentiate species. During 1996 fish surveys, spotted frogs were reported in the Davis/Placer subwatershed, along Davis and Placer Creeks. The TES Wildlife Database for the Blue Mountain Ranger District also lists the Middle Fork John Day River, Crawford Creek and Squaw Creek for sightings of spotted frog. In addition, some spotted frog surveys were conducted by Forest Service personnel in 2003 and 2004; personnel found spotted frogs near the Mouth of Camp Creek, in the Middle Fork John Day River near Camp Creek, Crawford Creek. Personnel also found eggmasses for spotted frogs in a pond near Bridge Creek and Highway 26.

Westslope Cutthroat Trout (*Oncorhynchus clarkii)*

Westslope cutthroat trout do not occupy any habitat in the Middle Fork John Day Sub-basin or tributaries thereof and so are not found in the Planning Area and will not be included in the analysis.

Project Area Location
The Middle Fork John Day River Allotment Management Planning Area is located about 18 air miles northeast of John Day, Oregon. The planning area incorporates 8 grazing allotments and 3 administrative pastures on approximately 186,500 acres.

The Planning Area is located within the Big Creek, Camp Creek and Upper Middle Fork Watersheds, located in the Middle Fork John Day River Sub-basin (see vicinity map).

Historic Conditions and Disturbance Regimes
Salmonids such as the John Day spring Chinook and summer steelhead, bull trout, and redband trout were well distributed throughout the watershed; the various age classes of these fish likely utilized a majority of the available stream habitat. Evidence suggests that bull trout were once common throughout the Middle Fork John Day subbasin (Wissmar et al. 1994). ODFW surveys show that Chinook salmon and steelhead were once present throughout all the Middle Fork John Day subbasin; Columbia River redband trout still occupy a significant portion of their historical range. However, Behnke (1992) noted that the original genetic diversity of resident redband and anadromous stocks of steelhead trout have been depressed by land and water use practices. Instream habitat conditions have been altered by land management activities from pre-European settlement conditions. It is likely that stream channels within the watershed area were narrower and deeper during pre-settlement times (pre 1850). Deep pools were more numerous due to the quantity of LWM providing velocity breaks and scour areas. Beaver activity played a role in stream function. Beaver dams raised water tables and flooded riparian areas which provided ground water recharge areas resulting in more water being available during the low flow period of late summer. Beaver dams captured sediment and created deep pool habitat that benefited fish. Higher water tables resulted in larger (wider) riparian areas with appropriate vegetation associations present and showing plant reproduction and vigor.

Streams reaches in lower gradient, wide valley bottoms were less confined, with greater sinuosity, higher water tables and connected floodplains. Riparian hardwoods, sedges, and conifers provided bank stability and potential large woody debris (hardwoods and conifers only); undercut banks were common, providing hiding cover for both anadromous (steelhead and Chinook) and resident salmonids (redband and bull trout) that occupied the streams. Sediment transport and deposition processes were pulse events, likely related to stand replacement fires that periodically occurred in the headwaters of the streams and periodic intense storm events that occurred in localized areas. Water quality probably reflected the lack of major disturbances within the watershed; there likely was little or no sediment/turbidity problems beyond what would have occurred naturally. The narrow, shaded stream courses had cooler summer water temperatures than what is now present, and there was little non-point source pollution generated by large ungulates. Additional spawning gravel was available for both resident and anadromous salmonids; salmonid numbers were higher as there were likely greater numbers of streams that provided all the habitat needs for the various salmonid life histories.

Historically, Sensitive Stream Reaches were mainly Rosgen “C” or “E” channel types with some low gradient “B” channel types, which exhibited greater meander with extensive floodplains and vast woody and herbaceous (sedges, rushes and riparian grasses) riparian vegetation. These areas had extensive water storage capacity, holding water during peak or high flows and releasing water during base or low flows. The stream segments were originally depositional reaches where smaller sediment and bedload materials settled out during high or peak flow levels. Therefore, channel substrate was comprised of smaller diameter particles such as gravel and sand. Undercut banks were common in the small bank substrate on the outside of bends in the streams. The greater stream meander also equated to greater pool frequency and quality. Beaver heavily utilized these reaches, creating dams that raised water tables, lowered stream gradient and slowed water movement though the system.

Patterns of fire on the Malheur National Forest, prior to European Settlement, served as a major influence on vegetative patterns, which ultimately affected watershed processes. Fire suppression has caused changes in the distribution, size and frequency of fires. It has also resulted in vegetative changes throughout the Forest, which has influenced the hydrology of the watershed. Overstocked stands as a result of fire suppression have led to increased susceptibility to insect mortality and subsequently increased fuel loading in some areas. The Summit Fire of 1997 burned 27,000 acres of both managed stands in general forest and scenic designated management areas. Many of the streams within the fire had available shade and large wood consumed by the fire. Fish species were temporarily displaced by high chemical/nutrient releases and temperature fluctuation but have recolonized to original occupied reaches.

Vegetation associations along stream channels were composed of riparian shrubs, sedges, rushes and grasses were present. Alder and willow were more common, providing shade, bank stability from roots, and nutrient input into the streams as well as hiding cover for fish. Deep-rooted riparian vegetation stabilized banks; allowing undercut banks and narrower channel profiles to be common in meadow reaches of streams. Aspen were more prevalent along those portions of streams that had fairly open forest canopies. Hardwoods and herbaceous vegetation provided nutrient input to streams in the form of terrestrial insects which fall into streams and become food for fish as well as leaf detritus that aquatic insects need to survive (Meehan 1991). Cottonwood trees were likely the major overstory component along larger streams and rivers such as the Middle Fork John Day River where spring flows created gravel bars suitable for seed germination.

Effects of Management Activities on Aquatic species and Habitat

Past and present management activities affecting aquatic species and habitat include logging, roading, mining, suppressing wildfires, and domestic livestock grazing. These management activities have altered stream bank stability, riparian and upland vegetation communities, water temperatures, and ultimately, overall stream channel morphology and fish habitat. Logging, mining, and road construction may produce sediment that can cause adjustments in the channel (Rosgen, 1996). Channel width/depth ratios have increased, pool quality and quantity (habitat complexity) has decreased, and available spawning gravels have become embedded or are unavailable due to reduced stream flows. In addition, water diversions for agricultural purposes decrease streamflows and increase summer water temperatures.

Recently, increased numbers of hatchery strays from other river systems have been found downstream in the John Day River system, and pose genetic and ecological problems to the natural fish stocks. Oregon Department of Fish and Wildlife (ODFW) identify the John Day stocks as “wild run” since no hatchery fish are planted in the John Day River system.

Placer, dredge and to a lesser extent hardrock mining, has impacted streams within the watershed. Most streams show evidence of some mining activity with extensive placer operations mostly north of the MFJD River. Impacts have been increased amounts of sediment introduced into the streams from mine tailings, resulting in pool habitat filling, changes in channel morphology, and disruption of normal floodplain function. Overall degradation of affected stream channels has resulted in less salmonid rearing and spawning habitat. Current regulations limit the impacts to aquatic resources and much of the historic mining activity has stabilized even though the disturbances are still evident.

Timber harvest and associated road building have produced the most significant changes to streams within the watershed. Logging activities that removed forest biomass likely altered hydrologic processes. Research has shown that peak snowmelt flows increase when openings are created within the forest (Chamberlin et al 1991). Logging, narrow gauge railroad grades, and road building within riparian areas has introduced sediment into streams, and removed shade/canopy, resulting in decreased water quality as sediments have clouded streams and the increased sun exposure has warmed stream waters. The Galena Watershed Analysis (USDA 1999) identified road densities ranging from 2.4 miles per square mile to 6.3 miles per square mile with the majority of subwatersheds having over 3 miles of road per square mile and up to 30% of roads in riparian areas. Riparian roads and railroad grades have restricted floodplains and caused channel adjustments which affect present habitat quality and quantity. Stronghold populations of salmonids are associated with higher-elevation forested lands and the proportion declines with increasing road densities (Quigley et al. 1996). The higher the road density, the lower the proportion of subwatersheds that support strong populations of key salmonids. Specifically, Quigley shows a strong correlation with road densities of 2 miles/mile^2 or higher and reduction of strong populations of salmonids. Further reductions of strong salmonid populations were identified at densities of 3 and 4 miles/mile^2 or greater. Surface erosion activity likely increased as a result of logging activities (mainly ground-based) that create compacted, bare soils where skid trails were located in draws; ultimately eroding downhill into adjacent streams. Railroad logging removed trees in the riparian zone that were potential large Woody Debris (LWD). Instream LWD was removed where railroad grades and roads were built in the landscape. Deficiencies in large wood are primarily the result of past logging and roads located within the floodplain which has limited the recruitment.

The majority of the Sensitive Stream Reaches have been grazed, railroad logged and/or mined. These activities directly or indirectly straightened stream channels and increased stream gradient often causing the stream to downcut (through fine stream bed and bank substrate). Downcut channels cause water tables to become lower and disconnect historic floodplains. The area able to support true riparian vegetation has been greatly reduced in this process. This also caused the smaller substrate (gravel and sand) in the channel to be transported downstream so that existing substrate (cobble) is actually larger than what was historically in a depositional reach. The loss of meander reduced pool frequency and quality.

Reduced base flows degraded summer rearing habitat quantity and quality for all fish. They also drastically reduced potential spawning habitat quantity and quality for fish that spawn in the fall (bull trout and Chinook salmon) during the low flow period. Steelhead and redband trout can be affected if flow levels drop earlier in the year drying out redds and causing direct mortality of eggs or young fish before emerging from gravels.

Grazing Effects

Grazing can affect bank stability with the removal of riparian vegetation. Livestock may cause mechanical damage of stream banks from hoof or head shear (Platts 1991). Undercut banks that reduce stream exposure to sunlight to maintain water temperatures and provide hiding cover for fish can be destroyed under the weight of cattle; this is exacerbated where deep-rooted, late seral vegetation has been replaced with more shallow-rooted, early seral species. This increase in bank instability can lead to changes in channel profile by increasing width and decreasing depth, modifying bank angle as well as increasing sediment input to the stream. Stream channel profiles (both bankfull and wetted width to depth ratios) are wider than expected in the project area. Extreme cases of overgrazing may cause stream channels to downcut, lowering water tables and disconnecting floodplains.

Cattle commonly use Sensitive Stream Reaches because the low gradient and wide valley bottoms makes access easy, herbaceous vegetation is available in meadows and water is nearby. This easy accessibility as well as available food and water make these reaches highly desirable to domestic livestock. The sensitivity of these reaches increases the potential for degradation of the stream channel, modification of water tables and floodplains as well as associated riparian areas. Cattle may impact fish directly by trampling redds where fish eggs/embryos are buried by adult fish. Redd trampling is less likely to occur with spring spawning species such as steelhead and redband trout when stream flows are higher, upland water sources are more prevalent and palatable forage is abundant in uplands as well as riparian areas. This also reduces the potential for impacting spotted frog egg masses. Redd trampling is more likely to occur with fall spawning fish which include bull trout and Chinook salmon because stream flows are low, upland vegetation is less palatable and fewer upland water sources are available so cattle tend to congregate more in riparian areas.

Livestock management practices have produced changes to some riparian areas. Monitoring of grazing historically focused on drier upland areas while data and analysis in riparian areas was limited (Platts 1991). It is unknown as to the extent that past or historic grazing activities have contributed to degradation of the watershed compared to other management activities. However, the Upper Middle Fork WA (pp. 4-16) stated that historically most areas were overgrazed, even when allowable use management objectives were set at 60%.

Concerns for the aquatic resources in the past 30 to 40 years have led to changes in the grazing strategy and produced dramatic improvements in most riparian areas throughout the subbasin. However, issues such as lowered water tables, disconnected flood plains and reduced riparian vegetation remain. Rates of recovery have depended on the current riparian vegetation condition/seral stage, stream condition, stream channel type, livestock grazing management, site potential and big game use.

Total exclosures that keep out deer, elk and domestic ungulates in Summit Creek and Camp Creek are reference areas to display site potential of similar areas. Livestock exclosures on Summit Creek and upper Camp Creek indicate a natural rate of recovery with wildlife presence.

This may be somewhat misleading as wildlife can use both shrubs and herbaceous vegetation more heavily in livestock exclosures in winter range areas where little forage is left after grazing by cattle outside the exclosure. Unfortunately, many of the exclosures have little or no information on site conditions when built to compare with grazed areas.

Livestock grazing has impacted fish habitat in less obvious ways. Components of native plant associations have been reduced or eliminated, allowing for the establishment of exotic plant species or conversion to early seral stage vegetation. In some cases intentional seeding of grasses that were adapted to grazing caused degraded riparian areas; Kentucky bluegrass and redtop were highly productive and resilient species introduced to the MFJD River. These species have shallow root systems that contribute little to stream bank stability compared to native, deep-rooted aquatic vegetation. They can also form mats that crowd out other species. Native grass and sedge species such as tufted hairgrass, wooly sedge, and Nebraska sedge were reduced due to their sensitivity to grazing. Riparian hardwood browsing may reduce quantity and vigor of plants that shade streams and maintain water temperatures. Browsing of hardwood seedlings and saplings can reduce or eliminate replacement of existing hardwoods, leaving only older plants which may be susceptible to blight or disease. This can indirectly reduce instream Coarse Woody Debris (CWD) quantities over the long term. Deep-rooted vegetation is essential to maintain stream bank stability, building of stream banks and creation of undercut banks. As stated in channel morphology in the fisheries section and in the hydrology section, channel evolution must have components of late seral vegetation and LWD to create high quality fish habitat.

<u>Summary</u>

Historic management activities have changed stream and riparian areas leading to degraded quality and reduced quantity of aquatic habitat. The degradation of riparian areas has resulted in reduced populations of Columbia spotted frogs. The loss of fish habitat complexity and quality has impacted TES fish (bull trout, steelhead, redband trout and Chinook salmon) and reduced fish populations in the project area and downstream in the Middle fork John Day River. These changes have also reduced habitat and likely populations of Columbia spotted frog.

Existing Conditions for Aquatic Species on Streams by Allotment and Pasture

Bear Allotment
There are approximately 3 miles of fish bearing (steelhead/redband, Chinook salmon) streams including the Middle Fork John Day River and Mosquito Creek in the Bear Allotment. Results of Level II stream surveys listing stream channel parameters and fish habitat are listed in table FI-5.

Table FI-5. Level II Stream Survey Data for Bear Allotment

Stream - Date Surveyed & Reaches	Pools Per Mi	Length	Ave. Wetted Width To Ave. Depth Ratio*	Bankfull Width To Depth	Med Wood per Mi	Large Wood per Mi	Bank Stability	High Temp	Embedded Y Or N
MOSQUITO 7/13/92 Start To: 2	78	3.7	>10♠	9.34	136	23♠	100	63	Y♠

♠Fails to Meet LRMP Amendment 29 Management objective; *Wetted width to depth ratios listed as <10 or >10 are based on extrapolation

Some pastures within this allotment contain only upland habitat. Pastures A, B, and B-1 have riparian areas, streams or fish; The B-1 pasture has an irrigation ditch running through the pasture.

C1 Pasture & C2 Pasture
The MFJD flows through both C1 and C2 pastures while a small portion of Mosquito Creek flows through the C2 Pasture. The reduced level of fish habitat complexity and quality as well as the fact that Mosquito Creek is no longer connected channel to the MFJD has resulted in reduced productivity and thereby populations of TES fish in this pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in these pastures.

Middle Fork John Day River
The Middle Fork of the John Day River, a 303(d) listed stream for temperature, flows through the C-1 and C-2 pastures and is considered to be steelhead spawning and rearing habitat, Chinook spawning and rearing habitat and bull trout migratory habitat. A spawning survey conducted in May 2002 noted that the majority of substrate was too large for steelhead spawning; however, some small inclusions of potential spawning habitat were available. The Middle Fork John Day River is mainly winter rearing habitat for steelhead as most steelhead utilize smaller tributaries for spawning activities and summer water temperatures are excessive for steelhead in the Middle Fork John Day River. Chinook salmon spawn in this section of the Middle Fork John Day River.

Stream surveys were completed on Middle Fork of the John Day River by the Oregon Department of Fish and Wildlife. Reach 3 of the survey encompasses the portion of the Middle

Fork of the John Day River that is in pastures C1 and C2 of the Bear allotment. This reach extends from the confluence with Armstrong Creek upstream for approximately 1.4 miles. This section of the Middle Fork is a Rosgen "C3" channel type. Riparian vegetation is composed of grasses and deciduous trees averaging 1 to 6 inch Diameter at Breast Height (DBH). Dominant habitat is pools (55%). There are a high percentage of actively eroding stream banks (40%) Average stream gradient is 0.4%. Artificially placed rock sills and log weirs create the majority of pool habitat.

Both pastures contain sensitive stream reaches for their entire length along the Middle Fork John Day River. In 1999, it was determined that shrubs, a key component on these units, along the banks of the Middle Fork John Day River on Pastures C1 and C2 were being impacted by late season grazing. This is a concern for shade, streambank stability as well as hiding cover and insect prey potential for fish. The grazing season was moved earlier in the year in an attempt to reduce pressure along the riparian area. Herbaceous and shrub conditions have improved; however, riparian shrub use is still a concern.

<u>Mosquito Creek</u>
Mosquito Creek flows through the C2 pasture. Historically, there was likely access to fish from the Middle Fork John Day River. Currently, the stream is intercepted by an irrigation ditch in this pasture about 600 feet before entering the Middle Fork of the John Day River. The irrigation ditch has been breached and the creek is flowing into a flat meadow area creating a marshy area of several acres with no defined channel that drains into the Middle Fork of the John Day River. Salmonids, unknown as to whether of steelhead or redband trout descent, do occur in the lower 2 miles of the stream. The stream provides spawning and rearing habitat for redband trout; however, little substrate appropriate for steelhead spawning was identified during Level II stream surveys. Information from Level II Stream surveys on Mosquito Creek is listed in Pasture E.

D Pasture
Mosquito Creek runs through pasture D for about 30 feet all of which is part of a livestock water gap. The water gap is used quite heavily. The remainder of the pasture is upland habitat. The short length of Mosquito Creek in this pasture makes it irrelevant for fish, fish habitat or Columbia spotted frog.

E-F (Hill) Pasture
The reduced level of fish habitat complexity and quality as well as the fact that Mosquito Creek is no longer connected channel to the MFJD has resulted in reduced productivity and thereby populations of TES fish in this pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

<u>Mosquito Creek</u>
The Level II stream survey described the dominant riparian vegetation is comprised of grass-forbs, dogwood, and grand fir with some ponderosa pine in the upland areas. The riparian cover vegetation consists of 99% grass-forb, 80% shrub, and 17% tree crown. The gradient of Mosquito creek is about 6% and bankfull width-depth ratio is 9.52. Banks are sand and gravel and are 95% stable. The substrate is sand/silt dominant with cobble subdominant. Cobble

embeddedness is 35%. The stream contains 36% pools, 61% riffles. Instream cover was 6-20%. Mosquito Creek is listed as a 303(d) stream for temperature but does meet *LRMP* management objective for shade. This stream does not meet *LRMP* management objectives for wetted width to depth ratio, LWD frequency, and cobble embeddedness. There are two road crossings on Mosquito creek. Forest Road 2000893 influences Mosquito Creek. This valley bottom road limits the recruitment of large wood, restricts the floodplain and is a source for fine sediment. No sensitive stream reaches have been identified in Mosquito Creek.

Armstrong Creek

Armstrong Creek is an interrupted intermittent stream in pasture G that flows through private ground and into the Middle Fork of the John Day River. Armstrong Creek is not occupied by steelhead or bull trout and so no level II surveys have been completed on this stream. No information is available the portion of Armstrong Creek in this pasture.

PASTURE G (Gibbs)

Armstrong Creek is an interrupted intermittent stream (portions have defined channel then no channel) in pasture G that flows through private ground and into the Middle Fork of the John Day River. Armstrong Creek is not occupied by steelhead or bull trout and so no level II surveys have been completed on this stream. A Sensitive Stream Reach was identified for Armstrong Creek on Forest Service land in a low gradient valley with no conifer canopy. This reach contains some Nebraska sedge and Baltic rush in and alongside the channel but herbaceous vegetation is mainly composed of the same non-hydric species present in the surrounding uplands. This vegetation is likely due to the small amount of water and short duration of flows. The shrub component, where present, is comprised of small thickets of hawthorn.

PASTURE H (Horse)

This is an upland pasture containing no streams or fish.

Camp Creek Allotment

There are less than 2 miles of Camp Creek, a 303(d) listed stream (for elevated summer temperature), that contain steelhead/redband trout within the allotment. A major storm event occurred in January of 1997 that downcut the lower mile of Camp Creek (a Sensitive Stream Reach) to where it flows into the Middle Fork John Day River, vastly changing habitat parameters from those measured in 1994. A stream survey was contracted in 2004 but analysis and reports are not yet complete. Riparian vegetation is limited on the lower segment because of the entrenched channel, narrowed floodplain and lowered water table. Summer water temperatures regularly exceed 75 degrees on Camp Creek. Pool habitat is limited from past management activities and the 1997 storm event. Large pools should be present in this portion of Camp Creek due to stream flows and large drainage area of the watershed.

Fish habitat in Camp Creek is limited mainly to migratory habitat for adult steelhead using tributaries or the headwaters of Camp Creek to spawn. Excessive embeddedness and the lack of pools limit winter rearing habitat for juvenile salmonids and high summer water temperatures reduce habitat available for summer rearing of salmonids.

Chinook salmon use the Middle Fork John Day River for spawning and rearing habitat. Steelhead use this river mainly for winter rearing habitat but some potential spawning habitat exists. Steelhead mainly use tributaries to the Middle Fork John Day River for spawning. Bull trout (fluvial life history) use the Middle Fork John Day River for migratory habitat. Fish habitat parameters measured during Level II stream surveys are listed in Table FI-6.

Table FI-6. Level II stream survey data for streams in Camp Creek Allotment

Stream - Date Surveyed & Reaches	Pools per Mi	Length (miles)	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Pct. Bank Stability	High Temp	High Temp Time	Embedded Y or N
CAMP 6/29/94 Start to: 2	26♠	0.6	>10♠	36.67	13.2	1.5♠	93	68	1100	Y♠
CAMP 6/29/94 Reach 3 to 4	23♠	1.8	>10♠	21.2	8.2	5.5♠	99	77♠	1600	N

♠ parameter does not meet *LRMP* Management objective;*extrapolation of wetted width to depth ratio—2004 survey analysis pending

LOWER CAMP PASTURE

Lower Camp Creek does not meet *LRMP* management objectives for stream channel parameters listed in table FI-6. The Middle Fork John Day River is described below with actively eroding banks. This reduced level of habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in this allotment. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have negatively impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

<u>Middle Fork John Day River</u>

The Middle Fork of the John Day River runs through both the Middle pasture and the Lower Camp Creek pasture. The Middle Fork functions as winter rearing habitat for steelhead and redband trout, rearing and spawning habitat for Chinook salmon and migratory habitat for bull trout. The Middle Fork John Day River is a Sensitive Stream Reach in these pastures. This stream is on the State of Oregon 303(d) list for elevated summer temperature.

In 1992 the Oregon Department of Fish and Wildlife conducted a stream survey for the Lower Middle Fork of the John Day River. In their description, reach 5 includes the parts of this river that are located in the Middle pasture and the Lower Camp Creek Pasture of the Camp Creek Allotment. This reach begins at Jungle Creek and extends for 2.9 miles upstream. The stream is unconstrained with multiple channels, and the broad valley contains multiple terraces. Riparian vegetation is composed of grasses and deciduous trees averaging 12 to 20 inch DBH. Dominant habitat is riffles (72%) and dominant substrate is gravel (51%). There is a high percentage of actively eroding stream banks (69%). Average gradient is 0.5%. Most of the pools were created artificially using rock sills and log weirs.

Field surveys conducted in January 2005 showed a lack of mature shrubs and little new recruitment of shrubs. Riparian herbaceous vegetation appeared to be in late seral condition and included wooly sedge, Nebraska sedge, Baltic rush as well as redtop and Kentucky bluegrass in some locations.

Camp Creek

Camp Creek runs through the Upper Camp Pasture, the Lower Camp Creek Pasture, the Campground Pasture and is adjacent to the Road Pasture. Camp Creek functions as winter rearing habitat for juvenile steelhead and redband trout and as migratory habitat for adult steelhead trout that use the headwaters and tributaries for spawning habitat. The portions of Camp Creek in this allotment are Sensitive Stream Reaches.

The portion of Camp Creek located in the Lower Camp Creek pasture and the Campground pasture is described by a Level II stream survey completed in 1994. Reach 1 of Camp Creek is a moderate sized stream. The stream flows through a moderate to steep greater than 600 feet, flat floored valley. The floodplain supports a mixed conifer forest ecosystem. The floodplain cover was 2% tree crown cover, 36.3% shrubs and 91% grass-forb ground cover. Stream shade averaged 3.8%. The dominant and subdominant substrate materials were cobble and gravel. The stream averaged 18.8 feet wide (wetted width) and had a volume of flow of 4.4cfs on June 29, 1994. Fish cover averaged 6 to 20% and large woody materials were not abundant. Water temperatures ranged from 62.6 degrees F. to 68 degrees F. There was a runoff event on January 1, 1997 that caused 2-3 feet degradation of Camp Creek channel. Fish habitat and riparian shrub cover was greatly reduced in the lower reach of Camp Creek.

The major fish habitat problems appear to be high maximum temperatures and excessive fines. This stream does not meet *LRMP* management objectives for pool frequency, LWD frequency, wetted width to depth ratio, cobble embeddedness and excessive summer temperatures. Log weirs were installed in 1982 in this reach to increase pool habitat, however these structures may be maintaining a wide, shallow channel. Redband/steelhead trout, speckled dace and sculpin were identified. There is a water gap about 25 feet long located above the bridge and below O'Rourke's private land. This water gap serves the Road pasture and is the only portion of Camp creek in the Road pasture. The Road pasture and the Lower Camp Creek pasture have irrigation ditches.

End of year range monitoring in the riparian zone of the Lower Camp Pasture showed shrub utilization did not meet management objectives 2 out of 3 times they were grazed (from 1999-2001). However, a field review conducted in summer 2004 showed numerous young willows (1-3 feet tall) showing uninterrupted growth form in and along the stream channel.

MIDDLE PASTURE

This pasture contains the Middle Fork John Day River (described in the Lower Camp Pasture) and small segments (less than 50 feet) of Gibbs Creek and Jungle Creek (both described in the Gibbs Pasture).

Middle Fork John Day River is described in the Lower Camp Pasture section. The reduced level of habitat complexity and quality as well as reduced shrub community has resulted in reduced productivity and thereby populations of TES fish in this pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have negatively impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

ROAD PASTURE

This pasture contains a water gap for approximately 25 feet on Camp Creek. The water gap is used quite heavily. This is the only stream in the pasture. The remainder of the pasture is upland habitat. The short length of Camp Creek in this pasture makes it irrelevant for TES fish, fish habitat or Columbia spotted frog.

NORTH PASTURE

The North pasture contains Cress Creek, an intermittent stream. There are no stream survey data for this stream because there are no fish in this stream. A field review conducted in January 2005 identified a static riparian condition with early seral riparian herbaceous vegetation; this was likely due a strong shrub component and conifer overstory as well as the limited amount and duration of flows. The stream turns into an ephemeral draw about ¾ mile up from the confluence with the Middle Fork John Day River.

Cress Creek is too small and due to its intermittent nature provides no appreciable water for TES fish in the Middle Fork John Day River. It is unknown if past management activities have impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

GIBBS MEADOW PASTURE

The Gibbs Pasture does not contain any fish-bearing streams. The unit does contain riparian habitat upslope of the Middle Fork of the John Day River, Gibbs Creek and Jungle Creek. There are no stream survey data for streams in this pasture. There is a nonfunctional water diversion in this pasture.

These small streams go dry in the pasture and do not provide appreciable amounts of water to the John Day River during low flows. TES fish in the Middle Fork John Day River are not affected by streams in this pasture. It is likely that habitat for Columbia spotted frog which are "suspected" in this pasture has been reduced because the pasture has not been irrigated for over 5 years and is converting to dry site species.

<u>Gibbs Creek</u>

Gibbs Creek is an interrupted intermittent stream that flows into the Middle Fork John Day River. The stream channel is present on most of the unit but some areas were found with no defined channel or evidence of water. No Level II streams surveys have been conducted on this stream because it is not fish-bearing. A field review conducted in January 2005 identified mainly upland species near this stream with some sections with seeps containing Nebraska sedge. Hawthorn was present the only shrub species found. Vegetation is composed mainly of upland species likely due to the small amount of water and duration of flows.

<u>Jungle Creek</u>

Jungle Creek is an interrupted intermittent stream that flows into the Middle Fork John Day River. No Level II streams surveys have been conducted on this stream because it is not fish-bearing. Vegetation is composed mainly of upland species likely due to the small amount of water and duration of flows.

UPPER CAMP PASTURE

This pasture contains no fish-bearing streams; there is an intermittent channel but no surveys have been conducted.

CAMPGROUND PASTURE

The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in this pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “suspected” in this pasture.

<u>Camp Creek</u>

This pasture contains a short segment (less than ¼ mile) of Camp Creek. Level II streams surveys from 1992 (see Table FI-6) identified that Camp Creek failed *LRMP* management objectives for pools, wetted width to depth ratios, LWD frequencies and temperatures. A field visit in January 2005 identified riparian herbaceous vegetation as mainly late seral with wooly sedge and Nebraska sedge present and numerous species and age classes of riparian shrubs present; however, the uppermost portion of Camp Creek in the pasture (approximately 100 yards) was composed mainly of bluegrass and redtop with cobble abundant.

Lower Middle Fork Allotment

There are approximately 89 miles of fish bearing streams (steelhead/redband trout, bull trout and Chinook salmon) in the Lower Middle Fork Allotment. Big Creek, Deadwood Creek, Coyote Creek, Big Boulder Creek and Granite Boulder Creek are 303(d) listed for excessive temperature. These same streams contain Sensitive Stream Reaches. Level II stream surveys have been conducted on many streams in the allotment. Results of these stream surveys are listed in Table FI-7 and identify where *LRMP* 29 management objectives were failed.

Valley bottom roads influence many of the streams from the confluence with the Middle Fork upstream. These roads limit the recruitment of large wood, restrict the floodplain and are a source for fine sediment. A 50,000 acre high intensity wildfire (Summit) burned portions of most subwatersheds of the allotment in 1996. Riparian vegetation was completely removed in many areas. High sediment (embeddedness), low quantities of Large Woody Debris and low pool frequency reduce fish habitat complexity and quality in nearly every stream in the allotment. About 2/3 of the allotment was affected. As a result, the Malheur Forest decided not to graze the burned portion through 2002.

PFC analyses were completed in 1999 on Badger Creek, Deep Creek, North Fork Elk Creek and Big Boulder Creek to determine riparian conditions in the area of the Summit fire.

Table FI-7. Level II stream survey data for streams in Lower Middle Fork Allotment

Stream - Date Surveyed & Reaches	Pools per Mi	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Pct. Bank Stability	High Temp	Embedded Y or N
BADGER 7/29/92 Start To: 4	77♠	5.4	>10♠	11.29	71	128	94	14.0	71.2♠
BALANCE 7/3/93 Start To: 1	40♠	1.7	>10♠	14.86	15	19♠	89	52.0	100♠

Stream - Date Surveyed & Reaches	Pools per Mi	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Pct. Bank Stability	High Temp	Embedded Y or N
BIG 2001 Start To 10	30♠	10.6	14.7♠	18.9	39	17♠	99	62.4	DATA GAP
BIG BOULDER 7/13/92 Start To: 5	36♠	7.4	>10♠	12.48	44	28♠	94	15.0	77.4♠
BADGER CREEK 2001 Reach 1-2	11♠	2.5	11.2♠	14.4	35	32♠	56♠	72.0	DATA GAP
WRAY CREEK 2001 Reach 1-2	14♠	2.6	10♠	12.7	49	36♠	87♠	66	DATA GAP
COYOTE 8/6/92 Start To: 3	69♠	3.5	>10♠	9.08	195	18♠	100	22.0	39.1♠
DEADWOOD 8/1/93 Start To: 2	27♠	3.0	>10♠	8.53	37	11♠	84♠	59.0	Y♠
DEEP 92 7/6/92 Start To: 2	61	3.5	>10♠	6.18	149	22♠	100	59.0	Y♠
DUNSTON 7/3/93 Start To: 2	28♠	1.5	<10	5.97	16	18♠	95	58.0	Y♠
E F BIG 8/12/93 Start To: 1	11♠	2.6	<10	7.21	30	5♠	95	63.0	Y♠
ELK 7/22/92 Start To: 3	107	3.0	>10♠	6.97	172	2♠	DATA GAP	55.0	Y♠
GRANITE BOULDER 2001 Reaches 2-4	14♠	4.64	16.2♠	15.8	19	21♠	99	64.0	1993 Y♠
LITTLE BOULDER 7/1/93 Start To: 2	23♠	5.8	>10♠	10.06	35	16♠	89♠	53.0	Y♠
MOSQUITO 7/13/92 Start To: 2	78♠	3.7	>10♠	9.34	136	23♠	100	61.0	Y♠
MYRTLE 2001 Start To: 3	20♠	4.2	11♠	12.5	31	11♠	97	69.8	DATA GAP
N F ELK 8/4/92 Start To: 2	95♠	3.8	>10♠	8.39	249	27♠		61.0	Y♠
SUNSHINE 7/2/93 Start To: 2	50♠	2.9	<10♠	5.30	23♠	25♠	87♠	51.0	Y♠

♠ parameter does not meet *LRMP* 29 Management objectives;*Wetted width to depth ratios listed as <10 or >10 are based on extrapolation

Balance Pasture

Malheur National Forest data indicates that Balance Creek, the only stream in this pasture, contains steelhead/redband trout. All or portions of the stream failed to meet *LRMP* management objectives for pool frequency, wetted width to depth ratio, cobble embeddedness, bank stability and LWD frequency.

The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Balance Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “suspected” in this pasture.

Sunshine Pasture
Sunshine Creek runs through the Balance Lake pasture and contains steelhead redband trout. No steelhead/redband trout were found in Dunston Creek on Malheur National Forest land.
The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in Sunshine pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Sunshine Creek:
Sunshine Creek below the 2045 road is considered to be spawning and rearing habitat for redband/steelhead trout. This area is also considered to be a sensitive stream reach. A level II stream survey was completed in July 1993. The stream survey report stated that the shrubs were heavily grazed, although it was unclear as to whether this was due to cattle or wildlife. The report also stated, "A rest from livestock grazing is necessary to allow riparian shrubs to recover and streambanks to heal." All or portions of the stream failed to meet LRMP management objectives for pool frequency, LWD frequency, wetted width to depth ratio, cobble embeddedness, shade and bank stability. Dominant stream bed substrate is cobble and gravel. Stream discharge was measured as 0.62 cfs. Dominant stream bank substrate is sand. All 32 riffles sampled had cobble embeddedness greater than 30%. Perhaps sand from unstable stream banks is the source of the embeddedness.

Dunston Creek
Steelhead/redband trout were observed only on private land, downstream of the allotment in Dunston Creek. The lower ½ mile to the confluence with the Middle Fork John Day River upstream of private land was determined to be a sensitive stream reach. A level II stream survey was completed in July 1993. The survey stated that the stream failed *LRMP* management objectives for cobble embeddedness, shade, bank stability and woody debris. The survey also noted, "A rest from livestock grazing may be necessary to increase shade." Stream discharge was measured as 0.45 cfs. Stream Gradient averaged 11%. Dominant/subdominant substrate was gravel/sand. Stream shade was 36%

Granite Boulder Pasture
Granite Boulder Creek, Beaver Creek, Dry Creek, Big Boulder Creek and its tributaries (Wray Creek, Badger Creek, and Myrtle Creek), and other streams run through the Granite Boulder pasture.

Data from 1993 Level II stream survey indicated embeddedness was high in most reaches of streams in this pasture. Embeddedness was high even in upper reaches, which are in a Scenic Area with limited disturbance. The embeddedness may be a natural consequence of granitic soils, although management activities, especially mining and roading, may have contributed fine sediment.

Streams in the Granite Boulder Pasture do not meet state temperature management objectives or *LRMP* management objectives for stream channel parameters listed in table FI-7. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Granite Boulder Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Granite Boulder Creek:
Granite Boulder Creek is a 303(d) listed stream for excessive temperature. The lower four miles of Granite Boulder Creek, below a waterfall, contain bull trout and steelhead/redband spawning and rearing habitat. The segment below section 28 contain Chinook salmon spawning and rearing habitat.

Granite Boulder Creek, failed *LRMP* management objectives for cobble embeddedness and shade in the 1993 survey. Cobble embeddedness exceeded 30% in riffles but is likely due to decomposed granitics from the geology of the watershed. Reaches surveyed in 2001 failed LRMP management objectives for pool frequency, wetted width to depth ratio and LWD frequency. The dominant streambed substrate is gravel or cobble in Granite Boulder Creek. Dominant stream bank substrate is sand, bedrock, and small boulders. Stream shade averaged between 34 and 40%. Shade was reduced in some places by road 4559 being adjacent to the stream, along with a high percentage of overstory conifers that were dead or dying due to insect infestations. Shrub cover was 47 to 61% on the lower reaches. Overstory conifers limit shrub growth.

Granite Boulder Creek contains a Sensitive Stream Reach from the Forest Service Boundary going upstream; the most sensitive portion is that area below the crossing with road 4559 where it moves to the west of the stream. Granite Boulder Creek and the associated riparian areas are in an improving trend based on stream survey information and field visits analyzing shrub and channel conditions in 2000-2004.

Beaver Creek:
Beaver Creek is considered to be redband/steelhead spawning and rearing habitat below section 17. It is considered to be Chinook salmon rearing habitat below the 4550 road.
Dominant streambed substrate is cobble on all reaches. Dominant stream bank substrate is gravel on the three lowest reaches and sand on the highest reach. The reach below the 4550 road was not embedded; all other reaches were embedded. Bank stability was 99% - 100%.
The Summit fire reduced stream shade and shrubs on the reaches of Beaver Creek above the 4550 road. Before the fire, shade ranged from 49 to 73%. Shrub cover ranged from 54 to 65 % on fish bearing reaches.

Dry Creek:
The lower half-mile of Dry Creek is considered to be redband/steelhead spawning and rearing habitat. It has not been surveyed, so no information on habitat conditions is available.

Big Boulder Creek:
Big Boulder Creek contains spawning and rearing habitat for redband/steelhead trout. Big Boulder Creek below the Myrtle Creek confluence is considered to be spawning and rearing habitat for Chinook salmon.

Dominant streambed substrate is cobble and bedrock in Big Boulder and Badger, gravel or sand in Wray, and sand in Myrtle. Dominant stream bank substrate is cobble or bedrock in Big Boulder, gravel in Wray, and sand in Badger and Myrtle. 1993 Surveys showed all reaches are >35% embedded. Stream bank stability varied from 91% to 99%.

The Summit fire radically reduced stream shade and shrubs on most parts of the Big Boulder watershed. But before the fire, stream shade on the lower reach of Big Boulder was 45%; this is probably because much of this reach is in stringer meadows on private land. Shade on other fish bearing stream reaches varied from 61 to 74%. Shrub cover varied from 23% to 76%. The reasons for this variation are unknown.

PFC analyses were completed in 1999 on Big Boulder Creek to determine riparian conditions in the area of the Summit fire. The summary determination was Functional at Risk with an upward trend. Limiting factors listed were the lack of a diverse age-class distribution of vegetation and lack of adequate vegetative cover to protect stream banks as well as weeds in the riparian zone.

<u>Wray Creek</u>
Wray Creek contains spawning and rearing habitat for redband/steelhead trout. Wray Creek does not meet *LRMP* management objectives for pool frequency, wetted width to depth ratio and bank stability.

<u>Badger Creek</u>
Badger Creek contains spawning and rearing habitat for redband/steelhead trout. Badger Creek does not meet *LRMP* management objectives for pool frequency, wetted width to depth ratio and bank stability.

PFC analyses were completed in 1999 on Badger Creek, with a summary determination of Nonfunctional (with an upward trend) due to a debris torrent from a recent 100+ year event.

<u>Myrtle Creek</u>
Myrtle Creek contains spawning and rearing habitat for redband/steelhead trout. Myrtle Creek does not meet *LRMP* management objectives for pool frequency, wetted width to depth ratio and LWD frequencies.

Susanville Pasture
Big Creek (and tributaries including Deadwood Creek), Coyote Creek, Elk Creek, and Deep Creek run through the Susanville pasture.

Embeddedness is high in most reaches of most streams. Embeddedness was high even in upper reaches of Big Creek, which, are in a Scenic Area and a Wildlife Emphasis Management Area, which have little disturbance. The embeddedness may be a natural consequence of granitic soils, although management activities, especially mining and roads, may have contributed sand. Sensitive Stream Reaches were designated on Big Creek (Pizer Pasture), Deadwood Creek (Pizer Pasture), Onion Gulch (Susanville Pasture) and Rock Creek (Susanville Pasture). However, field verification showed large channel substrate (cobble) on Big Creek limiting sensitivity to disturbance by domestic livestock.

Streams in the Susanville Pasture do not meet state temperature management objectives or *LRMP* management objectives for stream channel parameters listed in table FI-7. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Susanville Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “suspected” in this pasture.

<u>Big Creek</u>
Big Creek is considered to be bull trout, redband, and steelhead spawning and rearing habitat. The lower mile of Big Creek, no on National Forest land, is considered Chinook salmon spawning and rearing habitat. Bull trout spawn and rear throughout the Big Creek drainage within the Susanville Pasture. A biological survey for fish conducted in 2001 found the lowermost presence of bull trout approximately ¼ mile downstream of Deadwood Creek. There is the potential that bull trout summer rearing habitat may be limited due to excessive water temperature from Deadwood Creek.

Big Creek failed *LRMP* management objectives for pool frequency, wetted width to depth ratio, and LWD frequency. The Summit fire reduced stream shade and shrubs on the upper reaches of Big Creek. But even before the fire, shade varied from 21% to 43% on the National Forests. The low amount of shade was due in part to (1) a relatively wide stream (17-25 feet bankfull, except the upper two reaches); (2) low tree productivity on the lower two reaches on the National Forest and the uppermost reach; (3) mine tailings in Reynolds Meadow; (4) riparian logging; (5) meadows and wetlands with little tree cover; (6) about 30% of the trees were dead or dying; and closeness of road 2090 to the creek. Shrub cover ranged from 40% to 60%.

<u>Deadwood Creek</u>
Portions of Deadwood Creek are considered to be potential spawning and rearing habitat for bull trout and steelhead/redband trout although no bull trout were identified during the 1993 stream survey. Most steelhead spawning and rearing probably occurs in the lowest, low gradient reaches. In Deadwood Creek and Swamp Gulch, steelhead may also rear above the 4560 road, but falls, chutes, and low flows probably prevent most steelhead from spawning above the road. Dominant streambed substrate in Deadwood Creek is gravel, while sand is the dominant substrate in Swamp and Onion Gulches. The dominant stream bank substrate is sand. Deadwood Cr is not considered to be steelhead habitat. Above the 4560 road, dominant stream bed substrate ranges from sand to small boulders. The dominant stream bank substrate is gravel and sand. Cobble embeddedness, much of which was decomposed granites, was greater than 30% on all riffles observed. Stream bank stability ranged from 83% to 98%.

The 1993 stream survey measured flow at the mouth of Deadwood Creek as 5.5 cfs, nearly 1/3 of Big Creek total flow. The survey also reported that Deadwood Creek failed *LRMP* management objectives for shade, streambank stability, cobble emeddedness, wetted width to depth ratios, LWD frequency, pool frequency and temperature. The temperature of Deadwood creek would have direct impacts on Big Creek which is 303(d) listed for temperature. The survey report went on to state, “stream temperatures could be decreased with riparian plantings (protection from wildlife and livestock may be necessary in reach 1).” The Summit fire further reduced stream shade and shrub cover above the 4560 road. Stream surface shade ranged from 15% to 41% below the 4560 road, partly due to (1) meadow vegetation with scattered trees; (2) historic browsing of alder by wildlife and livestock; and (3) aggradation. Above the road shade ranged from 38% to 71%, partly due to tree mortality. Shrub cover ranged from 25 to 28% below the 4560 road. Above the road, shrub cover ranged from 26 to 44%. A biological survey of fish conducted in 2001 identified the lowermost distribution of bull trout in Big Creek to be ¼ mile below the confluence with Deadwood Creek. The temperatures of Deadwood Creek may be limiting potential rearing habitat for bull trout in Big Creek.

Swamp Gulch
A stream survey was completed in August 1993 and found steelhead or redband trout in the lower 0.3 miles below a series of barriers caused by high stream gradient. The stream failed *LRMP* management objectives for shade, streambank stability, stream temperature, LWD, and cobble embeddedness and pool frequency. The streamflow of this 6 foot wide stream (baseflow) was 1.8 cfs, or approximately 1/3 of the flow of Deadwood Creek which then flows into Big Creek. Big Creek is 303(d) listed for temperature and contains bull trout that require cold water temperatures. Survey information identified that shrub cover was particularly low in the lower 0.7 miles of stream in a 600+ foot wide valley bottom (sensitive stream reach) and recommended riparian planting and protection to improve conditions.

Onion Gulch
A stream survey was completed in August 1993 and found steelhead or redband trout in the lower 0.3 miles below a series of barrier falls caused by high stream gradient (21%). The stream failed *LRMP* management objectives for shade, streambank stability, stream temperature, LWD frequency, and cobble embeddedness and pool frequency. The streamflow of this 3 foot wide stream (baseflow) was 0.12 cfs. This stream contributes a small percentage of water to Deadwood and then Big Creek which contain bull trout that require cold water temperatures. Survey information identified that shrub cover was particularly low in the lower 0.3 miles of stream in a 100 foot wide valley bottom and recommended riparian planting and protection to improve conditions.

Deep Creek
Deep Creek through section 31 is considered to be spawning and rearing habitat for redband/steelhead. But the presence of fish migration barriers in all reaches indicates these may be mostly redband trout.

The dominant streambed substrate was sand. The dominant stream bank substrate is sand. The substrate is more than 35% embedded. Bank stability on the fish-bearing reaches is 100%. The Summit fire did not directly affect the fish-bearing reaches of Deep Creek, though shade and shrubs on the upper reaches were greatly decreased. Shade was 67% and 69% on the two fish-bearing reaches. Shrub cover was 68 and 82%.

PFC analysis was completed in 1999 on Deep Creek. The summary determination was Functional at Risk with an upward trend. Limiting factors listed were modified floodplain and the lack of a diverse age-class distribution of riparian vegetation.

Elk Creek

Elk Creek (below road 4560) and North Fork Elk Creek (slightly above road 4560) are considered to be spawning and rearing habitat for redband/steelhead. This creek has been affected by mining, including mining on private land around Susanville. The dominate streambed substrate is cobble and sand. The dominant stream bank substrate is sand for all reaches. Cobble embeddedness was greater than 35% on all stream reaches. Bank stability varied from 99 to 100%.

The Summit fire radically reduced shade and shrubs on the upper reaches of these streams. But before the fire, shade varied from 53% on the lower reach of Elk Creek to about 67% on the other four fish bearing reaches. Shrubs varied from 52% on the lower reach of Elk Creek to about 69% on other fish bearing reaches.

PFC analyses were completed in 1999 on North Fork Elk Creek to determine riparian conditions in the area of the Summit fire. The summary determination was Functional at Risk with an upward trend. Transport of fines and lack of riparian shrubs were listed as limiting factors.

Coyote Creek

During the stream survey in 1992, the only fish seen in Coyote Creek were below county road 20, on private land, and the surveyors thought the stream above the road was too small and shallow to provide usable fish habitat, especially deep pool winter habitat. But the Malheur National Forest 1985 fish distribution map shows fish up to near Crockett Knob, probably based on ODFW information. Also, fish passage at county road 20 has been improved since 1992, so there may be habitat for redband/steelhead in Coyote Creek.

The following description of habitat conditions is for the potential fish-bearing reach on the National Forest. Dominant streambed substrate is sand. Dominant stream bank substrate is sand. The substrate is >35% embedded. Bank stability is 100%.
The Summit fire reduced the shade and shrubs on Coyote Creek. Shade was 64% and shrub cover was 41% before the fire.

Pizer Pasture

Big Creek, Pizer Creek, Lost Creek, East Fork Big Creek and Deadwood Creek flow through the Pizer Pasture. All 5 streams contain steelhead/redband trout while Big Creek also contains bull trout.
Streams in the Pizer Pasture do not meet state temperature management objectives or *LRMP* management objectives for stream channel parameters listed in table FI-7. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Pizer Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Big Creek

Big Creek failed *LRMP* management objectives for pool frequency, wetted width to depth ratio, and LWD frequency. This stream is described further in the Susanville Pasture.

Pizer Creek

Pizer creek failed to meet *LRMP* management objectives for cobble embeddedness, LWD frequencies, pool frequencies, and wetted width to depth ratios. A portion of Pizer Creek contains a Sensitive Stream Reach.

Lost Creek

Lost Creek failed to meet *LRMP* management objectives for cobble embeddedness, LWD frequencies, pool frequencies, and wetted width to depth ratios. A portion of Lost Creek contains a Sensitive Stream Reach

East Fork Big Creek

East Fork Big Creek failed to meet *LRMP* management objectives for cobble embeddedness, LWD frequencies, and pool frequencies. A portion of East Fork Big Creek contains a Sensitive Stream Reach.

Deadwood Creek

Deadwood Creek failed *LRMP* management objectives for shade, streambank stability, cobble emeddedness, wetted width to depth ratios, LWD frequency, pool frequency and temperature. This stream is described further in the Susanville Pasture.

Chickenhouse Pasture

The pasture contains 2 perennial, non fish-bearing tributaries to Big Creek that cattle can access. Big Creek has corridor fence along most of the boundary of this pasture which excludes domestic livestock. There is a water gap approximately 200-300 feet long at the northeastern boundary but substrate in and along the channel of Big Creek is large cobble which is resilient to use by cattle. There are no Sensitive Stream Reaches in this pasture.

Upper Middle Fork Allotment

There is approximately 51.3 miles of fish bearing (steelhead/redband) streams in the Upper Middle Fork Allotment. Some of these streams support bull trout. Valley bottom roads influence many of the streams from the confluence with the Middle Fork upstream. These roads limit the recruitment of large wood, restrict the floodplain and are a source for fine sediment. The majority of fish bearing streams are 303(d) listed for temperature. Many of the streams contain sensitive stream segments that have downcut, lowering water tables, disconnecting floodplains and reducing riparian vegetation and consequently shade. Shrubs in the sensitive stream reaches of tributaries near the Middle Fork John Day are commonly utilized by livestock. Low pool and Large Woody Debris (LWD) frequencies, high cobble embeddedness (sediment) and high water temperatures reduce fish habitat complexity and quality in streams on the allotment. Large pool frequencies are lower than expected in some of the larger tributaries such as Vinegar, Davis, and Butte Creeks.

Table 8. Stream survey data for Upper Middle Fork Allotment

Stream Date Surveyed and Reaches	Pools per Mi	Residual Pool Depth	Large Pool Mi	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Bank Stability	High Temp	High Temp Time	Embedded Y or N
DAVIS 7/16/96 Start To: 5	93	0.72	0.00Ψ	6.2	>10♠	13.89	20	11♠	Data Gap	72.00	1510	Y♠

Stream Date Surveyed and Reaches	Pools per Mi	Residual Pool Depth	Large Pool Mi	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Bank Stability	High Temp	High Temp Time	Embedded Y or N
BEAVER 8/7/94 Start To: 4	47♠	0.83	0.00	5.9	DATA GAP	10.02	28	18♠	99	66.00	1400	N
BENNETT 7/22/92 Start To: 1	46♠	0.58	0.00	2.3	>10♠	5.7	39	21	93	62.00	1500	Y♠
BUTTE 7/13/92 Start To: 3	24♠	0.96	0.16Ψ	6.3	>10♠	8.66	44	30	89♠	57.00	1800	Y♠
CARIBOU 6/24/93 Start To: 2	43♠	0.83	0.00	3.6	>10♠	11.51	13	14♠	93	65.00	1600	Y♠
DEERHORN 6/26/93 Start To: 2	30♠	0.64	0.00Ψ	2.1	>10♠	11.97	23	9♠	84♠	59.00	1449	Y♠
LITTLE BOULDER 7/1/93 Start To: 2	23♠	1.03	0.00	5.8	>10♠	10.06	35	16♠	97	53.00	1615	Y♠
LITTLE BUTTE 7/29/93 Start To: 2	22♠	0.71	0.00	3.0	>10♠	7.95	26	23	Data Gap	51.00	1330	N
M F SUNSHINE 7/3/93 Start To: 1	60♠	0.71	0.00	1.3	>10♠	10.34	80	70	87♠	58.00	908	N
PLACER GULCH 1997 8/26/97 Start To: 5	102	0.71	0.00Ψ	4.3	>10♠	15.92	20	16♠	Data Gap	64.00	1334	Y♠
RAGGED 7/13/92 Start To: 3	80	0.61	0.00	5.3	>10♠	7.23	8	15♠	91	55.00	1000	Y♠
RUBY 6/22/93 Start To: 3	40♠	1.00	0.00	4.8	>10♠	11.68	41	29	94	55.00	1400	Y♠
SULPHUR 7/24/92 Start To: 1	52♠	0.53	0.00	2.2	>10♠	7.18	63	35	94	64.00	1500	Y♠
SUNSHINE 7/2/93 Start To: 2	50♠	0.69	0.00	2.9	<10♠	5.30	23	25	87♠	51.00	1210	Y♠
VINCENT 7/13/92 Start To: 3	75	0.66	0.00	6.8	DATA GAP	15.17	24	9♠	Data Gap	63.00	1400	Y♠
VINEGAR 8/5/91 Start To: 15	13♠	1.31	0.19Ψ	10.4	>10♠	13.81	55	30	Data Gap	50.00	937	Y♠
W F RUBY 6/24/93 Start To: 1	17♠	0.68	0.00	1.7	<10♠	6.52	27	30	100	58.00	1500	Y♠
TINCUP 8/2001 Start To: 1	13♠	0.4	0.00	1.1	17♠	7.6	2	1♠	100	53.60	1300	Data Gap
WINDLASS 6/27/93 Start To: 2	27♠	0.65	0.00	3.2	<10♠	5.15	22	14♠	Data Gap	50.00	1100	Y♠

♠ parameter does not meet *LRMP* Management objective; Ψ parameter does not meet Matrix Pathways of Indicators criteria where potential exists;*Wetted width to depth ratios listed as <10 or >10 are based on extrapolation

Butte Pasture

Ragged Creek, Ruby Creek, Butte Creek and Little Butte Creek, run through the Butte Creek Pasture; all streams contain steelhead/redband spawning and rearing habitat. Butte Creek is historic bull trout habitat (Buchanan et al 1997).

Streams in the Butte Pasture do not meet state temperature management objectives or *LRMP* management objectives for stream channel parameters listed in table FI-8. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Butte Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are “suspected” in this pasture.

Butte Creek and tributaries:
Butte Creek (to about the middle of section 19), Bennett Creek, and the lower few hundred feet of Sulphur Creek and an unnamed tributary are considered to be redband/steelhead trout rearing habitat. Butte Creek is the only stream with spawning habitat. The lower 1/2 mile is considered to be Chinook salmon spawning and rearing habitat. However, the lower portion of Butte Creek on private ground is highly disturbed and mouth of Butte Creek has a 3 foot vertical drop to the Middle Fork John Day River making access to Chinook salmon at lower flows unlikely. Butte Creek is historic bull trout habitat (Buchanan et al 1997). An individual fluvial adult bull trout was found in Butte Creek in 1995 during snorkel surveys conducted by McIntosh et al (1995) as part of a Chinook salmon study.

While Butte Creek is not 303(d) listed for temperature, stream temperature data shows elevated summer water temperatures. A level II stream survey was conducted in 1992. This stream failed *LRMP* management objectives for pool frequency, wetted width to depth ratio, bank stability and cobble embeddedness. Dominant stream bed substrate was cobble and gravel. Dominant stream bank substrate was sand. Cobbles were more than 35% embedded on all reaches. Bank stability ranged from 87 to 93%. Shade varied from 41 to 55%. Shrub cover varied from 30 to 52%. Numerous log weirs were constructed on the lower portion of Butte Creek. Some of these structures are creating good pool habitat below and spawning habitat above. However the majority of log weir structures are widening the stream and creating barriers to upstream movement by juvenile salmonids.

The Sensitive Stream Reaches on Butte Creek have received intense use when grazed intermittently in recent years. Portions of the Sensitive Stream Reach containing segments of channelized stream with little or no shrubs and low recruitment by new woody vegetation that could provide bank stability, shade and hiding cover for fish near the mouth of Butte Creek has sustained intense utilization in the recent past. Stream width to depth ratios are wider than expected due to past management and channelization in this section. Another portion of this Sensitive Stream Reach contains numerous shrubs in the riparian area. The Sensitive Stream Reach on Butte Creek between Bennett and Sulfur Creek contains a segment of unstable, braided stream caused by channel aggradation from high bedload movement.

Little Butte Creek and tributary
Little Butte Creek (to about 1/2 way through section 15) and an eastern tributary (through section 16) are considered to be historic bull trout habitat (Buchanan et al 1997) and redband/steelhead trout spawning and rearing habitat. The three important fish-bearing reaches are described here. Dominant streambed substrate is gravel. Dominant stream bank substrate is sand. On Little Butte Creek, none of the 13 riffles sampled had embedded cobbles; on the tributary, 22 of 27 riffles had embedded cobbles. Bank stability ranges from 90 to 99%. Shade on Little Butte Creek was 31%, due to browsing of shrubs, riparian logging, and dead and dying trees. Shade on the tributary varied from 48 to 56 %. Shrub cover varied from 1% to 53%, partly due to excessive browsing. Stream survey data recorded in 2000 noted the lack of defined channel at

the confluence with the MFJD River. The water spreads out into a wet meadow and may be a barrier to anadromous species.

Little Butte Creek and the eastern tributary contain Sensitive Stream Reaches. A walkthrough survey conducted in 2002 from the confluence with the MFJD to the forks of the stream noted heavy browsing by wildlife this year had removed terminal buds but numerous age classes of alder from 1 foot to 10+ feet tall were present and vigorous. Banks showed no instability by ungulates and herbaceous vegetation (sedges) were nearly ungrazed on the greenline and greenbelt. This survey also noted little potential steelhead spawning habitat but good summer rearing habitat in the reach surveyed. The lack of a single, defined channel flowing into the alluvial fan at the MFJD reduces the potential of this stream for access by steelhead.

Ragged Creek
Ragged Creek contains redband/steelhead trout spawning and rearing habitat, up to 1/2 of the way through section 11. The two important fish bearing reaches are described here. The stream fails *LRMP* management objectives for wetted width to depth ratios, LWD frequency and cobble embeddedness. There is a Sensitive Stream Reach designated on Ragged Creek.Dominant streambed substrate is sand and gravel. Dominant stream bank substrate is sand. Cobbles were more than 35% embedded. Bank stability was 86%. Shade varies from 49% (in a meadow reach) to 66%. Shrub cover varied from 18% (in the meadow reach) to 29%.

Ruby Creek
Ruby Creek contains spawning and rearing habitat for redband/steelhead trout. Redband/steelhead were also found a few hundred feet up some tributaries to this stream. Ruby Creek was surveyed for spawning habitat on April 27, 2001. No spawning activities were found. There were good spawning gravels and habitat present. Water temperature was 44°F.
Level II surveys were completed in June of 1993. The stream failed to meet *LRMP* management objectives for pool frequency, wetted width to depth ratio and embeddedness. There is a Sensitive Stream Reach designated on Ruby Creek. Dominant stream bed substrate was gravel. Subdominant substrate on two reaches is cobble and gravel on one. Embeddedness exceeded 30% on all three reaches. Stream bank stability ranged from 91 to 96%. Most erosion was due to small mining operations, and a failure at a road crossing. Shade ranged from 23 to 64%. Grass-forb cover ranged from 46 to 84%. Shrub cover ranged from 26 to 50%. Tree crown cover ranged from 23 to 61%.

Caribou Pasture
Little Boulder Creek, Tincup Creek, Windlass Creek, Murdock Creek, Caribou Creek, and Granite Boulder Creek all flow through the Caribou Pasture. Steelhead/redband trout spawning and rearing habitat is present in all these streams. Granite Boulder Creek also contains bull trout spawning and rearing habitat.

Streams in the Caribou Pasture do not meet state temperature management objectives or *LRMP* management objectives for stream channel parameters listed in table FI-8. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Caribou Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "suspected" in this pasture.

Little Boulder Creek

A steelhead spawning survey was conducted on Little Boulder Creek on July 12, 2001. The stream has a moderate gradient in the mid reaches and the upper reaches have a steep gradient. The lower end has ample steelhead spawning substrate with stable banks, good ground cover, and ample shade/cover.

Little Boulder Creek was surveyed in 1993. The stream did not meet *LRMP* management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. Bank stability for reaches 1, 2, and tributary 1 were 95%, 82%, and 97% respectively. Stream surface shade ranged from 23 to 28%, tree crown cover ranged from 31 to 44%. Shrub cover was from 0 to 19% and grass-forb cover from 84 to 98%. The dominant substrate in Little Boulder creek is cobble. Gravel is the subdominant substrate.

The main tributary to Little Boulder Creek (on the east side of Little Boulder Creek) was also surveyed. Stream bank stability ranged from 96% to 100%. Stream surface shade ranged from 15 to 27% with a grass forb cover of 80 to 83%. Shrub cover was 1-34% and tree crown cover ranged from 25 to 37%. Dominant substrate was gravel in reach 1 and sand in reach 2, in both reaches almost all samples showed cobble embeddedness exceeding the *LRMP* management objective of 30%.

Windlass Creek

Windlass Creek and a non fish bearing tributary were surveyed in June of 1993. Redband/steelhead trout and sculpin were observed in the lower 2.13 miles. The quality and quantity of spawning habitat was not documented. The stream failed *LRMP* management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. Stream flow was measured as 0.7 cfs on June 24, 1993. Riparian habitat survey indicated an average of 94 and 99% stream bank stability in the two stream reaches measured. Stream surface shade was 50% and 43% and tree crown cover was 38% and 34%. Grass-forb cover was measured at 90% and 97%, tree crown cover was 38% and 34%. Cobble embeddedness exceeded the *LRMP* management objective of 30% in two of the twenty-three samples in reach 1 and 30% was exceeded in one of the three observations in reach 2. The dominate substrate in both reaches was gravel. Reach 1 had cobble as the subdominant substrate and reach 2 had sand as the subdominant substrate. Windlass Creek tributary was assessed with one transect that indicated 100% bank stability with a stream surface shade of 53%. Grass-forb cover was 88% and shrub cover was 2%. Tree crown cover was 70%. The dominate substrate is cobble with a subdominant substrate of gravel. Embeddedness exceeded 30% in one of two observations.

The stream survey noted heavy use of riparian shrubs by cattle. This was evidenced because there was little use of shrubs below a fence in Reach 1, but heavy use above.
A spawning habitat survey was completed on Windlass Creek on July 12, 2001. The water flow was a small "trickle" and 65̊F at 1245. There is a considerable amount of sediment. There is very little steelhead spawning gravel and some redband gravel in isolated pockets.

Caribou Creek

Caribou Creek was surveyed in June of 1993. Redband/steelhead trout was the only fish species present. This stream failed *LRMP* Management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. Stream bank stability ranged from 89 to 99% while stream surface shade was 18 to 38%. Grass-forb cover ranged from 74% to 91% and the shrub cover was 3% to 31% and the tree crown cover ranged from 13 to 32%. The dominant substrate is gravel with a substrate of cobble or sand. The stream failed *LRMP* management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness.

There is a striking difference in the abundance, size and vigor of woody vegetation (mostly alder) on this stream above and below the pasture division fence near County Road 20. There is a nearly contiguous mass of shrubs over 10 feet tall with recruitment of younger plants armoring banks and shading the stream on Caribou Creek downstream of the Caribou Unit. There are some shrubs ranging from 1-4 feet tall spaced 10-20 feet apart on Caribou Creek at the fence line and going upstream inside the unit. Some riparian planting and protection has been completed in on Caribou Creek in the pasture.

A spawning survey completed in May 2003 and identified 10 steelhead redds in the lower 2.7 miles of Caribou Creek. A Sensitive Stream Reach was designated on Caribou Creek (see Map 8).

Granite Boulder Creek

The lower four miles of Granite Boulder Creek below a barrier waterfall is bull trout and steelhead spawning and rearing habitat. Portions of Granite Boulder flow through the Caribou pasture. This stream failed *LRMP* Management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. The dominant streambed substrate in Granite Boulder Creek is gravel or cobble. Dominant stream bank substrate is sand, bedrock and small boulders. Cobble embeddedness exceeded 30% in all 38 riffles observed during the 1993 stream survey. Embeddedness was high even in upper reaches, which are in the Scenic Area with limited disturbance. The embeddedness may be a natural consequence of granitic and sandstone soils, although management activities especially mining and roads, may have contributed sand. Bank stability was 91-100%. Stream shade averaged between 34% and 40%. Shade was affected by road 4559 being adjacent to the creek along with a high percentage of over story conifers that were dead or dying due to insect infestations. Shrub cover was 47% and 61% on the lower reaches. The lower 5 miles of Granite Boulder Creek is in the Lower Middle Fork Allotment.

Granite Boulder Creek was surveyed for steelhead spawning habitat on April 27, 2001. High spring flows and steep gradient limit steelhead and redband spawning habitat quality and quantity.

There is no Sensitive Stream Reach designated for this stream in the Upper Middle Fork Allotment.

Tincup Creek
Level II surveys were completed in September 2001. The stream was designated as a Rosgen channel type “B5a.” Flows were too low to measure. Sixty-seven percent of the substrate was sand smaller than 2 millimeters in diameter. Average bankfull width and depth were 3.8 feet and 1.2 feet while average wetted width and depth were 2.8 feet and 0.3 feet. Gradient was 7%. The lowermost 450 feet of Tincup Creek (to the confluence with the Middle Fork John Day River) were dry at the time of the survey. No fish were observed during the survey but fish have been observed in the lower mile of Tincup Creek as recently as 2000. This stream failed to meet *LRMP* management objectives for pool frequency, wetted width to depth ratio, LWD frequency. Use by livestock was noted in the stream survey report. There is a Sensitive Stream Reach designated on Tincup Creek in this pasture (see Map 10).

Murdock Creek
No survey information is available for Murdock Creek. This stream is not fish bearing but does contribute a small amount of water to the Middle Fork John Day River.

Deerhorn Pasture
Placer Gulch, Davis Creek, Deerhorn Creek, and portions of Little Butte Creek are located within this pasture. All streams contain steelhead/redband spawning and rearing habitat. Davis Creek is historic bull trout habitat (Buchanan et al. 1997).

Streams in the Deerhorn Pasture do not meet state temperature management objectives or *LRMP* management objectives for stream channel parameters listed in table FI-8. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Deerhorn Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Placer Gulch
A Level II stream survey of Placer Gulch was conducted in 1997. Placer Gulch did not meet *LRMP* management objectives for wetted width to depth ratio and LWD frequency. The survey indicated that the substrate has a dominant bed of gravel with the upper reach having a subdominant bed of cobble. The lower reach has a subdominant bed of gravel. Placer Gulch is considered as fish bearing in all reaches. Average shade on Forest Service managed portion of the stream was 34%.

Davis Creek
Davis Creek contains steelhead/redband trout spawning and rearing habitat. Davis Creek is historic bull trout habitat (Buchanan et al. 1997). Davis Creek was surveyed for spawning habitat on April 27, 2001. No redds or adult fish were found but good spawning gravels and habitat were present.

A Level II stream survey of Davis Creek was conducted in July 1996. Davis Creek does not meet *LRMP* management objectives for wetted width to depth ratio, LWD frequencies and cobble embeddedness. The survey indicated Rosgen “B” and “A” channel types in the lower portions of Davis Creek. Mapped channel gradients ranged from 4% in lowermost surveyed reach to 8% in the highest reach. Davis Creek also lacked large pools (greater than 3 feet deep) which would be expected in this stream due to size and drainage area.

Deerhorn Creek

Deerhorn Creek contains spawning and rearing habitat for steelhead and redband trout. Deerhorn Creek was surveyed for spawning habitat on April 27, 2001. No redds or adult fish were found. The channel is open to the MFJD River so fish can migrate upstream. There is a Sensitive Stream Reach designated on Deerhorn Creek in this pasture (see Figure 10).
A Level II stream survey was completed on 4 miles of Deerhorn Creek in June 1993. Stream flow on June 24 was 2.21 cfs. Deerhorn Creek failed *LRMP* management objectives for shade and LWD frequency in 2 of the 3 surveyed reaches and bank stability, embeddedness and pool frequency in all reaches. There is a 4-acre wetland on the east side of Deerhorn Creek in Section 23 at the end of Road 452. In reach 1, the stream survey report noted, "livestock grazing had reduced woody riparian vegetation to a very low level." Reach 2 also mentioned heavy browse on alder in the riparian area.

This stream did not meet range utilization in thresholds for shrub browse or residual herbaceous greenline stubble height when monitored.

Little Butte Creek

Stream survey information is discussed under the Butte Creek Pasture as the mainstem of Little Butte Creek is located within that pasture. There is a Sensitive Stream Reach designated on Little Butte Creek and the east fork in this pasture (see Figure 10).

Upper Vinegar Pasture

Streams in the Upper Vinegar Pasture do not meet LRMP management objectives for stream channel parameters listed in table FI-8. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Upper Vinegar Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Vincent Creek

Vincent Creek contains spawning and rearing habitat for redband trout and potential rearing habitat for steelhead. Vincent Creek was surveyed for spawning habitat on April 27, 2001 above and below the closed road of Forest road 2010. No spawning activity was observed. There is an undefined channel near the confluence with the Middle Fork John Day River that likely acts as a barrier to migration. Steelhead may be able to navigate this section of Vincent Creek in a high water year. Even still, there is little available spawning habitat for steelhead in this stream. Vincent Creek is 6.6 feet wide and had a flow rate of 0.11 cfs in mid-July. The stream has a gradient of 2% and flows through a moderate v-shaped valley with moderate side slopes and a valley floor of <100 feet wide, a narrow flat-floored valley with >30% side slopes and a 100-300 foot wide valley floor, and wide flat-floored valley with a valley floor > 600 feet wide. The stream flow is from a spring at the upper end and several marshy areas along the bank. The substrate is primarily sand, gravel and cobble and is embedded. The channel is moderately entrenched with gravel-sand banks. The riparian vegetation cover is comprised of 94% grass-forbs, 31% shrubs, and 14% tree crown. Stream shade is from 0 to 63%. In reach 1 the bank stability is 90%. Bank stability is 100% in reach 2 and reach 3.

Vinegar Creek

Vinegar Creek contains spawning and rearing habitat for steelhead, redband and potentially bull trout. Vinegar Creek is considered historic bull trout habitat (Buchanan et al 1997). A single bull trout was found in Vinegar Creek during electroshocking surveys conducted by ODF&W during summer 2000. It is currently unknown if this was part of an isolated population or just a stray fluvial fish. Spawning surveys on Vinegar Creek identified adult fish and redds from the mouth for 8.3 miles in 2002 and 2003. A portion of Vinegar Creek, above and below Forest road 618, Vinegar Creek was surveyed for bull trout spawning activites and habitat in September 2001. No adult bull trout or redds were observed.

A Level II stream survey was conducted in August 2001 on Vinegar creek. This stream failed to meet *LRMP* management objectives for pool frequency, wetted width to depth ratio, and in lower reaches LWD frequency. Ten of 17 reaches in the 1991 survey were observed to have >35% embeddedness which fails the *LRMP* management objective. There were 3 reaches described as having 0 to 25% cover, 7 reaches described as having 26 -50% cover, and 6 reaches with 51-75% cover. There was no information available on stream shading. Several Sensitive stream reaches are located on Vinegar Creek (see Figure 10).

Lower Vinegar Pasture

Streams in the Lower Vinegar Pasture do not meet LRMP management objectives for stream channel parameters listed in table FI-8. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Lower Vinegar Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Vinegar and Vincent Creek Level II stream survey parameters are described under the Upper Vinegar Pasture description.

DMA monitoring on Vinegar Creek in the Lower Vinegar Pasture in 2004 identified early seral stage riparian vegetation. Early seral vegetation makes stream banks sensitive to alteration. Shallow-rooted species such as redtop and Kentucky bluegrass create false banks and cause large areas of instability where 1 hoof from a cow may cause 6 feet of bank to collapse. Shrubs were heavily used, likely by wildlife and the only young shrubs were those planted by Forest Service and Oregon Trout in 2003. Banks are still eroding (channel widening) as evidenced from markers associated with planting have fallen into the stream.

Austin Allotment

This allotment has been treated as a pasture used in grazing the Upper Middle Fork Allotment. Only a small portion of Mill Creek (less than 400 yards) runs through this Allotment. Stream parameters are listed in the Blue Mountain Allotment as the majority of the stream is located within it. Redband trout and dace were the only fish found on National Forest land above a stream diversion. Mill Creek was dry below the Forest Boundary due to water diversions during stream surveys conducted in 1993. This stream failed to meet *LRMP* management objectives for pool frequency, LWD frequency, and cobble embeddedness. The perennial portion of Mill Creek begins in a wetland at about 4,300 feet elevation. Stream surface shading was an average of 40%. Shrub cover was 12% and tree crown cover was 20%.

The reduced level of habitat complexity and quality has resulted in reduced productivity and thereby populations of Sensitive fish (redband trout) in this allotment. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have impacted habitat for Columbia spotted frog likely resulting in reduced populations in this allotment.

Blue Mountain Allotment

There are approximately 23 miles of fish bearing (steelhead/redband trout and bull trout) streams in the Blue Mountain Allotment. Valley bottom roads influence many of the streams from the confluence with the Middle Fork upstream. These roads limit the recruitment of large wood, restrict the floodplain and are a source for fine sediment.

The majority of streams are 303(d) listed for temperature and also contain Sensitive Stream Reaches. Low pool frequencies, high cobble embeddedness (sediment) and high water temperatures reduce fish habitat complexity and quality in streams on this allotment.

Squaw Creek and Summit Creek and the Middle Fork John Day River in this allotment downcut over 3 feet during a large spring runoff event in 1997. Floodplains were disconnected and water tables were lowered from this event. Currently, there are no riparian shrubs providing shade to maintain stream temperatures, creating cover for fish or stabilizing raw banks for several hundred yards in each of these streams. Grasses, sedges and rushes are extremely limited on and above the greenline. Most of the impacted area was fenced to exclude cattle, but over two hundred yards of Squaw Creek which is downcut are still being grazed.

Table FI-9. Stream Survey Data Summary for Blue Mountain Allotment

Stream Date Surveyed & Reaches	Pools per Mi	Residual Pool Depth	Large Pool Mi	Trib Count	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Pct. Bank Stability	High Temp	High Temp Time	Embedded Y or N
CLEAR, 7/29/91 Start To: 6	7♠	1.22	0.49	7	8.2	11.86♠	34.86	155	36	Data Gap	51.00	1350	Y♠
CRAWFORD 7/9/93 Start To: 2	15♠	0.89	0.24	4	4.2	>10♠	8.44	5	2♠	99	64.00	1400	Y♠
FLY 7/27/92 Start To: 1	51♠	0.56	0.00$^{\Psi}$	0	1.4	>10♠	9.04	33	40	99	57.00	1400	Y♠
IDAHO 7/16/92 Start To: 3	62♠	0.69	0.00$^{\Psi}$	8	4.1	>10♠	9.49	20	28	98	55.00	1200	Y♠
MILL 93 7/7/93 Start To: 1	32♠	1.06	0.00	4	1.1	>10♠	6.08	0	0♠	91	70.00	1600	Y♠
ROAD T2 OF SUMMIT 7/28/92 Start To: 1	59♠	0.44	0.00$^{\Psi}$	0	2.0	>10♠	8.57	40	35	82♠	55.00	1700	Y♠
SQUAW 7/3/91 Start To: 14	7♠	1.66	0.23$^{\Psi}$	8	8.6	Data Gap	10.58	41	25		51.00	1500	Y♠
SUMMIT 7/11/92 Start To: 4	53♠	0.92	0.12	3	8.1	10.46♠	10.75	22	26	93	64.00	1530	Y♠

♠ parameter does not meet *LRMP* Management objective; $^{\Psi}$ parameter does not meet Matrix Pathways of Indicators criteria where potential exists;*Wetted width to depth ratios listed as <10 or >10 are based on extrapolation

End of year monitoring data associated with grazing (IIT) was collected for units in this allotment. Crawford Creek, Idaho Creek and the Middle Fork John Day River did not meet all IIT management objectives when data was collected.

Squaw Creek Pasture

This pasture is used only at the beginning of the season for a day or two as a place to turn cattle into before going into the larger pastures.

Streams in the Squaw Creek Pasture do not meet LRMP management objectives for stream channel parameters listed in table FI-9. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Squaw Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

<u>Middle Fork John Day River</u>

No Level II stream survey information is available for this stream in the Squaw Creek Pasture. This portion of the Middle Fork John Day River downcut during a high spring flow event in 1997. The stream is now a recovering Rosgen “F6” channel type with some point bars developing. The stream is almost entirely riffle or glide habitat. The water table dropped several feet when the channel downcut. This stream currently contains very little steelhead and redband trout spawning and rearing habitat in the pasture. The entire length of the Middle Fork John Day River is designated as a Sensitive Stream Reach (see Figure 10).

A PFC analysis was conducted in 2004 and was rated as Functioning at Risk with an upward trend. Riparian herbaceous vegetation, mainly Nebraska sedge and Baltic rush, are beginning to recolonize the stream banks but the shrub component is lacking; elk use is a concern in this unit.

<u>Squaw Creek</u>
A Level II stream survey was conducted in 1991, but information is no longer valid in this pasture as this portion of Squaw Creek downcut during a high spring flow event in 1997. The stream is now a recovering Rosgen "F6" channel type with some point bars developing. The stream is almost entirely riffle or glide habitat. The water table dropped several feet when the channel downcut. Squaw Creek stopped flowing in 2002 and 2003. Juvenile and adult steelhead were observed in this stream in 2002. This stream currently contains very little steelhead and redband trout spawning and rearing habitat in the pasture. The entire length of Squaw Creek is designated as a Sensitive Stream Reach (see Figure 10).

A PFC analysis was conducted in 2004 which determined this segment of Squaw Creek to be rated as Functioning at Risk with an upward trend. Riparian herbaceous vegetation, mainly Nebraska sedge and Baltic rush, are beginning to recolonize the stream banks but the shrub component is lacking; elk use is a concern in this unit.

<u>Summit Creek</u>
A Level II stream survey was conducted in 1991, but information is no longer valid in this pasture as this portion of Summit Creek downcut during a high spring flow event in 1997. The stream is now a recovering Rosgen "F6" channel type with some point bars developing. The stream is almost entirely riffle or glide habitat. The water table dropped several feet when the channel downcut; however it did not downcut as deeply as Squaw Creek. Summit Creek maintained base flows in 2002 and 2003 when Squaw Creek stop flowing. This stream currently contains very little steelhead and redband trout spawning and rearing habitat in the pasture. The entire length of Summit Creek is designated as a Sensitive Stream Reach (see Figure 10).
A PFC analysis was conducted in 2004 which determined this segment of Summit Creek to be rated as Functioning at Risk with a strong upward trend (because it is not downcut as deeply as Squaw Creek). Riparian herbaceous vegetation, mainly Nebraska sedge and Baltic rush, are recolonizing the stream banks but the shrub component is lacking; elk use is a concern in this unit.

Crawford Creek Pasture
Streams in the Crawford Creek Pasture do not meet LRMP management objectives for stream channel parameters listed in table FI-9. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Crawford Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

<u>Crawford Creek</u>

Crawford Creek runs through the Crawford Creek pasture and provides steelhead spawning and rearing habitat. Crawford Creek failed to meet *LRMP* management objectives for pool frequency, wetted width to depth ratio, LWD frequency and cobble embeddedness. The entire length of Crawford Creek is designated as a Sensitive Stream Reach (see Figure 9).
Crawford Creek originates from large wetlands at 5000 feet elevation (meadows and wetlands are common along the entire stream). Measured flow at the mouth of Crawford Creek was 0.57 cfs on July 10, 1993. The upper portion of the stream is perennial and the lower portion is intermittent. Average stream gradient is about 3 percent. Upland vegetation includes lodgepole pine. Some lodgepole pine forests along the stream may have been converted to grasslands (meadows). An abandoned logging mill was found with a system of abandoned railroad beds. This is evidence of past railroad logging in RHCAs.

The lowest part of the stream (stream reach 1) is in the flood plain of the Middle Fork John Day River. Average shade was 29 in reach 1 and 16% in reach 2 which failed the *LRMP management objective* for lodgepole pine sites and mixed conifer sites respectively. Average shade in reach 3 was 13% which faild the *LRMP* management objective for meadow habitat. Stream banks were 97 percent stable, which passed the forest management objective (90% stable). Stream bank failure was the common erosion type reported. However, numerous locations of valley bottom roads impact this stream.

<u>Sixteen Gulch</u>
Sixteen Gulch is not a fish-bearing stream. However, it does contribute to the base flows and downstream water quality.

Idaho Creek Pasture
Streams in the Idaho Creek Pasture do not meet *LRMP* management objectives for stream channel parameters listed in table FI-x9x. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Idaho Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

<u>Idaho Creek</u>
Idaho Creek is a tributary to Summit Creek, which is a direct link to the Middle Fork John Day River. Idaho Creek flows through the Idaho pasture and is considered as steelhead spawning and rearing habitat. This stream did not meet *LRMP* management objectives for pool frequency, wetted width to depth ratios and cobble embeddedness. Idaho Creek contains a Sensitive Stream Reach (see Figure 10).

The Level II stream survey of Idaho Creek was done in July of 1992, the seventh year of a drought. The streams were abnormally low and the range and riparian areas are drier than normal. The survey began at the confluence with Summit Creek for about 4.1 miles upstream to 1/4 mile above stream flow. Idaho Creek was 5.4 feet wide and had a flow rate of 0.16 cfs in mid July. The stream flow is from a spring at the upper end and several marshy, possible spring areas along its banks.

Fly Creek

Fly Creek is a perennial non fish-bearing tributary of Idaho Creek. The stream failed to meet *LRMP* management objectives for pool frequency, wetted width to depth ratio and cobble embeddedness. From the junction of Fly Creek with Idaho Creek it proceeds upstream about 1.4 miles. The stream averaged 3.1 feet wide and was 65.3% shaded with a water temperature of 57 degrees F. at 2 pm. The stream contained 22.9% pools, 71.2% riffles, 0 glides, and 5.9% side channels. The substrate is sand and is >35% embedded.

East Summit Pasture

Streams in the East Summit Pasture do not meet LRMP management objectives for stream channel parameters listed in table FI-9. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the East Summit Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Summit Creek

Summit Creek runs through East Summit pasture and contains steelhead and redband trout spawning and rearing habitat. . This stream failed to meet *LRMP* management objectives for pool frequency, wetted width to depth ratio and cobble embeddedness. The entire length of Summit Creek is designated as a Sensitive Stream Reach (see Figure 10).

The survey data for Summit Creek was collected during 1992, which was the 7th year of drought on the Malheur National Forest. The streams were abnormally low and the range and riparian areas were drier than normal. The habitat survey results must be considered in light of the possible influence of the existing drought. Summit Creek was surveyed in July from the confluence with the Middle Fork John Day River for about 7.4 miles upstream to 1/4 mile above the stream flow. Summit Creek is 7.2 feet wide and had a flow rate of 0.43 cfs in mid-July. The channel is moderately entrenched with dirt banks

West Summit Pasture

Streams in the West Summit Pasture do not meet LRMP management objectives for stream channel parameters listed in table FI-9. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the West Summit Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations in this pasture.

Middle Fork John Day River

The Upper Middle Fork John Day River runs through the West Summit pasture and contains steelhead spawning and rearing habitat. The Middle Fork John Day River was surveyed by Oregon Department of Fish and Wildlife in 1992. This reach is 47% riffle and 46% glide. Substrate is composed primarily of gravel (54%) and cobble (23%). Stream banks are 91% vegetation stabilized and 38% shaded.

While no data were collected, observations of this stream suggest wetted width to depth ratios and pool frequency do not meet *LRMP* management objectives. The entire length of the Middle Fork John Day River is designated as a Sensitive Stream Reach (see Figure 10).

<u>Clear Creek</u>
This stream failed to meet *LRMP* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness. Bank stability and riparian condition surveys done in May of 1994 found the stream channels in the area to be generally stable. Surveys showed 94 percent stream bank stability. Shading from vegetation averaged about 28 percent. Low shade readings (using a densiometer) were due to State highway 7 being adjacent to Clear Creek. Grass and forbs were the dominant vegetative cover and appeared to be in a healthy condition. The shrub and tree component was well represented by all age classes indicating that grazing was not suppressing reproduction and growth and that site potential was being met.

Approximately 1/4 mile of Clear Creek flows through this pasture and contains steelhead spawning and rearing habitat and migratory bull trout habitat. Clear Creek was surveyed for steelhead spawning on May 29, 2001. No redds or adult fish were observed but numerous salmonid fry and fingerlings were observed.

Sullens Allotment
There are approximately 43.6 miles of fish bearing streams (steelhead/redband trout and bull trout—only in Clear Creek) in the Sullens Allotment. Valley bottom roads influence many of the streams from the confluence with the Middle Fork upstream. These roads limit the recruitment of large wood, restrict the floodplain and are a source for fine sediment.
Clear Creek, Squaw Creek and Lunch Creek are 303(d) listed for temperature. All streams contain Sensitive Stream Reaches. Low pool frequencies, high cobble embeddedness (sediment) and high water temperatures reduce fish habitat complexity and quality in streams on this allotment. Width to depth ratios (both wetted and bankfull) are very high, reducing usable fish habitat and exacerbating high stream temperature problems in the summer.

Table FI-10. Stream Survey Data Summary for Sullens Allotment

Stream Date Surveyed & Reaches	Pools per Mi	Residual Pool Depth	Large Pool Mi	Trib Count	Corrected Length	Wetted Width to Depth*	Bankfull Width to Depth	Med WD/Mi	Large WD/Mi	Bank Stability	High Temp	High Temp Time	Embedded Y or N
BRIDGE93 7/26/93 Start To: 9	51♠	1.02	0.15	5	6.6	Data Gap	Data Gap	13	14♠	Data gap	53.00	1130	Data Gap
CLEAR, Pcity 7/29/91 Start To: 6	7♠	1.22	0.49	7	8.2	>10♠	34.86	155	36♠	Data Gap	51.00	1350	Y♠
DRY FORK CLEAR 7/19/91 Start To: 4	20♠	1.78	0.32	3	6.2	>10♠	11.35	49	34♠	Data Gap	71.00	1600	Y♠
LUNCH 7/2/93 Start To: 2	9♠	1.09	0.00	5	4.2	>10♠	15.74	28	5♠	Data Gap	56.00	1335	N
SQUAW 7/3/91 Start To: 14	7♠	1.66	0.23	8	8.6	>10♠	10.58	41	25♠	Data Gap	51.00	1500	Y♠

♠ parameter does not meet *LRMP* Management objective; Ψ parameter does not meet Matrix Pathways of Indicators criteria;*Wetted width to depth ratios listed as <10 or >10 are based on extrapolation
PFC analyses were conducted on several streams in 2000. These analyses were done at the reach level; each stream has from 3-12 reaches depending on total stream length. Determinations, trends and comments for each reach on these streams are listed in the table below. Nineteen reaches were rated as Functioning at Risk (with no apparent trend or a downward trend) or Not Functioning. Livestock use was listed as a problem on some of these reaches.

Bridge Creek Pasture
Streams in the Bridge Creek Pasture do not meet LRMP management objectives for stream channel parameters listed in table FI-10. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Bridge Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "Suspected" in this pasture.

<u>Bridge Creek</u>
This stream contains steelhead spawning and rearing habitat. Adult steelhead have been seen in this stream since the fish ladder was installed at Bates Pond. This stream failed to meet management objectives for pool and LWD frequency. No data was available for wetted width to depth ratio and cobble embeddedness. Much of this stream parallels Highway 26, which narrows the valley bottom and floodplain of this stream.

<u>Lunch Creek</u>
This stream contains steelhead spawning and rearing habitat. Adult steelhead have been seen in Bridget Ceek since the fish ladder was installed at Bates Pond. There is no known barrier between Bridge Creek and Lunch Creek. This stream failed to meet *LRMP* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

<u>Easy Creek</u>
This is an intermittent, non fish-bearing tributary to Lunch Creek. No Level II stream surveys have been conducted.

<u>Clear Creek</u>
Clear Creek contains steelhead and bull trout spawning and rearing habitat within this pasture. This stream failed to meet *LRMP* management objectives for pool frequency, LWD frequency, cobble embeddedness and wetted width to depth ratio.

<u>Dry Fork Clear Creek</u>
Dry fork Clear Creek contains steelhead spawning and rearing habitat. This stream failed to meet *LRMP* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

Savage Creek Pasture
Streams in the Savage Creek Pasture do not meet LRMP management objectives for stream channel parameters listed in table FI-10. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Savage

Creek Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog populations which are "suspected" in this pasture.

Dry Fork Clear Creek
Dry fork Clear Creek contains steelhead spawning and rearing habitat. This stream failed to meet *LRMP* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

Squaw Creek
This stream failed to meet *LRMP* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

Olmstead Creek
This is an intermittent, non fish-bearing tributary to Lunch Creek. No Level II stream surveys have been conducted.

Savage Creek
This is an intermittent, non fish-bearing tributary to Lunch Creek. No Level II stream surveys have been conducted.

Highway Pasture
Streams in the Highway Pasture do not meet LRMP management objectives for stream channel parameters listed in table FI-10. The reduced level of fish habitat complexity and quality has resulted in reduced productivity and thereby populations of TES fish in the Highway Pasture. Entrenched channels, reduced floodplain connectivity, lowered water tables and modified riparian vegetation communities have also impacted habitat for Columbia spotted frog which are "Suspected" in this pasture.

Clear Creek
Clear Creek contains steelhead spawning and rearing habitat and bull trout migratory habitat in this pasture. This stream failed to meet *LRMP* management objectives for pool frequency, LWD frequency, cobble embeddedness and wetted width to depth ratio.

Dry Fork Clear Creek
Dry fork Clear Creek contains steelhead spawning and rearing habitat. This stream failed to meet *LRMP* management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

Squaw Creek
This stream failed to meet LRMP management objectives for pool frequency, LWD frequency, wetted width to depth ratio and cobble embeddedness.

26 Pasture
There are no fish-bearing streams in this unit.

II. Proposed Action and Alternatives Considered
See Middle Fork John Day River Planning Area Environmental Impact Statement for details by each alternative. The three alternatives are as follows:

- Alternative 1—No grazing of domestic livestock
- Alternative 2—Current grazing with adaptive management
- Alternative 3—Proposed action grazing including infrastructure improvements and adaptive management

III. Potential Effects of the Proposed Action and Alternatives on Listed Species and Designated Habitat

To reduce the amount of redundancy in the document, the following discussion will not be done species by species (unless warranted), and alternative by alternative.

Redband trout and steelhead are resident and anadromous life forms of the same species. The potential effects of proposed actions are essentially the same for both species. These are the fish with the widest distribution within the project area. Potential effects to fish and fish habitat will focus on those species most likely affected by activities in the project area.

The Matrix of Pathways and Indicators (NOAA Fisheries and USFWS) will be used as a checklist for this evaluation. The scale of the effects will be limited to the planning area for direct and indirect effects while the cumulative effects include the planning area as well as the Middle Fork John Day River downstream of the planning area.

Direct and Indirect Effects

Alternative 1—No Grazing

Direct effects to aquatic species would not occur because no domestic livestock grazing would occur; therefore, there would be no disturbance to spawning adults or mortality to either eggs or pre-emergent alevins present in redds or in egg masses of spotted frogs

Indirect effects to aquatic species could occur as a result of habitat alteration by wild ungulates. Habitat parameters which may potentially be altered are listed in the Matrix of Pathways and Indicators below and include the following: temperature, width/depth ratio, road access, spawning gravel, valley width, stream gradient, bank stability and barriers. Temperature is not only influenced by stream shade but also by width/depth ratio, ground water interaction, and turbidity. Browsing by ungulates can decrease shade and vegetative ground cover thereby potentially increasing turbidity, infiltration of precipitation, and bank stability. Decreased bank stability can increase turbidity, sediment, and width/depth ratio. Roads, road management and use increases potential for sediment and harassment to spawning fish. Constructed or natural barriers to control livestock use of riparian areas benefit the condition of the ecosystem. Valley width is an indicator of channel type and associated potential for use by livestock. Sediment can increase cobble embeddedness, width/depth ratios, and decrease pool volume and quality.

The potential effects on water quality, habitat access, habitat elements, channel condition & dynamics, flow/hydrology, and watershed conditions have been evaluated.

Water Quality

Temperature: Stream shade maintains stream temperatures in the summer and winter. Stream temperatures can also be modified by increasing width to depth ratios (see width to depth ratio parameter).

Excess shrub utilization is more likely to occur in the fall months or when herbaceous vegetation is insufficient for ungulates. Excess shrub utilization can degrade riparian shrub communities altering species composition, reducing density of riparian shrubs or by changing the composition of life stages of shrubs present (usually reducing or removing the seedling/sapling component).

A near natural rate of recovery of riparian shrubs, stream channel width to depth ratios and aquatic habitat is expected by removing all livestock in the planning area. This will move stream temperatures toward desired conditions in streams of the planning area.

Sediment: Excessive streambank, riparian, and upslope trampling and vegetation removal from can cause increased instream sedimentation. Exclusion of domestic livestock from the planning area will reduce potential impacts on stream channel integrity/stability, parameters (such as width to depth ratios and streambank angle) or recovery processes such as building point bars and streambanks and the ability of the stream to handle high flow events which have effects on sediment production and processing.

Chemical Contaminations/Nutrients: There would be no input of nutrients from livestock with the No Grazing alternative.

Habitat Access

Physical Barriers: There would be no effect on this indicator. This includes effects on migratory corridors such as physical, biological, or chemical barriers between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures (see temperature parameter) or low flows.

Habitat Elements

Substrate Embeddedness: The majority of sediment is generated from roads or past logging. No new sources of sediment that may be detrimental to this indicator will result from this alternative. See discussion on sediment. Habitat-related indirect effects to aquatic habitat would be avoided by excluding domestic livestock and will allow for near-natural rates of habitat improvement. This will improve substrate available of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival (based on geomorphology of streams).

Large Woody Material (LWM): Livestock have no influence on LWM necessary for larger stream systems. In smaller stream systems and headwaters, riparian shrubs may provide the same function as large woody debris. Exclusion of livestock will result in appropriate growth forms (i.e. released, uninterrupted), life stages (i.e. seedling/sapling, young, mature), species composition and density of riparian shrubs for the potential of the site.

Pool Frequency and Quality: Factors that effect pool characteristics and frequency, such as large substrate, LWM, peak flows and sediment inputs, (see relevant indicators) will not be affected or impacted by excluding livestock grazing. Habitat-related indirect negative effects to aquatic habitat would be avoided and will result in near-natural rates of recovery.

Large Pools: Exclusion of livestock grazing will avoid habitat-related indirect adverse effects to aquatic habitat and will allow for near-natural rates of habitat improvement.

Off-channel Habitat: Exclusion of livestock grazing activities will have no effect on this indicator.

Refugia: Exclusion of livestock grazing will have no effect on this indicator.

<u>Channel Condition and Dynamics</u>
Wetted Width/Maximum Depth Ratio: Width to depth ratio can increase with increased sediment and bank instability. See discussion on sediment. Exclusion of livestock grazing will allow for improvement of stream channel integrity/stability, parameters (such as width to depth ratios and streambank angle) or recovery processes such as building point bars and streambanks and the ability of the stream to handle high flow events. Exclusion of livestock grazing will avoid potential for habitat-related indirect adverse effects to aquatic habitat and will allow for near-natural rates of habitat improvement.

Stream bank Condition: Streambank stability reductions can occur from increased peak flows, shearing (mechanical damage) of streambank soils, loss of vegetative cover from excessive grazing, and streambank cave-ins from animal pressure. See discussion on sediment.

Exclusion of livestock grazing will allow for ample growth to maintain health and vigor in plants, expanding hydrophytic plant communities where not currently at desired condition and maintaining plant communities where at desired condition. All residual stubble height of herbaceous vegetation would be available to trap sediment during high flows which is necessary to build streambanks and move toward objectives.

There would be no bank alteration by domestic livestock. This reduces potential to impact stream channel integrity/stability, parameters (such as width to depth ratios and streambank angle) or recovery processes such as building point bars and streambanks and the ability of the stream to handle high flow events. Livestock exclusion will allow for near-natural rates of habitat improvement.

Floodplain Connectivity: Streams can downcut from excessive use of vegetation or shift in vegetation community to shallow-rooted species and destabilization of banks (see stream bank condition). Exclusion of livestock grazing will avoid potential for habitat-related indirect adverse effects to aquatic habitat and will allow for near-natural rates recovery, potentially reconnecting floodplains and raising water tables.

<u>Hydrology/Flow</u>
Change in Peak/Base Flows: Peak/base flow can be modified by floodplain connectivity and drainage network (see those parameters). Exclusion of livestock grazing will avoid potential for

habitat-related indirect adverse effects to aquatic habitat and will allow for near natural rates of recovery of stream channels resulting in more natural peak and base flow regimes.

Drainage Network Increase: Exclusion of livestock grazing will avoid potential for indirect adverse effects to aquatic habitat and will allow for near-natural rates recovery of intermittent channels, potentially converting them to ephemeral draws and reducing the drainage network.

<u>Watershed Conditions</u>
Road Density and Location: This alternative will have no effect on this indicator. No roads will be constructed or decommissioned with the project.

Disturbance History: Exclusion of livestock grazing activities will have no effect on this indicator.

Riparian Conservation Areas: Exclusion of livestock grazing will avoid potential for habitat-related indirect adverse effects to aquatic habitat and will allow for near-natural rates of habitat improvement.

Alternative 2 (Existing Grazing) and 3 (Proposed Action Grazing)

The following is a site-specific analysis of the potential direct and indirect effects on steelhead, redband trout, bull trout, Chinook salmon and Columbia spotted frog habitats and populations from the action alternatives. Effects of Alternative 2 and 3 on aquatic habitat and species would be the same. Alternative 2 may require more adaptive management and administrative actions because no infrastructure improvements would occur as part of the project that would ease range management.

Assumptions for Effects Analysis

1. Malheur National Forest Riparian Monitoring Strategy (Appendix D) will be used to determine condition and trend of riparian areas for sensitive stream reaches in pastures in the project area. This information will be used to recommend allowable use levels, appropriate move triggers, endpoint indicators, and long term, site specific objectives for riparian areas. The riparian monitoring strategy includes implementation and effectiveness monitoring with feedback to ensure Near Natural Rates of recovery will occur. It is realized that survey methods and analysis tools will continue to evolve during the life of this project.
2. Move triggers and endpoint indicators will be met.
3. Where move triggers or endpoint indicators are not met and result in potential for impacts to riparian areas, streams or fish, appropriate administrative actions will be taken to adjust management strategies as needed to achieve desired riparian objectives.
4. Where 1-3 (above) conditions are met, effects will be limited to those that do not carry over to the following grazing season and will result in a “near natural” rate of recovery of riparian areas as defined by PACFISH Enclosure B (Appendix Y) will result.

Direct and Indirect Effects

Direct effects to fish are most likely to occur in terms of disturbance to spawning adults or in terms of mortality to either eggs or pre-emergent alevins present in redds, when livestock have access to spawning habitat during the spawning and incubation season prior to July 15 for steelhead/redband trout or after August 15 for bull trout or Chinook salmon. Direct effects to Columbia spotted frog are most likely to occur in terms of disturbance of egg masses or before juveniles are mobile.

There is the potential to cause negative impacts by domestic livestock to individual fish or Columbia spotted frogs with these alternatives. Trampling of steelhead, redband or bull trout redds (which contain eggs/embryos) or egg masses of spotted frogs by domestic livestock could result in direct mortality of TES aquatic species. Appropriate mitigation measures would be taken to minimize potential for these impacts. Specific measures which may be used include: grazing during periods when cattle seldom use riparian areas, riding/herding, electric fencing, moving cattle out of the unit to keep cattle away from redds/eggmasses, etc. Populations of aquatic species would not be negatively affected from trampling.

Indirect effects to fish are most likely to occur as a result of habitat alteration by livestock grazing. Habitat parameters which may potentially be altered by land management activities associated with grazing, are listed in the Matrix of Pathways and Indicators below and include the following: temperature, width/depth ratio, road access, spawning gravel, valley width, stream gradient, bank stability and barriers. Temperature is not only influenced by stream shade but also by width/depth ratio, ground water interaction, and turbidity. Browsing by ungulates can decrease shade and vegetative ground cover thereby potentially increasing turbidity, infiltration of precipitation, and bank stability. Decreased bank stability can increase turbidity, sediment, and width/depth ratio. Roads, road management and use increases potential for sediment and harassment to spawning fish. Constructed or natural barriers to control livestock use of riparian areas benefit the condition of the ecosystem. Valley width is an indicator of channel type and associated potential for use by livestock. Sediment can increase cobble embeddedness, width/depth ratios, and decrease pool volume and quality.

The potential effects on water quality, habitat access, habitat elements, channel condition & dynamics, flow/hydrology, and watershed conditions have been evaluated.

Water Quality

Temperature: Livestock grazing in riparian areas can decrease stream shade causing increased stream temperatures in the summer and decreased temperatures in the winter. Livestock grazing can also modify water temperatures by increasing width to depth ratios (see width to depth ratio parameter).

Excess shrub utilization from livestock is more likely to occur in the fall months or when herbaceous vegetation is insufficient for ungulates. Excess shrub utilization can degrade riparian shrub communities altering species composition, reducing density of riparian shrubs or by changing the composition of life stages of shrubs present (usually reducing or removing the seedling/sapling component).

The Malheur National Forest riparian monitoring strategy (Appendix D) determines allowable riparian shrub browsing by livestock. The overall level of shrub browse with livestock may be higher than from wildlife alone but will result in the same growth forms (i.e. released, uninterrupted), life stages (i.e. seedling/sapling, young, mature), species composition and density of riparian shrubs for the potential of the site as would occur without grazing of livestock. Using deferred grazing rotations, fencing and adequate riding by permittees will reduce browsing of riparian shrubs.

Livestock grazing will result in a near natural rate of recovery of riparian shrubs, stream channel width to depth ratios and aquatic habitat. This will not impact stream temperature in the short term and will improve stream temperature in the long term by moving conditions toward stream potential.

Sediment: Excessive riparian and upslope trampling and vegetation removal from cattle can cause increased instream sedimentation. Management and monitoring of the planning area will reduce bank disturbance and consequently sediment input from past levels. The riparian monitoring strategy (Appendix D) determines allowable bank alteration levels by livestock. The level of allowable bank alteration may be higher than from wildlife alone but will not negatively impact stream channel integrity/stability, parameters (such as width to depth ratios and streambank angle) or recovery processes such as building point bars and streambanks and the ability of the stream to handle high flow events.

Ephemeral drainages convey surface water for short periods of time in direct response to snowmelt or rainfall runoff. Ephemerals do not contain wetlands or riparian areas. When livestock are in the allotments, these ephemerals are typically dry, indicating the livestock would not be attracted to the area for water to drink or lounge in. Therefore, these ephemerals are used by livestock at the same intensity as the rest of the uplands, and grazing on ephemerals would not contribute any more sediment than the rest of the uplands being used by livestock. By active administration of the allotments and implementing the practices and mitigations listed, the proposed management will not significantly affect sediment. Livestock grazing under the proposed guidelines will meet PACFISH management objectives by avoiding habitat related indirect effects to aquatic habitat and will allow for near natural rates of habitat improvement.

Chemical Contaminations/Nutrients: Minimal input of nutrients from livestock feces is expected. Livestock grazing will meet PACFISH management objectives by avoiding habitat-related indirect adverse effects to aquatic habitat.

<u>Habitat Access</u>
Physical Barriers: The proposed grazing activities will have no effect on this indicator. This includes effects on migratory corridors such as physical, biological, or chemical barriers between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures (see temperature parameter) or low flows.

<u>Habitat Elements</u>
Substrate Embeddedness: No new sources of sediment that may be detrimental to this indicator will result from this activity. See discussion on sediment. Livestock grazing will meet PACFISH management objectives by avoiding habitat-related indirect effects to aquatic habitat and will allow for near-natural rates of habitat improvement. This will not degrade substrate available of sufficient amount, size, and composition to ensure success of egg and embryo over winter survival, fry emergence, and young-of-the-year and juvenile survival (based on geomorphology of streams).

Large Woody Material (LWM): Livestock have no influence on LWM necessary for larger stream systems. In smaller stream systems and headwaters, riparian shrubs may provide the same function as large woody debris. The riparian monitoring strategy (Appendix D) determines allowable riparian shrub browsing by livestock. The overall level of shrub browse with livestock may be higher than from wildlife alone but will result in the same growth forms (i.e. released, uninterrupted), life stages (i.e. seedling/sapling, young, mature), species composition and density of riparian shrubs for the potential of the site as would occur without grazing of livestock.

Pool Frequency and Quality: Factors that effect pool characteristics and frequency, such as large substrate, LWM, peak flows and sediment inputs, will not be affected or impacted by livestock grazing. See discussion on sediment. Livestock grazing under the proposed guidelines will likely meet PACFISH management objectives by avoiding habitat-related indirect negative effects to aquatic habitat and will allow for near-natural rates of recovery.

Large Pools: Livestock grazing will meet PACFISH management objectives by avoiding habitat-related indirect adverse effects to aquatic habitat and will allow for near-natural rates of habitat improvement.

Off-channel Habitat: The proposed grazing activities will have no effect on this indicator.

Refugia: Grazing activities will have no effect on this indicator.

Channel Condition and Dynamics

Wetted Width/Maximum Depth Ratio: Width to depth ratio can increase with increased sediment and bank instability. See discussion on sediment. The riparian monitoring strategy (Appendix D) determines allowable bank alteration levels by livestock. The level of allowable bank alteration may be higher than from wildlife alone but will not negatively impact stream channel integrity/stability, parameters (such as width to depth ratios and streambank angle) or recovery processes such as building point bars and streambanks and the ability of the stream to handle high flow events. Livestock grazing under the proposed guidelines will meet PACFISH management objectives by avoiding habitat-related indirect adverse effects to aquatic habitat and will allow for near-natural rates of habitat improvement.

Stream bank Condition: Streambank stability reductions can occur from increased peak flows, shearing of streambank soils by hoof or head action, loss of vegetative cover from excessive grazing, and streambank cave-ins from animal pressure. See discussion on sediment.

The riparian monitoring strategy (Appendix D) is designed to determine appropriate move triggers, thresholds and objectives that allow for ample growth to maintain health and vigor in plants, expanding hydrophytic plant communities where not currently at desired condition and maintaining plant communities where at desired condition. Additionally, deferred grazing management strategies allow herbaceous vegetation to set seed on a regular basis. The riparian monitoring strategy also determines minimum residual stubble height necessary to trap sediment during high flows which is necessary to build streambanks. The resulting height may be lower than where domestic livestock grazing has not occurred but is ample to move toward objectives.

The riparian monitoring strategy (Appendix D) also determines allowable bank alteration levels by livestock. The level of allowable bank alteration may be higher than from wildlife alone but will not negatively impact stream channel integrity/stability, parameters (such as width to depth ratios and streambank angle) or recovery processes such as building point bars and streambanks and the ability of the stream to handle high flow events.

With active administration of the allotments, livestock grazing will not significantly affect stream bank stability. Livestock grazing under the proposed guidelines will likely meet PACFISH/INFISH management objectives by avoiding habitat-related indirect adverse effects to listed fish and habitat in the short term and will allow for near-natural rates of habitat improvement in the long term.

Floodplain Connectivity: Streams can downcut from excessive use of vegetation or shift in vegetation community to shallow-rooted species and destabilization of banks (see stream bank condition). Livestock grazing using appropriate thresholds determined from the riparian monitoring strategy (Appendix D) will avoid potential for habitat-related indirect adverse effects to aquatic habitat and will allow for near-natural rates recovery, potentially reconnecting floodplains and raising water tables.

Hydrology/Flow

Change in Peak/Base Flows: Integrated monitoring of thresholds for stubble height, riparian shrub use in riparian zones and bank alteration with appropriate administration and adaptive management will not contribute to increased peak flows or lower base flows. Livestock grazing will avoid habitat-related indirect adverse effects to aquatic habitat and will allow for near-natural rates of habitat improvement.

Drainage Network Increase: The proposed grazing activities with active administration and adaptive management will avoid potential for indirect adverse effects to aquatic habitat and will allow for near-natural rates recovery of intermittent channels, potentially converting them to ephemeral draws and reducing the drainage network.

Watershed Conditions

Road Density and Location: Grazing activities will have no effect on this indicator. No roads will be constructed or decommissioned with the project.

Disturbance History: The proposed grazing activities will have no effect on this indicator.

Riparian Conservation Areas: Active administration of the allotments and implementation of the practices and mitigations listed (i.e. upland salting, riding and unit rotation), the proposed management will not impact RHCAs. The riparian monitoring strategy (Appendix D) is designed to move toward natural community composition. Livestock grazing will meet avoid habitat-related indirect adverse effects to aquatic habitat and will allow for near-natural rates of improvement.

Summary of Direct and Indirect Effects for Alternative 2 and 3

There is the potential to cause negative impacts by domestic livestock to individual fish or Columbia spotted frogs with these alternatives. Appropriate mitigation measures would be taken to minimize potential for these impacts. Populations of aquatic species would not be negatively affected from trampling.

Aquatic habitat quality and quantity would improve on streams at near natural rates of recovery in the Planning Area. Proper administration and adaptive management based on results of the Malheur National Forest riparian monitoring strategy (including implementation and effectiveness monitoring) will ensure recovery of riparian areas and stream habitat. Timeframes of riparian and instream habitat recovery would vary from 2 years to decades depending on current riparian vegetation seral stage, abundance/condition of shrubs, and existing stream channel characteristics compared to stream potential. Most streams will not meet Riparian Management Objectives (RMOs) in the next 20 years; it is questionable as to whether there is potential to meet RMOs on all streams. Carrying capacity of aquatic habitat would increase with improved cover from riparian shrubs, decreased width to depth ratios, lower summer water temperatures and greater terrestrial and aquatic insect (food) abundance. This would improve populations of TES fish and Columbia spotted frog in the project area.

Cumulative Effects

The past, present and foreseeable future actions listed in Appendix J of the Middle Fork AMP DEIS were analyzed in conjunction with direct and indirect effects of project activities to determine cumulative effects on fish, spotted frogs and aquatic habitat in project area streams and downstream in the Middle Fork John Day River. Effects of past actions on aquatic species and habitats were described in the existing condition portion of the Fisheries Section

All Alternatives

Cumulative Effects are the same for all alternatives because direct and indirect effects result in a "near natural" rate of recovery of aquatic habitat quality and quantity as well as populations of TES fish and Columbia spotted frog.

Existing roads, particularly those within RHCAs and riparian areas would continue to reduce potential for shade, stream channel meander, and overall stream function and increase sediment input to streams. Implementation of regular road maintenance activities are designed to reduce sediment delivery to streams by clearing blocked culverts and blading road surfaces to reduce erosion/sedimentation and potential for road failure. Stream crossings of roads will maintain stream channel entrenchment, reducing floodplain connectivity and keeping water tables at lower levels than natural and providing potential for direct sediment input to streams. However, the Blue Aquatic project modified 11 stream crossings in Vincent/Vinegar and Granite Boulder Creeks to allow for fish passage of all age classes at all flows, handle 100-year flow events and allow some channel aggradation which could reconnect floodplains to currently entrenched stream channels. Additional foreseeable future culvert projects associated with the Camp Watershed Oxbow Culvert Replacement, Bridge/Lunch Creek Culvert Replacements and Butte Creek Culvert Replacement have the same objectives and effects as the Blue Aquatic project.

The Crawford Vegetation Management project activities will reduce overall negative effects of roads by completing maintenance on the existing road system and relocating roads out of the riparian areas into uplands. Harvest activities are expected to move vegetation towards the historic range of variability and reduce potential for catastrophic wildfires while the use of default PACFISH RHCAs is expected to protect riparian resources.

Riparian shrub planting and protection along the Middle Fork John Day River (on both private and National Forest System lands), in the Camp Creek and Big Creek watersheds, the Southeast Galena and Summit Fire Recovery, the Long Creek Allotment Improvement Project has accelerated and will continue recovery of riparian vegetation communities, provide shade, improve stream channel parameters and maintain lower summer water temperatures. Floodplain and mine tailing restoration activities on Confederated Tribes of Warm Springs is expected to reconnect the floodplain to the stream channel, accelerate riparian recovery and improve aquatic habitat on the Middle Fork John Day River. This project will also improve fish access to Butte Creek at the confluence with the Middle Fork John Day River. Future activities on the Dunston property are designed to increase channel sinuosity, improve riparian vegetation and accelerate recovery of aquatic habitat in the Middle Fork John Day River.

Livestock grazing on private lands along the Middle Fork John Day River is expected to maintain current riparian and stream conditions at these locations.

No grazing on pastures in areas of Malheur National Forest System lands affected by future wildfires for a minimum of 2 growing seasons (Malheur National Forest post-fire grazing guidelines) would reduce potential for cumulative effects of wild and domestic ungulate browsing and grazing pressure to allow hardwoods to re-establish and herbaceous vegetation to recover in riparian areas. The effects would be similar and additive to hardwood planting and protection. Re-initiation of grazing by domestic livestock within Forest Plan and Interagency Interdisciplinary Team (IIT) management objectives would not retard attainment of Riparian Management Objectives (RMOs) in planning area streams.

Range infrastructure improvements which include water developments, spring protection and fence construction implemented through Categorical Exclusions on the Long Creek and Lower Middle Fork Allotments are designed to improve cattle distribution and reduce pressure of domestic livestock on riparian areas.

Riparian conditions, aquatic habitat quality and quantity would improve on streams at "near natural" rates in the project area. Timeframes of riparian and instream recovery would vary from 2 years to decades depending on current riparian vegetation seral stage, abundance/condition of shrubs, and existing stream channel characteristics compared to stream potential. Most streams will not meet Riparian Management Objectives (RMOs) in the next 20 years; it is questionable as to whether there is potential to meet RMOs on all streams. Carrying capacity of aquatic habitat would increase with improved cover from riparian shrubs, decreased width to depth ratios, lower summer water temperatures and greater terrestrial and aquatic insect (food) abundance. This would improve populations of TES fish and Columbia spotted frog in the project area and potentially downstream in the Middle Fork John Day River.

Effects Determination and Rationale for Alternative 1

Mid-Columbia Summer Steelhead (T): No Effect
Columbia River Basin Bull Trout (T): No Effect
Chinook Salmon (S): No Impact
Chinook Salmon Essential Fish Habitat: No Effect
Interior Redband Trout (S): No Impact
Columbia Spotted Frog (S): No Impact

Direct, indirect and cumulative effects would result in riparian conditions, aquatic habitat quality and quantity improving on streams at "near natural" rates in the planning area with no potential for direct effects to individual TES fish or Columbia Spotted Frog. This would improve populations of TES fish and Columbia spotted frog in the project area and potentially downstream in the Middle Fork John Day River.

Effects Determination for Alternatives 2 and 3

Mid-Columbia Summer Steelhead (T): *May Effect—Likely to Adversely Affect*
Columbia River Basin Bull Trout (T): *May Effect—Likely to Adversely Affect*
Chinook Salmon (S): *May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species*
Chinook Salmon Essential Fish Habitat: *Unlikely to Adversely Modify*

Interior Redband Trout (S): *May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species*
Chinook Salmon Essential Fish Habitat: *Unlikely to Adversely Modify*
Columbia Spotted Frog (S): *May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species*

Rationale for Alternatives 2 and 3

Adaptive management using the Malheur National Forest Riparian monitoring strategy (implementation and effectiveness monitoring) is designed to result in a near natural rate of recovery of riparian areas and streams. Implementing deferred rotations would put livestock in pastures concurrent with breeding/spawning and incubation activities of TES fish and Columbia spotted frog in some years.

There is the potential to have negative effects on individual fish or frogs from direct impacts of domestic livestock stepping on redds/eggmasses or disturbing/harassing adult TES species during breeding activities (prior to July for steelhead, redband trout and spotted frog, and after August 15 for bull trout and chinook salmon). Mitigation measures would reduce potential for direct effects to TES species and therefore would not have negative impacts on populations as a whole. However, grazing cattle during breeding/spawning and incubation periods creates the potential for direct take or impacts to individuals resulting in LAA and MIIH effects determinations for TES species.

Implementing deferred rotations, utilizing early season grazing and limiting hot season grazing duration in pastures would benefit riparian areas and streams thereby improving TES habitat and populations. Improving habitat is a greater benefit to populations of TES species than the potential of impacting individual fish or spotted frogs.

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Appendix G – PACFISH Enclosure B

United States Department of Agriculture **Forest** Service **R-6**

Reply to: 2670 **Date:** August 14, 1995

Subject: PACFISH Grazing Guidelines Revision

To: PACFISH Forest Supervisors

Enclosed is a revision of Enclosure B - Recommended Livestock Grazing Guidelines, sent to you in a memo dated May 24, 1995, providing feedback to questions raised at the PACFISH Implementation Workshops. Please replace the original Enclosure B with this revision dated July 31, 1995. It should be understood that this revision does not alter the intent or intended implementation of the subject guidelines as originally written but rather attempts to further clarify them to avoid possible misinterpretation.

If you have any questions, please contact Ron Wiley (503-952-6418), Wayne Elmore (503-447-4115), or Don Nelson (503-326-5917).

/s/Gordon Haugen
GORDON HAUGEN
Columbia River
Basin/PACFISH Coordinator

Enclosure

ENCLOSURE B

RECOMMENDED LIVESTOCK GRAZING GUIDELINES
(Rev. 7/31/95)

KEY ASSUMPTIONS

*Influences of livestock grazing must result in riparian restoration at a minimum of "near natural" rates. We recognize that some environmental effects are inherent with the presence of livestock. However, we believe that "near natural" rates of recovery can be provided if we limit environmental effects to those <u>that do not carry through to the next year</u>, thereby avoiding cumulative, negative effects.

a) Condition thresholds are not exceeded;
b) Standards and Guidelines for forage and browse utilization are not exceeded;
c) A 70% rate of recovery is documented.

"Carryover effects": Pacfish/Infish implies, but does not clearly state, that if we meet the standards and guidelines and do not exceed the condition thresholds, there will be an acceptable level of carryover effects. The level of these carryover effects needs to be disclosed in the appropriate decision document.

*Adverse affect to aquatic habitat associated with livestock grazing can be avoided, and riparian restoration provided by controlling:

-season of use (tied to plant phenology and soil characteristics rather than calendar dates); and
-amount of use.

*Providing for the health, form and function of riparian systems should remain the focus of management efforts.

*Stream gradient, inherent stability characteristics, potential vegetative communities, and type of degradation (i.e., vegetation vs. bank/channel characteristics) are important factors in determining restoration potential and guidelines that will lead to restoration.

*Guidelines for developing allotment specific prescriptions can be identified at the programmatic level. However, in general, the prescriptions themselves must be developed to fit "on-the-ground" conditions within the context of those guidelines.

*In some definable cases, avoiding adverse affects can only be accomplished by suspending livestock grazing. These cases include problems related to ecological status.

*Effective monitoring using specific measurement approaches, as well as administration, are essential.

PROGRAMMATIC GUIDELINES FOR LIVESTOCK GRAZING

As noted in the assumptions above, the goals, or desired outcomes of management efforts provide the foundation for the recommended programmatic livestock grazing guidelines. The guidelines and resulting site specific prescriptions are of value only to the extent they contribute to meeting these goals. The Environmental Assessment for PACFISH interim direction provides suitable riparian goals for the land management agencies (See PACFISH EA, APPENDIX, pages C-3 and C-4). All management activities implemented, including non-livestock related activities, should contribute to accomplishment of these goals.

Where these goals are met, the following on-the-ground attributes will be evident (See BLM Technical Reference 1737-9, Process for Assessing Proper Functioning Condition):

(1)Floodplains are inundated by relatively frequent events (i.e., 1-3 years).

(2)Stream sinuosity, width/depth ratio, and pool frequency reflect the capabilities of the setting (i.e., landform, geology, and bioclimatic region).

(3)Lateral stream movement is associated with natural sinuosity (i.e., streambank stability reflects the inherent capabilities of the setting).

(4)The overall system is vertically stable.

(5)Streambank morphology reflects the inherent capabilities of the ecological setting.

(6)Upland watershed conditions within the allotment are not contributing to degradation of riparian habitat conservation areas.

(7)Riparian vegetation characteristics:

-diverse age structure for woody species (where such species are a part of the natural system);
-plants exhibit high vigor;
-species present indicate maintenance of riparian soil moisture;
-streambank vegetation protects stream banks and dissipates energy during high flows (i.e., consider community type composition, rooting characteristics, and plant density); and
-provide an adequate source of coarse and/or large woody debris (where such debris is a part of the natural system).

MANAGEMENT CONSIDERATIONS

Based on the key assumptions previously outlined, the following guidelines are recommended for use in modifying applicable allotment management plans/annual operating plans/project decision documents/instructions to permitees to provide a high degree of assurance that objectives for conservation and restoration of anadromous fish habitat will be met.

These recommendations do not specifically address "priorities" for taking action. Taking action to conserve Columbia River Anadromous Fish is not optional. However, we believe priorities can be identified where there are insufficient resources to "do it all." Those priorities are as follows:

1) Maintain or improve conditions, where the criteria for "late seral" ecological status are met or exceeded (i.e., it is easier to protect healthy riparian systems than restore degraded ones).

2) Adjust management practices, where the criteria for "mid-seral" ecological status are met but the trend is static or downward. This is especially important, where vegetative factors are primarily responsible for the mid-seral rating (i.e., making adjustments at this stage is likely to prevent stream bank/channel damage of a lasting nature).

3) Adjustments in management practices, where the criteria for "early seral" ecological status are met, and primarily tied to deteriorated stream bank/channel conditions (especially in cases of severe channel downcutting where channel evolution has not re-created a floodplain), may contribute little to the recovery of the system in the near term.

RECOMMENDATIONS

*Continue current grazing prescriptions in pastures/allotments where ecological status is "late seral" (or better) based on either riparian vegetation or stream bank/channel conditions. Ensure residual herbaceous vegetation heights of at least 4 to 6 inches, and that no "condition thresholds" are exceeded. (See Key Definitions - Ecological Status and Residual Herbaceous Vegetation Heights)

*Where ecological status is "mid-seral," limit grazing in pastures/allotments to provide at least 6 inches of residual herbaceous vegetation and to ensure that no "condition thresholds" are exceeded. For moderate and low gradient (i.e., Rosgen "B" and "C" channel types) channels, with substrates composed of medium to fine easily eroded materials, also limit use to early season grazing to provide for recovery of stream bank/channel characteristics. (See Key Definitions - Early Season Grazing)

*In pastures/allotments where ecological status is "early seral", the following is strongly recommended:

-In moderate and low gradient (i.e., Rosgen "B" and "C" channel types) channels, with substrates composed of medium to fine easily eroded materials, consider rest.

-In all moderate to high gradient stream systems (Rosgen "A" and "B" type channels) with coarse substrate materials that provide inherent stability, whose ecological status rating of early seral is tied entirely to vegetation characteristics, grazing may be permitted if limited to early season use, residual herbaceous vegetation heights of at least 6 inches are met, and no "condition thresholds" are exceeded.

*Where early season grazing, as prescribed above, would result in adverse affects or is impractical, mid- or late-season grazing may be alternatives. However, residual herbaceous vegetation requirements would still have to be met and no "condition thresholds" could be exceeded.

*Appropriate "condition thresholds" will be monitored in all pastures/allotments. Results are to be reported on an annual basis, and appropriate adjustments made to the annual operating plans. (See likely consequences of implementation of this recommendation in the following section.)

KEY DEFINITIONS

Condition Thresholds: A number of indicators of impending impacts that would carry over to the next year would be monitored during the period of use and act as "triggers" to prevent damage. These should not be exceeded anytime during the grazing season. The recommended triggers and associated threshold values are as indicated below:

New bank alteration: bank instability that becomes evident after livestock grazing is initiated in a pasture/allotment in a given year. This assumes that early season use occurred following peak flows, when most of the additional bank damage can be tied to land use activities. The recommended threshold is 5% of the lineal bank distance (includes both sides of the stream).

Riparian area alteration: two measures of riparian area alteration are proposed. Each keys on areas away from stream banks that are good early indicators of impending riparian damage.

-The first relates to use of "riparian islands" - those portions of riparian areas slightly higher and drier than the rest of the riparian area. These are often dominated by Kentucky bluegrass. The recommended threshold is 25% of the areas with visible trampled soils or a vegetation height of 2 inches, which ever is reached first.

-The second measure relates to livestock use of "riparian sinks" - those portions of riparian areas slightly lower and more moist than the rest of the riparian area. These are often dominated by carex species. The recommended threshold is utilization in excess of a vegetation height of 3 inches.

-Riparian "island" and "sinks" are not significant components of all riparian areas. Generally only one of these features would be used as an indicator of impending riparian damage (i.e., the one that represents a significant component of the riparian area away from the stream side and/or which first shows signs of damage).

Woody vegetation utilization: proposed limitations on season and amount of use, suggest that woody vegetation utilization would seldom be of concern. Monitoring of this feature would generally be limited to those circumstances where the prescription calls for mid- or late-season grazing or where there is a documented problem with woody vegetation utilization. The recommended threshold is 30% of the current year's growth, measured as incidence of use.

Early Season Grazing: Early season grazing is defined in terms of the phenology of the vegetation. Early season grazing is limited to that period where upland vegetation is green but not drying. It typically begins about the second to third leaf stage and ends between boot and flowering of perennial upland bunch grasses. Caution should be used to avoid soil compaction and bank alteration from physical damage that can occur in some settings with early season grazing.

Ecological Status: Al Winward, in Clary and Webster (1989), defined "ecological status" as a measure of the degree of similarity between current vegetation and potential vegetation for a given riparian area. Our definition of "ecological status" adds to Winward's definition, recognizing the importance of stream bank and channel features. Definitions follow for each of the categories:

In those areas where livestock are a significant factor in the streambank rating, use both or either/or the vegetative factor and the streambank factor in determining the seral stage.

Early Seral *

-Percent similarity of riparian vegetation to the potential natural community/composition ≤ 25%; or,
-Stream bank/channel condition rating "poor".

Mid-Seral *

-Percent similarity of riparian vegetation to the potential natural community/composition 26-50% or better; and,

-Stream bank/channel condition rating of at least "fair".

Late Seral *

-Percent similarity of riparian vegetation to the potential natural community/composition ≥ 50%; and,
-Stream bank/channel condition rating "good" or better.

* If similarity of riparian vegetation information is lacking or cannot be readily obtained, use BLM Technical Reference 1737-9, Process for Assessing Proper Functioning Condition, or other rating systems. In using the previously mentioned technical reference, the following approximate crosswalk may be applied to relate functioning condition and ecological status:

-Proper Functioning Condition - continue current management if monitoring data supports or use recommendations for late seral.

-Functional-At Risk, upward trend - continue current management if monitoring data supports or use recommendations for mid-seral.

-Functional-At Risk, static trend - use recommendations for mid-seral or early seral depending on site specific conditions.

-Functional-At Risk, downward trend; or,

-Non-Functional, use recommendations for early seral.

<u>Greenline</u>: That specific area on or near the waters edge where a more or less continuous cover of perennial vegetation is encountered. Natural plant species forming the greenline are composed primarily of large, hydric species such as beaked sedge, Nebraska sedge, bluejoint reedgrass, or other especially strong rooted species capable of buffering the forces of water at the bankfull discharge level. Disturbance activities, such as overgrazing or trampling by animals or people, result in changes to shallow rooted species such as Kentucky bluegrass, which have a reduced ability to buffer water forces.

<u>Late Season Grazing</u>: Late season grazing generally begins after sugar storage in woody vegetation is complete and leaf fall has started. Upland plant seeds have shattered and mean air temperatures begin to cool.

<u>Near Natural Rate of Recovery</u>: Synonymous with PACFISH requirement not to "retard" or "measurably slow" recovery of degraded riparian features. Further defined in these recommendations within the context of effects that "carry over to the next year." Any effect that carries over to the next year is likely to result in cumulative negative effects, and measurably slow recovery of degraded riparian features.

<u>Residual Herbaceous Vegetation Height</u>: Residual herbaceous vegetation height, measured at the end of the growing or grazing season (which ever occurs latest), is used as an indicator of a system's ability to withstand erosive stream flows, filter sediment and build stream banks. Residual herbaceous vegetation height measurements are to be taken on those hydric species along the greenline with the capability to buffer water forces. (See above discussion of "greenline.")

Soil Appendix H

Data from Condition and Trend Transects

These data show ground cover and moss percent, obtained from points spaced one foot apart on 100 foot long transects. Up to three transects were located near each other in a "cluster". The project soil scientist determined vegetation type from the photographs and vegetation data. Uncertainty is indicated by a question mark in the table. Usually, but not always, transects in a cluster had soil and vegetation that were similar to each other. In some cases, soil and vegetation changed within a single transect; this is especially true for the "EF" transects.

The table is sorted alphabetically in the following order: Vegetation, Allotment, Unit, Cluster. The old Susanville unit of the Lower Middle Fork Allotment was not grazed from 1997 through 2002, as it was rested after the Summit Fire.

Vegetation types:

DM - "Dry Meadow" These transects are in grasslands where soil profiles are dry by mid-summer. Soil depth ranges from deep to shallow. This vegetation type includes both "meadow" and "shallow upland" soil types, but ground cover probably does not differ between these soil types.

EF - "Edge of Forest" The individual transect has both ponderosa pine and "shallow upland" soil types. The ground cover shown in the table is between the ground cover for the forest and the ground cover for the non-forest parts of the transect.

F - "Forest" These transects are mostly in ponderosa pine forest, though some are in lodgepole pine.

MM - "Moist Meadow" These transects are mostly in moist to wet meadows. Some, such as the Summit Cr. and Pie Mdw. clusters, have some dry meadow soil.

Veg.	Bare Soil %	Moss %	Allotment	Unit	Cluster Name	Trans Num	Year	Erosion Index
DM?	33	12	Blue Mountain	Crawford	Pie Mdw.	3	2003	30
DM?	19	8	Blue Mountain	Crawford	Taylor Flats	1	2003	35
DM	6	11	Lower Middle F.	Dead-wood	Hunter Mdw.	1	2000	36
DM	2	14	Lower Middle F.	Dead-wood	Hunter Mdw.	2	2000	36
DM	22	0	Lower Middle F.	Susan-ville(new)	Res Mdw.	1	2003	35
DM	19	0	Lower Middle F.	Susan-ville(new)	Res Mdw.	2	2003	35
DM	27	2	Lower Middle F.	Sunshine	Sunshine Cr.	2	2003	30

DM?	26	0	Sullens	Savage	Frosty Gulch	2	2003	40
DM?	15	0	Sullens	Squaw Mdw.	Squaw Mdws. 28	1	2003	40
DM?	14	0	Sullens	Squaw Mdw.	Squaw Mdws. 28	2	2003	40
DM?	20	25	Upper Middle F.	Deerhorn	Placer Gulch	3	2003	35
DM?	19	0	Upper Middle F.	Lower Vinegar	Vincent Cr.	1	2003	35
DM?	46	0	Upper Middle F.	Lower Vinegar	Vincent Cr.	2	2003	35
DM?	27	0	Upper Middle F.	Lower Vinegar	Vincent Cr.	3	2003	35
EF	18	0	Blue Mountain	Crawford	Twin Ponds	2	2003	35
EF	58	5	Blue Mountain	Crawford	Twin Ponds	3	2003	35
EF	10	0	Upper Middle F.	Caribou	Flat Cr.	1	2003	39
EF	7	20	Upper Middle F.	Caribou	Flat Cr.	2	2003	39
EF	9	0	Upper Middle F.	Caribou	Flat Cr.	3	2003	39
EF	29	0	Upper Middle F.	Caribou	Hunt Gulch	1	2003	38
EF	11	6	Upper Middle F.	Caribou	Hunt Gulch	3	2003	38
F	1	0	Lower Middle F.	Balance	Balance Spr.	3	2003	40
F	4	18	Lower Middle F.	Susan-ville(new)	Quartz Cr.	1	2003	35
F	5	1	Lower Middle F.	Susan-ville(new)	Quartz Cr.	2	2003	35
F	1	2	Lower Middle F.	Susan-ville(new)	Quartz Cr.	3	2003	35
F	7	0	Upper Middle F.	Caribou	Hunt Gulch	2	2003	38
F	0	0	Upper Middle F.	Deerhorn	Placer Gulch	1	2003	35
F	2	12	Upper Middle F.	Deerhorn	Placer Gulch	2	2003	35
MM	9	6	Blue Mountain	Crawford	Crawford Mdw.	1	1998	40
MM	2	0	Blue Mountain	Crawford	Crawford Mdw.	2	1998	40
MM?	15	8	Blue Mountain	Crawford	Pie Mdw.	1	2003	30

MM?	37	0	Blue Mountain	Crawford	Pie Mdw.	2	2003	30
MM	14	16	Blue Mountain	Crawford	Taylor Flats	2	2003	35
MM?	17	0	Blue Mountain	Idaho	Summit Cr.	1	2003	35
MM?	21	4	Blue Mountain	Idaho	Summit Cr.	2	2003	35
MM	1	0	Lower Middle F.	Coyote Mdws.	Coyote Mdw.	1	2003	35
MM	7	0	Lower Middle F.	Coyote Mdws.	Coyote Mdw.	2	2003	35
MM?	9	0	Sullens	Savage	Frosty Gulch	1	2003	40
MM	8	0	Sullens	Squaw Mdw.	Squaw Mdws.	1	2003	40
MM	0	19	Upper Middle F.	Caribou	Cow Camp Mdw.	1	2003	35
MM	4	23	Upper Middle F.	Caribou	Cow Camp Mdw.	2	2003	35

Appendix I

Middle Fork John Day River Grazing EIS

Wildlife Biological Evaluation
for
Threatened, Endangered, and Sensitive (TES) Species

Blue Mountain Ranger District
Malheur National Forest

Prepared by: /s/ Ken Schuetz Date: 4/18/2005
Ken Schuetz
Wildlife Biologist

I. SUMMARY

Table 1--Threatened, endangered and sensitive (TES) species considered in the analysis of the Middle Fork John Day Rangeland Planning Draft Environmental Impact Statement (EIS) and the effects determination for the No Action and Action alternatives.

Species	Status	Occurrence	Alt. 1	Alt. 2	Alt. 3
Terrestrial Species					
Gray Wolf *Canis lupus*	E	HD/N	NE	NE	NE
Northern Bald Eagle *Hailaeetus leucocephalus*	T	HD/D	NE	NE	NE
North American Lynx *Lynx canadensis*	T	HN	NE	NLAA	NLAA
American Peregrine Falcon *Falco perigrinus anatum*	S	HD/S	NI	NI	NI
California Wolverine *Gulo gulo luteus*	S	HD/S	NI	MIIH	MIIH
Pygmy Rabbit *Brachylagus idahoensis*	S	HN/N	-----	-----	-----
Pacific Fisher *Martes pennanti*	S	HD/N	NI	NI	NI
Western Sage Grouse *Centrocercus urophasianus phaios*	S	HD/S	NI	MIIH	MIIH
Gray Flycatcher *Empidonax wrightii*	S	HD/S	NI	MIIH	MIIH
Bobolink *Dolichonyx oryzivorus*	S	HD/S	NI	MIIH	MIIH
Upland Sandpiper *Bartramia longicauda*	S	HN/N	-----	-----	-----
Tricolored Blackbird *Agelaius tricolor*	S	HN/N	-----	-----	-----
Bufflehead *Bucephala albeola*	S	HN/N	-----	-----	-----

Status

E	Federally Endangered
T	Federally Threatened
S	Sensitive species from Regional Forester's list
C	Candidate species under Endangered Species Act

Occurrence

HD	**Habitat Documented** or suspected within the project area or near enough to be impacted by project activities
HN	**Habitat Not** within the project area or affected by its activities
D	Species **Documented** in general vicinity of project activities
S	Species **Suspected** in general vicinity of project activities
N	Species **Not documented** and not suspected in general vicinity of project activities

Effects Determinations

Threatened and Endangered Species

NE	No Effect
NLAA	May Effect, Not Likely to Adversely Affect
LAA	May Effect, Likely to Adversely Affect
BE	Beneficial Effect

Sensitive Species

NI	No Impact
MIIH	May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species
WIFV	Will Impact Individuals or Habitat with a Consequence that the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species
BI	Beneficial Impact

II. INTRODUCTION

This Biological Evaluation (BE) analyzes the potential effects of the No Action and Action alternatives for the Middle Fork John Day Rangeland Planning Area on the Malheur National Forest. This BE satisfies the requirements of Forest Service Manual 2672.4 that requires the Forest Service to review all planned, funded, executed or permitted programs and activities for possible effects on proposed, endangered, threatened or sensitive species.

The following sources of information have been reviewed to determine which TES species, or their habitats, occur in the project area:

- Regional Forester's Sensitive Species List
- Forest or District sensitive species database(s) and the GIS mapping layer(s)
- Oregon Natural Heritage Program, Rare, Threatened and Endangered Plants and Animals of Oregon
- Project area maps and aerial photos.

III. PROJECT DESCRIPTION

See Chapter 1 of the Middle Fork John Day Rangeland Planning Draft Environmental Impact Statement (FEIS) for a complete description of the project area and Chapter 2 for alternative descriptions, design criteria and mitigation. See Appendix J of the FEIS for the list of the past, ongoing and reasonably foreseeable future projects; all activities on this list have been considered in the cumulative effects analyses for each species in this Biological Evaluation.

IV. EFFECTS ANALYSIS

A. Terrestrial Species

The Middle Fork John Day Rangeland Planning area was evaluated to determine which TES species might occur based on the presence of probable habitat types, known sightings and the biological requirements of each species involved.

A.1. Listed Species

Gray Wolf (Canis Lupis)

Status

Federal Status: Endangered
USDA-Forest Service (Region 6) Status: Endangered
State Status: Endangered (last revised 12/1998) (ODFW 2000)
Oregon Natural Heritage Program Status: List 2-extirpated (ONHP 2001)

Major Threats

Human-caused mortality is the major factor limiting the recovery of wolves with the majority of losses due to shooting, trapping and vehicle accidents. In addition, wolves, particularly juveniles, are susceptible to canine parvovirus and distemper.

Roads negatively affect this species by increasing human presence in wolf habitat and increasing the likelihood of negative contacts. A disproportionate number of human-caused mortalities occur near roads. These mortalities are mostly legal and illegal shooting resulting from human access provided by roads. Vehicle collisions account for additional mortalities.

Thurber and others (1994) cite three studies (Jensen and others 1986, Mech 1988, Thiel 1985) indicating wolf packs would not persist where road densities exceeded about 1.0 mi/mi^2 (Wisdom et al. 2000).

Population Status and Trend

In 2000, the gray wolf was added to the threatened and endangered species list for the Forest by the US Fish and Wildlife Service. The Service's rationale for including the species on the list is two-fold. First, Forest lands fall within the historic range of the gray wolf. The second reason for listing is that there has been documented sightings of wolves from Central Idaho's experimental, non-essential population and were tracked in the past years, in various locations in northeastern Oregon, indicating that there is suitable habitat in the area. Currently there are populations of gray wolves establishing in Idaho and Montana. There are no known wolf packs in Oregon but dispersing wolves could establish in remote areas within the State.

The gray wolf once ranged across nearly all of North American continent. During colonization of North America wolves were persecuted by European settlers to the point of extirpation in many states. Effective government eradication programs continued the extermination of wolves in the West. By the 1930’s wolves were extirpated from all of the lower 48 states except Minnesota (Mack and Laudon 1998). Most of the eradication was due to conflicts between the carnivores and livestock. Many programs were initiated to extirpate wolves, grizzly bears and mountain lions out of areas that were used for livestock grazing (Kauffman 1996).

Historically, wolves occupied a broad spectrum of habitats including grasslands, sagebrush steppe, coniferous and mixed forests, and alpine areas. Wolves are limited by prey availability and are threatened by negative interactions with humans (i.e. shooting, trapping). Generally, land management activities are compatible with wolf protection and recovery, although there have been conflicts between wolves and livestock grazing in other states (Idaho and Montana). Habitat and disturbance effects are of concern only in denning and rendezvous areas. In other areas where wolves are present, few land management actions have been determined to have an effect on wolves, and the Forest Service and BLM's role in wolf protection has been focused on cooperating with the Service in public education about the species ecology and their legal protection.

Source Habitat Trend

Source habitats span a broad elevational range and include all terrestrial community groups except exotic herblands and agriculture (Wisdom et al. 2000).

Source habitats for gray wolf likely occurred throughout the basin historically. The current extent of habitat, albeit largely unoccupied, is similar to the historic distribution except for the Columbia Plateau, Lower Clark Fork, and Upper Clark Forks Ecological Reporting Units (ERUs), where habitat is more patchily distributed that it was historically. The overall trend in source habitats across the basin was neutral.

Existing Condition

Historically, wolves occupied all habitats on this Forest (Wisdom et al. 2000), but are currently considered extirpated.

In 1999, one female radio-collared wolf (B-45-F) from the experimental, non-essential Idaho population traveled to the Malheur National Forest and was trapped and returned to Idaho. This wolf was in the vicinity of the Upper Middle Fork Watershed. During the fall of 2000, a male wolf was killed on Interstate 84 near Baker City, Oregon. This indicates that wolves can and will travel to Oregon and the Malheur National Forest. It is very probable that dispersing wolves will eventually establish breeding territories in Oregon and possibly on the Malheur National Forest.

<u>All Alternatives</u>

Direct, Indirect and Cumulative Effects

Livestock grazing and management would not have any direct or indirect effects on gray wolves or their habitat. No cumulative effects from these alternatives or other projects are expected due to the reasons listed in the previous section. Currently there are no wolf populations in Oregon.

Determination

At this time, the determination for almost all project activities on the Malheur National Forest is **NO EFFECT (NE)** for the following reasons:

- No populations currently occupy the Malheur National Forest.
- No denning or rendezvous sites have been identified on the Malheur National Forest.
- There is an abundance of prey on the forest, therefore prey availability is not a limiting factor.

Bald Eagle (Haliaetus leucocephalus)

Status

Federal Status: Threatened (list 1-7-00-SP-588).
USDA-Forest Service (Region 6) Status: Threatened (USFS 2000)

State Status: Threatened (last revised 12/1998) (ODFW 2000)
Oregon Natural Heritage Program Status: List 1 (ONHP 2001)

Biology and Ecology

Bald eagles prey largely on fish and, to a lesser extent, waterfowl and are usually associated with rivers or lakes. Habitat includes clean water with abundant fish and/or waterfowl populations, and large, wolfy perch trees and roost sites nearby. In the Pacific Northwest, bald eagle nests are usually in multistoried, predominantly coniferous stands with old growth components near water bodies which support adequate food supply (USFWS 1986). They usually nest in the same territories each year and often use the same nest repeatedly which can result in very large nest structures, 2-3 feet deep and up to 5 feet in diameter. They will use alternate nests. Nest trees have stout upper branches to support the nest structure and usually provide an unobstructed view of an associated water body. Most nests in Oregon have been within 1/2 mile of water.

On the Malheur National Forest, bald eagles congregate at winter roost sites during the late fall, winter, and early spring. They scavenge in agricultural valleys and wetlands, feeding primarily on carrion normally found in areas of cattle concentration and birthing, or where ranchers dispose of dead animals. They roost at night in mature forest stands that provide a microclimate that helps protect them from cold weather and wind. Bald eagles roost and feed in Bear Valley, along the South Fork John Day River, Middle Fork John Day River, and the main John Day River. Bald eagles have been sighted on or near the Blue Mountain Ranger District in each month, but not every month for every year since 1990; and peak use is November to March.

Bald eagles have been sighted along the Middle Fork of the John Day River and probably forage there during the winter as long as carrion is present and available. Temporary winter roosts are possible within the project area but none have been documented. In 2001, wildlife biologists identified the first suspected bald eagle nest to be located on the Blue Mountain Ranger District. The nest was identified in the western portion of the project area immediately upslope form the Middle Fork John Day River. It is believed the nest failed to fledge young. The nest has been monitored annually since 1991, but no bald eagles have been observed using the nest. No conclusions can be drawn at this time whether or not the site is a legitimate eagle nest location, but annual monitoring will continue.

There are no bald eagles or critical habitat necessary for their recovery within the project area. According to the Pacific Bald Eagle Recovery Plan (USFWS 1986), key areas nearest the project area occur as winter roost sites along the John Day River.

Alternative 1 - No Action Alternative

Direct, Indirect and Cumulative Effects

Under the No Action Alternative, there would be no new management activities; therefore, there should be no direct, indirect or cumulative effects to bald eagles or their habitat.

Determination

Due to the nature of the no action alternative, there would be **NO EFFECT (NE).**

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Direct, Indirect and Cumulative Effects

Livestock management and use would occur in the project area from the spring through fall. A this time, bald eagle presence in the area is believed to be transitory in nature and livestock grazing would not be expected to have any direct or indirect effects on bald eagles. It is still questionable whether the known nest site is actually a bald eagle nest site; the site will be monitored annually for nest activity. Since nesting and roosting sites are speculative at best, no cumulative effects to bald eagles from this project would be expected.

Determination

There would be **NO EFFECT (NE)** to bald eagles or critical habitat by implementing livestock grazing. Livestock grazing would not be anticipated to alter current use or reduce habitat for bald eagles.

Canada lynx

Status

Federal Status: Threatened (list 1-7-00-SP-588).
USDA-Forest Service (Region 6) Status: Threatened
State Status: Endangered (last revised 12/1998) (ODFW 2000)
Oregon Natural Heritage Program Status: List 2

Major Threats

The Canada lynx has a large range in northern North America, particularly in Alaska and Canada. Declines have occurred in some populations, but are apparently still widespread and relatively abundant in most of the historic range, though population data are lacking for many areas. Lynx distribution at southern latitudes, including mountainous regions in Northeast Oregon, represent the occupation of marginally suitable habitat that decreases in quality and availability as one continues to move southward.

Habitat loss, fragmentation and susceptibility to overharvest (trapping) are major concerns across the lynx's range (TNC 1999). Factors contributing to these concerns include; forest management activities, fire suppression, landscape level catastrophic wildfire, roads, developments that destroy habitat, grazing, predator control and trapping, competition with other predators, and human disturbances (winter recreation off-highway travel and highways) that displace lynx from their habitat (Wisdom et al. 2000, TNC 1999, and Witmer et al. 1998).

Population Status and Trend

Empirical data for distribution within the Interior Columbia River Basin are scarce, and data on abundance of lynx populations are not available. McKevley and others (1999) recently summarized all known lynx locations in the United Sates, which provides a framework for designing and conducting future surveys and demographic studies of lynx populations (Wisdom et al. 2000).

Source Habitat Trend

Basin-wide, source habitat was projected to have increased moderately or strongly in 47 percent of the watersheds. The Blue Mountains Ecological Reporting Unit (ERU) has undergone a positive absolute (+26.93%) and relative (>100.00%) change in source habitat availability (moderate or strong increases in more than 50 percent of the watersheds). An increase in Blue Mountains source (denning) habitat was most influenced by an increase in mid- and late-seral montane forest and mid-seral subalpine forests (Wisdom et al. 2000).

Biology and Ecology

Lynx are typically associated with large tracts of high elevation boreal forests where their physical adaptations of long legs and broad paws allow them to negotiate deep snow and effectively hunt their principal prey, the snowshoe hare (Lepus americanus). Lynx require a mix of late and early seral habitats to meet their cover and food needs. Mature forests provide the lynx with denning space and hiding cover, while early seral habitats provide a prey base (Koehler 1990). Intermediate successional stages may serve as travel cover, but function primarily to provide connectivity within a forested landscape. Home range size varies considerably and is usually dependent upon prey availability. Typical home range territories are 45-155 mi2 (Ruggiero 1994).

Lynx denning habitat is characterized as having large woody debris that provides security and thermal cover and mature overstory canopies. These elements combine to provide both vertical and horizontal structural diversity (Ruggiero 1994). Habitat quality, as measured by the availability of alternate den sites, appears to be an important factor in kitten survival when disturbance occurs. Primary denning sites are often in large hollow logs, beneath windfall or upturned roots, or in brush piles in dense thickets (Brittell et al. 1989). Lynx den sites are in forests with a high density of downfall logs in patches scattered over 5-10 acres (>40 logs per 40 yards [46 m] lying 1 to 4 feet [0.3-1.3 m] above the ground) (Koehler 1990). Pockets of dense forest must be interspersed with prey habitat. Pockets of late and old forest, at least 5-10 acres (2-4 ha), should be left for denning sites. Management units should be designed to provide travel corridors, especially along ridges and saddles, as lynx are more likely to use these areas.

Lynx primarily prey on snowshoe hare (Lepus americanus). Their diet also includes squirrels (Tamiasciurus spp.), ducks (Anas spp), and upland game birds; especially grouse (Dendrogapus spp). Preferred foraging habitat is found in early to mid-successional, densely stocked, mixed conifer forests that support plentiful populations of snowshoe hare for hunting (Ruggiero 1994). Good hare habitat is provided by stands with a high stem and lower bough density (approximately 2,400 to 13,000 stems and boughs per acre) on trees that are small (less than 4-inch dbh with 1-inch diameter stems and boughs preferred) but above snow level. Lynx populations usually fluctuate in a cycle with snowshoe hare populations, peaking about every 9 to 10 years. Because of these volatile swings, their populations became very low about every 10 years. Therefore, they can be rare in any one given area at these times.

Deep snow and cold temperatures are often associated with lynx habitat. Other predators, such as the wolverine, may need to migrate to lower elevations under these conditions in order to follow their food source. Lynx, however, remain and thrive under these conditions due to their physical adaptations to low temperatures, deep snow and ability to successfully hunt the snowshoe hare.

Because lynx populations fluctuate with snowshoe hare populations, events that create snowshoe hare cover and forage generally benefit lynx (Koehler and Brittell 1990). These events might have negative short-term effects by eliminating denning habitat. However, as forest succession progresses after a disturbance, such as fire, insect outbreak, or logging, stands transition from non-habitat to forage and then to denning habitat. A certain level of dynamic cycling it seems is essential for maintaining optimal habitat.

Travel corridors provide security during movement from denning areas to foraging areas and during dispersal. Cover that is generally greater than 8 feet tall with stem densities in excess of 180 trees per acre allows for movement of lynx within their home ranges (Koehler 1990). Riparian corridors, forested ridges, and saddles appear to be favored travel ways. Lynx avoid large openings (> 300 feet from cover) that have the potential to disrupt movement between isolated populations (Ruggiero 1994).

Lynx can be managed by managing for their prey. Snowshoe hare populations increase dramatically following disturbance, particularly fire. However, snowshoe hare recolonization may not occur until 6 to 7 years following logging, and that snowshoe hare densities may not reach their maximum for another 20 to 25 years (Koehler and Brittell 1990). This depends on site conditions and type of treatment. As stands become older (about 20 to 30 years old), their benefits to snowshoe hare decrease.

Distribution

The geographic range of lynx includes all of Alaska and Canada (except the northeastern parts of Northwest Territories) and the United States south to a line from southern Oregon to southern Colorado, southern Iowa, southern Indiana and southern Maryland (Verts and Carraway 1998). Lynx are considered to have historically resided in 16 of the contiguous United States (Maine, New Hampshire, Vermont, New York, Massachusetts, Pennsylvania, Michigan, Wisconsin, Minnesota, Washington, Oregon, Idaho, Montana, Wyoming, Utah, and Colorado) based on historical observations, trapping records, and other documented evidence. The occurrence of lynx in most of the contiguous United States is likely the result of transient dispersal during declines in population density of their primary prey, snowshoe hares (Ruediger et al 2000).

Oregon Distribution

Oregon is considered to be at the southern fringe of the lynx's range, and animal density and habitat use are expected to differ from further north where habitat is considered more suitable. The lynx has always been rare in Oregon.

In Oregon, there are twelve verified records of lynx documented between 1897-1993, six of which were taken from the Blue Mountains (Ruggiero et al 1999, Verts and Carraway 1998). Of these 12 known specimens, one each was collected in 1897, 1964, 1974, and 1993, 2 in 1920, and 3 each in 1916 and 1927. Three of the six specimens taken in the Blue Mountains were collected near the town of Granite, over 40 miles northeast of the project area. The remaining six specimens were taken from the Wallowa Mountains, the Cascade Mountains, the Willamette Valley, the Stinkingwater Mountains and the Steens Mountains.

Peaks in density of lynx populations in Alaska reportedly occurred in 1916-1918, 1926-1928, 1963-1966, and 1974-1975 (Ruediger et al 2000). Peak periods somewhat correlate to collections made in Oregon. Verts and Carraway (1998) suggest that lynx occurrence in Oregon may be dispersers from occupied areas farther north that immigrate into the area and persist for a short time.

Local Surveys

Surveys using a hair sampling protocol that targets lynx were conducted on the Malheur National Forest in 1999, 2000 and 2001. The data did not determine lynx presence. In the early 1990's, winter track and camera station surveys were conducted on the Malheur National Forest to inventory forest carnivores, but no lynx were detected.

Recent unconfirmed lynx sightings have been reported along the Middle Fork of the John Day River, Blue Mountain Ranger District, and in the Reynolds Creek Subwatershed, Prairie City Ranger District.

Based on the limited available information, the Fish and Wildlife Service cannot substantiate the historic or current presence of a resident lynx population in Oregon (USFWS 2000). Verts and Carraway (1998) conclude that there is no evidence of self-maintaining populations in Oregon and USDI (1997) considered lynx "extirpated" from Oregon. Additional surveys and research are warranted before lynx are considered as having self-maintaining populations in Oregon.

Local Habitat

Potential habitat on the Malheur National Forest is defined as stands above 5,000 feet that are subalpine fir, lodgepole pine, Engelmann spruce, or moist grand fir types. Biophysical environments are considered cold/dry, cool/moist or cool/wet. Subalpine fir, Engelmann spruce and lodgepole pine plant associations are considered primary habitat. Grand fir types in the cool/moist and cool/wet biophysical environments provide habitat only in conjunction with the primary types and are considered secondary habitat.

Lynx require a mix of early and late seral habitats to meet their food and cover needs. Early seral habitats provide the lynx with a prey base, while mature forests provide denning space and hiding cover (Koehler 1990). Pockets of dense forest must be interspersed with prey. Lynx den sites are in forests with a high density of downfall logs in patches scattered over 5-10 acres (>40 logs per 40 yards [46 m] lying 1 to 4 feet [0.3-1.3 m] above the ground) (Koehler 1990). Favored travel ways within and between habitat areas include riparian corridors, forested ridges, and saddles.

To ensure that lynx have habitat for movement and dispersal, a network of corridors that are at least 400 feet wide and that interconnect late and old structural stage stands will be maintained. The goal is to provide movement and dispersal habitat while managing the forest within a historic range of variability. The Forest Plan requires that within these corridors, canopy closure be maintained in the upper 1/3 of site capability. This standard does not necessarily meet lynx needs because it applies to overhead cover, measured above about 5 feet, rather than horizontal cover near the ground that is more important to lynx. Nevertheless, these2 corridors tend to have more trees and provide better lynx hiding cover than surrounding stands, even in the warm-dry and hot-dry biophysical environments. They offer the best options for lynx dispersal and movement.

Lynx Analysis Units (LAUs)

Lynx Analysis Units (LAUs) are areas delineated for management of habitat characteristics and implementation of Project Design Criteria (PDC's) necessary for the lynx to complete its life cycle. An LAU contains lands capable of producing the necessary lynx components: denning and foraging habitat. LAUs encompass both suitable lynx habitat and unsuitable areas. Habitat may or may not be currently in suitable conditions for denning or foraging habitat.

LAUs are not designed to represent the actual home range of a lynx. Rather, LAUs are intended to provide the fundamental or smallest scale which to begin evaluation and monitoring of the effects of management actions on lynx habitat. Conservation measures listed in the LCAS will generally apply only to lynx habitat on federal lands within LAU's.

Three LAU's have been designated on the Malheur National Forest. The Middle Fork John Day Rangeland Planning Area contains the entire Indian Rock LAU and a small portion of the Glacier LAU. The Indian Rock LAU is located in and around the Vinegar Hill-Indian Rock Scenic Area and Jump Off Joe Wildlife Emphasis Area; 55% of the LAU (19,201 of the 34,644 acres) is classified as lynx habitat. The Glacier LAU is located at the southeast corner of the project area; about 2,000 acres, or less than 2%, of the LAU is in the project area, and only 80 acres classifies as lynx habitat, so further discussion will focus on the Indian Rock LAU.

Lynx Denning, Foraging, and Unsuitable Habitat

Lynx habitat was classified as denning, foraging, or unsuitable using remote sensing data and field reconnaissance.

Lynx habitat classification in Indian Rock LAU - denning, foraging, unsuitable, and created unsuitable habitat by acres and percent of total lynx habitat.

Habitat Element	Existing Condition	
	Acres	% Habitat
Denning	5,320	28%
Forage	4,895	25%
Unsuitable[1]	8,297	43%
Created Unsuitable[2]	685[2]	4%[2]
Unclassified	3	0%
Total[3]	19,201[3]	100%[3]

[1]*Unsuitable* = habitat made unsuitable by management activities, such as timber harvest, within the last ***15*** years *or* habitat made unsuitable by natural disturbances such as wildfire or wind throw regardless of when the disturbance occurred.

[2]*Created Unsuitable* = a subset of "unsuitable" and refers to lynx habitat made unsuitable by management activities within the last ***10*** years. The 685acres of "created unsuitable" habitat displayed above are not included in the 8,297 acres of "unsuitable" habitat.

[3]*Total acres* = denning + forage + unsuitable + created unsuitable = 19,201 acres.

Denning habitat comprises 28% of total lynx habitat, and typically occurs in stands where mature trees and multiple canopy layers are present. The number of down logs tends to be higher in these stands than in younger stands. Down logs of the density to provide good denning habitat occur infrequently, but are believed to occupy at least 10% of the total denning habitat. During past field reconnaissance, areas of sufficient downed logs have been identified, but not recorded or mapped. In the eastern portion of the LAU, in Vincent and Vinegar Creeks, a windstorm impacted approximately 1,400 acres. This area has sufficient down material for denning habitat, but lacks the overstory because almost all overstory trees were blown down. Although some stands may lack the down wood necessary to provide a den, most other important structural characteristics are intact.

Foraging habitat comprises 26% of total lynx habitat. In this LAU, normal snow depths are 2-4 feet at elevations above 5,000 feet. The quality of forage habitat is unknown throughout most of the LAU.

Denning and foraging habitats are typically interspersed. Habitat has been fragmented by natural disturbances, such as wildfire and wind throw, as well as human-related disturbances, such as timber harvest.

Approximately 43% of total lynx habitat is currently classified as "unsuitable" mostly due to the Summit wildfire that occurred during the summer of 1996. These stands currently do not have the necessary vegetation and/or down logs to support lynx for either denning or foraging. "Created unsuitable" is a subset of "unsuitable" and refers to lynx habitat made unsuitable by management activities within the last ***10*** years. In the Indian Rock LAU, approximately 4% of the habitat is classified as "created unsuitable."

The fire area was seeded and planted, and natural in-growth is high as well. In particular, lodgepole pine is seeding in aggressively over much of the fire area. In the next 10 to 15 years, in the absence of another stand replacing event, much of the unsuitable habitat will develop into foraging habitat.

Grasslands, Shrublands, Meadows

Grass, shrub, and non-forest plant communities occupy ridge tops with sparse soil, valley bottoms with deep soils, and small openings within ponderosa pine and western juniper stands. Historically, dry-land bunchgrasses, primarily fescue-wheatgrass plant associations, dominated these sites. Past grazing has degraded many of these sites, and they now also support introduced grasses, such as cheatgrass and *Ventenata*, and native "increaser" species, such as cluster tarweed, that indicate site degradation.

Low and stiff sagebrush shrub communities occur in thinner soiled areas intermixed with the hot/dry and warm/dry forests in the lower elevation of the watershed. Alpine sagebrush/elk sedge communities occur along open higher elevation slopes along the northern boundary of the watershed. Young mountain mahogany shrubs are present and often heavily browsed by big-game animals. Regeneration and recruitment of new bitterbrush is almost non-existent, and its decline can also be attributed to heavy browsing.

The numerous wet meadows, from one quarter to over 15 acres, are some of the most productive areas for livestock and wildlife forage. Native grasses, sedges, and rushes dominate many of these meadows, and other native species, such as blue camas and iris, are common. Other wet meadows have significant amounts of Kentucky bluegrass, a non-native species, in addition to native sedges and rushes. Although these meadows have not yet reached their full biotic potential, long-term range plots and professional observation by rangeland managers indicate a general upward trend in the vegetative and soil conditions throughout the LAU.

Riparian Vegetation

The riparian vegetation in the LAU is cool-moist and conifer dominated with interspersed moist meadow communities in the upper stream reaches; mixed-conifer/hardwood types in the middle elevation; and grass/sedge dominated communities in the lower elevation. At higher elevations, conifer-dominated reaches have diverse mixes of conifers with increasing proportions of Engelmann spruce and subalpine fir. Hardwoods, primarily alder, are generally limited to natural or created openings in the canopy in these upper reaches. Mid-elevation reaches currently show the effects of historical harvest, livestock grazing, and poor road location. Large diameter conifers are lacking in most accessible reaches. Hardwoods, especially alder, willow, dogwood, and occasionally cottonwood and aspen trees, increase in these reaches. Hardwoods often are of low vigor due to excessive browsing and lack of natural disturbances, such as fire or beaver, stimulating reproduction.

Streamside roads limit the vegetative potential along many streams by occupying significant portions of the historical floodplains. Examples include: Placer Gulch, Granite Boulder, Vincent, Vinegar, Butte, and Davis Creeks. Roads in or near riparian areas reduce the amount of trees available for recruitment of large woody debris.

Livestock Grazing

Grazing has had a major influence on the Indian Rock LAU. Cattle and thousands of sheep grazed the watershed in the late 1860's until the 1960's in a continuous-seasons grazing regime. However, since the 1940's, cattle have dominated. All or portions the Lower Middle Fork and Upper Middle Fork Allotments are within the LAU and are managed by the Malheur National Forest. A small portion of the Sullens Allotment is in the Glacier LAU.

LAU, grazing allotment names, allotment acres within the LAU, the number of cow/calf pairs, and the season of use within the LAU.

LAU	Grazing Allotments	Acres	Cow/calf pairs[1]	Dates of use
Indian Rock	Lower Middle Fork	24,097	549	6/1 – 10/31

Indian Rock	Upper Middle Fork	10,198	485	6/1 – 10/15
Glacier	Sullens	1,970	241	6/16 – 10/15
[1] Entire allotments are not necessarily contained within the LAU. Cow/calf pairs are total numbers permitted by allotment and not necessarily using any part of the allotment at any given time.				

Livestock and big game grazing and browsing has the potential to adversely affect summer foraging habitat for the snowshoe hare, and thus, lynx. Snowshoe hare rely heavily upon woody stems for forage and will feed upon willow, alder, aspen, snowberry, huckleberry, and other hardwood plant species. Domestic and wild ungulates are known to browse, sometimes heavily, on these plant species as well. Limited information from range monitoring reports indicates an improving trend in allotment conditions, including the condition of the hardwood habitats. However, many of the more palatable hardwoods, such as alder, willow, and aspen, are in poor condition and in some areas may not provide for the needs of snowshoe hares.

Open Road Density and Disturbance

Highway 20 is located in a major valley bottom and consequently does not fragment lynx denning or foraging habitat located at higher elevations. Maintenance Level 3, 2 and 1 roads do fragment habitat and road use does have the potential to disturb lynx and other wildlife. Although an activity might not occur in lynx habitat, the activity may be accessed by a road within or adjacent to lynx habitat. Summer road use through lynx denning habitat during the denning season could negatively affect lynx if the disturbance forces them to move kittens. Otherwise lynx do not appear to avoid roads except at high traffic volumes (Ruediger et al. 2000).

Lynx are more vulnerable to human-caused mortality near wide, open roads with high traffic volume. There is a general correlation between maintenance level and expected traffic volume. Highway roads typically experience the highest traffic volumes and M/L 1 roads experience the lowest traffic volumes.

Roads within the Indian Rock LAU do not approach the traffic threshold (2000 vehicles per day) considered problematic to lynx. All roads in the LAU have low traffic levels. In 1997, the Grant County Road Department conducted vehicle counts on County Road 20 (not in the LAU), which occurs along the Middle Fork John Day River and is about 2 miles south of the LAU, and reported average daily use at 117 trips per day. Unfortunately, the vehicle count was not conducted during hunting season, the season of highest use, but it is estimated that average daily use might increase to 250+ trips per day during this season. Maintenance level 3 roads receive moderate to low use, and maintenance level 2 roads receive little to no use except from September to December during the fall hunting seasons.

Total open road density in the LAU is 2.14 miles per square mile, somewhat higher than the level of 2.0 miles per square mile recommended by Ruediger et al. (2000). In denning habitat, open road density is 1.06 miles per square mile. In foraging habitat, open road density is 2.64 miles per square. Road density in foraging habitat will always be somewhat higher because these areas are generally associated with harvest units.

Alternative 1 - No Action Alternative

Direct, Indirect and Cumulative Effects

There would be direct, indirect or cumulative effects to Canada lynx or potential home range or travel corridors by implementing the No Action alternative..

Determination

There would be **No Impact (NI)** to wolverine by implementing the No Action alternative.

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Direct and Indirect Effects

Livestock grazing has the potential to adversely affect summer foraging habitat for the snowshoe hare, and thus, lynx. Snowshoe hare rely heavily upon woody stems for forage and will feed upon willow, alder, aspen, snowberry, huckleberry, and other hardwood plant species. There could be some loss of vegetation in travel or connectivity corridors as well.

Effects would be considered minimal given appropriate livestock administration and utilization monitoring. Livestock management strategies in Alternatives 2 and 3 would be adjusted annually to ensure herbaceous and shrub utilization standards in the Forest Plan are met. Appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery. Proposed management strategies would promote better utilization of upland sites and decrease pressure in riparian areas. Better livestock distribution would help move vegetation towards desired conditions. Overall improvements to range condition would be anticipated.

Human disturbance related to livestock movement and infrastructure construction and repair might displace transient or dispersing lynx; however, risks are considered low. Any disturbances would be localized and of short duration.

Cumulative Effects

All of the effects in the Middle Fork John Day Rangeland Planning EIS, Appendix J – Cumulative Effects have been considered for their cumulative effects on lynx. Past adverse effects on denning, foraging and dispersal habitat have been primarily a result of timber harvest and road construction; in particular, the lower elevations of the project area have been highly managed.

The existing condition section describes the current percentages of denning, foraging and unsuitable habitat. The Summit Fire likely resulted in the greatest reduction in denning/foraging habitat in the last 15 years. The fire area was seeded and planted, and natural in-growth is high as well. In particular, lodgepole pine is seeding in heavily over much of the fire area. In the next 10 to 15 years, in the absence of another stand replacing event, much of the unsuitable habitat will develop into foraging habitat. Habitats are relatively well connected.

Total open road density in the LAU is 2.14 miles per square mile, somewhat higher than the level of 2.0 miles per square mile recommended by Ruediger et al. (2000).

The Crawford Vegetation Management Project, Balance Fuels and Thinning Project, and Easy Fire Salvage are being planned within the project area. These projects are not in any LAU, but harvest units may be in prescribed lynx plant associations. The number of acres is considered insufficient for lynx and what does exist is noncontiguous; therefore, these areas are not considered suitable for lynx to occupy. Harvest units/prescribed fire would be designed to maintain connective/dispersal habitat. If new road construction is required for these projects, roads would likely be closed upon completion of management activity.

Salvage logging under the Easy Fire could reduce future down logs for denning; again, this area is not considered ideal source habitat for lynx because of vegetation. Firewood cutting could also remove snags or down logs that could provide denning habitat; however, firewood cutting occurs along roads which tends to discourage lynx use.

Recent hardwood planting on about 25 miles of streams has helped increase shrubs in riparian areas, improving lynx dispersal and foraging habitat. Past aspen fencing projects in Summit and proposed aspen fencing in Blue will also help maintain hardwood habitats. Past livestock grazing reduced these habitats, but better grazing administration in recent years has begun to reverse those trends.

Large-scale wildfires have the potential to alter source habitat and connectivity habitat for lynx as well as habitat for its prey species. The precise effects of future wildfires would depend upon the magnitude, duration, and intensity of those fires. High intensity/low frequency fires are the historic fire regime for lynx source habitats; however, the same kind of fires are outside the historic range of variability for the Dry Forest types.

Tribal and private lands are at lower elevations along County Road 20; areas unlikely to support much lynx activity except for dispersing animals. Recent hardwood planting, riparian fencing, and improved grazing systems have all contributed to improved dispersal habitat.

Recreation use in the area is high, at least during the fall hunting seasons. This activity can directly disturb lynx. Hunting intensity tends to be greater at the lower elevations where open road densities are high, and less so in the upper elevations (source habitats for lynx) where open road density is low. One of the most significant recreation trends in recent years is the growth in use of motorized off-highway vehicles (OHVs). OHV users are increasingly attracted to parcels of public lands where access is readily available, this in turn concentrates the use of OHV and the potential disturbance associated with that use (Toweill & Thomas 2002).

Given appropriate grazing administration and utilization monitoring, livestock grazing would not be expected to contribute substantial negative effects to lynx, its prey of their habitats.

Determination

Actions proposed under the action alternatives **may effect individuals, but are not likely to adversely affect the continued existence of the Canada lynx.** Livestock grazing would reduce some vegetation, particularly grasses/forbs that some prey species use for cover and forage. There could be some loss of vegetation in travel or connectivity corridors as well. Effects would be considered minimal given appropriate grazing administration and utilization monitoring. Grazing would not impede natural rates of vegetation recovery. Human disturbance related to livestock movement and infrastructure construction and repair might displace individual animals; however, risks would be considered low. Disturbances would be localized and of short duration

A.2. Sensitive species

American Peregrine Falcon (Falco peregrinus)

Status

Federal Status: Species of Concern
USDA-Forest Service (Region 6) Status: Sensitive
State Status: Threatened (ODFW 2000)

Biology and Ecology

Peregrine falcons prefer a variety of open habitats near nesting cliffs or mountains (Snyder 1991). They usually inhabit areas near water, such as lakes, rivers, or oceans. Nest sites are often used for several years. They tend to choose overhanging cliffs with loose soil, sand, dead vegetation, or gravel, in which they can scrape a depression for their eggs. Peregrine falcons primarily eat birds. Secondary prey species include tree and ground squirrels, rabbits, various other small mammals (Snyder 1991).

The peregrine falcon's most destructive predator is man. Peregrine falcon populations in the United Sates were dramatically reduced by exposure to chlorinated hydrocarbon pesticides. These pesticides reduce eggshell thickness, thereby causing the eggs to break during incubation. These pesticides are now banned in the United States and Canada. The peregrine falcon has made a dramatic comeback in the past decade.

Existing Condition

Peregrine falcons have been observed in the project area with most sightings occurring at Coyote Bluffs and Ragged Rocks. Coyote Bluffs is located on cliffs adjacent to the Middle Fork of the John Day River; cliff characteristics and close proximity to County Road 20 probably make this site low potential for nesting. Ragged Rocks is located approximately on the southern boundary of the project area; this site has been identified as having good potential for falcon nesting. Both sites have been monitored since the late 1980s/early 1990s. Nesting peregrines have not been documented at either site. Nesting habitat also occurs about one mile north of the project area on the Umatilla National Forest; peregrines have been reported there, but nesting has not been documented.

<u>All Alternatives</u>

Direct, Indirect and Cumulative Effects

Peregrine falcon presence in the area appears to be transitory in nature; therefore, falcons would not likely be affected by livestock management. There would be no direct, indirect, or cumulative effects to falcons.

Determination

There would be **No Impact (NI)** to peregrine falcon by implementing any of the alternatives.

California wolverine (Gulo gulo luteus)

Status

Federal Status: Species of Concern (list 1-7-00-SP-588)
USDA-Forest Service (Region 6) Status: Sensitive
State Status: Threatened (ODFW 2000)
Oregon Natural Heritage Program Status: List 2 (ONHP 2001)

Major Threats

Status is not well known in many portions of the range and extirpated from most of its historic range in the contiguous 48 states. Wolverines are showing promising signs of semi-recovery in selected western states (TNC 1999).

Wolverine populations are suspected to be small, especially sensitive to disturbance, and vulnerable to local extinction (Ruggerio et al. 1994). Past decline in population may have been due primarily from fur trapping, but habitat alteration (e.g. agriculture, oil exploration, cattle grazing, rural settlement, timber harvest, road construction, and ski area development) and general human disturbance are contributing factors (TNC 1999, Witmer et al. 1998).

Population Status and Trend

Hash (1987) describes a contraction in the North American range of the wolverine beginning around 1840 with the onset of extensive exploration, fur trade, and settlement. State records suggest very low wolverine numbers in Montana, Idaho, Oregon, and Washington from the 1920s through 1950s, with increases in wolverine sightings since the 1960s (Banci 1994, Wisdom et al. 2000).

Source Habitat Trend

Basin-wide, source habitat was projected to have increased moderately or strongly in 56 percent of the watersheds. The Blue Mountains ERU has undergone a positive absolute (+27.46%) and relative (>100.00%) change in source habitat availability (moderate or strong increases in more than 50 percent of the watersheds). An increase in Blue Mountains source habitat was most influenced by an increase in mid- and late-seral montane community types (Wisdom et al. 2000).

Habitat

The wolverine occurs in a broad range of wilderness habitats (Verts and Carraway 1998). Source habitats for wolverines include alpine tundra and all subalpine and montane forests. Within the forest type, all structural stages except the closed stem exclusion stage provide source habitat (Wisdom et al. 2000). The impression that wolverines require high elevation habitat may be a result of remaining wolverine populations retreating to inaccessible, undeveloped areas, which are often at high elevations (Witmer et al. 1998).

Wolverines are solitary predators that range over vast and remote territories; consequently, they are difficult to study and to survey (Rausch and Pearson 1972). Most available research indicated that wolverines were strictly associated with secluded wilderness areas and that distribution is probably limited to upper montane and sub-alpine forest types. Some recent work suggests that although wolverines may frequent these two forest types during most of the year, during the winter they may follow migrating big game herds to lower elevation winter range (Wisdom et al. 2000, Ruggiero 1994). Big game is considered the wolverine's primary winter food source, and they often scavenge on winterkills.

In summer, wolverines use a variety of foods including small mammals, birds, carrion, and berries (Wisdom et al. 2000). Copeland (1996) found that carrion related food supplied 46 percent of wolverine diets in Idaho during both summer and winter. Banci (in the Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx, and Wolverine in the Western United States 1994) suggests that diversity of habitats and foods is important to wolverines.

Several special habitat features have been identified for wolverines. Natal dens in the western United States is generally located in subalpine basins in isolated talus fields surrounded by trees (Copeland 1996). There is also evidence that wolverine use down logs and hollow trees for denning and cavities in live trees may be used (Wisdom et al. 2000). Both talus and areas associated with large, fallen trees were used as maternal dens sites in Idaho (Copeland 1996).

Regardless of habitat type used, the critical component to suitable source habitat seems to be the absence of human activity or development (Hash 1987). High elevation wilderness and undisturbed backcountry refugia are still considered critical to the current welfare and viability of existing wolverine populations (Hornocker and Hash 1981).

Denning Habitat

A denning habitat model developed primarily by Jeff Copeland, Idaho Department of Fish and Game, was used to identify potential wolverine denning habitat on the Malheur National Forest. Utilizing PMR (Pacific Meridian Resources Company) data and ArcInfo base coverage, key habitat components were queried to produce a forest level coverage of potential denning habitat. Key elements included topographic relief with flat to concave curvature, slopes with north to northeast aspects, areas above 5,000-foot elevation, and rock or snow cover types.

The analysis identified large areas of potential denning habitat in the Strawberry Mountain Wilderness, Monument Rock Wilderness, and in some northern portions of the Malheur National Forest as well, likely the areas around Vinegar Hill-Indian Rock Scenic Area, Jump Off Joe Wildlife Emphasis Area and Dixie Butte Wildlife Emphasis Area.

Distribution

Wolverines once occupied the boreal zone across the northern part of the continent and southward into the mountains of Colorado and California. Bailey (1936) states that wolverine were thought to be rare in the United States, but probably were not yet extinct in the Cascades and Sierra Nevada's.

Wolverines were always rare in Oregon, although recent sightings, tracks, and collected remains document their continued presence at low densities in the state (Csuti et al. 1997). Current distribution appears to be restricted to isolated wilderness areas. Verts and Carraway (1998) believe that while there is a possibility of self-maintaining population of wolverine in the state, most animals seen or collected are likely dispersers from Washington and Idaho populations.

Numerous animals have been collected or sighted around the northwest. A query of the Oregon Natural Heritage database reveals that there are about 150 observations of wolverines in Oregon, with most occurring in the mountainous northeast (Baker, Grant, Umatilla, Union and Wallowa Counties) region (Edelmann and Copeland 1997).

Confirmed observations on Malheur National Forest and adjacent areas include:

- A partial skeleton and tufts of fir found near Canyon Mountain, Grant County (1992)
- Tracks and a probable denning site found in the Strawberry Mountain Wilderness (1997)
- Tracks in Monument Rock Wilderness (1997)
- Collection of an animal from Steens Mountain, Harney County, (1973)
- Hair and track collection on Snow Mountain Ranger District, Ochoco National Forest (1992)

Additional sightings of animals and tracks have occurred on the District, but none have been confirmed.

Existing Condition

In the Blue Mountains, source habitat for wolverine occurs primarily in wilderness and large roadless areas. Areas of low human impacts, low human disturbance, and high deer and elk concentrations are preferred. Within the project area, the Vinegar Hill-Indian Rock Scenic Area, Jump Off Joe Wildlife Emphasis Area and Dixie Butte Wildlife Emphasis Area exhibit these characteristics. Elsewhere on the District, the Strawberry Mountain Wilderness, Dry Cabin Wildlife Emphasis Area and the Shaketable, McClellan Mountain, and Aldrich Mountain Roadless Areas share these characteristics. The project area includes potential winter foraging habitat.

The Cold, Moist and Lodgepole Forest types represent the highest quality habitat, particularly where they remain relatively undeveloped and undisturbed. Quality habitat includes both the Old Forest Multiple Strata (OFMS) and Young Forest Multiple Strata (YFMS) structural stages. The Galena Watershed Analysis (USDA 1999) and Upper Middle Fork John Day Watershed Analysis (USDA 1998) indicate these watersheds are at or near their Historic Range of Variability (HRV) for OFMS and YFMS. The project area provides sufficient cover and security to meet landscape connectivity between potential home range areas.

It is likely that a wolverine could use the project area, particularly the large, unroaded areas associated with the Vinegar Hill-Indian Rock Scenic Area, Jump Off Joe Wildlife Emphasis Area and Dixie Butte Wildlife Emphasis Area.

Local Surveys

Periodically throughout the 1990s, wolverine surveys were conducted across the District, including areas in and near the project area. No wolverine tracks or individuals were found. A wolverine was confirmed from bones and fur found in the Strawberry Mountain Wilderness in 1992. Unconfirmed sightings of wolverine were reported in the project area near Dixie Mountain and to the northwest near Big Boulder Creek. Additional sightings of animals and tracks have occurred on the District, but none have been confirmed.

Alternative 1 - No Action Alternative

Direct, Indirect and Cumulative Effects

There would be direct, indirect or cumulative effects to wolverine or potential home range or travel corridors within the project area. All late OFMS and YFMS and connectivity habitat would remain as currently exists.

Determination

There would be **No Impact (NI)** to wolverine by implementing the no action alternative.

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Direct and Indirect Effects

Livestock grazing can have indirect adverse impacts on habitat for wolverines. Important habitat features such as travel corridors and cover patches may be affected if overgrazing occurs and results in loss of ground vegetation, particularly shrubs. In addition to big game, small prey animals such as ground squirrels, pocket gophers, and mice can be impacted from livestock grazing by a loss of vegetation (Fagerstone and Ramey 1995).

Wolverine life history ecology is closely tied to big game ecology; seasonal presence and movement patterns of wild ungulates can affect the species. Management recommendations by Banci (1994) suggest that management activities should incorporate strategies that improve the deer and elk forage base for wolverine, without significantly changing vegetation structure. The Middle Fork John Day Rangeland Planning EIS, Chapter 3, Big Game, describes the effects of livestock grazing on big game populations; conclusions are summarized here.

In the project area, livestock grazing would reduce some vegetation, particularly grasses/forbs that some prey species use for cover and forage. There could be some loss of vegetation in travel or connectivity corridors as well. Effects would be considered minimal given appropriate livestock administration and utilization monitoring. Livestock management strategies in Alternatives 2 and 3 would be adjusted annually to ensure herbaceous and shrub utilization standards in the Forest Plan are met. Appropriate utilization thresholds and move triggers would be established that allow near natural rates of vegetation recovery. Proposed management strategies would promote better utilization of upland sites and decrease pressure in riparian areas. Better livestock distribution would help move vegetation towards desired conditions.

ODFW biologists do not believe that current grazing systems are limiting the availability of forage for over-wintering big game (communication with ODFW biologists Darren Bruning and George Keister

2004). Implementation of grazing systems under Alternative 2 or 3 would maintain the current balance of forage between livestock and elk. As directed by the Forest Plan, livestock use in designated winter range would be monitored and adjusted to ensure that conflicts with big game do not arise. Monitoring points would be established to measure residual plant material before fall grazing concludes.

Overall improvements to range condition would be anticipated, and as a result, these improvements would be beneficial to deer and elk, and therefore could indirectly improve wolverine habitat as well. There would be some short-term movement of deer and elk relative to cattle and management activities, but grazing would not be expected to reduce big game populations. Human disturbance related to livestock movement and infrastructure construction and repair might displace transient or dispersing wolverine as well; however, disturbances would be localized and of short duration.

Cumulative Effects

All of the effects in the Middle Fork John Day Rangeland Planning EIS, Appendix J – Cumulative Effects have been considered for their cumulative effects on wolverines. Past adverse effects on foraging and dispersal habitat have been primarily a result of timber harvest and road construction; in particular, the lower elevations of the project area have been highly managed.

Activities that have cumulatively affected big game habitat and populations can also cumulatively affect wolverine (see Middle Fork John Day Rangeland Planning EIS, Chapter 3, Big Game Habitat, Cumulative Effects). The existing condition section of this report describes the conditions of cover, forage and open road density, and their effects on habitat effectiveness for big game. Habitat values reflect the effects of past management activities as well as natural events such as wildfire. Most of the project area is well above Forest Plan standards for big game cover; however, open road densities are high in many locations, particularly in winter range, potentially affecting deer and elk distribution, and therefore indirectly affecting wolverine. Forage quality and quantity is likely reduced compared to historic levels. Fire suppression has resulted in increased canopy cover and reduced growing conditions at the ground level and has eliminated fire as a forage rejuvenating agent.

The Crawford Vegetation Management and Balance Fuels and Thinning Projects are projected to have both positive and negative effects to wolverine and its prey. Positive effects include reducing canopy cover and increasing forage for deer and elk as well as ground cover for smaller, wolverine prey species. Although timber harvest can increase forage, it can also reduce the hiding cover provided by understory trees. New timber harvest and prescribed burning projects are being designed to retain a portion of the existing hiding cover. Salvage logging under the Easy Fire could reduce future down logs for denning; however, this area is not considered ideal source habitat for wolverine because of vegetation type and the intensively managed condition of the area. Firewood cutting could also remove snags or down logs that could provide future denning habitat; however, firewood cutting occurs along roads which tends to discourage wolverine use.

Recent hardwood planting on about 25 miles of streams has helped increase shrubs in riparian areas, improving wolverine dispersal and foraging habitat. Past aspen fencing projects in Summit and proposed aspen fencing in Blue will also help maintain hardwood habitats. Past livestock grazing reduced these habitats, but better grazing administration in recent years has begun to reverse those trends.

Large-scale wildfires have the potential to alter source habitat and connectivity habitat for wolverines as well as habitat for its prey species. The precise effects of future wildfires would depend upon the magnitude, duration, and intensity of those fires. High intensity/low frequency fires are the historic fire regime for wolverine source habitats; however, the same kinds of fires are outside the historic range of variability for the Dry Forest types.

Tribal and private lands are at lower elevations along County Road 20; areas unlikely to support much wolverine activity except for dispersing animals and possibly winter foraging habitat. Past timber harvest and road construction has reduced the quality of habitat for wolverine. Conversely, recent hardwood planting, riparian fencing, and improved grazing systems have all contributed to improved dispersal and foraging habitat.

Recreation use in the area is high, at least during the fall hunting seasons. This activity can directly disturb wolverine or disturb deer and elk populations, a major prey source. Hunting intensity tends to be greater at the lower elevations where open road densities are high, and less so in the upper elevations (source habitats for wolverine) where open road density is low. One of the most significant recreation trends in recent years is the growth in use of motorized off-highway vehicles (OHVs). OHV users are increasingly attracted to parcels of public lands where access is readily available, this in turn concentrates the use of OHV and the potential distrubance associated with that use (Toweill & Thomas 2002).

Given appropriate grazing administration and utilization monitoring, livestock grazing would not be expected to contribute substantially to overall negative effects to wolverines, its prey of their habitats.

Determination

Action alternatives **May Impact Individuals or Habitat (MIIH)**, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population. Livestock grazing would reduce some vegetation, particularly grasses/forbs that some prey species use for cover and forage. There could be some loss of vegetation in travel or connectivity corridors as well. Effects would be considered minimal given appropriate grazing administration and utilization monitoring. There would be some short-term movement of deer and elk relative to cattle movement and management activities, but grazing would not be expected to reduce big game populations. Human disturbance related to livestock movement and infrastructure construction and repair might displace transient or dispersing wolverine as well; however, disturbances would be localized and of short duration and risks would be considered low.

Pacific Fisher (Martes pennanti)

Status:

Federal – Species of concern
State - Sensitive
Region 6 - Sensitive

Biology and Ecology:

Authorship and citation for the following baseline data, unless indicated otherwise, is taken from http://www.livingbasin.com./endangered/Mammals/fisher.html

Fishers are medium sized carnivores that prey on a wide variety of foods including birds, rabbits, porcupines, and carrion. Distribution is likely governed by the availability of food but the presence of overhead cover may also be an important factor. Home range sizes of fishers vary up to 30 km2 (about 7,400 acres) for adult males. The range of one male will overlap those of more than one female, but home ranges within adult sexes are exclusive.

Fishers are found only in North America. Their current range is reduced from that which occurred prior to European settlement of the continent, but most of this reduction has occurred in the United States (Ruggiero et al. 1994). Fisher's range is in forested areas of central and southern Canada, south in the east to Wisconsin, Minnesota, Michigan, New York, and New England. In the west, they range south into northern Idaho, western Montana, Oregon, Washington, and the Sierra Nevada in California (Marshall 1996).

In Oregon, their range is the coastal range, Klamath Mountains, Cascade Range, and east to the Blue Mountains, and Gearhart Mountain or farther. They occur, or are likely to occur, in Baker, Clackamas, Coos, Curry, Deschutes, Douglas, Jackson, Josephine, Klamath, Lake, Lane, Linn, Tillamook, Union, and Wallowa counties. They formerly occurred in all forested counties (Marshall 1996). Parts of the Malheur National Forest are delineated to be within the fisher's range in Grant County, Oregon, according to the map found in Csuti et al. (1997).

Fishers use primarily coniferous or mixed-wood habitats. Optimum fisher habitat consists of a diversity of forest types and, therefore, greater prey abundance. Studies have shown a preference for forests dominated by multi-layered conifer stands, and in Idaho, they prefer mesic forest habitats (Witmer et al. 1998), but some hardwoods may be desirable for maximum prey numbers and diversity. A 70 to 80 percent canopy closure is believed optimum, but a California study showed a preference for 40 to 70 percent canopy cover areas. Fishers are known to inhabit second growth and even clearcuts after cover is established (Marshall 1996). It is not known whether the second growth and sparse overhead canopy habitats are used transiently or the basis of stable home ranges (Ruggiero et al. 1994). Large diameter trees with cavities, especially riparian cottonwoods in British Columbia, are important as natal den sites. Fishers move to larger cavities as the young grow. Dense forest stands in the latter successional stages provide the best quality habitat, particularly in western North America. Ruggiero et al. (1994) noted that fisher use riparian areas disproportionately more than their occurrence and exhibit a strong preference for habitats that have overhead tree cover.

In Ruggiero (1994) it has been hypothesized that the physical structure of the forest and prey associated with the structure are the critical features that explain fisher habitat use, not specific forest types. Forest structure needs to provide three important functions for fisher usage: 1) lead to a high diversity of dense prey populations, 2) lead to high vulnerability of prey to fisher, and 3) provide natal and maternal dens and resting sites.

Fishers are vulnerable to habitat loss through forestry, trapping, and hydroelectric development. Loss of habitat through the cutting of forests for timber or conversion to other land uses, over-trapping and the widespread use of poisons as a harvest and predator control method have also contributed to the reduction and extirpation of Fisher populations. Forest harvesting elsewhere also increases access for trappers, which is a particular concern because fishers are taken in marten sets. Marshall (1996) states that timber harvesting is not considered compatible with maintenance of maximum fisher numbers in most areas; and if severe, it will eliminate fishers. Degraded, destroyed, or fragmented habitat may result in isolated habitats that are too small to maintain viable fisher populations.

Existing Condition

Although habitat exists in the project area, fisher are not known or suspected to occur there. Fisher have been extirpated from much of their range due to trapping and loss of habitat due to logging (http://imnh.isu.edu/digital atlas/splash_navigate/pcmain.htm). They are considered extirpated from Oregon (Oregon Natural Heritage Program 2001).

The Cold, Moist and Lodgepole Forest Types represent the highest quality habitat, particularly where they remain relatively undeveloped and undisturbed. Quality habitat includes both the Old Forest Multiple Strata (OFMS) and Young Forest Multiple Strata (YFMS) structural stages. The Galena Watershed Analysis (USDA 1999) and Upper Middle Fork John Day Watershed Analysis (USDA 1998) indicate these watersheds are at or near their Historic Range of Variability (HRV) for OFMS and

YFMS. The project area provides sufficient cover and security to meet landscape connectivity between potential home range areas.

Alternative 1 - No Action Alternative

Direct, Indirect and Cumulative Effects

There would be direct, indirect or cumulative effects to fisher or potential home range or travel corridors within the project area. All late OFMS and YFMS and connectivity habitat would remain as currently exists. Although habitat exists in the project area, fisher are not known or suspected to occur there. The fisher is considered extirpated from Oregon (Oregon Natural Heritage Program 2001).

Determination

There would be **No Impact (NI)** to wolverine by implementing the no action alternative.

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Direct, Indirect and Cumulative Effects

Livestock grazing can have indirect adverse impacts on habitat for fisher. Habitat features such as travel corridors and cover patches may be affected if overgrazing occurs and results in loss of ground vegetation, particularly shrubs. In addition to big game, small prey animals such as ground squirrels, pocket gophers, and mice can be impacted from livestock grazing by a loss of vegetation (Fagerstone and Ramey 1995).

Because fishers are not known or suspected to occur in the project area and because they are considered extirpated in Oregon, such minor effects to habitat are considered inconsequential. No direct, indirect or cumulative effects would be expected. .

Determination

There would be **No Impact (NI)** to pacific fisher by implementing livestock grazing. Although habitat exists in the project area, fisher are not known or suspected to occur there. The fisher is considered extirpated from Oregon (Oregon Natural Heritage Program 2001).

Western Sage Grouse (Centrocercus urophasianus phaios)

Status

Federal Status: Species of Concern (list 1-7-00-SP-588)
USDA-Forest Service (Region 6) Status: Sensitive (USFS 2000)
State Status: N/A

Major Threats

Conversion of sagebrush cover types to agricultural lands and conversion of shrub-steppe vegetation to exotic forbs and annual grasses (Wisdom et al. 2000) have drastically reduced or altered the availability of this species' habitat. In southeastern Oregon over 2,760 square miles of federally administered lands have been modified to the detriment of sage grouse (Willis et al. 1993). Predation and livestock grazing also contribute to the decline of sage grouse numbers.

Population Status and Trend

Prior to the 1950s, estimates of abundance were anecdotal, and historical population levels are unknown (NatureServe Explorer 2002). Early accounts, however, suggest that this species was once widespread and abundant in many areas of the West. There are reports of sage grouse at times blackening the sky and being shot by the wagon-load (NatureServe Explorer 2002). Declines began with livestock overgrazing of western rangelands aggravated by over harvesting and periods of drought. By the 1920s and 1930s sage grouse were thought to be declining throughout their range (NatureServe Explorer 2002). Population declines have continued to present day with accumulating loss and degradation of sagebrush habitats.

Wisdom et al. (2000) reports that sage grouse populations have shown significant, steep declines since the 1940s in Idaho, Oregon and Washington. The rates of decline in Idaho, Oregon, and Washington are not significantly different, suggesting common, widespread factors affecting these populations. In Oregon, long-term population declines have averaged 30 percent since 1950 (Interagency Interdisciplinary Sage Grouse Planning Team 2000). Braun (1998 in NatureServe Explorer 2002) estimates a current total of fewer than 142,000 grouse range-wide, and population levels fewer than 20,000 in Montana, Oregon and Wyoming.

A complicating factor is that sage grouse in this geographic area may exhibit population cycles with a periodicity of around 10 years. Apparent trends over short periods should be regarded with caution. Nonetheless, trends for populations in Colorado, for example, reveal that each population peak has been lower than the last. There have been no sustained population increases in any part of the range (NatureServe Explorer 2002).

Source Habitat Trend

The current extent of habitat is similar to the historic distribution, although the abundance of habitat has changed in some areas. Basin-wide, nearly 48 percent of the watersheds showed a moderate or strongly declining trend in habitat, and declines exceeded increases in every ERU. The Blue Mountains ERU has undergone a negative absolute (-11.73% and -12.70%) and relative (-30.14% and -32.78%) change in winter and summer source habitat availability (Wisdom et al. 2000).

Habitat

Sage grouse are obligate residents of sagebrush habitat, usually inhabiting sagebrush-grassland or juniper-sagebrush-grassland communities. Throughout their range habitats used includes a wide variety of sagebrush mosaic habitats (Schroeder et al. 1999), including:

- tall sagebrush types such as big sagebrush, three-tip sagebrush (*A. tripartita*), and silver sagebrush (*A. cana*);
- low sagebrush types, such as low sagebrush (*Artemesia arbuscula*) and black sagebrush (*A. nova*);
- mixes of low and tall sagebrush with abundant forbs;
- riparian and wet meadows;
- steppe dominated by native forbs and bunchgrasses;
- scrub-willow (*Salix* spp.)
- sagebrush/woodland mixes with juniper (*Juniperus* spp.), ponderosa pine (*Pinus ponderosa*),or quaking aspen (*Populus tremuloides*).

In southeastern Oregon, the most widely used vegetation type throughout the year is forb-rich sagebrush types with low stature sagebrush, and mosaics of low and high stature sagebrush (Willis et al. 1993). Vegetation types of low stature primarily include low sagebrush (A. longiloba), although black sagebrush, stiff sagebrush (A. rigida), and three-tipped sagebrush may be used. Wyoming big sagebrush (A. t. var wyomingensis) and mountain big sagebrush (A. t. var vaseyana) are the primary species of high stature used in mosaic form with low sagebrush in Oregon. Neither expansive dense sagebrush nor expansive open areas constitute optimal sage grouse habitat.

Sage grouse use sagebrush of different age classes and stand structures for lek (courtship display), nesting, brood rearing, and wintering. During the mating season (March-May), leks may be on bare areas, such as swales, irrigated fields, meadows, burns, and roadsides or areas of low cover and stature of sagebrush and are more often within vegetation types of low sagebrush or low/big sagebrush mosaics. When not on the lek, sage grouse disperse to the surrounding areas (Interagency Interdisciplinary Sage Grouse Planning Team 2000).

After mating, hens usually nest near lek grounds, but some fly as far as 12 to 20 miles (19-32 km) to favorable nesting sites (Interagency Interdisciplinary Sage Grouse Planning Team 2000). They prefer sagebrush 14 to 25 inches (36-63.5 cm) tall with an open canopy, 10-50%, for nesting. During the nesting season, cocks and hens without nests use relatively open areas for feeding, and roost in dense sagebrush patches.

Early brood rearing occurs near the nest site depending on the availability of forbs and insects, which are the main food source for the chicks. Young broods use areas of low plant height (9 to 15 inches) and density, while older broods and adults use areas with taller plants (7 to 25 inches) (Interagency Interdisciplinary Sage Grouse Planning Team 2000). Sage grouse apparently do not require open water for day-to-day survival if succulent vegetation is available, but they utilize free water if it is available.

Habitat used by summering groups generally takes three forms: mid-elevation playas and waterholes, high mountain areas, and alfalfa developments. After early brood rearing, hens with broods leave early brooding areas when forbs have desiccated and move to areas that still have green vegetation, such as meadows/ephemeral wet riparian areas. There they spend the mid- and late summer period with other hens and brood groups. Hens without broods group up with other unsuccessful hens in meadow habitats. By August, most birds cluster near permanent watering sites. In Oregon, sage grouse movements in mid-elevational summering areas are more random.

The Interagency Sage Grouse Planning Team (2000) identify important late brood rearing habitats as sagebrush, meadows and riparian areas, dry lake beds, and agricultural lands. The optimum habitat contains a mosaic of these lands types that include at least:

- 40 percent of the area in sagebrush stands that are 16 to 32 inches tall with a canopy cover of 10 to 25 percent and
- An herbaceous understory of 15 percent grass canopy cover and
- 10 percent forb canopy cover

Habitat loss, predation, drought, and poor weather conditions during hatching and brooding have been cited as factors leading to poor recruitment. Sage grouse hunting is closely regulated in states where it is allowed, and is not generally cited as a factor in sage grouse decline (NatureServe 2002).

Sagebrush is used for hiding cover year-round and provides thermal cover during summer and winter. Vegetation types used for wintering include primarily low sagebrush, big sagebrush, and mosaics of low and big sagebrush, where the often prefer wind swept areas free of snow.

Sagebrush, used year-round, is the most important component in the diet of adult sage grouse. Sagebrush constituted less than 60 percent of the diet only between June and September. Other forage consists largely of herbaceous leaves of dandelion (Taraxacum spp.), legumes (Fabaceae), yarrow (Achillea spp.) and wild lettuce (Lactuca spp.), which is used primarily in late spring and summer.

Insects are a minor diet item for adult sage grouse. Chicks consume primarily insects, especially ants and beetles, in their first week of life (Interagency Interdisciplinary Sage Grouse Planning Team 2000). Their diet then switches to forbs, with sagebrush gradually assuming primary importance.

Distribution

Sage grouse occur from central Washington, southern Idaho, Montana, southeastern Alberta, southwestern Saskatchewan, southwestern North Dakota, and western South Dakota south to eastern California, south-central Nevada, southern Utah, western Colorado; formerly north to southern British Columbia, south to northern New Mexico and southeast to western Oklahoma (AOU 1998).

Western sage grouse (B. u. phaios), if indeed phaios is a taxonomically valid subspecies, occur from central and eastern Washington (Ellensburg, and Columbia County) south to southeastern Oregon; formerly to southern British Columbia (Osoyoos Lake) (NatureServe 2001). Taxonomic validity is questionable due to introduction of nominate subspecies into range of phaios. Validity may be impossible to determine (NatureServe 2002).

Existing Conditions

On the Malheur National Forest, sage grouse habitat is primarily associated with the larger expanses of sagebrush habitat located on the southern end of the Forest. In the project area, sagebrush habitats and juniper/sagebrush habitats are very limited, probably providing marginal habitat at best. About 360 acres of juniper woodlands, 450 acres of dry meadows and grasslands, 1,060 acres of dry shrublands, 430 acres of moist meadows and grasslands, and 660 acres of moist shrublands that could provide western sage grouse habitat occur in the project area. These habitats comprise less than 2% of the project area, and all of these acres are not necessarily in a condition that will support this species. Quality sagebrush communities, for example, are relativity rare. Habitat in the project area is considered marginal.

There is no documented occurrence of sage grouse within the project area; there are no known leks or suspected leks. It is possible that adult sage grouse with young may use non-forested areas, but use would be only occasional and random. Potential late season brood rearing habitat exists within meadow/ephemeral wet riparian areas; hens with broods or hen groups may use these lower elevation habitat as sagebrush types dry up and herbaceous plants mature in June and July, but again, use is expected to be occasional or random.

Alternative 1 - No Action Alternative

Direct, Indirect and Cumulative Effects

Under the No Action Alternative, there would be no new management activities; therefore, there should be no direct, indirect or cumulative effects to sage grouse or their habitat.

Determination

Due to the nature of a no action alternative, there would be **NO IMPACT (NI)**.

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Direct and Indirect Effects

In the project area, sagebrush habitats and juniper/sagebrush habitats are very limited, probably providing marginal habitat at best. There is no documented occurrence of sage grouse within the project area; there are no known leks or suspected leks. It is possible that adult sage grouse with young may use non-forested areas, but use would be only occasional and random. Potential late season brood rearing habitat exists within meadow/ephemeral wet riparian areas; hens with broods or hen groups may use these lower elevation habitat as sagebrush types dry up and herbaceous plants mature in June and July, but again, use is expected to be occasional or random.

Management Guidelines for Sage Grouse (Interagency Interdisciplinary Sage Grouse Planning Team 2000) concluded that effects to sage grouse would me minimal if livestock grazing results in levels of forage use consistent with Resource Management Plans. Under Alternatives 2 and 3, livestock grazing would be managed to meet Forest Plan utilization standards and therefore, near natural rates of vegetation recovery as well. Therefore, habitat would be maintained.

Permitted livestock can introduce noxious weeds by transporting seeds in their hair/wool or in digestive systems if coming from or trailing through an area already infested with weeds. In most pastures, current levels of noxious weeds are below threshold levels that can cause significant changes in terrestrial habitat. Only the River and Tailings Pastures have the higher proportions of noxious weeds, 16% and 35% respectively. Both pastures are located along the Middle Fork John Day River and are small in size.

As stated in the Vegetation and Rangeland Resource Section of the Middle Fork John Day Grazing EIS, Noxious Weeds Section, livestock grazing or associated permittee actions have not been identified as a major factor in the establishment and spread of noxious weeds in the project areas. Alternatives 2 and 3 may increase the chance of noxious weed introduction and spread of noxious weeds by livestock; however, permittees and Forest Service Range Management personnel presence on allotments would assist in detection and control.

Livestock grazing would not be expected to reduce sage grouse populations or habitat.

Cumulative Effects

All of the activities in Appendix J have been considered for their cumulative effects on western sage grouse. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute adverse effects to the species or its habitat.

Juniper woodlands, sagebrush shrublands and dry grasslands have probably changed due to 100 years of fire suppression. Other conifer species have encroached on these habitats, reducing their size. On residual acres, juniper density probably has increased. Livestock grazing, primarily early in the century, may have caused changes in shrub, grass and forbs composition or abundance.

Few management activities other than livestock grazing are being implemented in these habitats today. No juniper eradication or prescribed burning projects are being planned specifically for sagebrush habitats. Proposed burning in adjacent forested habitats may burn through some of the smaller sagebrush shrublands, light to moderate burn intensities would likely benefit these habitats by increasing structural stage diversity and enhancing growth of forbs and grasses as well

On adjacent Tribal lands, recent riparian fencing and improved grazing systems are all contributing to improving habitat. On adjacent private lands, livestock grazing is maintaining or improving current habitat conditions.

Current levels of noxious weeds in the project area are generally below threshold levels that can cause measurable changes in terrestrial habitat. Invasive plants such as cheatgrass and *Ventenata* are of concern and not easily eradicated. Over the long-term, habitat may be degraded by encroaching noxious weeds and invasive plants if they are not controlled.

Livestock grazing would be managed to meet Forest Plan utilization standards and therefore, near natural rates of vegetation recovery. Permittees and Forest Service Range Management personnel presence would assist in detection and control of noxious weeds. Livestock grazing would not contribute significant adverse effects that would preclude sage grouse from using the habitat in the project area or reduce populations.

Determination

Action alternatives **May Impact Individuals or Habitat (MIIH)**, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population. Livestock grazing would not be expected to measurably change sagebrush habitat or potential late brood-rearing habitat. At moderate grazing levels, livestock grazing can be compatible with sage grouse management. Habitat in the project area is marginal, and may not support sage grouse.

Gray flycatcher (Empidonax wrightii)

Status

Federal Status: N/A
USDA-Forest Service (Region 6) Status: Sensitive (USFS 2000)
State Status: N/A

Major Threats

This species is vulnerable to land clearing, but it is generally found in very arid environments not usually converted to agriculture (USDA Forest Service 1994). Clearing of juniper in favor of grasslands for livestock grazing or widespread harvesting of juniper could be detrimental.

Population Status and Trend

North American BBS (Breeding Bird Survey) shows a survey-wide significantly increasing trend of 10.2 percent average per year (n = 89) during the 1966-1996 sample period; a nonsignificant decline of -1.0 percent average per year (n = 22) during 1966-1979; and a significant increase from 1980 to 1996 of 10.0 percent average per year (n = 84) (Sauer et al. 1997).

Data for Oregon reflects a strong long-term increase of 7.9 percent average per year (n = 29) during the 1966-1996 period (Sauer et al. 1997).

Habitat

The gray flycatcher prefers relatively treeless areas with tall sagebrush, bitterbrush, or mountain mahogany communities, but is also associated with pinyon-juniper woodland with understory sagebrush, and open ponderosa pine forests (Csuti et al. 1997). This species is most abundant in extensive tracts of big sagebrush, often selecting areas along washes where the sagebrush is especially tall. In the western Great Basin, this species nests in tall big sagebrush shrublands (Ryser 1985).

During the nonbreeding season, this species commonly inhabits arid scrub, riparian woodland, and mesquite (NatureServe 2002).

Distribution

Breeding range covers extreme southern British Columbia and south-central Idaho south to southern California, southern Nevada, central Arizona, south-central New Mexico, and locally western Texas (NatureServe 2002). In Oregon, this species is typically found east of the Cascade Mountains (Csuti et al. 1997).

Birds winter in southern California, central Arizona, south to Baja California and south-central mainland of Mexico (NatureServe 2001).

Existing Condition

The Malheur National Forest considers this species as a rare (not seen every year) summer resident. About 360 acres of juniper woodlands, 450 acres of dry meadows and grasslands, 1,060 acres of dry shrublands, 430 acres of moist meadows and grasslands, and 660 acres of moist shrublands that could provide gray flycatcher habitat occur in the project area. These habitats comprise less than 2% of the project area, and all of these acres are not necessarily in a condition that will support this species. Quality sagebrush communities, for example, are relativity rare. Numerous mountain mahogany stands and some bitterbrush occur as small inclusions in other forested habitat types. Because they are small, they were not mapped separately; therefore, acres for these types are not available.

Alternative 1 -No Action Alternative

Direct, Indirect and Cumulative Effects

Under the No Action alternative, there would be no livestock grazing; therefore, there should be no direct, indirect or cumulative effects to gray flycatchers or their habitat.

Determination

Due to the nature of a no action alternative, there would be **NO IMPACT (NI).**

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Direct and Indirect Effects

In the project area, sagebrush habitats and juniper/sagebrush habitats are very limited, probably providing marginal habitat at best. Under Alternatives 2 and 3, livestock grazing would be managed to meet Forest Plan utilization standards and therefore, near natural rates of vegetation recovery as well. Therefore, habitat would be maintained.

Permitted livestock can introduce noxious weeds by transporting seeds in their hair/wool or in digestive systems if coming from or trailing through an area already infested with weeds. In most pastures, current levels of noxious weeds are below threshold levels that can cause significant changes in terrestrial habitat. Only the River and Tailings Pastures have the higher proportions of noxious weeds, 16% and 35% respectively. Both pastures are located along the Middle Fork John Day River and are small in size.

As stated in the Vegetation and Rangeland Resource Section of the Middle Fork John Day Grazing EIS, Noxious Weeds Section, livestock grazing or associated permittee actions have not been identified as a major factor in the establishment and spread of noxious weeds in the project areas. Alternatives 2 and 3 may increase the chance of noxious weed introduction and spread of noxious weeds by livestock; however, permittees and Forest Service Range Management personnel presence on allotments would assist in detection and control.

Livestock grazing would not be expected to reduce gray flycatcher populations or habitat.

Cumulative Effects

All of the activities in Appendix J have been considered for their cumulative effects on gray flycatchers. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute adverse effects to the species or its habitat.

Juniper woodlands, sagebrush shrublands and dry grasslands have probably changed due to 100 years of fire suppression. Other conifer species have encroached on these habitats, reducing their size. On residual acres, juniper density probably has increased. Livestock grazing, primarily early in the century, may have caused changes in shrub, grass and forbs composition or abundance.

Few management activities other than livestock grazing are being implemented in these habitats today. No juniper eradication or prescribed burning projects are being planned specifically for sagebrush habitats. Proposed burning in adjacent forested habitats may burn through some of the smaller sagebrush shrublands, light to moderate burn intensities would likely benefit these habitats by increasing structural stage diversity and enhancing growth of forbs and grasses as well. Within forested stands, proposed harvest and prescribed burning could kill occasional bitterbrush, mountain mahogany, and sagebrush shrubs, but damage would be incidental.

On adjacent Tribal lands, recent riparian fencing and improved grazing systems are all contributing to improving habitat. On adjacent private lands, livestock grazing is maintaining or improving current habitat conditions.

Current levels of noxious weeds in the project area are generally below threshold levels that can cause measurable changes in terrestrial habitat. Invasive plants such as cheatgrass and *Ventenata* are of concern and not easily eradicated. Over the long-term, habitat may be degraded by encroaching noxious weeds and invasive plants if they are not controlled.

Livestock grazing would be managed to meet Forest Plan utilization standards and therefore, near natural rates of vegetation recovery. Permittees and Forest Service Range Management personnel presence would assist in detection and control of noxious weeds. Livestock grazing would not contribute significant adverse effects that would preclude gray flycatchers from using the habitat in the project area or reduce populations.

Determination

Action alternatives **May Impact Individuals or Habitat (MIIH)**, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population. Livestock grazing would not be expected to measurably change sagebrush habitat. At moderate grazing levels, livestock grazing can be compatible with gray flycatcher management.

Bobolink (Dolichonyx oryzivorus)

Status:

Federal - None
State - Sensitive
Region 6 - Sensitive

Habitat

Unless otherwise mentioned, the following information on bobolinks was derived from Dechant et al. (2001).

Bobolinks are found in native and tame grasslands, haylands, lightly to moderately grazed pastures, no-till cropland, small-grain fields, old fields, wet meadows, and planted cover. Bobolinks prefer habitat with moderate to tall vegetation, moderate to dense vegetation, and moderately deep litter, and without the presence of woody vegetation. They are found in areas with high percent grass cover and moderate percent forb cover, and avoid haylands with high legume-to-grass ratios; however, a forb component is beneficial for nesting cover.

If habitat is not maintained, use by bobolinks declines significantly, possibly due to the accumulation of litter and encroachment of woody vegetation. Bobolinks respond positively to properly timed burning or mowing treatments. In 2 years, a Wisconsin field that was burned in April each year was occupied by bobolinks in early June; the year it was not burned, the field was occupied by mid-May. Bobolink abundance declined in the burn year, but peaked 1-2 years postburn. In South Dakota, bobolinks preferred lightly grazed (grazed by American bison [*Bos bison*]) areas to spring-burned areas.

In the Great Plains, bobolinks responded positively to moderate grazing in tallgrass, but negatively to heavy grazing in shortgrass. In southeastern North Dakota, bobolinks occurred in grazed areas that had few shrubs and moderate to deep litter. Higher densities of bobolinks were found in areas under a short-duration grazing treatment (involved a system of pastures rotated through a grazing schedule of about 1 week grazed and 1 month ungrazed) than in idle areas.

Bobolink territories include both foraging and nesting areas. Average territory size ranged from 0.45 to 2.5 ha, depending on habitat variables. Bobolinks appear to prefer large grassland areas to small, having a minimum size of approximately 10-45 ha. Studies suggest bobolink abundance in tallgrass prairie fragments was positively related to area and/or fragment size.

Bobolinks generally are considered an uncommon or rare host of the brown-headed cowbird (*Molothrus ater*), but their nests may be multiply-parasitized as well. Nest depredation and brown-headed cowbird brood parasitism generally decreased farther from woody edges, and nest depredation rates were lower on large (130-486 ha) than on small (16-32 ha) grasslands. Nest productivity is usually highest in habitats far (>45 m) from a forest edge.

Keys to management are providing large areas of suitable habitat (native and tame grasslands of moderate height and density, with adequate litter), controlling succession, and protecting nesting habitat from disturbance during the breeding season. Avoid disturbing (e.g., haying, burning, moderately or heavily grazing) nesting habitat during the breeding season, approximately early May to mid-July. Treatments can be done in early spring (several weeks prior to the arrival of adults on the breeding grounds) or in the fall after the breeding season.

Distribution

Bobolinks breed from southern British Columbia across southern Canada to Nova Scotia, and south to eastern Oregon, central Colorado, central Illinois, western Virginia, and western North Carolina (Marshall 1996).

Existing Condition

Bobolinks are very local and scattered in the eastern one-third of Oregon and are known to breed on the Malheur National Wildlife Refuge, south end of Blitzen Valley, Harney County, Union County, and Wallowa County (Marshall 1996). Locally, sporadic nesting occurs in the Prairie City, Mt. Vernon, Silvies Valley, and Bear Valley areas (Sweeney, 2001; Winters 2001). In the project area, there has only been one reported sighting on the Middle Fork of the John Day River.

Bobolinks appear to prefer large grassland areas to small, requiring approximately 25-110 acres depending on habitat quality. Consequently, habitat in the project area is likely limited to meadows and grasslands along the Middle Fork of the John Day River. About 900 acres of capable habitat exist, with the majority of the acres on private land. On National Forest Lands potential habitat is associated with the tributary streams and only at the lower reaches where they enter the Middle Fork. Along the tributary steams, habitat is considered marginal. Many of these acres are grazed and may not be providing tall enough grass for bobolinks. Meadows exit in the uplands, but they tend to be small or habitat is naturally dry and low in productivity. Because of the low quality and the natural fragmentation, bobolinks would likely use only the largest areas.

Alternative 1 -No Action Alternative

Direct, Indirect and Cumulative Effects

Under the No Action Alternative, there would be no livestock grazing; therefore, there should be no direct or indirect or cumulative effects to bobolinks or their habitat.

Determination

Due to the nature of a no action alternative, there would be **NO IMPACT (NI).**

Alternative 2 (Existing Grazing) and Alternative 3 (Proposed Action Grazing)

Direct and Indirect Effects

Livestock grazing would be managed to meet Forest Plan utilization standards and therefore, near natural rates of vegetation recovery as well. Grazing could occur in areas that may occasionally be used as nesting, loafing and brood-rearing habitat. At moderate grazing levels, livestock grazing can be compatible with bobolink management.

Brown-headed cowbirds are strongly associated with livestock; the species are nest parasites. Bobolinks generally are considered an uncommon or rare host of the cowbirds; however, parasitism rates have varied from 0% of 20 nests to 34% of 47 nests (Dechant et al. 1999)

Permitted livestock can introduce noxious weeds by transporting seeds in their hair/wool or in digestive systems if coming from or trailing through an area already infested with weeds. In most pastures, current levels of noxious weeds are below threshold levels that can cause significant changes in terrestrial habitat. Only the River and Tailings Pastures have the higher proportions of noxious weeds, 16% and 35% respectively. Both pastures are located along the Middle Fork John Day River and are small in size.

As stated in the Vegetation and Rangeland Resource Section of the Middle Fork John Day Grazing EIS, Noxious Weeds Section, livestock grazing or associated permittee actions have not been identified as a major factor in the establishment and spread of noxious weeds in the project areas. Alternatives 2 and 3 may increase the chance of noxious weed introduction and spread of noxious weeds by livestock; however, permittees and Forest Service Range Management personnel presence on allotments would assist in detection and control.

Given the marginal quality of the habitat for bufflehead in the project area and the general compatibility of the species with livestock grazing, effects would be considered incidental.

Cumulative Effects

All of the activities in Appendix J have been considered for their cumulative effects on bobolinks. Past road construction, railroad construction, mining and livestock grazing likely had the greatest impacts on habitat along the Middle Fork John Day River. Few management activities being conducted today would affect the habitat to the same degree.

On adjacent Tribal lands, recent riparian fencing and improved grazing systems are all contributing to improving habitat. On adjacent private lands, livestock grazing is maintaining or improving current habitat conditions.

Livestock grazing would be managed to meet Forest Plan utilization standards and therefore, near natural rates of vegetation recovery as well. Therefore, livestock grazing would not contribute additive adverse effects that would preclude bobolinks from using the meadows along the Middle Fork John Day.

Determination

Action alternatives **May Impact Individuals or Habitat (MIIH)**, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population. Grazing could occur in areas that may occasionally be used as nesting, loafing and brood-rearing habitat. However, at moderate grazing levels, livestock grazing can be compatible with bobolink management.

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Appendix J – Noxious Weeds

GRANT COUNTY WEED LIST – June 2004

Source: Pat Holliday, Grant County Soil & Water Conservation District
721 S. Canyon Blvd., John Day, OR 97845
541 575-0135, ext. 101
FAX 541 575-0646

KNOWN SPECIES INFESTING FOREST AND IN POPULATIONS SMALL ENOUGH TO TREAT "T"-LIST

Bearded creeper (common crupina)	*Crupina vulgaris*
Houndstoungue	*Cynoglossum officinale*
Leafy spurge	*Euphorbia esula*
Mediterranean sage	*Salvia aethiopis*
Perennial pepperweed	*Lepidium latifolium*
Plumeless thistle	*Carduus acanthoides*
Purple Loosestrife	*Lythrum salicaria*
Rush skeletonweed	*Chondrilla juncea*
Spikeweed	*Hemizonia pungenis*
Squarrose knapweed	*Centaurea virgata*
Tansy ragwort	*Senecia jacobaea*
Yellow starthistle	*Centaurea solstitialis*

KNOWN SPECIES TO INVENTORY/MONITOR BUT TOO WIDESPREAD TO TREAT
(except in specific sites like campgrounds) **"A"-LIST**

Bearded creeper (Common Crupina)	*Crupina vulgaris*
Diffuse knapweed	*Centaurea diffusa*
Leafy spurge	*Euphorbia esula*
Mediterranean sage	*Salvia aethiopis*
Perennial pepperweed	*Lepidium latifolium*
Purple Loosestrife	*Lythrum salicaria*
Rush skeletonweed	*Chondrilla juncea*
Spikeweed	*Hemizonia pungenis*
Spotted knapweed	*Centaurea maculosa*
Squarrose knapweed	*Centaurea virgata*
St. Johnswort (Klamath weed)	*Hypericum perforatum*
Tansy ragwort	*Senecio jacobae*
Yellow starthistle	*Centaurea solstitialis*

SPECIES TO WATCH FOR, TREAT AND REPORT
"B"-LIST

Canada thistle	*Cirsium arvense*
Dalmation toadflax	*Linaria dalmatica*
Poison hemlock	*Conium maculatum*
Puncturevine	*Tribulus terrestris*
Russian knapweed	*Acroptilon repens*
Scotch thistle	*Onopordum acanthium*
Western waterhemlock	*Cicuta douglasii*
White top (Hoary Cress)	*Cardaria spp.*

GRANT COUNTY WEED LIST – June 2004 (continued)

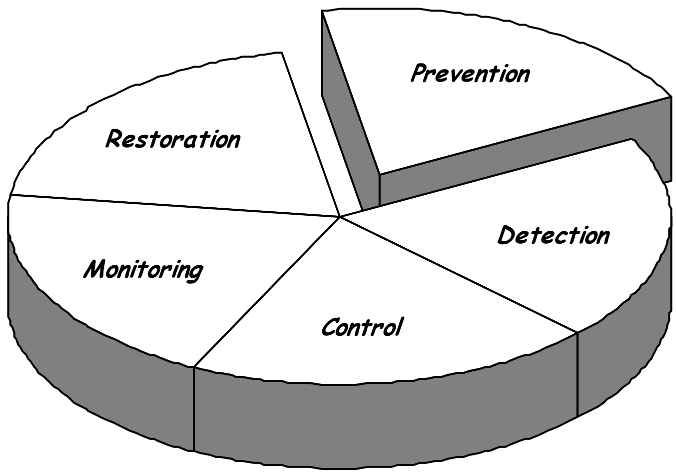
Miscellaneous

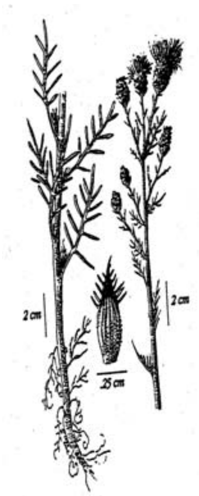
Broad-leaved cocklebur	*Xanthium strumarium L.*
Common burdock	*Arctium minus*
Dodder	*Cuscuta spp.*
Field bindweed	*Convolvulus arvensis L.*
Kochia	*Kochia scoparia*
Medusahead rye	*Taeniatherum caput-medusae*
Milkthistle	*Silybum marianum*
Teasel	*Dipsacus sylvestris*

Noxious Weed Cover by Allotment

ALLOTMENT_NAME	PASTURE_NAME	PASTURE ACRE	WEED ACRES	% WEED COVER
Austin On & Off	Austin On & Off	535.21	13.13	2.45%
Austin On & Off TOTAL		535.21	13.13	2.45%
Bear C & H	Antler/a	118.04	0.00	0.00%
	B1	11.62	0.00	0.00%
	Bend/b	53.36	0.00	0.00%
	Cole/c1	39.54	0.02	0.05%
	Corral/c2	62.8	0.00	0.00%
	Def/d	172.23	0.00	0.00%
	Gibb/g	322.85	0.00	0.00%
	Hill - e/f	299	18.60	6.22%
	Horse\Pasture/H	450.4	0.00	0.00%
Bear C & H TOTAL		1,529.84	18.62	1.22%
Blue Mtn C & H	Crawford	8,430.95	67.83	0.80%
	East Summit	1,195.62	193.56	16.19%
	Idaho	10,543.59	610.03	5.79%
	Squaw Creek	80	0.00	0.00%
	Upper Phipps Mdw	44.35	0.29	0.65%
	West Summit	2,320.04	54.37	2.34%
Blue Mtn C & H TOTAL		22,614.55	926.09	4.10%
Camp Creek C & H	Gibbs\Meadow	56.17	2.93	5.21%
	Lower\Camp	89.68	6.14	6.85%
	Middle\Unit	45.71	0.00	0.00%
	North Unit	97.95	0.00	0.00%
	Road Unit	124.23	1.17	0.94%
	Upper Camp	141.8	6.13	4.32%
	Campground Unit	40	0.00	0.00%
Camp Creek C & H TOTAL		595.54	16.37	2.75%
ELK On & Off	Elk On & Off	210.17	0.00	0.00%

ALLOTMENT_NAME	PASTURE_NAME	PASTURE ACRE	WEED ACRES	% WEED COVER
ELK On & Off TOTAL		210.17	0.00	0.00%
Lower Middle Fork	Balance Creek	2,033.54	2.87	0.14%
	Chickenhouse	727.74	0.01	0.00%
	Coyote	5103.16	26.82	0.53%
	Deadwood	8501.06	33.30	0.39%
	Big Boulder	13,449.73	22.82	0.17%
	Granite\Boulder	9,340.66	26.22	0.28%
	Pizer	9,036.74	27.83	0.31%
	Sunshine	4,573.55	18.87	0.41%
	Susanville	6,307.24	80.63	1.28%
Lower Middle Fork TOTAL		59,073.42	239.37	0.41%
Sullens C & H	26	563.14	2.50	0.44%
	Bridge Creek	26,115.47	23.83	0.09%
	Highway	3,132.93	2.30	0.07%
	Savage Creek	16,789.77	16.25	0.10%
	Squaw Mdw	98.29	0.00	0.00%
Sullens C & H TOTAL		46,699.60	44.88	0.10%
Upper Middle Fork C	Austin	4,408.38	98.50	2.23%
	Blackeye\Creek	665.84	0.00	0.00%
	Butte	13,334.58	113.93	0.85%
	Caribou	9,592.58	828.69	8.64%
	Deerhorn	13,854.19	21.43	0.15%
	Lower Vinegar Creek	7,001.66	199.05	2.84%
	River	110.98	17.63	15.89%
	Shop Pasture	313.01	13.70	4.38%
	Tailing	47.2	16.44	34.84%
	Upper Vinegar	5,569.10	427.22	7.67%
Upper Middle Fork C TOTAL		54,897.52	1736.60	3.16%
Grand Total		186,155.85	2995.06	1.61%





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Guide to Noxious Weed Prevention Practices

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Guide to Noxious Weed Prevention Practices

Introduction

Preventing the introduction and spread of noxious weeds is one objective of Integrated Weed Management Programs on National Forest System lands throughout the United States. This Guide to Noxious Weed Prevention Practices (Guide) provides a comprehensive directory of weed prevention practices for use in Forest Service planning and wildland resource management activities and operations. This Guide will help National Forest and Grassland managers and cooperators identify weed prevention practices that mitigate identified risks of weed introduction and spread for a project or program.

This Guide uses the term "*weed*" to include all plants defined as "*noxious weeds*" by Forest Service policy:

> **". . .plants designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof."** (FSM 2080.5)

For National Forests and Grasslands that use a State-defined noxious weed list, the listed weed species are the priority for implementing weed prevention practices in cooperation with neighbors and partners. National forests and grasslands that do not have a State-defined noxious weed list need to determine local weed prevention priorities using weed lists created by other State or local organizations. At line officer's discretion, the practices described in this Guide may also be applied to non-native invasive plants that are not defined as "noxious".

Supporting Direction

> This Guide to Noxious Weed Prevention Practices supports implementation of the February 3, 1999 Executive Order on Invasive Species. Federal agencies are expected to follow the direction in the Executive Order.

Development of weed prevention practices is supported by Forest Service noxious weed policy and strategy. Forest Service policy identifies prevention of the introduction and establishment of noxious weed infestations as an agency objective. This policy directs the Forest Service to: (1) determine the factors that favor establishment and spread of noxious weeds, (2) analyze weed risks in resource management projects, and (3) design management practices to reduce these risks. The Forest Service Noxious Weed Strategy identifies development of practices for prevention and mitigation during ground-disturbing activities as a long-term emphasis item. The February 1999 Executive Order on Invasive Species requires Federal agencies to use relevant programs and authorities to prevent the introduction of invasive species and not authorize or carry out actions that are likely to cause the introduction or spread of invasive species unless the agency has determined, and made public, documentation that shows that the benefits of such actions clearly outweigh the potential harm, and all feasible and prudent measures to minimize risk of harm will need to be taken in conjunction with the actions.

Using This Guide

All resource management projects need to analyze weed risks in the planning stage. Risk includes identifying the likelihood of weeds spreading to the project area and determining the consequence of weed establishment in the project area. Resource programs undertaking maintenance operations need to analyze weed risks when preparing operating plans. A finding of risk is the basis for identifying the appropriate weed prevention practices from the Guide, which are likely to be effective in a particular project situation.

The Guide to Noxious Weed Prevention Practices provides a toolbox of ideas for use in mitigating identified weed risks in resource management operations. The Guide adds no new requirements or regulations.

In 2001 two weed prevention practices are required by Forest Service policy:

1. **For forested vegetation management operations, use equipment cleaning contract provisions WO-C/CT 6.36 (see Appendix 1)**

2. **Post and enforce weed-free feed orders, where they exist. (FSM 2081.03).**

All other weed prevention practices in this Guide are optional for use based upon an analysis of weed risks. This list of practices, if applied, is considered to be good overall direction, however, not all of these practices can be implemented in every project.

When considering the use of a weed prevention practice for a specific project or resource program, evaluate the efficacy of the weed prevention practice to meet the goal, its feasibility to implement in the specific situation, and its cost-effectiveness. A determination of cost-effectiveness may consider the probability and cost of weed control if a weed prevention practice is not used and the relative contribution of the project or activity to the overall weed risk at the site.

The Guide identifies weed prevention practices that can be applied to specific site-disturbing projects and that may also be applicable for maintenance activities. These weed prevention practices are listed in the first section: "*General Weed Prevention Practices for Site-disturbing Projects and Maintenance Activities*." The remaining sections list weed prevention practices that are more uniquely applicable to particular resource management programs, listed by type of resource activity. The intent of this Guide is for managers to first identify and apply the General Weed Prevention practices and then supplement those practices with the appropriate resource activity specific guidance.

Aquatic Weed Prevention Practices

Goal 1. To prevent new weed infestations and the spread of existing weeds, avoid or remove sources of weed seed and propagules.

- Aquatic 1. Provide outreach to state fish and game departments, counties, and other agencies concerning the unique prevention measures and control practices associated with aquatic weeds.

- Aquatic 2. Inspect boats (including air boats), trailers, and other boating equipment and remove any visible plants, animals, or mud before leaving any waters or boat launching facilities. Drain water from motor, live well, bilge, and transom wells while on land before leaving the vicinity. Wash and dry boats, tackle, downriggers, anchors, nets, floors of boats, props, axles, trailers, and other boating equipment to kill weeds not visible at the boat launch.

- Aquatic 3. Before transporting to new waters, rinse boat and boating equipment with hot (40°C or 104°F) clean water, spray boat or trailer with high-pressure water, or dry boat and equipment for at least 5 days.

- Aquatic 4. Inspect seaplanes and remove weeds from floats, wires, cables, water rudders, and pump floats; wash with hot water or spray with high-pressure water, or dry for at least 5 days.

- Aquatic 5. Before take-off – avoid taxiing through heavy surface growths of weeds before takeoff; raise and lower water rudders several times to clear off plants. If weeds were picked up during landing, clean off the water rudders before take-off and leave the water rudders up during take-off. After take-off – if water rudders were down during take-off, raise and lower water rudders several times to free weed plant fragments while over original body of water or over land. If weeds remain visible on floats or water rudders, the pilot may return to flight origin and remove plants if an extra landing and takeoff is not a safety concern.

- Aquatic 6. Maintain a l00 feet buffer of aquatic weed-free clearance around boat launches and docks.

- Aquatic 7. Promptly post sites if aquatic invasives are found. Confine infestation; where prevention is infeasible or ineffective, close facility until infestation is contained.

- Aquatic 8. Wash and dry tackle, downriggers, float tubes, waders, and other equipment to remove or kill harmful species not visible at the boat launch.

- Aquatic 9. Avoid moving weed plants from one body of water to another.

- Aquatic 10. Avoid running personal watercraft through aquatic plants near boat access locations. Instead, push or winch watercraft onto the trailer without running the engine. After the watercraft is out of the water, start the engine for 5-10 seconds to blow out any excess water and vegetation. After engine has stopped, pull weeds out of the steering nozzle. Inspect trailer and any other sporting equipment for weed fragments and remove them before leaving the access area. Wash or dry watercraft before transporting to another body of water.

- Aquatic 11. Waterfowl hunters may use elliptical, bulb-shaped, or strap anchors on decoys, because these types of anchors avoid collecting submersed and floating aquatic plants. Inspect waders and hip boots, removing any aquatic plants, and where possible, rinse mud from them before leaving the water. Remove aquatic plants, animals, and mud attached to decoy lines and anchors.

- Aquatic 12. Construct new boat launches and ramps at deep-water sites. Restrict motorized boats in lakes near areas that are infested with weeds. Move sediment to upland or quarantine areas when cleaning around culverts, canals, or irrigation sites. Clean equipment before moving to new sites. Inspect and clean equipment before moving from one project area to another.

Cultural Resources

- Use the General weed prevention practices.

Fire Management

Pre-fire, Pre-incident Training

Goal 1. Improve effectiveness of prevention practices through weed awareness and education.

- Fire 1. Increase weed awareness and weed prevention in all fire training.

- Fire 2. Include weed risk factors and weed prevention practices in Resource Advisor duties on all Incident Management Teams and Burn Rehabilitation Teams.

Plans

Goal 2. Improve effectiveness of prevention practices through weed awareness and education.

- Fire 3. Assign a local weed specialist or include in Resource Advisor duties to the Incident Management Team when wildfire or control operations occur in or near a noxious weed area.

- Fire 4. Resource Advisors need to provide briefings that identify operational practices to reduce weed spread, (for example: avoiding known weed infestation areas when locating fire lines). Include this information in shift briefings.

- Fire 5. Provide weed identification aids to Field Observers.

Wildfires – General

All wildfire weed prevention goals apply except in instances where human life or property is at risk.

Goal 3. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- Fire 6. Ensure that rental equipment is free of weed seed and propagules before the contracting officers representative accepts it.

- Fire 7. Maintain a network of airports, helibases, camps, and staging areas in a noxious weed-free condition.

- Fire 8. Coordinate with local weed specialists to locate and treat practice jump areas to make them weed-free.

- Fire 9. Inspect and treat weeds that establish at equipment cleaning sites after fire incidents.

Goal 4. Avoid creating soil conditions that promote weed germination and establishment.

- Fire 10. Use appropriate suppression tactics to reduce suppression-induced disturbances to soil and vegetation while minimizing seedbed creation due to disturbance from fire effects. .

- Fire 11. Avoid moving water buckets from infested lakes to lakes that are not infested prior to inspection and cleaning. There is no hazard in using water infested with aquatic weeds on terrestrial sites.

Prescribed Fire

Goal 5. To prevent new weed infestations and the spread of existing weeds, avoid or remove sources of weed seed and propagules or manage fire as an aid in control of weeds.

- Fire 12. Ensure that rental equipment is free of weed seed and propagules before the contracting officers representative accepts it.

- Fire 13. Avoid ignition and burning in areas at high risk for weed establishment or spread due to fire effects. Treat weeds that establish or spread because of unplanned burning of weed infestations.

- Fire 14. When possible use staging areas and helibases that are maintained in a weed-free condition.

- Fire 15. Pre-inventory project area and evaluate weeds present with regard to the effects on the weed spread relative to the fire prescription.

Goal 6. Avoid creating soil conditions that promote weed germination and establishment.

- Fire 16. Use appropriate preparation and suppression tactics to reduce disturbances to soil and vegetation.

Fire Rehabilitation

Goal 7. Incorporate weed prevention into project layout, design, alternative evaluation, and decisions.

- Fire 17. Evaluate weed status and risks in Burned Area Emergency Rehabilitation plans. When appropriate, apply for Burned Area Emergency Rehabilitation and restoration funding.

Goal 8. To prevent conditions favoring weed establishment, re-establish vegetation on bare ground caused by project disturbance as soon as possible using either natural recovery or artificial techniques as appropriate to the site objectives.

- Fire 18. To prevent weed spread, treat weeds in burned areas as part of the Burned Area Emergency Rehabilitation plan. For known infestations that will likely increase, the first preference is prevention, such as planting species to compete with unwanted plants.

- Fire 19. Inspect and document weed establishment at fire access roads, cleaning sites, all disturbed staging areas, and within burned areas; control infestations to prevent spread within burned areas. If you suspect the presence of noxious weeds, request BAER funds to inspect and document for emergence in the spring. Request BAER funds for control if noxious weeds are present and NEPA has already been approved.

- Fire 20. Seed and straw mulch to be used for burn rehabilitation (for wattles, straw bales, dams, etc.) all need to be inspected and certified that they are free of weed seed and propagules.

- Fire 21. Regulate human, pack animal, and livestock entry into burned areas at risk for weed invasion until desirable site vegetation has recovered sufficiently to resist weed invasion.

Forest Vegetation Management

Timber Harvest Operations & Stewardship Contracting

Goal 1. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- Forest Veg 1. Treat weeds on projects used by contractors, emphasizing treatment of weed infestations on existing landings, skid trails, and helibases before activities commence.

- Forest Veg 2. Train contract administrators to identify noxious weeds and select lower risk sites for landings and skid trails.

- Forest Veg 3. Encourage operators to maintain weed-free mill yards, equipment parking, and staging areas.

- Forest Veg 4. Use standard timber sale contract provisions such as WO-C/CT 6.36 to ensure appropriate equipment cleaning (reference Appendix 1).

Goal 2. To prevent weed germination and establishment, retain native vegetation in and around project activity and keep soil disturbance to a minimum consistent with project objectives.

- Forest Veg 5. Minimize soil disturbance to no more than needed to meet project objectives. Logging practices to reduce soil disturbance include, but are not limited to:

  - Over-snow logging
  - Skyline or helicopter logging
  - Reuse landings, skid trails and helibases when they are weed free

- Forest Veg 6. Minimize period from end of logging to site preparation, revegetation, and contract closure.

Post Vegetation Management Operations

Goal 3. To prevent weed germination and establishment, retain native vegetation in and around project activity and keep soil disturbance to a minimum consistent with project objectives.

- Forest Veg 7. Minimize soil disturbance to no more than needed to meet vegetation management objectives. Prevention practices to reduce soil disturbance include, but are not limited to:

  - Treating fuels in place instead of piling
  - Minimizing heat transfer to soil in burning
  - Minimizing fireline construction

Goal 4. To prevent favorable conditions for weed establishment, re-establish vegetation on bare ground caused by project disturbance.

- Forest Veg 8. For long-term restoration and weed suppression where forested vegetation management has created openings, recognize the need for prompt reforestation.

Grazing Management

Goal 1. Consider noxious weed prevention and control practices in the management of grazing allotments.

- Grazing 1. Include weed prevention practices, inspection and reporting direction, and provisions for inspection of livestock concentration areas in allotment management plans and annual operating instructions for active grazing allotments.

- Grazing 2. For each grazing allotment containing existing weed infestations, include prevention practices focused on preventing weed spread and cooperative management of weeds in the annual operating instructions. Prevention practices may include, but are not limited to:

  - Altering season of use
  - Exclusion
  - Activities to minimize potential ground disturbance
  - Preventing weed seed transportation

- Maintaining healthy vegetation
- Weed control methods
- Revegetation
- Inspection
- Reporting
- Education

<u>Goal 2</u>. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds. Minimize transport of weed seed into and within allotments.

- <u>Grazing 3</u>. If livestock are potentially a contributing factor to seed spread, schedule use by livestock in units with existing weed infestations which are known to be susceptible to spread by livestock, to be prior to seed-set or after seed has fallen.

- <u>Grazing 4</u>. If livestock were transported from a weed-infested area, annually inspect and treat allotment entry units for new weed infestations.

- <u>Grazing 5</u>. Close pastures to livestock grazing when the pastures are infested to the degree that livestock grazing will continue to either exacerbate the condition on site or contribute to weed seed spread. Designate those pastures as unsuitable range until weed infestations are controlled.

<u>Goal 3</u>. Maintain healthy, desirable vegetation that is resistant to weed establishment.

- <u>Grazing 6</u>. Through the allotment management plan or annual operating instructions, manage the timing, intensity (utilization), duration, and frequency of livestock activities associated with harvest of forage and browse resources to maintain the vigor of desirable plant species and retain live plant cover and litter.

- <u>Grazing 7</u>. Manage livestock grazing on restoration areas to ensure that vegetation is well established. This may involve exclusion for a period of time consistent with site objectives and conditions. Consider practices to minimize wildlife grazing on the areas if needed.

<u>Goal 4</u>. Minimize disturbed ground conditions favorable for weed establishment in the management of livestock grazing.

- <u>Grazing 8</u>. Include weed prevention practices that reduce ground disturbance in allotment management plans and annual operating instructions. Consider for example: changes in the timing, intensity, duration, or frequency of livestock use; location and changes in salt grounds; restoration or protection of watering sites; and restoration of yarding/loafing areas, corrals, and other areas of concentrated livestock use.

- <u>Grazing 9</u>. Inspect known areas of concentrated livestock use for weed invasion. Inventory and manage new infestations.

<u>Goal 5</u>. Improve effectiveness of weed prevention practices through awareness programs and education. Promote weed awareness and prevention efforts among range permittees.

- <u>Grazing 10</u>. Use education programs or annual operating instructions to increase weed awareness and prevent weed spread associated with permittees' livestock management practices.

- Grazing 11. To aid in their participation in allotment weed control programs, encourage permittees to become certified pesticide use applicators.

Lands and Special Uses

Goal 1. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- Lands 1. Consider weed status of lands when making land adjustment decisions.
- Lands 2. Conduct weed inventories of all lands considered for acquisition.
- Lands 3. As a condition of land adjustment decisions, the Forest Service may require the nonfederal proponent to treat weeds, to federal standards, on the land proposed for federal acquisition.
- Lands 4. Include a weed prevention and control provision in all new special-use authorizations such as, permits, easements or leases involving ground-disturbing activities when authorized activities present a high risk for weed infestation or the location of the activity is vulnerable to weed introduction or spread. Include a weed prevention and control provision in existing authorizations that authorize ground-disturbing activities when the authorization is amended for other reasons; consider the need to amend an authorization directly, when ground-disturbing activities are involved. These provisions can be accomplished through the development and incorporation of a supplemental clause (reference sample clause R1-D4 in Appendix 2) or as a requirement in an associated operation and maintenance plan.

Minerals

Goal 1. Incorporate weed prevention into project layout, design, alternative evaluation, and decisions.

- Minerals 1. Include weed prevention measures, including project inspection and documentation, in operation and reclamation plans.

Goal 2. To prevent conditions favoring weed establishment, minimize bare soil conditions and re-establish vegetation on bare ground caused by project disturbance.

- Minerals 2. Retain bonds until reclamation requirements are completed, including weed treatments, based on inspection and documentation.

Recreation, Wilderness, and Special Management Areas

Goal 1. To prevent new weed infestations and the spread of existing weeds, avoid or remove sources of weed seed and propagules.

- Recreation 1. Encourage public land users before recreating on public lands, to inspect and clean motorized and mechanized trail vehicles of weeds and their seeds.
- Recreation 2. On designated public lands, issue closure orders that specify the use of weed free or weed-seed-free feed, hay, straw, and mulch. Refer to 36 CFR 251.50 and Appendix 3. Cooperate with State, County, Tribal governments, and other agencies to develop and support publicly available weed-free materials.
- Recreation 3. Where they exist, post and enforce weed-free feed orders. (FSM 2081.03)
- Recreation 4. Encourage backcountry pack and saddle stock users to feed stock only weed-free feed for several days before travel on National Forest System lands.
- Recreation 5. Inspect, brush, and clean animals, especially hooves and legs before entering public land. Inspect and clean tack and equipment.
- Recreation 6. Tie or hold stock in ways that minimize soil disturbance and avoid loss of desirable native vegetation.
- Recreation 7. Annually inspect all campgrounds, trailheads, and recreation areas that are open to public vehicle use for weeds; treat new infestations.
- Recreation 8. Maintain trailheads, boat launches, outfitter and public camps, picnic areas, airstrips, roads leading to trailheads, and other areas of concentrated public use in a weed-free condition. Consider high use recreation areas as high priority for weed eradication.
- Recreation 9. Consider seasonal or full time closure to campgrounds, picnic areas, and other recreation use areas until weeds are reduced to levels that minimize potentials for spread.
- Recreation 10. In areas susceptible to weed infestation, limit vehicles to designated, maintained travel routes. Inspect and document inspections on travelways for weeds and treat as necessary.

Goal 2. Improve effectiveness of prevention practices through weed awareness and education.

- Recreation 11. Post weed awareness messages and prevention practices at strategic locations such as trailheads, roads, boat launches, and forest portals.
- Recreation 12. In weed-infested areas, post weed awareness messages and prevention practices at roadsides.

Research Activities

Goal 1. Incorporate weed prevention into research project design, layout, installation, and decisions.

Research 1. Address weed establishment risk and spread in research project study plans and decisions.

Road Management

New and Reconstruction

Goal 1. Incorporate weed prevention into project layout, design, alternative evaluation, and decisions.

- Road 1. For timber sale purchaser road maintenance and decommissioning, use standard timber sale contract provisions such as WO-C/CT 6.36 to ensure appropriate equipment cleaning (reference Appendix 1).

- Road 2. For road new and reconstruction conducted as part of public works (construction) contracts and service contracts include contract language for equipment cleaning such as is in WO-C/CT 6.36 (Appendix 1).

Road Maintenance and Decommissioning

Goal 2. Minimize roadside sources of weed seed that could be transported to other areas.

- Road 3. Periodically inspect system roads and rights-of-way for invasion of noxious weeds. Train road maintenance staff to recognize weeds and report locations to the local weed specialist. Inventory weed infestations and schedule them for treatment.

- Road 4. Schedule and coordinate blading or pulling of noxious weed-infested roadsides or ditches in consultation with the local weed specialist. Do not blade or pull roadsides and ditches that are infested with noxious weeds unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, ensure the weeds remain on-site. Blade from least infested to most infested areas. When it is necessary to blade noxious weed-infested roadsides or ditches, schedule activity when seeds or propagules are least likely to be viable and to be spread. Minimize soil surface disturbance and contain bladed material on the infested site.

- Road 5. Avoid acquiring water for dust abatement where access to the water is through weed-infested sites.

- Road 6. For timber sale purchaser road maintenance and decommissioning, use contract provisions for equipment cleaning such as WO-C/CT 6.36 (Appendix 1).

- Road 7. For road maintenance and decommissioning conducted as part of public works (construction) contracts and service contracts include contract language for equipment cleaning such as is in WO-C/CT 6.36 (Appendix 1).

- Road 8. Treat weeds in road decommissioning and reclamation projects before roads are made impassable. Reinspect and follow-up based on initial inspection and documentation.

Watershed Management

Goal 1. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- Watershed 1. Inspect and document for early detection of noxious weed establishment and spread in riparian areas and wetlands. Eradicate new infestations before they become established.

- Watershed 2. Address noxious weed risks in watershed restoration projects and water quality management plans.

- Watershed 3. Pay particular attention to practices listed under "General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs" and Aquatic Weed Prevention Practices".

Wildlife, Fisheries, and Botany

Goal 1. Avoid creating soil conditions that promote weed germination and establishment.

- Wildlife 1. Periodically inspect and document those areas where wildlife concentrate in the winter and spring resulting in overuse or soil scarification.

- Wildlife 2. Use weed-free materials at big game baiting stations.

- Wildlife 3. For wildlife openings and habitat improvement projects, follow the practices outlined in General Weed Prevention Practices--Goal 4; Forest Vegetation Management, Timber Harvest Operations & Stewardship Contracting.

APPENDIX 1

Forest Service Timber Sale Contract Provisions

WO-C6.36

C6.36 – EQUIPMENT CLEANING. (5/01) Unless the entire Sale Area is already infested with specific noxious weed species of concern, Purchaser shall ensure that prior to moving on to the Sale Area all off-road equipment, which last operated in areas known by Forest Service to be infested with specific noxious weeds of concern, is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Purchaser shall certify in writing that off-road equipment is free of noxious weeds prior to each start-up of timber sale operations and for subsequent moves of equipment to Sale Area. The certification shall indicate the measures taken to ensure that off-road equipment is free of noxious weeds will be identified. “Off-road equipment” includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. A current list of noxious weeds of concern to Forest Service is available at the Forest Supervisor’s Office.

Purchaser must clean off-road equipment prior to moving between cutting units on this timber sale that are known to be infested with noxious weeds and other units, if any, that are free of such weeds. Sale Area Map shows areas, known by Forest Service prior to timber sale advertisement, that are infested with specific noxious weed species of concern.

Purchaser shall employ whatever cleaning methods are necessary to ensure that off-road equipment is free of noxious weeds. Equipment shall be considered free of soil, seeds, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools is not required.

Purchaser shall notify Forest Service at least 5 days prior to moving each piece of off-road equipment on to the Sale Area, unless otherwise agreed. Notification will include identifying the location of the equipment's most recent operations. If the prior location of the off-road equipment cannot be identified, Forest Service may assume that it was infested with noxious weed seeds. Upon request of Forest Service, Purchaser must arrange for Forest Service to inspect each piece of off-road equipment prior to it being placed in service.

If Purchaser desires to clean off-road equipment on National Forest land, such as at the end of a project or prior to moving to a new unit that is free of noxious weeds, Purchaser and Forest Service shall agree on methods of cleaning, locations for the cleaning, and control of off-site impacts, if any.

New infestations of noxious weeds, of concern to Forest Service and identified by either Purchaser or Forest Service on the Sale Area, shall be promptly reported to the other party. Purchaser and Forest Service shall agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found. In the event of contract modification under this Subsection, Purchaser shall be reimbursed for any additional protection required, provided that any work or extra protection required shall be subject to prior approval by Forest Service. Amount of reimbursement shall be determined by Forest Service and shall be in the form of a reduction in stumpage rates, unless agreed otherwise in writing. However, in no event may stumpage rates be reduced below Base Rates.

INSTRUCTIONS: Include in all new contracts.

The Forest Service must identify on the sale area map units that are infested with specific noxious weeds species of concern.

The prospectus for the sale must notify prospective purchasers that maps of these known locations are available from the local Forest Supervisor's Office or District Ranger Station. A list of noxious weeds of concern to the Forest Service (normally included in the Noxious Weed Program Guide) must be available for the purchaser's inspection. The current National Forest Noxious Weed Program Guide, noxious weed atlas, or other data sources, as needed, will be used to determine locations of known infestation.

Significant changes in the status of noxious weed infestations on the sale may require contract modifications to deal with changed conditions. An example might be where new noxious weed infestations are discovered after contract award, which require costly additional methods to prevent the spread of such infestations.

WO-CT6.36

<u>CT6.36</u> – <u>EQUIPMENT CLEANING</u>. (5/01) Unless the entire Sale Area is already infested with specific noxious weed species of concern, Purchaser shall ensure that prior to moving on to the Sale Area all off-road equipment, which last operated in areas known by Forest Service to be infested with specific noxious weeds of concern, is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Purchaser shall certify in writing that off-road equipment is free of noxious weeds prior to each start-up of timber sale operations and for subsequent moves of equipment to Sale Area. The certification shall indicate the measures taken to ensure that off-road equipment is free of noxious weeds will be identified. "Off-road equipment" includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. A current list of noxious weeds of concern to Forest Service is available at the Forest Supervisor's Office.

Purchaser must clean off-road equipment prior to moving between cutting units on this timber sale that are known to be infested with noxious weeds and other units, if any, that are free of such weeds. Sale Area Map shows areas, known by Forest Service prior to timber sale advertisement, that are infested with specific noxious weed species of concern.

Purchaser shall employ whatever cleaning methods are necessary to ensure that off-road equipment is free of noxious weeds. Equipment shall be considered free of soil, seeds, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools is not required.

Purchaser shall notify Forest Service at least 5 days prior to moving each piece of off-road equipment on to the Sale Area, unless otherwise agreed. Notification will include identifying the location of the equipment's most recent operations. If the prior location of the off-road equipment cannot be identified, Forest Service may assume that it was infested with noxious weed seeds. Upon request of Forest Service, Purchaser must arrange for Forest Service to inspect each piece of off-road equipment prior to it being placed in service.

If Purchaser desires to clean off-road equipment on National Forest land, such as at the end of a project or prior to moving to a new unit that is free of noxious weeds, Purchaser and Forest Service shall agree on methods of cleaning, locations for the cleaning, and control of off-site impacts, if any.

New infestations of noxious weeds, of concern to Forest Service and identified by either Purchaser or Forest Service on the Sale Area, shall be promptly reported to the other party. Purchaser and Forest Service shall agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found. In the event of contract modification under this Subsection, Purchaser shall be reimbursed for any additional protection required, provided that any work or extra protection required shall be subject to prior approval by Forest Service. Amount of reimbursement shall be determined by Forest Service and shall be in the form of a reduction in stumpage rates, unless agreed otherwise in writing. However, in no event may stumpage rates be reduced below Base Rates.

INSTRUCTIONS: Include in all new contracts.

The Forest Service must identify on the sale area map units that are infested with specific noxious weeds species of concern.

The prospectus for the sale must notify prospective purchasers that maps of these known locations are available from the local Forest Supervisor’s Office or District Ranger Station. A list of noxious weeds of concern to the Forest Service (normally included in the Noxious Weed Program Guide) must be available for the purchaser's inspection. The current National Forest Noxious Weed Program Guide, noxious weed atlas, or other data sources, as needed, will be used to determine locations of known infestation.

Significant changes in the status of noxious weed infestations on the sale may require contract modifications to deal with changed conditions. An example might be where new noxious weed infestations are discovered after contract award, which require costly additional methods to prevent the spread of such infestations.

APPENDIX 2

Sample Special Use Supplemental Clause

USDA-Forest Service
Northern region

Include a weed prevention and control provision, such as the following supplemental clause example, in all new special-use authorizations such as, permits, easements, and leases, or when those authorizations are amended, when there are ground-disturbing activities.

The following is a weed prevention and control supplemental clause approved for use in Region 1. **(Reminder: Supplemental clauses used in a special use authorization must be reviewed and approved by the Regional Forester, after review by the local Office of the General Counsel.)**

R1 SUPPLEMENT 2709.11-2000-1
2709.11, 50

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R1-D4 - Noxious Weed/Exotic Plant Prevention and Control. Use this clause in all authorizations involving ground disturbance which could result in the introduction or spread of noxious weeds and/or exotic plants. This clause may also be used where cooperative agreements for noxious weed control are in place with state and local governments.

The holder shall be responsible for the prevention and control of noxious weeds and/or exotic plants of concern on the area authorized by this authorization and shall provide prevention and control measures prescribed by the Forest Service. Noxious weeds and exotic plants of concern are defined as those species recognized by (*insert county weed authority and/or national forest*) in which the authorized use is located.

The holder shall also be responsible for prevention and control of noxious weed and exotic plant infestations which are not within the authorized area, but which are determined by the Forest Service to have originated within the authorized area.

When determined to be necessary by the authorized officer, the holder shall develop a site-specific plan for noxious weed and exotic plant prevention and control. Such plan shall be subject to Forest Service approval. Upon Forest Service approval, the noxious weed and exotic plant prevention and control plan shall become a part of this authorization, and its provisions shall be enforceable under the terms of this authorization.

With respect to the second paragraph of the above provision, the intent is to apply this provision only for a well defined confined area such as a narrow linear right-of-way where it can be determined without a doubt that the noxious weeds resulted from the activities of the holder.

APPENDIX 3

EXAMPLE OF A CLOSURE ORDER

Closure Order

SPECIAL ORDER
OCCUPANCY AND USE
ON NATIONAL FOREST SYSTEM LANDS
IN THE STATE OF MONTANA

Pursuant to the Regulations of the Secretary of Agriculture, Title 36 CFS 261.50 (a) and (b), the following acts are prohibited within all National Forest System lands within the State of Montana.

These restrictions are in addition to those enumerated in Subpart A, part 261, Title 36 of the Code of Federal Regulations and will remain in effect from October 6, 1997, until rescinded or revoked.

1. The possession or storage of hay, grain, straw, cubes, palletized feed or mulch that is not certified as being noxious weed free or noxious weed seed free by an authorized State Department of Agriculture official or designated county official; each individual bale or container must be tagged or marked as weed free and reference the written certification (36 CFR 261.58 (t)).

Pursuant to 36 CFR 261.50 (e), the following are exempt from this Order:

A. Persons with a permit specifically authorizing the action or omission.

B. Transporting feeds, straw, or hay on Federal, State, and county roads that are not Forest Development Roads or Trails.

The above restrictions are necessary to prevent the spread of noxious weeds on National Forest Systems lands (16 USC 551). Upon issuance of this order, all previous orders requiring the use of certified noxious weed free or noxious weed seed free forage on NFS lands in Montana shall be superceded.

Violation is punishable by a fine of up to $5,000 and/or up to six months imprisonment (16 U.S.C. 551 and 18 U.S.C. 3571 (b) (6).

/S/ Kathleen A. McAllister 10-8-97

HAL SALWASSER Date
Regional Forester
Northern Region