United States Department of Agriculture
Forest Service
Emigrant Creek Ranger District
265 Highway 20 South
Hines, OR 97738
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File Code: 1950

Date: August 1, 2008

Dear Reader:

The Van Allotment Environmental Assessment (EA) is available for 30-day public review and comment. The Van Allotment is located in the Wolf Creek Watershed and is within the boundary of the Emigrant Creek Ranger District, Malheur National Forest, Oregon. The legal location is primarily in T18S, R33E, sections 1-3, 10-17, 20-23, and 26-27.

The Malheur National Forest proposes to continue authorization of grazing on the Van Allotment in a manner that is consistent with the Malheur Forest Plan as amended. The Proposed Action proposes to continue authorization of grazing while maintaining and improving desired resource conditions on key management sites. In addition to the Proposed Action the Forest Service also evaluated the No Grazing Alternative. The Responsible Official is Jerome Hensley, District Ranger for Emigrant Creek Ranger District, Malheur National Forest.

For further information, or to request a hard copy of the EA, contact Lori Bailey at the Emigrant Creek Ranger District, 265 Hwy 20 South, Hines, OR 97738; telephone (541) 573-4300; FAX (541)-573-4398 or e-mail at comments-pacificnorthwest-malheur-emigrantcreek@fs.fed.us. The EA is available on the following Malheur National Forest website: http://www.fs.fed.us/r6/malheur/projects/index.shtml

This comment period is intended to provide those interested in or affected by this proposal an opportunity to make their concerns known prior to a decision being made by the Responsible Official. Pursuant to 36 CFR Part 215.5, the opportunity to comment ends 30 days following the date of publication of the legal notice (36 CFR 215.6). Those who provide timely and substantive comments will be eligible to appeal the decision pursuant to 36 CFR part 215 regulations.

Written, facsimile, hand-delivered, oral, and electronic comments concerning this action will be accepted for 30 calendar days following publication of this notice. The publication date in the newspaper of record is the exclusive means for calculating the comment period for this proposal. Those wishing to comment should not rely upon dates or timeframe information provided by any other source. The regulations prohibit extending the length of the comment period.

Written comments must be submitted to the Responsible Official: Jerome Hensley, District Ranger, 265 Highway 20 South, Hines, Oregon 97738. The office business hours for those submitting hand-delivered comments are: 8:00 to 4:30 Monday through Friday, excluding holidays.

Oral comments must be provided at the Responsible Official's office during normal business hours via telephone 541-573-4300 or in person, or at an official agency function (i.e. public meeting) that is designed to elicit public comments. Electronic comments must be submitted in a format such as an email message, plain text (.txt), rich text format (.rtf), or Word (.doc) to comments-pacificnorthwest-malheur-emigrantcreek@fs.fed.us. In cases where no identifiable name is attached to a comment, a verification of identity will be required for appeal eligibility. If using an electronic message, a scanned signature is one way to provide verification.

Electronic comments must be submitted as part of the actual e-mail message, or as an attachment in Microsoft Word, rich text format, or portable document format only. E-mails submitted to e-mail addresses other than the one listed above, in other formats than those listed, or containing viruses will be rejected.

It is the responsibility of persons providing comments to submit them by the close of the comment period. It is the responsibility of persons providing comments by electronic means to ensure that their comments have been received. Individuals and organizations wishing to be eligible to appeal must meet the information requirements of 36 CFR 215.6.

Sincerely,

Jerome Hensley

JEROME HENSLEY
District Ranger

United States Department of Agriculture

Forest Service

August 2008

Preliminary Environmental Assessment for Van Allotment

Emigrant Creek Ranger District, Malheur National Forest

Grant and Harney Counties, Oregon

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SUMMARY

The Malheur National Forest proposes to continue authorization of grazing on the Van Allotment in a manner that is consistent with the Malheur Forest Plan as amended. The project area is located in the Wolf Creek Watershed and is within the boundary of the Emigrant Creek Ranger District, Malheur National Forest, Oregon. This action is needed, because current livestock management is not meeting forest Plan standards. A 2005 forage production analysis determining suitable range conditions indicated the current total livestock forage allocation exceeds available production in a near normal growing season (livestock forage is over-allocated). Previous forage production estimates completed in 1957 and 1981 support this finding. In some areas, vegetation and other resource conditions are not always consistent with the Malheur Forest Plan standards (as amended) indicating livestock distribution and utilization can be modified to better contribute to desired conditions. Adjustments from current management is needed because resource conditions are not always consistent with the Malheur Forest Plan Standards. Adjustments from current management is proposed where existing conditions are not being met or are not moving at an acceptable rate towards desired conditions. The following paragraphs identify where adjustments in management are needed.

The proposed action is expected to maintain and improve desired resource conditions on key management sites. These sites include:

- Aspen stands in Schurtz Creek, Dry Creek and Gabe Creek drainages
- Riparian conditions in Schurtz Creek, Dry Creek, Gabe Creek and Middle Fork Wolf Creek drainages
- Unsatisfactory range condition sites within identified pastures

In addition to the Proposed Action the Forest Service also evaluated the following alternatives:

- No Grazing Alternative

Based upon the effects of the alternatives, the responsible official will decide whether or not to authorize grazing on the Van Allotment and if the decision is to continue authorization of grazing, then to decide any specific standards and guidelines that would be used with this action.

CHAPTER 1 - INTRODUCTION

Document Structure

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

- *Chapter 1: Introduction:* The section 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 section 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 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: Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource. Within each section, the affected environment is described first, followed by the effects of the Alternatives including the No Action or No Grazing Alternative that provides a baseline for evaluation and comparison of the other alternatives.
- *Chapter 4: Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Emigrant Creek Ranger District Office in Hines, Oregon.

Background

National Direction

Prior to 1995, controversy existed over whether there was any need to consider a grazing permit 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 1995 Rescission Act (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. Public Law 104-19, 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. In order 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, extensive unregulated grazing on public land occurred 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. Requirements including base property and commensurability were also designated by statute to ensure economic stability to local communities and to foster stewardship toward the public land resources and to manage rangelands for sustainability. The 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. Borman (2005) states that "today livestock numbers on public lands are substantially lower and grazing is generally managed. Grazing then and grazing now are not the same." Some of these impacts, such as the capability for sites to 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 environmental assessment of vegetation and watershed conditions takes into account the historic level of use that occurred on the Van Allotment 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 managed lands and Taylor Grazing Act for BLM lands was to establish controls and stewardship activities to improve the public land grazing resource. The core of that stewardship created 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.

Forest Direction

This environmental assessment (EA) is tiered to the Malheur National Forest Land and Resource Management Plan FEIS (herein referred to as the Forest Plan) approved May 25, 1990 as amended by:

- Forest Plan Amendment #29 for *Incorporation of the Columbia River Basin Anadromous Fish Habitat Management Policy and Implementation Guide (The Interim Strategies for Managing Fish Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH*), (herein referred to as Forest Plan Amendment #29 or PACFISH) dated August 18, 1994.

- The Regional Forester's Amendment #2 for the *Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales*, (herein referred to as Regional Forester's Amendment #2) dated June 5, 1995.
- *The Inland Native Fish Strategy EA, Decision Notice and Finding of No Significant Impact,* (herein referred to as INFISH) dated July 28, 1995.

The Forest Plan identified the Van Allotment as having lands in unsatisfactory condition. Specifically, the Van Allotment is classified as PCA – where the allotment has an AMP, but basic resource damage is occurring. Allotments are classified as PC when analysis or evaluation indicate that one or more of the following conditions exist and livestock use on the allotment is or has been a major factor contributing to this condition.

- Maximum summer water temperatures are elevated above State Standards or other approved criteria on SMU Class I or II streams (FSM 25256) and this is largely due to the loss of shade-producing vegetation in the allotment.
- Less than 80 percent of the total miles of SMU Class I and II streams are in a stable condition (60 percent for Class III and 50 percent for Class IV streams) where this is largely due to the loss of stabilizing streambank vegetation.
- Gully development of sufficient size to lower the seasonally saturated zone and change the plant community type is occurring.
- Soil condition rating on 25 percent or more of Key Areas is rated poor or very poor.

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 (AMP). AMPs are updated by conducting an environmental analysis of the impacts of grazing and associated activities. The Forest Plan originally scheduled an AMP for Van Allotment to be completed in 1991 (USDA Forest Service 1990).

Watershed Assessment

A Watershed Assessment (WA) for the Lower Malheur Watershed was completed in December 1996. The intent of a watershed assessment is to develop and document a scientifically based understanding of the processes and interactions occurring within a watershed. This EA incorporates by reference the Lower Malheur Watershed Assessment, dated December 1996. The Lower Malheur Watershed Assessment (December 1996) followed a six-step process that characterized the watershed (Step 1), identified issues and key questions (Step 2), described current resource conditions (Step 3), described reference conditions (Step 4), synthesized and interpreted information (Step 5), and made recommendations (Step 6). The Lower Malheur Watershed Assessment (December 1996) described opportunities from which to develop site-specific projects designed to meet enhancement or management opportunities that would cause positive trends towards the desired future conditions, as described in the Forest Plan. Existing conditions were determined from field data. The differences between existing condition and desired future condition represent selected resource opportunities. The Lower Malheur Watershed Assessment (December 1996) identified Schurtz Creek as a riparian area of concern. This EA incorporates many of the recommendations made in the Lower Malheur Watershed Assessment (December 1996).

Historic Grazing Practices on the Malheur National Forest

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 Harney and Grant County culture and economy.

The Malheur National Forest, like many areas in the Western United States, has a reputation of livestock overuse that started in the late 1800's and continued into the mid 1930's. Early maps dated back to 1912 show that cattle range extended northward to the Harney County line and the remainder of the area was used as sheep range. No fences were present and the cattle roamed at-will. This dual use over most of the range from the time the snow melted in the spring until late fall was responsible for the erosion and poor range conditions of the past, some of which are still observable today in areas such as Schurtz creek. By about the 1930's sheep had been eliminated from this range and in the 1950's all permits were converted to cattle with allotments formed to regulate grazing practices.

Improved grazing systems and pasture designs were implemented to accelerate riparian area recovery in the late 1970's and throughout the 1980's. Implementation of the Malheur National Forest Land and Resource Management Plan in the early 1990's reduced the amount of allowable use by livestock grazing to accelerate the rate of recovery in riparian areas, and to limit utilization on shrubs. In the mid to late 1990's other mitigations associated with the Endangered Species Act and the INFISH amendments to the Forest Plan were implemented to further protect riparian areas and associated aquatic species.

Grazing Practices in the Planning Area

The Van Range Planning Area is comprised of the Van livestock grazing allotment, and is located on the Malheur National Forest, Emigrant Creek Ranger District and is approximately 30 miles northeast of Burns, Oregon (see Figures 1 and 2). The Van Allotment encompasses approximately 6,600 acres of National Forest Lands. The allotment is within the Wolf Creek Watershed. There are no anadromous fish in the project area; therefore INFISH applies to this analysis area, not PACFISH. Elevations range from 4200 to over 5000 feet. Annual precipitation averages 17 inches and falls mostly in the form of snow.

Grazing records for the Van Allotment area date back to 1949 when the allotment was created. Grazing practices from 1949 to 1954 were season long use from mid June through October consisting of 175 cattle or 1054 AUMs. From 1955 to 1969, season long grazing of 142 head, or 752 AUMs were permitted for about the same season. In 1970, a division fence was constructed splitting the Van Allotment into two pastures, North (Dry Creek) and South (Schurtz Creek) pastures and the grazing season was changed to June 1 to September 30 for 752 AUMs (see figure 3). A system of two-pasture deferred-rotation

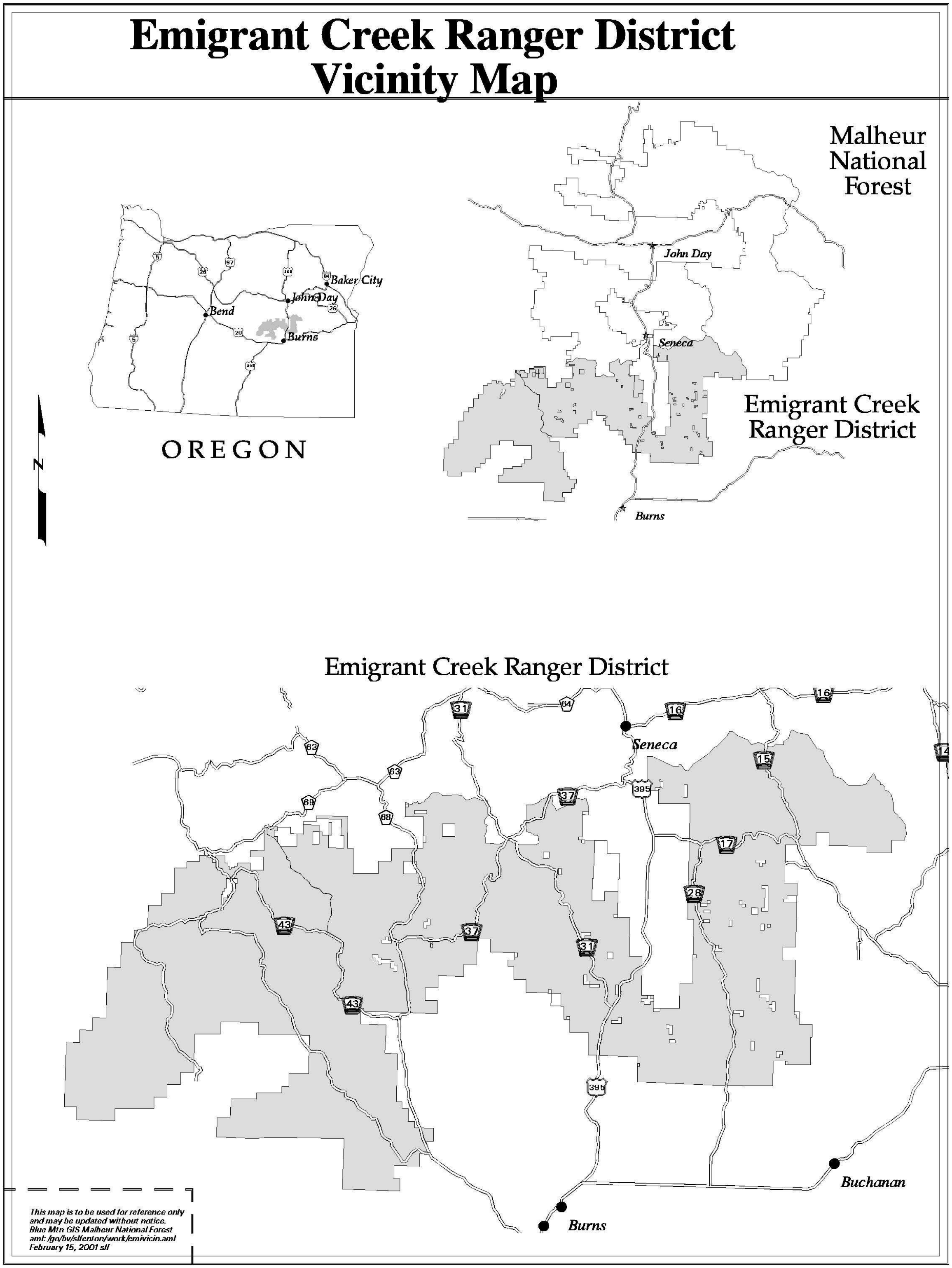

Figure 1: Emigrant Creek Ranger District Vicinity Map. Location of the Emigrant Creek Ranger District

Malheur National Forest
Emigrant Creek Ranger District
Van Allotment

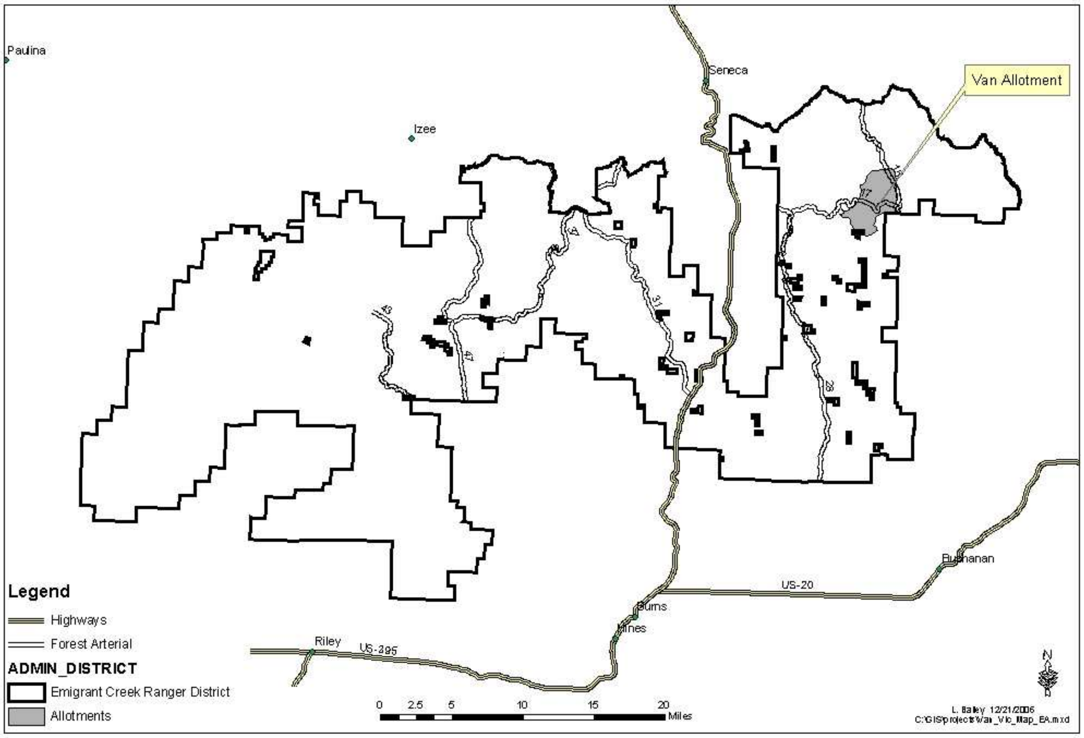

Figure 2: Van Allotment Vicinity Map. Location of the Van Allotment.

was initiated at that time. The units have since been rotated and used first on alternate years.

The Wolf Creek Enclosure (250 acres) was built in 1976 and rested until 1985. Since 1985, when Dry Creek pasture is used first, the Wolf Creek Enclosure is utilized for about 10 days, every other year. Schurtz Creek Riparian pasture (47 acres) was built in 1990-1991 and rested for 3 years through the 1993 grazing season. From 1994-1996 the Schurtz Creek Riparian pasture was scheduled for overnight use only. Starting in 1997 the Schurtz Creek Riparian pasture was scheduled for grazing for 2-3 days each year. Since 2000 the Schurtz Creek Riparian pasture is scheduled for use to Forest Plan standards. The Gabe Exclosure (40 acres) was built in 2003 and has been rested with no planned use (see figure 3).

A 2005 forage production analysis determining suitable range conditions indicated the current total livestock forage allocation exceeds available production in a near normal growing season (livestock forage is over-allocated). Previous forage production estimates completed in 1957 and 1981 support this finding.

Current management in the Van Allotment permits 142 head from 6/1-9/30 when Dry Creek pasture is grazed first and from 5/26-9/25 when Schurtz Creek pasture is grazed

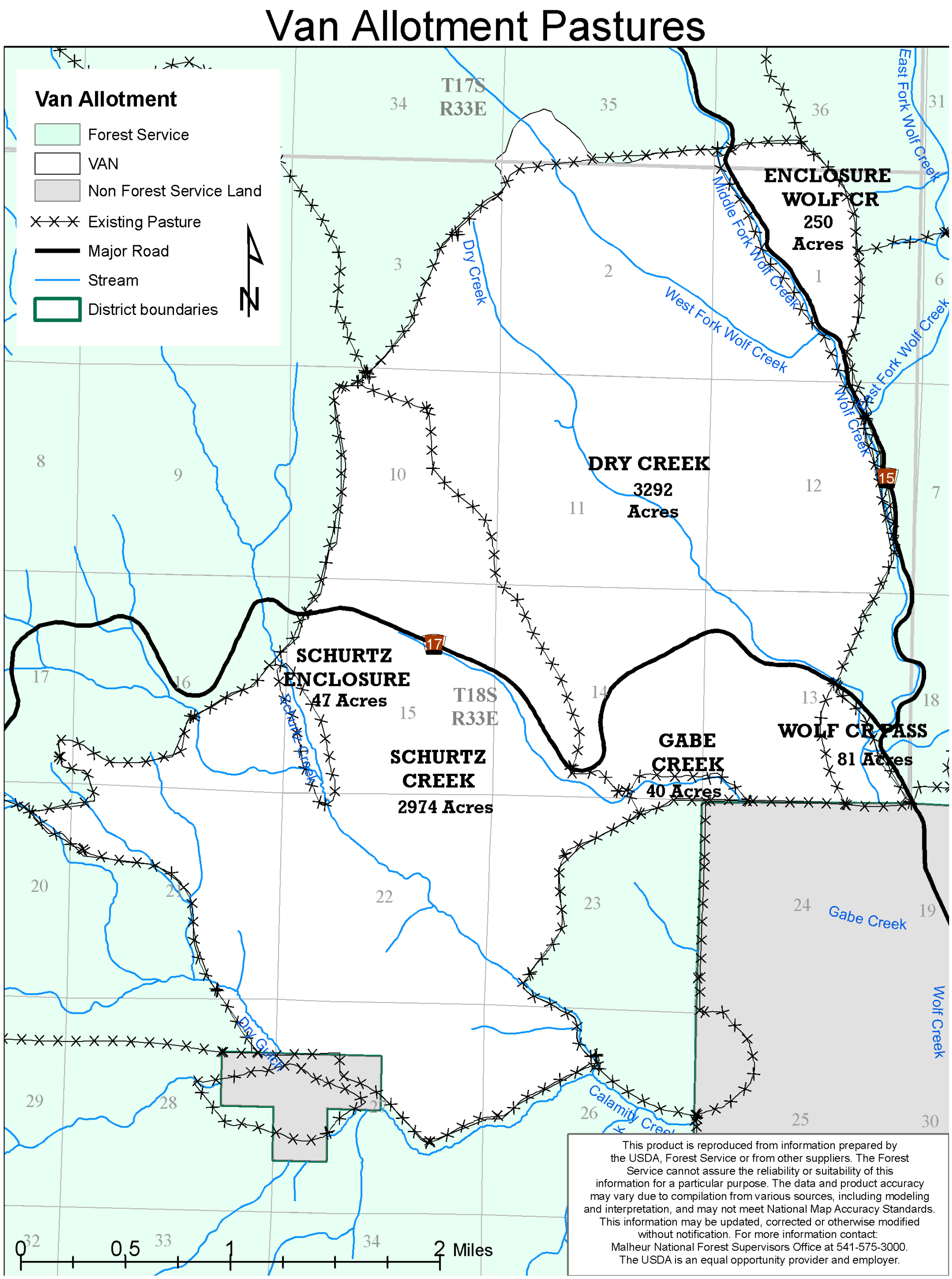

Figure 3: Van Allotment Pastures Map. Current pastures in the Van Allotment.

first for a total of 752 AUMs. In 2005 the entire allotment was rested due to resource concerns. In 2006 the permittees voluntarily agreed to take a 20% reduction in time, to address resource concerns. In spite of this, actual use in 2006 was 487 AUMs (a 35% reduction) because allowable utilization was exceeded before the scheduled off date. In 2007 and 2008 the Van Allotment was rested.

In spite of all these improvements, current management in the Van Allotment is not producing adequate results because of the following reasons:

- The current total livestock forage allocation exceeds available production in a near normal growing season (livestock forage is over-allocated);
- Riparian vegetation along 2.24 miles of Schurtz Creek lacks the resiliency that allows a riparian wetland area to withstand (hold together during) high water events. Specifically there is a lack of diverse age-class distribution of riparian-wetland vegetation, lack of diverse composition of riparian-wetland vegetation, lack of species that indicate maintenance of riparian-wetland soil moisture characteristics; lack of streambank vegetation comprised of those plants or plant communities that have root masses capable of withstanding high-streamflow events; lack of adequate riparian-wetland vegetative cover to protect banks and dissipate energy during high flows; and riparian-wetland plants do not exhibit high vigor.
- 2.24 miles of Schurtz Creek (reach 1, segment 1) failed to meet 5 of the six riparian management objectives in Forest Plan Amendment 29 (bank stability, pool frequency, width/depth ratio, water temperature, and large woody debris RMOs were not met, canopy closure was met);
- Riparian function was assessed adjacent to about 2.24 miles of Schurtz creek by district personnel and determined to be Functional at Risk with no apparent trend.
- Upland vegetation in Schurtz Creek pasture shows evidence of serious grazing-related degradation resulting in reduction of native large bunchgrasses, increases in sagebrush, and increase in grazing-resistant forbs and Sandberg's bluegrass;

Because current management is not producing adequate results, adjustments are needed. Adjustments from current management are proposed where existing conditions are not improving at an acceptable rate towards desired conditions.

Other Information

The Van Allotment project was initially scoped on August 13, 2004 with three similar actions including the House Creek, West Malheur, and Wolf Mountain Allotments. During that environmental analysis process the Van Allotment was removed from the analysis. A Decision Notice (DN) and FONSI for the House Creek, West Malheur, and Wolf Mountain Allotments were signed on 12/21/2005.

This EA focuses on resolving current areas of resource concern that may be contributing to undesirable conditions in specific locations and situations. This EA documents the environmental analysis of effects of livestock grazing in the Van Allotment and will be used to develop a new Allotment Management Plan (AMP).

Purpose and Need for Action

Purpose

The purpose of this proposed action is to continue authorization of livestock grazing in a manner that is consistent with the Malheur Forest Plan as amended. Authorization is needed on this allotment 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 Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976).*
- The allotment contains lands identified as suitable for domestic livestock grazing in the Malheur Forest Plan and continued domestic livestock grazing is consistent with the goals (Forest Plan pages IV-2), desired future conditions (Forest Plan pages IV-7 and IV-10), objectives (Forest Plan pages IV-18), forest wide standards (Forest Plan pages IV-34), and management areas (Forest Plan pages IV-50 through IV-137).
- The Malheur National Forest Plan permits livestock use on suitable range when the permittee manages livestock using prescribed practices (Forest Plan IV-2).
- It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans. **(FSM 2203.1)**
- By regulation, forage producing lands will be managed for livestock grazing where consistent with land management plans. **(36 CFR 222.2 (c))**

Need

Within the Van Allotment current livestock management is not producing adequate results and resource conditions are not always consistent with forest plan standards, guidelines, goals, and objectives. Because of these reasons, adjustments from current livestock management are needed. Adjustments from current management are proposed where existing conditions are not being met or are not improving at an acceptable rate towards desired conditions. The following paragraphs identify where adjustments in management are needed.

Unsatisfactory Range Conditions

There is a need to improve unsatisfactory range conditions because:

- Data collected outside livestock enclosure fences (riparian management pastures) indicates that suitable rangelands are in unsatisfactory condition.
- A 2005 forage production analysis determining suitable range conditions indicated the current total livestock forage allocation exceeds available production in a near normal growing season (livestock forage is over-allocated). Previous forage production estimates completed in 1957 and 1981 support this finding.

Aspen Stands

There is a need to enhance, restore and protect aspen stands in Schurtz Creek, Dry Creek and Gabe Creek drainages because:

- Most aspen stands are small and appear as a few old decadent stems with little or no viable regeneration. This has occurred because they are being overgrown by conifers; disturbances that could regenerate the clones are lacking; ungulates browse the few new sprouts that do occur, and lowered water tables from stream down-cutting. Without protection from ungulates, aspen sprouts often are prevented from maturing by browsing.

Riparian Conditions

There is a need to enhance and restore riparian conditions in Middle Fork Wolf Creek, Schurtz Creek, Dry Creek and Gabe Creek drainages because:

- Streambanks need stabilization and the stream channels need to be reconnected to the floodplain in order to promote riparian species capable of stabilizing stream banks.
- Riparian vegetation along 2.24 miles of Schurtz Creek lacks the resiliency that allows a riparian wetland area to withstand (hold together during) high water events. Specifically there is a lack of diverse age-class distribution of riparian-wetland vegetation, lack of diverse composition of riparian-wetland vegetation, lack of species that indicate maintenance of riparian-wetland soil moisture characteristics; lack of streambank vegetation comprised of those plants or plant communities that have root masses capable of withstanding high-streamflow events; lack of adequate riparian-wetland vegetative cover to protect banks and dissipate energy during high flows; and riparian-wetland plants do not exhibit high vigor.
- 2.24 miles of Schurtz Creek (reach 1, segment 1) failed to meet 5 of the six riparian management objectives in Forest Plan Amendment 29 (bank stability, pool frequency, width/depth ratio, water temperature, and large woody debris RMOs were not met, canopy closure was met);
- Riparian function was assessed adjacent to about 2.24 miles of Schurtz creek and determined to be Functional at Risk.

- Dry Creek Spring and another unnamed spring are being impacted by livestock trampling and over utilization of forage has reduced or eliminated many native riparian species at the spring sites.

These actions respond to the goals and objectives outlined in the Malheur National Forest Plan as amended, and helps move the project area towards desired conditions described in that plan. These actions also initiate many of the recommendations made in the Lower Malheur Watershed Assessment (December 1996).

Desired Conditions

The desired conditions for the Van Allotment are described in the Forest Plan (USDA Forest Service 1990), as amended. The Forest Plan provides the parameters for identifying and defining project-specific desired conditions. The purpose and need for an action is driven by the difference between the existing and desired condition. The proposed action was developed with the purpose of beginning movement or to continue moving riparian areas and other plant communities towards desired conditions.

Using the Forest Plan, as amended, the following site specific desired conditions were developed to address the areas of concern where vegetation and other resource conditions are not always consistent with the Malheur Forest Plan as amended. General desired conditions described in the Forest Plan as amended still apply but are not listed below.

Rangeland Resources

- Modified grazing strategies in the Schurtz Creek, Dry Creek and Middle Fork Wolf Creek drainages will increase the rate of improvement in riparian vegetation; riparian areas within these drainages will show improvements due to reduced utilization of grasses and shrubs.
- Woody riparian shrubs with improved age class distribution will be more prevalent in the Schurtz Creek, Dry Creek and Middle Fork Wolf Creek drainages (Forest Plan IV-7).
- Reduced forage allocation will increase the rate of improvement in upland vegetation of bunchgrasses and shrubs.
- Grazing management adjustments will improve distribution patterns on the Schurtz Creek, Dry Creek and Wolf pastures.

Riparian Vegetation

- Aspen stands in Gabe creek, Schurtz creek and Dry creek drainages will be more abundant, diverse, naturally regenerating, and in uninterrupted or released architecture.
- Species indicative of maintenance of riparian soil moisture (late seral riparian vegetation such as sedges and rushes) are present within riparian areas. (This would be about 75% of the percent expected for the greenline capability group (Winward 2000)).

- Diverse age structure for woody species is present where such species are a part of the natural system.
- Plants exhibit high vigor.
- Influences of livestock grazing 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.
- "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 standard for shade provided by the shrub component based on the site potential as outlined in Malheur Forest Plan Amendment #29 for Management Area 3B. To meet or move towards 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.

Watershed and Fisheries

The desired conditions for watershed and fisheries builds on the desired conditions described for riparian vegetation discussed in the previous section.

- Stream channels in Schurtz Creek and Middle Fork Wolf Creek drainages are interacting with floodplains. Riparian species present indicate maintenance of riparian-wetland soil moisture characteristics. Down cutting is not evident.
- Stream bank vegetation protects stream banks and dissipates energy during high flows (i.e., consider community type composition, rooting characteristics, and plant density).
- Steambanks are building at near natural rates of recovery and carryover effects do not impact stream channel geomorphology including profile, bank angle.

The Forest Service recognizes the Riparian Management Objectives (RMO) from INFISH are important for high quality fish habitat. However, RMO's are not expected to show measurable change during the life of this NEPA document. Because RMO's are long term objectives, PACFISH (Enclosure B), which was incorporated into INFISH, gives direction to use changes in vegetative condition rather than changes 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 would ultimately degrade, retard, or prevent the attainment of the RMOs". The following are long term watershed and fisheries desired conditions but would not likely occur during the life of the document:

- Riparian areas will meet or be moving 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, 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 will ensure that streams contain high habitat complexity and quality to support all life histories of native fish 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.
- 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.
- Schurtz Creek, West Fork Wolf Creek, and Wolf Creek will meet Oregon State Water Quality Standards for temperature, where the potential exists. If they do not meet temperature standards, it is where temperature is not influenced by land management practices.

Heritage

- The archaeological site within the Van Allotment that is eligible or potentially eligible for listing on the National Register of Historic Places (NRHP) is protected from significant impacts caused by grazing and range management actions.

Decision Framework

The land allocation identified in the Forest Plan, in combination with public comments and the predicted environmental impact of Alternatives documented in this assessment, will guide considerations in the selection of a reasonable, balanced, and appropriate decision. This EA is not a decision document. It discloses the environmental consequences of implementing the proposed action and alternative to that action. Allotment-specific decisions will be documented in a separate Decision Notice signed by the District Ranger.

The decision that the Responsible Official will make in the Decision Notice is whether to authorize some level of livestock grazing, and, if so, what management prescriptions will be applied (including Standards, Guidelines, grazing management, and monitoring) to ensure that Desired Conditions are met, or that progress is made towards those objectives in an acceptable timeframe.

Proposed Action

A proposed action is defined early in the project-level planning process. This serves as a starting point for the interdisciplinary NEPA planning team, and gives the public and other agencies specific information on which to focus comments. Using these comments, and information from preliminary analysis, the interdisciplinary team then develops alternatives as needed to the proposed action. The Proposed Action Alternative (reference Map #1) is briefly described below and described in further detail in Chapter 2.

The Emigrant Creek Ranger District, Malheur National Forest proposes to continue authorization of livestock grazing on the Van Allotment, under management systems designed to meet Forest Plan standards and guidelines. This alternative focuses on desired resource conditions. Adaptive-management principles would be applied by describing sideboards to management that are designed to provide flexibility, while ensuring that Desired Conditions are met or are progressing in the desired direction. Examples of changing conditions would be drought, range readiness dates, or grazing following a non-use period.

A proposed course of action is selected as a starting point that we believe best meets or approximates the desired condition. As long as management stays within these sideboards or constraints, management adaptations may be implemented to respond to changing conditions and needs seasonally. Monitoring will be the key to determining if or when adaptation would occur and would guide the selection of adaptive changes to be applied to ensure adequate progress. New science and management techniques would be incorporated as needed, or when they are developed. All adaptive actions would be within the scope of effects described in this document or a supplemental NEPA document, and a decision would be made as appropriate. This action would ensure that livestock-grazing use is consistent with the Forest Plan, as amended, that proper management is in place on the ground, and that management remains focused on the attainment of Desired Conditions.

The following paragraphs illustrate management strategies for the Van Allotment. These possible management scenarios are not all-inclusive, and "best management practices" would be used where appropriate. The following activities, management practices, and livestock use are proposed to accomplish this.

- **Rest entire allotment for 3-5 consecutive years** – The allotment would be rested for 3-5 consecutive years in order to allow the Forest Service ample time to obtain funds to purchase materials for proposed fences. The 2006 grazing season demonstrated that the Schurtz Creek pasture cannot be successfully grazed without first creating riparian pastures.
- **Maximum permitted AUMs would be 441 –** Reduction in permitted AUMs is based on the 2005 forage production analysis which determined suitable range conditions. This analysis indicated the current total livestock forage allocation exceeds available production in a near normal growing season (livestock forage is over-allocated). Previous forage production estimates completed in 1957 and 1981 support this finding. Therefore, maximum permitted AUMs would be reduced by a total of 41% (752 to 441 AUMs) from current management.
- **Potential season of use from May 15-September 30–** The potential season of use would be no earlier than May 15 and no later than September 30. The actual season of use would be determined yearly and is subject to change in response to various resource conditions, climate, and natural events such as debris torrents or floods. However, it is recommended that late summer and fall grazing be reduced as much as possible. Livestock turn on date would be dependent on range readiness criteria and livestock removal dates would be dependent on move triggers and end point monitoring.

- **142 permitted/average numbers –** The permitted/average numbers would be 142 and is subject to change in response to various resource conditions, climate, and natural events such as debris torrents or floods.
- **Riparian management pastures would be established -** Three riparian management pastures would be established with associated water gaps (see proposed action map).
  - **a.** Frog[1] and Hawthorn[1] pastures would be established and rested until the riparian vegetation has sufficient composition and abundance of late seral species in order to protect stream banks and dissipate energy during high flows. (This would be about 75% of the percent expected for the greenline capability group (Winward 2000)). Prescribed or intensively managed grazing would resume within the Frog and Hawthorn pastures when the above conditions are met, and when grazing would not retard RMO's or would not be detrimental to riparian shrub communities, and allows recovery at a near natural rate.
  - **b.** Riparian management pasture Fry[2] would be established on the lower mile of Schurtz Creek. Livestock grazing would not be permitted in this pasture.
- **Aspen stands would be regenerated and protected** - Regenerate aspen stands in Gabe creek, Schurtz creek and Dry creek drainages by conifer removal, prescribe burning and protection by fencing[3] and excluding livestock grazing.
- **Range improvements would be implemented** – Range improvements would be implemented in order to protect resources and improve livestock distribution.
  - a. Fence[4], develop and exclude livestock grazing on Dry Creek Spring and an unnamed spring in the Dry Creek drainage.
  - b. Modify (enlarge) Wolf Creek Pasture fence[4]. Use Wolf Creek pasture for about 10 days in the spring on the years Dry Creek Pasture is grazed first (every other year).
  - c. Place two water troughs[5] in existing dry stock ponds and require water hauling by permittee on years Schurtz Creek pasture is grazed last (every other year).
- **Stream restoration activities would be implemented** – Stream restoration activities would be implemented in order to accelerate recovery. Stream

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[1] Materials and labor to construct would be provided by the Forest Service. Labor to maintain would be the responsibility of the Permittee.

[2] Materials, labor to construct and maintain would be provided by the Forest Service.

[3] Materials and labor to construct the aspen exclosures would be provided by the Forest Service. Maintenance of these exclosures would be the responsibility of the Forest Service.

[4] Materials to construct the spring exclosures and developments would be provided by the Forest Service. Labor to construct and maintain fences and spring developments would be the responsibility of the Permittee.

[5] Materials for water troughs would be provided by the Forest Service. Labor to construct and maintain troughs would be the responsibility of the Permittee.

restoration activities would stabilize stream banks and reconnect the stream to the floodplain in order to promote riparian species capable of stabilizing stream banks.

a. Install a combination of small check dams and LWD[6] in Schurtz Creek, Gabe Creek and Dry Creek.

b. Stabilize headcuts on Gabe Creek and Dry Creek with rocks, wood or filter cloth[6].

- **Standards and Guidelines for Upland and Riparian Utilization** – Utilization would meet Forest Plan Standards at the end of the current use period (not the end of the growing season due to unpredictable growth during the late summer).

  a. **Upland Utilization:** Upland utilization would not exceed 35% on grasses and 30% on shrubs (FP IV-18, 35, and 58). The following would act as triggers to remove livestock.

    - Approaching 3-inch stubble height (or 35% use) on upland grasses, or
    - 30% use on upland shrubs

  b. **Riparian Utilization:** Riparian utilization would not exceed 35% on grasses, sedges and rushes and 30% on shrubs (FP IV-18, 35, and 58). The following would act as triggers to remove livestock from the riparian pastures.

    - A 6-inch greenline stubble height (or 35% use) on sedges and rushes, or
    - Approaching 3-inch floodplain stubble height (or 35% use) on grasses, or
    - No more than 20% bank alteration, or
    - 30% use on riparian shrubs

- **Monitoring** – A combination of 1) The Malheur National Forest Range Monitoring Guidelines (June 2005) (Appendix A), 2) The Malheur National Forest Riparian Monitoring (Condition and Trend) Strategy (2005) (Appendix B), and 3) the monitoring protocol developed by the Interagency Implementation Team (IIT), as amended in 2004 (IIT 2004), would be used to determine if grazing is allowing movement towards desired conditions and Forest Plan Standards, as amended. If monitoring does not indicate an upward trend, adaptive management would allow the Forest Service to adjust grazing management using a variety of tools (timing, intensity, duration, and season of use) to achieve an upward trend. Holechek et al. (1998) suggested that management changes may be needed if utilization guidelines exceed 30% of the pasture/allotment for 2 consecutive years or 2 of 5 years.

[6] The Forest Service would conduct all activities either internally or through contract.

a. **Upland Trend:** Existing C&T plots would continue to be read at least once every 5-10 years. An additional 2-3 upland long-term monitoring plots would be established in Dry Creek pasture in specific locations to determine trend.

b. **Upland Annual Monitoring:** Upland utilization would not exceed 35% on grasses and 30% on shrubs (FP IV-18, 35, and 58). The following would act as end point monitoring indicators to remove livestock.

- Approaching 3-inch stubble height (or 35% use) on upland grasses, or
- 30% use on upland shrubs

c. **Riparian Trend:** Riparian vegetation would be monitored using the vegetation cross-section composition, greenline composition, and woody species regeneration sampling procedures as described in Winward (2000) and Burton et al 2007).. This process would be completed at least once every 5-10 years to determine riparian vegetation trend.

d. **Riparian Annual Monitoring:** Riparian utilization would not exceed 35% on grasses, sedges and rushes and 30% on shrubs (FP IV-18, 35, and 58). The following would act as triggers to remove livestock from the riparian pastures.

- A 6-inch greenline stubble height (or 35% use) on sedges and rushes, or
- Approaching 3-inch floodplain stubble height (or 35% use) on grasses, or
- No more than 20% bank alteration, or
- 30% use on riparian shrubs

Management Areas

The Forest Plan (1990) divided National Forest System Lands into Management Areas (MA), each with different management goals, resource potential, and limitations. Forest Plan Amendment #29 amended MA 3A and 3B (Riparian Areas) and provided desired future conditions for each of these MAs. Additionally, this amendment provided more specific numeric standards for these MAs. Standards are now based on the same scientific information used in PACFISH (March 25, 1994) and INFISH (July 28, 1995). Riparian Habitat Conservation Areas (RHCA) were created with incorporation of PACFISH and INFISH into the Forest Plan. In this manner, RHCAs are not management areas; however, they amend the Forest Plan and incorporate new goals, objectives, standards, guidelines, and management direction. These new standards take the place of direction described in the Forest Plan. The following MAs and RHCAs are located within the Van Allotment.

Table 1 – Management Areas, Van Allotment

Management Area (MA)	MA Acres	Percent of Planning Area
1-2 Forest and Rangeland	1384	21
4A Big Game Winter Range	4592	69
RHCA	650	10
Totals	6626	100

Management Area 1 - General Forest

This management area primarily consists of forested lands and is designed to emphasize timber production on a sustained yield basis while providing for other resource values. Generally, acres for MA 1 and MA 2 (see below) are combined. There are about 1,384 acres of MA 1/2 general forest/rangeland in the planning area.

Standards for MA1

- Manage allotments to utilize available forage while maintaining vegetation (including trees) and site productivity.
- Create and utilize transitory forage resulting from past timber harvest if restocking of cutover areas within regeneration period is assured.
- Design structures which facilitate livestock distribution to protect tree regeneration.
- Plan and implement range forage seedings that are not detrimental to tree restocking of harvested areas within planned regeneration periods.

Management Area -2 – General Rangeland

This management area primarily consists of nonforested grasslands and low-site ponderosa pine lands that are unsuitable for timber production. Forage production is emphasized on nonforested areas on a sustained yield basis while providing for other resource values. This management area is usually included as non-forested lands within other MAs, primarily MA 1 – General Forest. See MA 1 for acres.

Standards for MA2

- Design and administer range management activities to promote objectives of management indicator species.
- Manage allotments to ensure that resource values other than forage are maintained at or above minimum requirements.

Management Area 4A – Big Game Winter Range Maintenance

This management area consists of non-forested grasslands, bitterbrush and mountain mahogany brush fields, and forested lands. The goal of MA 4A is to maintain or enhance the quality of the winter range habitat for deer and elk through timber harvesting, prescribed burning, and other management activities, including access management and restricted activities during winter months. There are about 4,592 acres of big-game winter range in the planning area.

Standards for MA4A

- Prioritize forage utilization to provide for big game species at levels derived in consultation with the Oregon Department of Fish and Wildlife for each area.
- Include the forage needs of big game in late fall when preparing or updating allotment management plans and when considering seasonal extensions of livestock grazing.

Riparian Habitat Conservation Area (RHCA)

Riparian habitat conservation areas are portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. The planning area contains about 650 acres of RHCAs. These areas include traditional riparian corridors, wetlands, intermittent headwater streams (MA3A), and other areas where proper ecological functioning is crucial to maintenance of the streams water, sediment, large woody material, and nutrient delivery systems.

Standards for RHCA

- Grazing Management 1 - Modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect inland native fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objectives.
- Grazing Management 2 – Locate new livestock handling and/or management facilities outside Riparian Habitat Conservation Areas. For existing livestock handling facilities inside the Riparian Habitat Conservation Areas, assure that

facilities do not prevent attainment of Riparian Management Objectives. Relocate or close facilities where these objectives cannot be met.

- Grazing Management 3 – Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that would not retard or prevent attainment of Riparian Management Objectives or adversely affect inland native fish.

Public Involvement

Information provided as a result of the scoping process is located in the Van Range Planning Area Project Record. Using the comments from the permittees, public, other agencies, and tribes, (see Issues section), the interdisciplinary team developed a list of issues to address.

Scoping

The proposal was listed in the Schedule of Proposed Actions as the Wolf/Van Grazing AMP project in the summer/fall 2002 issue. This project included the Van, Wolf Mountain and West Malheur Allotments and was later combined with the House Creek Grazing AMP project. The proposals were combined and provided to the public and other agencies for comment during scoping period from August 13 to September 13, 2004.

A separate scoping letter was sent to the permittees using the allotment in August, 2004. In addition, as part of the public involvement process, the agency met with all permittees in May 2005. Every effort was made to address permittee concerns. The permittees provided input on alternatives and site specific development proposals for their allotment.

The project was initially scoped on August 13, 2004 with three similar actions including the House Creek, West Malheur, and Wolf Mountain Allotments. During the environmental analysis process the Van Allotment was dropped. The House Creek, West Malheur, and Wolf Mountain Allotments Environmental Assessment were completed in December 2005.

On September 8, 2005 NEPA Coordinator Lori Bailey spoke with Harney County Judge Steven Grasty to discuss specific concerns of the County Court.

On April 30, 2007 Acting District Ranger Matthew Reidy met with the Van Permittee's to discuss the 2007 grazing season.

On May 1, 2008 District Ranger Jerome Hensley met with the Van Permittee's to discuss the proposed action and the progress on the analysis.

Tribal Consultation

Tribal scoping letters were sent for comment during the scoping period from August 13 to September 13, 2004. Letters were sent to the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of Warm Springs Reservation of Oregon and the Nez Perce Tribe. No responses were received.

On March 15, 2005 then District Ranger Margaret David Bailey, NEPA Coordinator Lori Bailey and Vegetation Manager George Wynn met with members of the Burns Paiute Tribe as per the process of the existing Memorandum of Understanding (MOU). Topics included an overview of the project, potential alternatives and timelines. Verbal comments were in agreement with the proposed action.

On February 1, 2007 then District Ranger Margaret David Bailey and District Archeologist Pat Haynal met with members of the Burns Paiute Tribe as per the process of the existing Memorandum of Understanding (MOU). Topics included an overview of the project, potential alternatives and timelines. Verbal comments were in agreement with the proposed action.

Issues

Scoping is used to identify issues that relate to the effects of the proposed action. An issue is an unresolved conflict or public concern over a potential effect on a physical, biological, social, or economic resource as a result of implementing the proposed action and alternatives to it. An issue is not an activity; instead, the projected effects of the proposed activity create the issue. Issues are generated by the public, other agencies, organizations, and Forest Service resource specialists and are in response to the proposed action. Issues provide focus for the analysis of environmental effects and may influence alternative development, including development of project design features and any additional mitigation measures. In this document issues are tracked and are used to display differing effects of the proposed action and the alternatives.

The issues were separated into three groups for the purpose of this analysis: Significant issues, Analysis Issues and Issues Eliminated from Detailed Study. The Council for Environmental Quality (CEQ) NEPA regulations give guidance (40 CFR Sec. 1501.7) to "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)." A definition of each issue group is discussed below:

Significant issues are defined as those directly or indirectly caused by implementing the proposed action; however, the effects cannot be reduced by normal Best Management Prescriptions (BMPs) or Project Design Features (PDFs). Usually an alternative is developed to address significant issues.

Analysis issues are defined as those directly or indirectly caused by implementing the proposed action; however, the effects could be reduced with normal BMPs and PDFs and an alternative was usually not developed to address these analysis issues. However, these analysis issues would be tracked in the relevant resource area effects analysis in Chapter 3 and in the Comparison of Alternatives section at the end of Chapter 2- Section 2.4.

Issues Eliminated from Detailed Study are identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence.

The Interdisciplinary Team (IDT) identified potential issues and the Responsible Official approved those issues to be carried through the analysis as either significant issues or analysis issues in order to fully develop and allow further comparison of the proposed action and alternatives. An IDT issue identification summary document is in the project record files. The environmental consequences of the proposal are disclosed in Chapter 3 for each resource affected by the significant or analysis issues. Each issue has indicators to allow members of the public and the Responsible Official to determine how well issues are addressed by the alternatives (see Comparison of Alternatives section at the end of Chapter 2 for effects of the alternatives on issues). A discussion of all issue groups, specific issues and the indicator(s) for each issue is given below.

Significant Issues

The Forest Service identified two categories of significant issues raised during the scoping process. These significant issues include:

Issue 1 – Riparian Vegetation and Aquatic Habitat

Concern: Riparian vegetation on Schurtz Creek lacks the resiliency that allows a riparian wetland area to withstand (hold together during) high water events (Reference Purpose and Need section on page 9). Segments of Schurtz Creek have unstable banks.

Segments of Dry Creek have unstable banks and a headcut which indicates the creek may be functioning at risk. Dry Creek Spring and another unnamed spring are being impacted by livestock trampling and over utilization of forage has reduced or eliminated many native riparian species at the spring sites.

Measures: Permitted livestock numbers, duration of grazing in riparian areas, effects to sensitive aquatic species, bank alteration, and riparian vegetation trend along the green line and floodplain as described in Winward (2000).

Issue 2 – Upland Vegetation

Concern: Upland vegetation in Schurtz Creek pasture shows evidence of serious grazing-related degradation resulting in reduction of native large bunchgrasses, increases in sagebrush, and increases in grazing-resistant forbs and Sandberg's bluegrass.

Measure: Permitted livestock numbers, stubble height on upland grasses and browse on upland shrubs. Condition and trend of upland range sites, and duration of livestock grazing in pastures.

Analysis Issues

Analysis issues considered for this analysis generated from public comments and/or the project interdisciplinary team are listed below.

Economics

Concern: National Forest livestock grazing contributes to local economic activity. Changes in permitted livestock numbers can result in impacts especially when substitute sources of forage are not available. Changes in how the allotment is managed can affect implementation and operations costs.

Resolution: Permitted livestock numbers, grazing related jobs and income, and permittee and Forest Service costs.

Soils

Concern: Impacts to soils.

Resolution: Livestock grazing may affect long-term soil productivity by causing detrimental soil compaction by trampling, detrimental soil puddling by trampling and trailing, detrimental soil erosion by reducing ground cover, and nutrient loss. The Forest Plan standards and guidelines to manage soil and water resources to maintain or enhance the long-term productivity of the Forest will be met. The alternatives will be analyzed and the effects on soils will be compared to the Forest Plan standards and guidelines.

Threatened, Endangered, Proposed and Sensitive Species

Concern: Impacts to threatened, endangered, proposed and sensitive species.

Resolution: The Forest Service is required to analyze the effects of proposed projects on threatened, endangered, proposed and sensitive species. To meet this requirement, biological assessments (BA) and/or biological evaluations (BE) for species known to occur or which may occur in the planning area have been prepared by Forest Service biologists.

Appendix H determined No Effect to the terrestrial wildlife specie whose status is considered threatened and the terrestrial wildlife specie whose status is considered endangered from the proposed action. Because there would be no effect to threatened and endangered species expected from the action alternatives, a BA and consultation with the United States Fish and Wildlife Service (USFWS) is not required.

A Regional Sensitive Species list was provided to the Forest by the Pacific Northwest Region (Region 6) of the Forest Service. This list identifies sensitive species that may occur on the Malheur National Forest. IDT members have prepared Biological Evaluations (BE) (Appendices F, G and H) for sensitive species that analyze the effects of the proposed actions on these species. In summary, effects of the proposed action on sensitive plant, aquatic and terrestrial wildlife species range from no impact to 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, to beneficial impacts.

Management Indicator Species

Concern: Impacts to management indicator species (MIS).

Resolution: Indicator species for the Emigrant Creek Ranger District are identified in the Malheur Forest Plan (IV-32). Chapter 3 discloses the effects to MIS by alternative. The wildlife specialist report discloses more information regarding MIS.

Biological Soil Crusts

Concern: Impacts to biological soil crusts. The EA should discuss the importance of biological soil crusts and include an inventory and evaluation of their current status over the entire planning area, the causes of their degradation, concomitant losses of ecosystem function, and how they will be recovered.

Resolution: Chapter 3 discloses the effects to biological soil crusts by alternative. The botany specialist report discloses more information regarding biological soil crusts.

Forested Vegetation

Concern: Potential effects of livestock grazing on the health and density of ponderosa pine forests. Has grazing helped move away from the historic range of variability (HRV)?

Resolution: Chapter 3 discloses the effects to forested vegetation by alternative. The silviculturist specialist report discloses more information regarding forested vegetation and HRV.

Heritage Resources

Concern: The EA should address potential impacts to heritage resources.

Resolution: Chapter 3 discloses the effects to heritage resources by alternative. All alternatives include management requirements, constraints and mitigation measures to protect heritage resources. The heritage specialist report discloses more information regarding heritage resources.

Issues Eliminated From Detailed Study

The issues listed below were eliminated from detail study for this analysis:

Suitability and Capability Determinations

Concern: Address the suitability of areas for livestock grazing.

Resolution: The Forest Plan has determined the capability and suitability of the plan area and established programmatic direction including goals, objectives, standards, guidelines, and monitoring requirements. Range specialist reports collected in the 1960's examined the site-specific capability and capacity of these allotments. This information was used during development of the Forest Plan. 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 analysis is to determine whether or not to authorize livestock grazing in the project area (Wilderness Society v. Thomas 188 F.3d 11(9th Cir. 1999)).

Monitoring and Credibility

Concern: The Forest Service does not adequately monitor all parameters (utilization on grasses and grasslikes and shrubs and bank stability) listed in the Forest Plan.

Resolution: FSH 2209.13 Chapter 90 Rangeland Management Decision Making Section 97-Monitoring states: "Monitoring and evaluation shall be identified as part of the project decision. Conduct planned monitoring only to the extent needed to determine if planned actions have been implemented and whether they are effective in achieving objectives. The significant issues or effects should dictate monitoring requirements".

Monitoring would be conducted using established protocols for the Malheur National Forest which are listed in the monitoring section in Chapter 2. When monitoring indicates that resource problems are occurring, these concerns are resolved through permit administration using the direction given in FSH 2209.13 Chapter 10.

Reliability and Verifiability of Current Utilization Standards

Concern: Current utilization standards are not reliable and verifiable.

Resolution: The Forest Plan as amended identifies appropriate utilization standards. These standards will be monitored using established protocols for the Malheur National

Forest which are listed in the monitoring section in Chapter 2. Monitoring locations are further specified by allotment in the allotment management plan (AMP).

Trespass Livestock

Concern: The EA should address trespass livestock.

Resolution: Chapter 10 FSM Chapter 2238.4 requires that unauthorized use and permittee excess use be billed at higher rates based upon the full commercial value of leased forage. These concerns would be resolved through permit administration using the direction given in FSH 2209.13 Law enforcement may be notified when livestock are discovered that are not authorized to be on Forest Service land.

Inventoried Roadless Areas

Concern: Timber harvest should be avoided in roadless areas.

Resolution: There are no inventoried roadless areas in the planning area and no timber harvest is proposed.

Unroaded Areas

Concern: Uninventoried roadless areas (unroaded areas) should be considered for their potential roadless and wilderness values.

Resolution: Livestock grazing would have no impact on whether an area would or would not be considered unroaded.

Total Maximum Daily Loads (TMDL)

Concern: Scheduled TMDLs should be integrated into allotment planning.

Resolution: The Van Allotment EA 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).

Schurtz Creek, and the portions of Wolf Creek and West Fork Wolf Creek that flow through the Van allotment, all exceeded the Oregon State temperature standards in the years they were monitored. However, at this time none of the streams on the Van allotment are on the Oregon DEQ 303(d) list, and the intermittent nature of Schurtz Creek may create extenuating circumstances. For this project the protocol and decision framework were not initiated because (1) no streams on the Van allotment are on the Oregon DEQ 303(d) list, and (2) the project would not measurably affect the parameter (summer temperature) for which streams within the analysis area would be listed and, therefore, a WQRP is not needed for this project. The TMDL for the Malheur sub-basin is scheduled for 2007 through a collaborative approach with the State and Tribes http://www.deq.state.or.us/wq/tmdls/malheurriver.htm

Consistency with other Laws and Regulations

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

Regional Forester's Sensitive Species List (Update)

On January 31, 2008, Regional Forester Linda Goodman released an updated Sensitive Species List which includes federally listed, federally proposed and sensitive species lists. In the cover letter for the updated species list (Regional Forester Linda Goodman, January 31, 2008) the Regional Forester states that projects initiated prior to the date of this letter may use the updated sensitive species list or the list that was in effect when the project was initiated. The Responsible Official for the project has authority to decide which list to use. "Initiated" means that a signed and dated document such as a project initiation letter, scoping letter, or Federal Register Notice for the project exists.

The Van Range Allotment Project EA meets the criteria for "initiated" because the EA was scoped on August 13, 2004. I have decided to use the 2004 Regional Forester Sensitive Species list as documented in the EA.

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)." 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."

Appendix H determined No Effect to the terrestrial wildlife specie whose status is considered threatened and the terrestrial wildlife specie whose status is considered endangered from the proposed action. Because there would be no effect to threatened and endangered species expected from the action alternative, a BA and consultation with the United States Fish and Wildlife Service (USFWS) is not required.

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 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 USC 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 for projects such as this. The entire process of preparing an environmental assessment 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 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 in this document 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.

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 Van 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 E.O. 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" forestland is a term used only for non-Federal land, which would not be affected by proposed alternatives in this project. 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…"

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 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."

Forest wide standards are to implement a weed control program to confine present infestations and prevent establishment of noxious weeds in new areas. The Malheur National Forest strives to implement the Pacific Northwest (PNW) Regional Strategy for Noxious Weeds and Non-native Invasive Plant Management that is tiered to the National Forest Service Strategic Plan. The Malheur National Forest conducts annual noxious weed surveys. Noxious weed control measures on the forest presently consist of mechanical and hand pulling of weeds in affected areas.

This EA is tiered to a broader scale analysis (the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, hereby referred to as the R6 2005 FEIS). The R6 2005 FEIS culminated in a Record of Decision (R6 2005 ROD) that amended the Malheur National Forest Plan by adding management direction relative to invasive plants. This project is intended to comply with the new management direction. This project will also be in compliance with the 1988 Record of Decision for Managing Competing and Unwanted Vegetation (1988 ROD) and the 1989 Mediated Agreement.

- All heavy equipment will be cleaned prior to entering National Forest System Lands.
- Seed, straw, and other materials used for road decommission and erosion control will be certified to be free of noxious weed seed.
- Use only gravel, fill, sand, and rock that are judged to be weed free by District weed specialists if needed for project.
- Native plant materials are to be used for revegetation unless accepted extenuating circumstances are identified.

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-Economic, Chapter 3).

Project Record

This EA hereby incorporates by reference the Project Record (40 CFR 1502.21). However, Chapter 3 provides a summary of 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 the EA. These Specialist Reports are for Forest Vegetation, Wildlife, Soil, Water, Fisheries, Range, Botany, Heritage, and Socio-Economics. The Project Record is available for review at the Emigrant Creek Ranger District Office, 265 Highway 20 South, Hines, Oregon, Monday through Friday during normal business hours.

CHAPTER 2 - ALTERNATIVES

Introduction

Chapter 2 describes the proposed action and the alternative to the proposed action, the 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. 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 Van Planning Area 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 describes in detail ways to manage livestock grazing practices on lands and resources in the Van Allotment, The Proposed Action Alternative and The No Grazing Alternative. 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 Van Planning Area began in summer/fall 2002. 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.

The action alternative analyzed in detail discloses environmental effects associated with its implementation. It is compared to the no action alternative 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 meets the intent of the "No Action" alternative as required by NEPA.

Alternatives Considered but Eliminated from Detailed Analysis

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 alternatives or components of alternatives were considered, but eliminated from detailed consideration for reasons summarized below.

Alternative A

An alternative that increased grazing on the allotment was brought forward in response to scoping. This proposal was considered but eliminated from detailed analysis because range analysis data does not support an increase in AUMs, increased grazing would not move us toward desired conditions and does not fully meet the purpose and need for action.

Range analysis data do not support an increase in AUMs. Forage production estimates for the allotment indicates that the current total livestock forage allocation exceeds available production in a near normal growing season.

Alternative B

An alternative that included wildlife enhancement, increase forage for big game, eliminate or reduce the impact on old growth, and a reduction in grazing access was brought forward in response to scoping. This alternative was considered but eliminated from detailed analysis because of the following reasons: (1) portions of this alternative (wildlife enhancement) are incorporated into the Proposed Action alternative. Aspen stand enhancement, reduction or elimination of livestock utilization in specified areas, and installation of rock structures and large wood, are all activities that would enhance wildlife habitat and increase forage for big game; (2) aspen enclosures, spring enclosure, and reduced use by livestock are also incorporated into the Proposed Action Alternative and would reduce grazing access in identified areas; and (3) livestock grazing is not expected to have impacts on old growth.

Alternative C

An alternative that included a reduction in non-motorized recreation and reduce conflicts between different users including hikers, fishermen, hunters and cattle was brought forward in response to scoping. This proposal was considered but eliminated from detailed analysis because it is outside the scope of this analysis.

Alternative D

An alternative that proposed management of vegetation to increase forage, control fire, reduces noxious weeds and bugs was brought forward in response to scoping. This proposal was considered but eliminated from detailed analysis because it is outside the scope of this analysis. Additionally, parts of this alternative are being considered in future projects such as the Jane (formerly the Van) Vegetation Management project and the Harney LLP project.

Alternative E

The current management alternative was considered but eliminated from detailed analysis because of the following reasons: (1) Forage production estimates for the allotment indicates that the current total livestock forage allocation exceeds available production in a near normal growing season, (2) Data collected outside livestock enclosure fences (riparian management pastures) indicates that suitable rangelands are in unsatisfactory condition, (3) Aspen stands are being impacted by livestock browsing, (4) Riparian function was assessed adjacent to about 2.24 miles of Schurtz creek by district personnel and determined to be Functional at Risk with no apparent trend, (5) Dry Creek Spring and an unnamed spring are being impacted by livestock trampling and heavy grazing has reduced or eliminated many native riparian species at the spring sites, (6) Wolf Creek Pasture fence needs to be modified to reduce utilization on the Middle Fork of Wolf Creek riparian vegetation, and (7) the current management alternative may not be consistent with the Forest Plan, as amended.

Alternatives Considered in Detail

As described in the Alternative Development section, the No Grazing and one grazing alternative were analyzed to predict their effect on the environment. The Other Elements of the Proposed Action Alternative section displays assumptions, background information, and design elements common to the action Alternative. 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 alternative. These methods to avoid or mitigate possible undesired consequences are described in the next section, Management Requirements, Constraints, and Mitigation Measures, of this chapter.

The "No Action" alternative is required by NEPA. Consideration of the no grazing alternative meets the intent of the "No Action" alternative as required by NEPA.

The Proposed Action Alternative

Purpose and Design

This Alternative is based on "adaptive management," a process that uses monitoring information to determine if management changes are needed-and, if so, what changes, and to what degree. It is a process that allows the Forest Service to cope with uncertainty and changing conditions over time. It gives the authorized officer the flexibility to adapt to changes.

The purpose of this alternative is to provide continued 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 INFISH Riparian Management Objectives (RMO) at a near natural rate of recovery. Areas of concern would be dealt with through adaptive management, administrative changes and physical changes (such as water developments or fence construction) to improve allotment management.

This means that a proposed course of action would be selected as a starting point that we believe best meets or fosters Forest Plan Desired Conditions. Recurrent monitoring would occur over time, with evaluation of the results by the Forest Service to make appropriate adjustments in management, as needed, to ensure adequate progress toward Forest Plan Desired Conditions. All adaptive management options available would be analyzed under this environmental assessment and adopted for potential future use.

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 INFISH. The Malheur National Forest Riparian Monitoring Strategy (Appendix B) provides a starting point for acceptable level of effects or condition thresholds (endpoint indicators). The intent of INFISH 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 EA.

Description of Specific Features

The Emigrant Creek Ranger District, Malheur National Forest proposes to continue authorization of livestock grazing on the Van Allotment, under management systems designed to meet Forest Plan standards and guidelines. This alternative focuses on desired resource conditions. Adaptive-management principles would be applied by describing sideboards to management that are designed to provide flexibility, while ensuring that Desired Conditions are met or are progressing in the desired direction. Examples of changing conditions would be drought, range readiness dates, or allowing use following a non-use period.

A proposed course of action is selected as a starting point that we believe best meets or approximates the desired condition. As long as management stays within these sideboards or constraints, management adaptations may be implemented to respond to changing conditions and needs seasonally. Monitoring will be the key to determining if or when adaptation would occur and would guide the selection of adaptive changes to be applied to ensure adequate progress. New science and management techniques would be incorporated as needed, or when they are developed. All adaptive actions would be within the scope of effects described in this document or a supplemental NEPA document, and a decision would be made as appropriate. This action would ensure that livestock-grazing use is consistent with the Forest Plan, as amended, that proper management is in place on the ground, and that management remains focused on the attainment of Desired Conditions.

The following paragraphs illustrate management strategies for the Van Allotment. These possible management scenarios are not all-inclusive, and “best management practices” would be used where appropriate. The following activities, management practices, and livestock use are proposed to accomplish this.

- **Rest entire allotment for 3-5 consecutive years –** The allotment would be rested for 3-5 consecutive years in order to allow the Forest Service ample time to obtain funds to purchase materials and construct fences. The 2006 grazing season demonstrated that the Schurtz Creek pasture cannot be successfully grazed without first creating riparian pastures.
- **Maximum permitted AUMs would be 441 –** Reduction in permitted AUMs is based on the 2005 forage production analysis which determined suitable range conditions. This analysis indicated the current total livestock forage allocation exceeds available production in a near normal growing season (livestock forage is over-allocated). Previous forage production estimates completed in 1957 and 1981 support this finding. Therefore, maximum permitted AUMs would be reduced by a total of 41% (752 to 441 AUMs) from current management.
- **Potential season of use from May 15-September 30–** The potential season of use would be no earlier than May 15 and no later than September 30. The actual season of use would be determined yearly and is subject to change in response to various resource conditions, climate, and natural events such as debris torrents or floods. However, it is recommended that late summer and fall grazing be reduced as much as possible. Trigger and end point monitoring may also be used to determine duration of livestock grazing
- **142 permitted/average numbers –** The permitted/average numbers would be 142 and is subject to change in response to various resource conditions, climate, and natural events such as debris torrents or floods.
- **Riparian management pastures would be established -** Three riparian management pastures would be established with associated water gaps (see proposed action map).
  - **a.** Frog[1] and Hawthorn[1] pastures would be established and rested until the riparian vegetation has sufficient composition and abundance of late seral species in order to protect stream banks and dissipate energy during high flows. (This would be about 75% of the percent expected for the greenline capability group (Winward 2000). Grazing would resume within the Frog and Hawthorn pastures when the above conditions are met, and when grazing would not retard RMO's or would not be detrimental to riparian shrub communities, and allows recovery at a near natural rate.
  - **b.** Riparian management pasture Fry[2] would be established on the lower mile of Schurtz Creek. Livestock grazing would not be permitted in this pasture.
- **Aspen stands would be regenerated and protected** - Regenerate aspen stands in Gabe creek, Schurtz creek and Dry creek drainages by conifer removal, prescribe burning and protect by fencing[3] and excluding livestock grazing.

[1] Materials and labor to construct would be provided by the Forest Service. Labor to maintain would be the responsibility of the Permittee.

[2] Materials, labor to construct and maintain would be provided by the Forest Service.

[3] Materials and labor to construct the aspen exclosures would be provided by the Forest Service. Maintenance of these exclosures would be the responsibility of the Forest Service.

- **Range improvements would be implemented** – Range improvements would be implemented in order to protect resources and improve livestock distribution.
  a. Fence[4], develop and exclude livestock grazing on Dry Creek Spring and an unnamed spring in the Dry Creek drainage.
  b. Modify (enlarge) Wolf Creek Pasture fence[4]. Use Wolf Creek pasture for about 10 days in the spring on the years Dry Creek Pasture is grazed first (every other year).
  c. Place two water troughs[5] in existing dry stock ponds and require water hauling by permittee on years Schurtz Creek pasture is grazed last (every other year).
- **Stream restoration activities would be implemented** – Stream restoration activities would be implemented in order to accelerate recovery. Stream restoration activities would stabilize stream banks and reconnect the stream to the floodplain in order to promote riparian species capable of stabilizing stream banks.
  a. Install small check dams and place LWD[6] in Schurtz Creek, Gabe Creek and Dry Creek.
  b. Stabilize headcuts on Gabe Creek and Dry Creek with rocks, wood or filter cloth[6].
- **Standards and Guidelines for Upland and Riparian Utilization** – Utilization would meet Forest Plan Standards at the end of the current use period (not the end of the growing season due to unpredictable growth during the late summer).
  a. **Upland Utilization:** Upland utilization would not exceed 35% on grasses and 30% on shrubs (FP IV-18, 35, and 58). The following would act as triggers to remove livestock.
     - Approaching 3-inch stubble height (or 35% use) on upland grasses, or
     - 30% use on upland shrubs
  b. **Riparian Utilization:** Riparian utilization would not exceed 35% on grasses, sedges and rushes and 30% on shrubs (FP IV-18, 35, and 58). The following would act as triggers to remove livestock from the riparian pastures.
     - A 6-inch greenline stubble height (or 35% use) on sedges and rushes, or
     - approaching 3-inch floodplain stubble height (or 35% use) on grasses, or
     - no more than 20% bank alteration, or
     - 30% use on riparian shrubs

[4] Materials to construct the spring exclosures and developments would be provided by the Forest Service. Labor to construct and maintain fences and spring developments would be the responsibility of the Permittee.

[5] Materials for water troughs would be provided by the Forest Service. Labor to construct and maintain troughs would be the responsibility of the Permittee.

[6] The Forest Service would conduct all activities either internally or through contract.

- **Monitoring** – A combination of 1) The Malheur National Forest Range Monitoring Guidelines (June 2005) (Appendix A), 2) The Malheur National Forest Riparian Monitoring (Condition and Trend) Strategy (2005) (Appendix B), and 3) the monitoring protocol developed by the Interagency Implementation Team (IIT), as amended in 2004 (IIT 2004), would be used to determine if grazing is allowing movement towards desired conditions and Forest Plan Standards, as amended. If monitoring does not indicate an upward trend, adaptive management would allow the Forest Service to adjust grazing management using a variety of tools (timing, intensity, duration, and season of use) to achieve an upward trend. Holechek et al. (1998) suggested that management changes may be needed if utilization guidelines exceed 30% of the pasture/allotment for 2 consecutive years or 2 of 5 years.

    e. **Upland Trend:** Existing C&T plots would continue to be read at least once every 5-10 years. Additional 2-3 upland long-term monitoring plots would be established in Dry Creek pasture in specific locations to determine trend.

    f. **Upland Annual Monitoring:** Upland utilization would not exceed 35% on grasses and 30% on shrubs (FP IV-18, 35, and 58). The following would act as triggers to remove livestock.

    - Approaching 3-inch stubble height (or 35% use) on upland grasses, or
    - 30% use on upland shrubs

    g. **Riparian Trend:** Riparian vegetation would be monitored using the vegetation cross-section composition, greenline composition, and woody species regeneration sampling procedures as described in Winward (2000) and Burton et al (2007). This process would be completed at least once every 5-10 years to determine riparian vegetation trend.

    h. **Riparian Annual Monitoring:** Riparian utilization would not exceed 35% on grasses, sedges and rushes and 30% on shrubs (FP IV-18, 35, and 58). The following would act as triggers to remove livestock from the riparian pastures.

    - A 6-inch greenline stubble height (or 35% use) on sedges and rushes, or
    - approaching 3-inch floodplain stubble height (or 35% use) on grasses, or
    - no more than 20% bank alteration, or
    - 30% use on riparian shrubs

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), through the use of adaptive management and administrative changes that deal with areas of concern discussed in Chapters 1 and 3. Adaptive management and administrative changes would modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect inland native fish. Adaptive management may also suspend grazing if adjusting practices are not effective in meeting Riparian Management Objectives (GM-1).

Other Elements of the Proposed Action Alternative

This section displays other assumptions, background information, and design elements of the proposed action alternative. The IDT assumed that, if the following elements are followed, then effects from livestock use would be acceptable.

- ### Forest Plan Standards and Guidelines as Amended by INFISH Would be Met or Moving Towards

Rangeland management strategies and methods that are based on range and other resource science are incorporated into the Allotment Management specific to each allotment/pasture and are commensurate with resource needs. The objectives behind these strategies are 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 (Appendix A and B). Monitoring includes identification of designated monitoring areas (DMA) 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). Thresholds and end-point indicators may change during the life of this EA 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 – INFISH 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).

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) and Burton et al 2007. Burton et al (2007) describes criteria used for selection of DMAs To provide monitoring results representative of grazing use, small areas where livestock use is affected by range developments (such as 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.

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

The Malheur National Forest Draft Range Monitoring Guidelines (June 2005) (Appendix A), the Malheur National Forest Riparian Monitoring (Condition and Trend) Strategy (2005) (Appendix B), and/or the monitoring protocol developed by the Interagency Implementation Team (IIT), as amended in 2004 (IIT 2004) and Burton et al 2007 and Regional Rangeland Ecosystem Analysis and Monitoring Handbook (FSH 2209.21) 2006, may be used to determine if grazing is meeting or moving towards desired conditions. 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 (but is not limited to):

- Changing livestock numbers;
- Changing the time livestock are in a 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
- Cancel, modify or suspend the permit in whole or part.

- **Grazing Would be Based on AUMs; Permits Would be Based on Average Animal Use and Cow/Calf Pairs**

The Proposed Action establishes a maximum number of Animal Unit Months (AUM) which allows for a range of permitted animal numbers and season of use for each allotment. AUMs allow flexibility for annual adjustment of both numbers and/or season within the permitted use level. AUMs in the proposed action are the maximum number that would be permitted in the allotment-number of animals and season of use would be adjusted so as not to exceed the maximum AUMs. The proposed action identifies the permit livestock numbers (an average number of livestock) and the average season 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 allotment. The actual livestock numbers and period of use may be adjusted in response to discussions with resource specialists and in response to resource needs, range readiness and monitoring (the number of livestock using the allotment may be increased while reducing the season of use, or may increase the season of use while reducing the number of livestock). For example, grazing livestock for the full season would require the permittee to reduce the number of livestock (below permitted number) to meet allowed AUMs. Flexibility that allows for annual adjustments provides a management tool to assure that riparian and rangeland objectives are 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 permit will display the “average” number of livestock for the “average” season of use (Grazing Permit Administration 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 maximum permitted AUMs). This EA would permit cow/calf pairs, but the responsible official may decide to allow other classes of livestock.

- **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 would be functional before animals are turned out into the pasture to be used. Range improvements would be reconstructed as the need arises (i.e. end of life span).

- **Appropriate Administrative Actions Would Occur**

Appropriate administrative actions would be taken when the permittee's management is not in compliance with the Annual Operating Instructions (AOI). Consequences would occur as described in Forest Service Handbook (FSH) 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 (FSM).

- **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 any alternative were selected. Activities including motorized access travel management, road maintenance, recreation, noxious weed management, fire protection, and other management actions would still occur in the Planning Area (Appendix C, 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 D).

- **Noxious weed strategy**

The prevention of the spread or invasion of noxious weeds is an objective of the Proposed Action Alternative. No treatments of weeds are proposed within this EA, but the prevention strategy in the mitigation section is incorporated into the Proposed Action Alternative.

- **Heritage Resources**

Archeological and Historic sites that are determined to be negatively impacted by grazing activities would be protected through mitigation developed in consultation with the Oregon State Historic Preservation Office.

Van Allotment Proposed Action

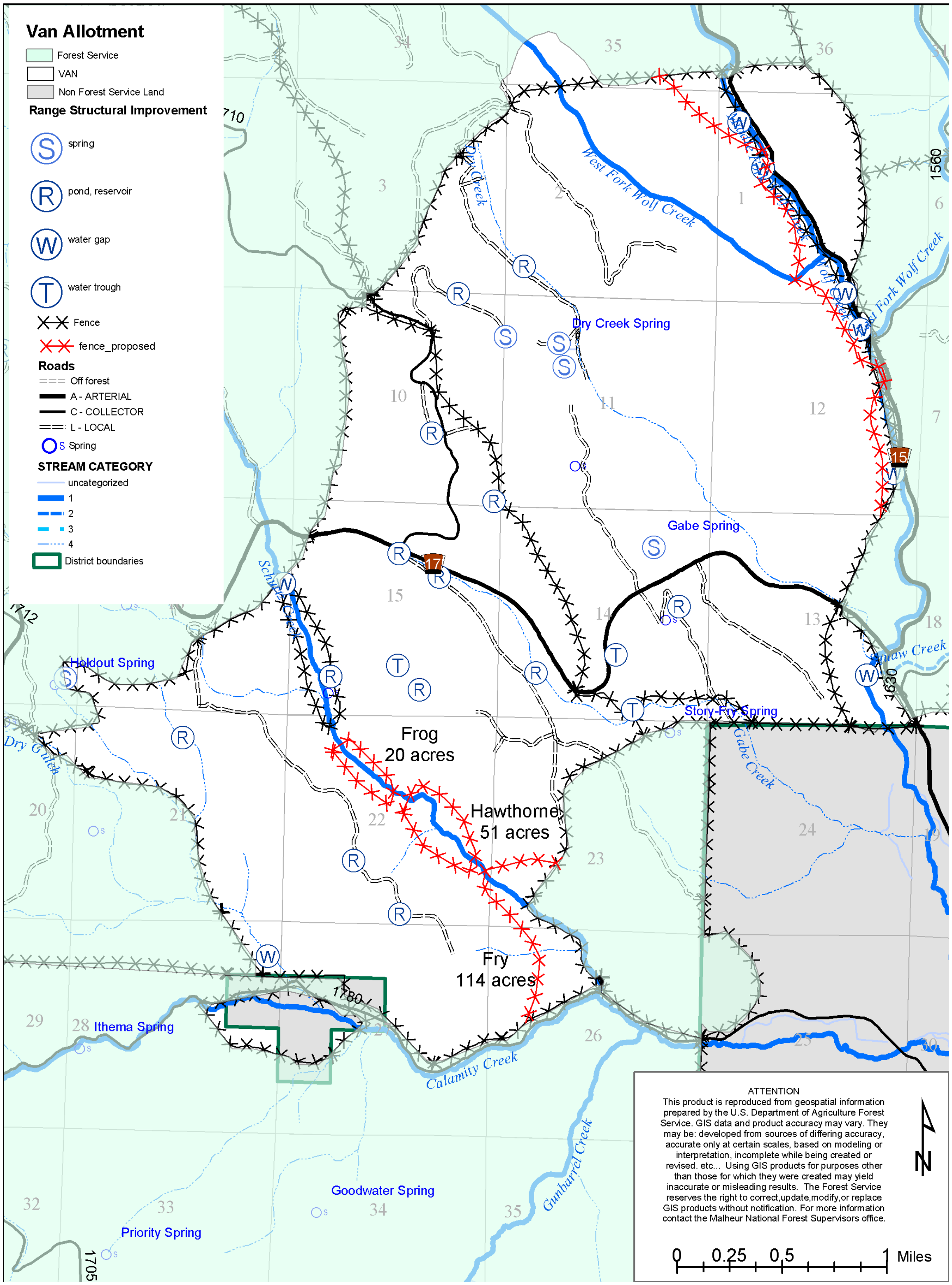


Figure 4: Van Allotment Proposed Action.

The No Grazing Alternative

Purpose and Design

Under this alternative, the Term Grazing Permit would be cancelled. No permit would be issued for the Van Allotment until and unless a subsequent NEPA decision to re-authorize grazing on any or all of the allotment is 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 this Alternative 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

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

All range developments currently in existence on the allotment (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 is desired, a subsequent decision would need to be made regarding those developments. The permittee would be reimbursed for their depreciated 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 maintenance shifting to the private landowner.

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).

Design Criteria

In response to public comments on the proposal, design criteria were developed to ease some of the potential impacts the alternatives may cause. The Forest Service developed the following additional design criteria to be used as part of the action alternative. Throughout the project, all applicable Watershed Management, and Vegetative Management Best Management Practices (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

Unless noted otherwise in the decision document, these design criteria are mandatory if the Responsible Official selects the action alternative for implementation.

Table 2 Design Criteria

Resource	Design Criteria	Objective	Responsible Person
Range	New water developments would be constructed by excavating a hole approximately 2-6 feet deep, which would allow for the placement of a springbox for water collection. A buried pipe would extend to a water trough, and be equipped with a float valve to conserve water. Water troughs would 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 would be constructed to provide additional protection to the spring source. All headworks and spring sources would be protected by fencing.	To maintain and improve spring conditions.	Range Management Specialist
Silviculture	Place salt blocks outside of conifer where the trees are less than 6' high. Salt blocks would not be placed in aspen stands or aspen plantations.	To avoid damaging regeneration.	Range Management Specialist and Silviculturist
Watershed	For fence construction along riparian areas, no repeated use (going back and forth over the same path) of ATVs or other motorized vehicles would occur within riparian areas.	To avoid damaging soil and riparian conditions	Range Management Specialist, Hydrologist, or Fish Biologist

Table 2 Design Criteria (cont.)

Resource	Design Criteria	Objective	Responsible Person
Fisheries	Place salt blocks outside of RHCAs.	Reduce impacts to riparian areas	Range Management Specialist
	Emphasize placing new water gaps in portions of channels where fine spawning gravels are not present	Eliminate damage to redds	Fisheries Biologist, Hydrologist and Range Management Specialist
	Construction of rock structures, addition of large woody debris and head cut stabilization would be performed during the instream work period with hand equipment.	Stabilize streambanks and reconnect the flood plain with the stream channel.	Fisheries Biologist and Hydrologist
Terrestrial Wildlife	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) would also apply to hardwood tree species of black cottonwood and quaking aspen.	Improve this “featured” habitat	Range Specialist
	Aspen restoration by thinning and burning would be accomplished by hand methods.	Restore aspen	District Wildlife Biologist
	All livestock water troughs would have wildlife escape ramps permanently installed.	Reduce drowning impacts to birds, small mammals and bats.	Range Specialist

Table 2 Design Criteria (cont.)

Resource	Design Criteria	Objective	Responsible Person
Heritage	If site inspection indicates a need for mitigation measures at any archaeological or historic sites these would be developed in consultation with the Oregon State Historic Preservation Office and would be tailored to the specific conditions at each site.	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
	Salt blocks would not be located on archeological and historic sites.	Protect NRHP eligible and potentially eligible sites from significant grazing related impacts	District Archaeologist, Range Specialist
	For proposed range improvement projects, clearances under Section 106 of the National Historic Preservation Act would be completed and concurred with as needed by the Oregon State Historic Preservation Office before the projects are implemented.	Protect NRHP eligible and potentially eligible sites from significant grazing related impacts	District Archaeologist, Range Specialist

Table 2 Design Criteria (cont.)

Resource	Design Criteria	Objective	Responsible Person
Noxious Weeds	Permittees would be provided with a current list of noxious weeds identification material. A map showing known noxious weed infestations sites within each allotment would be reviewed at each annual operating meeting. Permittees would be asked to add known noxious weed locations not shown on the map.	To reduce the risk of spreading noxious weeds	Range Specialist
	All equipment used to construct, reconstruct, or maintain water developments and fences would 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. Cleaned equipment would be inspected and approved by the Forest Officer in charge of administering the project prior to the equipment being moved into the project area.	To reduce the risk of introducing noxious weeds	Range Specialist, Forest Botanist
	Any seed, straw, and other materials used in the construction, reconstruction, or maintenance of water developments or in restoration projects will be certified free of noxious weed seed.	To reduce the risk of introducing noxious weeds	Range Specialist, Forest Botanist
	Any gravel, fill, sand, and rock used in the construction, reconstruction, or maintenance of water developments or in restoration projects will be judged to be weed free by district weed specialists.	To reduce the risk of introducing noxious weeds	Range Specialist, Forest Botanist
	Native plant materials are to be used for revegetation unless accepted extenuating circumstances are identified.	To restore native species whenever possible	Range Specialist, Forest Botanist

Table 2 Design Criteria (cont.)

Resource	Design Criteria	Objective	Responsible Person
Noxious Weeds (continued)	Executive Order 13112 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." Forest wide standards are to implement a weed control program to confine present infestations and prevent establishment of noxious weeds in new areas. The Malheur National Forest will implement the Pacific Northwest (PNW) Regional Strategy for Noxious Weeds and Non-native Invasive Plant Management that is tiered to the National Forest Service Strategic Plan. The Malheur National Forest conducts annual noxious weed surveys. Noxious weed control measures on the forest presently consist of mechanical and hand pulling of weeds in affected areas. This EA is tiered to a broader scale analysis (the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, hereby referred to as the R6 2005 FEIS). The R6 2005 FEIS culminated in a Record of Decision (R6 2005 ROD) that amended the Malheur National Forest Plan by adding management direction relative to invasive plants. This project is intended to comply with the new management direction. This project will also be in compliance with the 1988 Record of Decision for Managing Competing and Unwanted Vegetation (1988 ROD) and the 1989 Mediated Agreement. The management requirements and mitigation measures meet the intent of Executive Order 13112, R6 2005 FEIS, 1988 Record of Decision for Managing Competing and Unwanted Vegetation (1988 ROD) and the 1989 Mediated Agreement and the Pacific Northwest (PNW) Regional Strategy for Noxious Weeds and Non-native Invasive Plant Management that is tiered to the National Forest Service Strategic Plan.		

Monitoring Plans

Resource monitoring would be implemented with the action alternative. The objectives are to determine if management activities are moving resources towards desired conditions. In addition to any monitoring requirements that may apply from the Malheur National Forest Monitoring Plan, monitoring activities would include the following:

Noxious Weed Monitoring

Noxious weeds would be monitored for changes in populations. (Range Specialist)

Aspen Treatment Monitoring

Aspen stand treatment and protection measures would be monitored for effectiveness. When aspen protection measures are deemed no longer needed (aspen shoots are at least 8 feet high), they would be removed. (Wildlife Biologist and Silviculturist)

Aquatic/Hydrology Monitoring

Stream temperatures (303 (d)), sediment/substrate, LWD, pools, bank stability, lower bank angle, width/depth ratio, PFC survey and fish survey monitoring would continue at established sites. (Fish Biologist and/or Hydrologist)

Heritage Resource Monitoring

Monitor sites that have exhibited evidence of grazing impacts after the implementation of appropriate mitigation measures as determined in consultation with the Oregon SHPO. This monitoring will evaluate the effectiveness of implemented mitigations. (Archeologist)

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. (Archeologist)

Range Resource Monitoring

Range resource monitoring for the Proposed Action Alternative was described in the Description of Specific Features section on page 36. Based on 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 (but is not limited to):

- Changing livestock numbers;
- Changing the time livestock are in a 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 part.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 3. Alternative Comparison

Significant Issue	Unit of Measure	Proposed Action	No Grazing
Issue 1 – Riparian Vegetation and Aquatic Habitat	**Permitted Numbers**		
	AUMs	441	0
	Duration of Livestock Grazing in Riparian Areas		
	Time	Reduced at least 41%	Reduced 100%
	Expected Bank Alteration		
	Bank Alteration	Less than 20%	None
	Riparian Vegetation Trend		
	Rate	Upward – Near Natural Rate	Upward – Natural Rate
	Effects to Sensitive Aquatic Species		
	Effect	MIIH[1]	BI[2]
Isssue 2 – Upland Vegetation	**Permitted Numbers**		
	AUMs	441	0
	Duration of Livestock Grazing in Uplands		
	Time	Reduced 41%	Reduced 100%
	Vegetation Rate of Recovery		
	Rate	Upward - Near Natural Rate	Upward – Natural Rate

[1] MIIH –May Impact Individuals and their Habitat but would not likely contribute to a trend towards federal listing or cause a loss of viability to the populations

[2] BI = Beneficial Impact

Implementation Schedule

Depending on which alternative is selected by the Responsible Official, activities included in the decision would occur in approximately the following timescale. All activities would occur within 5 grazing seasons of the decision.

Table 4. Implementation Schedule

Activity	2009	2010	2011	2012	2013
Proposed Action Alternative					
Complete AMP for Van Allotment	X	X			
Pasture/Allotment Fence construction/reconstruction	X	X	X	X	
Install water troughs	X	X	X	X	
Spring Protection (Dry Creek)	X	X	X	X	
Aspen Restoration/Protection	X	X	X	X	X
Install rock structures/LWD	X	X	X	X	X
Stabilize headcuts	X	X	X	X	X
No Grazing Alternative					
Notice of permit cancellation given to permittee	X				
No grazing implemented			X		

CHAPTER 3 - ENVIRONMENTAL CONSEQUENCES

This chapter summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in Chapter 2.

This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the No Grazing Alternative and the grazing alternative. Past, present, and reasonably foreseeable future activities were analyzed, along with proposed activities, to determine cumulative effects. This was done in a manner consistent with CEQ guidance contained in a June 24, 2005 Memorandum. Specifically, that cumulative effects analysis consider relevant past actions to the extent needed to determine if the effects from the proposed alternatives would add to, modify, or mitigate the currently existing effects from such past actions. Relevant past, present, and reasonably foreseeable future activities are displayed in Appendix C.

Specialist Reports

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

Vegetation and Rangeland Resources

The vegetation pattern in this area varies from forested stands composed of ponderosa pine, Douglas-fir, white fir, aspen, and juniper to non-forested areas of grasses, forbs, brush, and scattered ponderosa pine and/or juniper.

The principal human impacts have altered the natural succession of this area through past management practices in fire suppression, grazing, timber harvesting, fuel management, and road building.

Rangeland Resources

Most of the woodlands Potential Vegetation Groups (PVG) are juniper climax plant associations that were historically dominated by a low stocking of either juniper or scattered ponderosa pine with grasses, forbs, and shrubs. The trees in these plant associations were kept at a low stocking in this early seral stage by frequent low intensity fires. Juniper was more prominent on scab flats and rocky ridges where there was not enough vegetation to support fires. With the advent of fire control and grazing, stocking of tree species have increased on these sites and areas that were formerly non-forested have been converted to woodlands (Skovlin and Thomas, 1995). With the increase in juniper there is usually a decrease in other vegetation and an increase in fire interval. Prior to the effective control of fire, juniper levels in the watershed were dominated by seedlings and saplings stages with very few pole and larger sizes, except for small pockets of mature trees or isolated individuals. The mature juniper trees were generally confined to areas not prone to frequent fire, such as rock-dominated areas or isolated individuals. Once established, juniper utilizes the majority of the available soil moisture causing sagebrush and other shrub species to decline. Eventually juniper root systems will utilize nearly all of the available soil moisture such that shrublands can become pure juniper stands and reduce total ground cover leaving bare ground that is susceptible to erosion and the invasion of non-native plant species (Loewen and Schwenke, 2002).

Non-forested PVG sites are composed of plant associations where trees are generally absent. Vegetation on these sites is dominated by a variety of perennial grasses, forbs, and shrubs. Due to past grazing practices, the exclusion of fire, and the invasion of introduced species there has been an increase in annual species and a decrease in perennial species. These areas include wet and moist meadows, dry meadows, and rocky scablands.

The natural fire regime is one of frequent (5-25) low intensity fires except for the scab flats and rocky ridges where large old growth juniper was predominantly located. Most historical perennial species were adapted to these fire regimes. Some introduced annual species such as cheatgrass are also well adapted to fires. Cheatgrass (*Bromus tectorum*) is present in scattered patches across the allotment but at this time is not considered a significant problem.

Starting approximately 130 years ago there has been a dramatic decrease in riparian vegetation shrub species (alder, willow, dogwood, maple, etc) over historical conditions due to increased browsing by ungulates and increased competition from conifers. These past changes in vegetation, along with increased trampling of banks, and changes in hydrological conditions due to roads have changed the stream structure, resulted in downcutting, which has lowered the water table in many areas. This has caused a further decrease in other riparian vegetation such as forbs and shrubs, and a decrease in the width of the riparian vegetation along the streams in this area.

With the encroachment of ponderosa pine and juniper into non-forested areas (meadows, riparian areas, etc), more moisture is being used by these dominant species which has caused a decline in other plant species.

Van Allotment

Range analysis was conducted on the Van Allotment in 1994, 1997, and 2002. Analysis data include vegetation typing, rangeland condition and trend assessments, ecologic phase determination for selected vegetation communities in primary range, forage production estimates, and a review of forage utilization monitoring records for the past five years. The data was augmented with proper functioning condition survey on Schurtz Creek in 2004.

Allotment Use Records

The allotment is managed on a deferred rotation using two units. The units are rotated and used first on alternative years. This grazing strategy was initiated in 1970 when the division fence was constructed. Table 5 displays actual use records for the Van Allotment from 1949 to present.

Table 5: Permitted and Actual Use, Van Allotment 1949-Present

Year	Permitted Season of Use	Permitted Numbers	Permitted AUMs	Actual Use AUMs
1949-1954	6/16-10/30	175	1054	1054
1955-1969	6/16-10/16	142	752	752
1970-1979	6/10 – 9/30	142	752	752
1980-2004	*	142	752	752
2005	N/A	Non-Use	752	0
2006	6/16 – 8/20	142	752	487
2007-2008	N/A	Non-Use	752	0

* - 6/1-9/30 when Dry Creek is grazed first and 5/26-9/25 when Schurtz Creek is grazed first.

Range Analysis Summary

Range analysis data were collected in 1994, 1997, and 2002 for plant associations/communities in key livestock use areas. Ocular macroplot data collected at transect locations outside riparian exclosures were interpreted by the Area Ecologist. For upland plots in the Schurtz Creek pasture the data indicate poor to very poor conditions with “serious grazing related degradation resulting in reduction of native large bunchgrasses, increases in sagebrush, increase in grazing resistant forbs and Sandberg bluegrass, high cover by cheatgrass and little cover by Idaho fescue or bluebunch wheatgrass”. Data for upland plots in the Dry Creek pasture indicated poor condition in quaking aspen/mesic forb communities where "vegetation is quite sparse due to shade by trees and cattle grazing. Young aspens were noted to be heavily damaged by cattle", and "heavy browsing of young aspens and ground surface trampling by cattle" was noted (Swanson, 2005).

The bulk of primary range on this allotment is located in or immediately adjacent to riparian zones. There is relatively little acreage of upland pasture available to rotate livestock into during the warmest days of the summer. Therefore livestock spend most days in August and early September loafing close to water in the relatively cool riparian zones. Riparian forage species preferred by livestock are grazed repeatedly during this period and consequently suffer competitive disadvantage to less palatable species. Vegetation communities conforming to management area prescriptions and desired condition statements for the analysis area are for the most part restricted to steep side slopes (over 40%), small parks surrounded by timber, and other areas where livestock access is limited. That livestock grazing is primarily responsible for the Functional at Risk rating in the Schurtz Creek drainage is born out by the upward trend noted in riparian condition within a small riparian pasture (Schurtz Creek Riparian Pasture - established in 1993), where livestock grazing did not occur between 1993 and 2002, and which has been grazed by livestock for only short periods each grazing season since. The fence around this pasture does not represent a significant impediment to deer and elk.

Such primary upland range as does exist adjacent to riparian zones and in various small parks appears to be receiving substantial grazing pressure (enough to show static trend in several transect locations) under current management. Any action that would reduce the current season of use in riparian areas (such as establishment of additional riparian pastures in Schurtz Creek) would, without a concurrent reduction in livestock forage allocation, probably result in additional livestock grazing pressure on currently degraded upland range.

Forage production has been estimated for capable/suitable range within the Schurtz Creek and Dry Creek pastures. Results indicate that under management conditions where primary and secondary ranges are fully utilized (not exceeding Forest Plan Standards); the current livestock forage allocation can not be met. Furthermore, under current management it is unrealistic to assume that secondary range forage can be fully utilized without exceeding utilization standards on primary range.

Range Improvements

Several range improvements exist within the Van Allotment. It is the responsibility of the permittee to maintain these range improvements as outlined in the term grazing permit. Appendix E lists each improvement.

Pasture Management Summary

The allotment is managed on a deferred rotation using two units, North (Dry Creek) and South (Schurtz Creek) pastures. The units are rotated and used first on alternative years. This grazing strategy was initiated in 1970 when the division fence was constructed. Prior to the 1970 the grazing strategy was season long. The Wolf Creek pasture was built in 1976 and rested until 1985. Since 1985, when Dry Creek pasture is used last, the Wolf

Creek pasture is utilized for about 10 days, every other year. Schurtz Creek riparian pasture was built in 1990-1991 and rested for 3 years through the 1993 grazing season. From 1994-1996 the pasture was scheduled for overnight use only. Starting in 1997 the pasture was scheduled for grazing for 2-3 days each year. In 2000 the pasture was scheduled for grazing to standards.

Dry Creek Pasture Key Area Summary

Dry Creek pasture is on the northeast end of the Van Allotment. Douglas-fir/elk sedge, Ponderosa pine/Idaho fescue, Grand fir/elk sedge and western juniper plant associations make up the majority of the acres in the pasture. Dry Creek pasture is used first for early season grazing on alternative years. A key area was established in this pasture on Gabe Creek, a category 4 stream. However, this key area was excluded from livestock grazing in 2002 and is no longer formally monitored.

Schurtz Creek Pasture Key Area Summary

Schurtz Creek Pasture is on the southwest end of the Van Allotment and is used first for early season grazing on alternative years. Mountain big sagebrush/Idaho fescue-bluebunch wheatgrass, ponderosa pine/snowberry, and ponderosa pine/bluebunch wheatgrass plant associations make up the majority of the acres in the pasture. Stubble height measurements taken on Kentucky bluegrass in 2004 and 2006 demonstrate that standards were not met in this pasture both years. The allotment was rested in 2005, had livestock driven thru in 2006 and was not monitored in 2003.

Schurtz Creek Riparian Pasture Key Area Summary

Schurtz Creek riparian enclosure was built in 1990-1991 and rested for 3 years through the 1993 grazing season. From 1994-1996 the enclosure was scheduled for overnight use only. Starting in 1997 the enclosure was scheduled for grazing for 2-3 days each year. In 2000 or 2001 the enclosure was scheduled for grazing to standards.

Information concerning plant associations, stream lengths and categories, and key areas for the Schurtz Creek riparian pasture is included in the Schurtz Creek pasture section presented above. Stubble height measurements taken on sedges within the enclosure demonstrate that standards were met in this pasture in 2004 and 2006. The allotment was rested in 2005 and 2007 and not monitored in 2003.

Wolf Creek Pasture Key Area Summary

Wolf Creek Pasture is on the east end of the Van Allotment. The pasture is about 250 acres and was established in 1976 and rested until 1985. Since 1985, when Dry Creek pasture is used last, the Wolf Creek pasture is utilized for about 10 days, every other year. Grazing in this pasture has not been formally monitored within the last 5 years.

Effects on Rangeland Resources

The vegetation and rangeland resources section, as well as information in Appendix C, describe past allotment use records and vegetation management activities. The reported current conditions are in essence the cumulative effects of past activities. Expected conditions and trends that would result from combining the effects from these past activities with the direct and indirect effects of each alternative are described below.

Direct and Indirect Effects of the Proposed Action Alternative

Forage production estimates conducted in 1957, 1981 and 2005 indicated there is not enough forage to support previously authorized numbers of livestock. Evaluation of the existing condition revealed poor upland vegetative conditions and low vigor of remaining riparian vegetation. Cattle distribution continues to be a problem. As upland forage cures out and palatability and nutrient content begins to decline in the late summer and early fall, cattle are naturally drawn into the riparian areas. Grazing pressure in the riparian areas is having a negative impact on the riparian vegetation. Limited water availability is also contributing to poor livestock distribution and subsequent congregation in the riparian areas of the allotment. Therefore, a 41% reduction would be implemented by reducing the late summer and fall grazing season.

Resting the entire allotment for 3-5 consecutive years to allow the Forest Service adequate time to build riparian pastures, and reducing the late summer and fall grazing season by 41% would allow upland and riparian vegetation to recover from past overgrazing. The absence of domestic livestock in the uplands for 3-5 consecutive years would increase the vigor and amount of upland vegetation. Upland vegetation compositions would slowly change to being dominated by late seral species where the potential exists. Upland vegetation cover would increase. Indicators of functionality deficiencies would improve.

The absence of domestic livestock in riparian zones for 3-5 consecutive years would increase the vigor and amount of riparian grasses and sedges and increase willow canopy cover where willows currently exist. Riparian vegetation cover and bank stability would increase. Indicators of functionality deficiencies would improve.

Riparian vegetation within the Frog and Hawthorn riparian pastures would move towards the expected greenline capability group (Winward 2000) at a near natural rate. When livestock grazing is re-initiated within the newly created riparian pastures it would be designed so that grazing does not retard moving towards riparian management objectives or that is not detrimental to riparian shrub communities, and allows recovery to continue at a near natural rate. Indicators of functionality deficiencies would improve. Riparian vegetation cover and bank stability would increase. Stream banks would eventually become lined with tall sedges in those locations where the potential exists.

Riparian vegetation within the Fry pasture would move towards the expected greenline capability group (Winward 2000) at a natural rate because no livestock grazing would occur within this pasture.

Existing tanks and stock ponds listed in Appendix E would be cleaned out and maintained to improve water holding and storing capacity. Permittees would be authorized to haul water to troughs place in existing dry stock ponds at improvement number 16414. This would only be necessary on the years that Schurtz pasture is grazed last. These actions would improve livestock distribution throughout the entire pasture.

The Wolf Creek pasture fence would be modified to reduce livestock pressure on the fence and adjacent riparian area. Livestock would be distributed away from the riparian area, thereby reducing utilization in the riparian areas of the Middle Fork of Wolf Creek and increasing utilization in the uplands.

Cattle would be excluded from aspen stands in Gabe Creek, Schurtz Creek and Dry Creek drainages. Forage within the exclosures of these aspen stands would not be available for livestock consumption until the fences are removed (about 10 years) and is not expected to be a significant decrease in livestock forage because of the limited acres being fenced (less than 10 acres). If by fencing an aspen stand a water source is also fenced, alternative sources of livestock water would need to be developed outside of the exclosures. Little impact to livestock movement patterns is expected from fencing because permittees would be involved in the placement of the fences or natural barriers to ensure that livestock travel routes are not blocked and to avoid the creation of livestock congregation areas.

Proposed fence construction on Dry Creek Spring and the unnamed spring would protect the spring sources and riparian vegetation from livestock trampling and utilization because livestock would be excluded from the spring sources. An alternative source of water would be provided at Dry Creek spring and at the unnamed spring if needed. Cattle traveling routes would not be impacted due to fence design and permittees would be involved in the placement of the fence.

Small rock structures and large wood would be strategically placed in Schurtz Creek, Dry Creek and Gabe Creek to catch sediment. Overtime these structures would vertically stabilize the stream channel thus allowing the water table to once again interact with the associated flood plain and adjacent meadow. Raising the water table would promote the re-establishment of wet meadow plant communities.

Adaptive management strategies would be employed in the combination best suited to meeting riparian and upland objectives. Adaptive management strategies could include (but would not be limited to): changes in timing duration and frequency of grazing; distribution of livestock; and stocking rates. A shorter, earlier timing of grazing with a higher stocking rate could be used to provide for riparian stubble height and shrub objectives by giving time for riparian species re-growth and preventing late season shrub utilization. This strategy could be incorporated with a rest-rotation system to speed riparian recovery. Attainment of upland management objectives could be facilitated through a later season grazing treatment which would provide for seed set in perennial grasses. Invasive annuals could be grazed in a high intensity, short duration grazing treatment to reduce competition with desirable native perennials. Adaptive management strategies can be modified and adjusted based on monitoring data, livestock operations and seasonal fluctuations. Activities that improve upland vegetative conditions would take grazing pressure off of the riparian areas and provide for improved livestock distribution.

Many examples of adaptive management effectiveness are available, such as Technical Reference 1734-14 (Leonard et al. 1997) which evaluated and rated grazing strategies for stream riparian habitats. Continuous season-long grazing was rated as poorly compatible (rating of 1), compared with deferred-rotation which is rated (rating of 4) as more compatible with stream riparian habitats. New strategies, such as low impact herding and protein supplementation may be incorporated with adaptive management strategies.

Direct and Indirect Effects from the No Grazing Alternative

Under this alternative, all Term Grazing Permits would be cancelled upon implementation of the decision and resolution of the appeals process. No permits would be issued to graze livestock on the Van Allotment unless there was a subsequent NEPA analysis and a decision to reauthorize livestock grazing.

Range improvements including: fences, water systems and corrals would remain on the allotment but would no longer be the responsibility of the permittees to maintain. Permittees would be reimbursed for their amortized share of cooperative range improvements where they participated in the development (Forest Service Handbook 1109.13 Chapter 70).

Subsequent decisions would be needed regarding retention of any improvements for other resource needs such as wildlife or recreational use. Alternative funding sources for maintenance would need to be secured. Allotment boundary fence maintenance would be re-assigned to adjacent permittees. If private landowners wished to continue grazing the associated private lands, it would be necessary for them to fence the boundaries to insure their livestock would not trespass on National Forest lands. Fences in common with other state and federal lands would remain intact with ownership assumed to belong to the private land owner, state or federal agency.

The absence of domestic livestock grazing in riparian zones would increase the amount of riparian grasses and sedges and increase willow canopy cover where willows currently exist. Stream banks would eventually become lined with tall sedges in those locations where the potential exists.

The absence of domestic livestock grazing in the uplands would increase the amount of upland vegetation. Upland vegetation compositions would slowly change to being dominated by late seral species where the potential exists. On vegetation types where conifers are a component, understory shrubs and grasses would continue to decline as canopies close.

Cumulative Effects Common to All Alternatives

Past domestic grazing is described in Appendix C. This past domestic grazing has reduced plant species that have low tolerance to grazing and are preferred by livestock; and has increased plant species that are tolerant to grazing. Past timber management (as described in Appendix C), has opened up conifer canopies and allowed understory shrubs and grasses to increase in those areas for a short term increase in forage. Over time, the conifer canopies have closed and understory shrubs and grasses have declined.

Future vegetation projects (described in Appendix C) such as the Jane (formerly the Van) Vegetation Management project and the Harney LLP project would open up conifer canopies and allow understory shrubs and grasses to increase in those areas for a short term increase in forage. Eventually, the conifer canopies would close up again and understory shrubs and grasses would start to decline. Future activities that improve upland vegetative conditions would take grazing pressure off the riparian areas and provide for better livestock distribution.

Cumulative Effects of the Proposed Action

Under the Proposed Action Alternative, upland and riparian vegetation would increase as adaptive management strategies are utilized. Resource conditions at Schurtz Creek, Dry Creek, Gabe Creek, and Wolf Creek would be expected to improve through adaptive management and proposed range improvements although not as quickly as the No Action Alternative.

The diminished vegetation conditions from past actions would not be further diminished under this Alternative because livestock grazing would be managed so that effects from livestock grazing would not carry over to the following grazing season, thus allowing a "near natural" rate of recovery of riparian areas as defined by PACFISH Enclosure B (Appendix J).

Cumulative Effects from No Grazing Alternative

Under the no grazing alternative, herbaceous plants and shrubs would no longer be utilized by livestock. Plant productivity, diversity and species composition may change over time. Plants with low tolerance to grazing may increase in abundance. Upland vegetation compositions would slowly change to being dominated by late seral species in those locations where the potential exists.

The no grazing alternative would allow an increase in bunchgrass production for bluebunch wheatgrass, Idaho fescue, and other bunchgrasses within the allotment where the potential exists. Bunchgrass forage may develop residual growth resulting in "wolfy" plants, which are not as palatable to wild ungulates. The establishment of older non-palatable plants would occur over time, unless some type of disturbance such as fire occurred. Wildlife foraging behavior and plant preference may be altered in absence of livestock grazing.

Shrub communities without fire or other disturbance regimes would gradually move towards the predominance of shrubs over grasses and forbs. Improvement would occur at a rate faster than those predicted in the action alternative. Stream banks would eventually become lined with tall sedges in those locations where the potential exists. Riparian vegetation conditions would be maintained or would improve meeting or moving towards the Inland Native Fish Strategy (USDA Forest Service, 1995).

The diminished vegetation conditions from past actions would not be further diminished because effects from livestock grazing would not occur and a "near natural" rate of recovery of riparian areas as defined by PACFISH Enclosure B (Appendix J) would occur.

Forested Vegetation/Condition

The current forested vegetation conditions are the result of past fire suppression policies, grazing practices, past harvesting practices, past fuel practices, and past road building practices. Borman (2005) states that dense ponderosa pine forests and less-than-desirable forest conditions of today originated primarily in the early 1900s, with the convergence of factors that no longer apply. Those factors include (1) especially favorable climate years for tree reproduction; (2) exceptionally heavy, unregulated, unmanaged grazing by very large numbers of horses, cattle, and sheep during the late nineteenth and early twentieth centuries in most of the West; and (3) substantially reduced return intervals for low-intensity ground fires that served to thin dense stands of younger trees. These factors are no longer occurring in the project area. Today, livestock grazing is regulated and monitored, and fire is being reintroduced to thin dense stands of younger trees.

Regardless of the type of forested stands, most are generally overstocked. Most of the area has been partially harvested sometime in the last 50 years; refer to Appendix C for more information on past harvesting. Most of this harvesting was in the form of salvaging, sanitation, or regeneration cutting. There is still a large old growth component in many of these stands, which is generally declining. Many of these stands are susceptible to disease and insects.

Dry Upland Forest PVG

The Dry Upland Forest PVG has been subdivided into Hot Dry, and Warm Dry Plant Association Groups (PAG). In these forested stands there are a variety of understory shrubs, forbs and grasses that grow in conjunction with trees. With increased stocking of trees there has been a decrease in the stocking of shrubs, forbs, and grasses in these stands, and also a decrease in the plant species diversity with a corresponding decrease or change in the wildlife species that used the area. With the invasion of trees into non-forested areas there has been a decrease in the total number and the diversity of plant species that inhabited the former non-forested site. Finally with increased diversity and stocking of trees (stands that were once dominated by ponderosa pine that have now converted to mix conifer stands) there has been a decreased diversity and total number of plants and animals that use these stands.

Hot Dry Plant Association Group

This association is composed of three types of stands: 1) ponderosa pine and juniper, 2) predominantly even aged ponderosa pine stands, and 3) two storied stands. The predominant tree species in this group is ponderosa pine with less amounts of juniper. Occasionally Douglas-fir may be growing in some stands but are small inclusions of other plant associations. This association is commonly intermixed with the non-forested association.

Most of the stands in this association are heavily overstocked and growth has declined in recent years making them susceptible to insects and disease.

Warm Dry Plant Association Group

Ponderosa pine historically was the dominant tree species in this potential vegetation group with Douglas-fir or white fir the climax species. Dominance of ponderosa pine was historically maintained by periodic fire. Juniper historically occurred mainly on rocky ridges, scab flats, and southern aspects. Juniper is now more common throughout the watershed, including riparian areas. Lack of periodic fire has enabled the invasion of juniper into mix conifer stands.

With the advent of fire suppression, and past timber harvesting practices, the composition of these stands have radically changed and moved towards climax species. The stocking has increased two to four fold (basal area) and up to 10 times (trees per acre). These changes in composition and stocking have changed the continuity, arrangement and loading of fuels, which has resulted in changing the fire regime of this area. With this increased density and increased shading the composition and abundance of shrubs, forbs, and grasses have decreased

Aspen within the Warm Dry Plant Association Group

Quaking aspen (*Populus tremuloides*) was once quite common and occurred generally in the riparian areas as uneven age stringer stands in riparian areas. Today, aspen occurs mainly as clumps or small stringer stands and has decreased in frequency. Cadastral surveys conducted in the mid-1800's recorded "jungles of aspen" in some meadows on the Malheur National Forest. The present aspen stands are the remnants of these much larger stands and were the young regeneration that was present when this fire suppression began.

Today, most aspen stands found within the watershed are small and appear as a few old decadent stems with little or no viable regeneration. This has occurred because they are being overgrown by conifers; disturbances that could regenerate the clones are lacking; ungulates browse the few new sprouts that do occur, and lowered water tables from stream down-cutting. Without protection from ungulates, aspen sprouts often are prevented from maturing by browsing.

In most cases, succession of these aspen stands to conifers has led to diminished patch size, loss of vertical structural diversity, and loss of this species from most riparian corridors. The lack of stand regeneration has resulted in a decline of aspen acreage in the planning area and the competitive capabilities of aspen to regenerate and maintain vigor.

Aspen can produce viable seed but usually regenerate vegetatively through root suckers (adventitious shoots that sprout from the shallow lateral roots of the parent tree if apical dominance does not inhibit suckering). This process is accelerated when the parent tree is stressed or killed. The result is a clump (clone) of trees identical in genetic composition, which can cover many acres under the right conditions. Although the physiological age of individual mature trees varies from 60 to 120+ years, the clone itself may be hundred or thousands of years old. Research suggests that some clones in the Great Basin are at least 8,000 years old.

Disturbances such as prescribed fire and vegetation treatments, as well as protection from browsing are necessary to perpetuate aspen. Where aspen stands have been treated, either with fire (natural or prescribed) or by removal of overstory vegetation, and protected to exclude or restrict browsing, regeneration has been successful and vigorous.

Effects on Forested Vegetation

Direct and Indirect Effects Common to all Alternatives

The direct and indirect effect on forested vegetation is negligible because domestic livestock do not normally consume forested vegetation. Effects to aspen are displayed in the terrestrial wildlife section of this chapter.

Cumulative Effects Common to all Alternatives

Heavy ungulate grazing in the early part of the last century removed competing grasses, allowing conifer seedlings to become established. Coupled with fire suppression activities, which did not allow fire to periodically burn through these stands and kill many of these new seedling have allowed the forest stands to become overstocked (trees per acre), and allowed tolerant species (white fir, and Douglas-fir) to increase in stand composition. With time and growth the basal area now occupied by the forest vegetation is often two to three times the historical basal area on these sites. With this increase in forest vegetation, the understory grazing and browsing plants have decreased. Also this forest vegetation colonized former nonforested vegetation lands. In the last half of the past century, there was numerous timber harvesting activities in this watershed. Appendix C describes this past harvesting within the allotment. This harvesting has generally removed many of the fire resistance ponderosa pines from many areas. In addition there have been numerous clear cutting of forest stands in the watershed. This clear cutting has increased the number of grasses, forbs, and shrubs. Over time (approximately 10 to 20 years) as the clear cuts are re-vegetated and trees begin to fully occupy the site, there will be a decrease in the amount of grasses, forbs and shrubs.

In the future it is foreseeable that there could be vegetation projects that could affect the forested vegetation in this allotment. At this time, future clear cutting is unlikely. Commercial and pre-commercial thinning (like the proposed Van Vegetation Management Project) of overstocked stands to reduce stocking levels and move stand compositions toward early seral species is highly likely. With this thinning there should be an increase in ground vegetation beginning the next growing season and increasing for 3 to 5 years. This increase should then peak and hold steady for 10 to 20 years, before beginning a gradual decrease over time as the residual trees from the last treatment increase in size and begin to use the available moisture and light. The amount of increase in ground vegetation and the length of time of the release of this ground vegetation are directly proportional to the degree of harvest that occurs. The greater the decrease in density of the forest vegetation, the greater will be the increase in ground vegetation and the greater the length of time before the residual trees once again cause a decrease in ground vegetation.

Biological Soil Crusts

Rangeland lichens grow as a part of the complex interrelationship between lichens, bryophytes, and cyanobacteria that make up the microbiotic crust (biological soil crusts). Many microbiotic lichens found in the Basin are widespread globally, yet the area they now cover in the United States has been greatly reduced compared to historic times. The major threats to survival of microbiotic crusts in the Basin include: invasion of exotic annual grasses and associated increases in fire frequency; conversion of rangelands to agriculture and suburban developments; and livestock trampling. Areas that contain shrubs and microbiotic crusts can be grazed by livestock when the soil is moist with little harm to the crusts (Quigley, et al., 1997).

Quigley, et al., (1997) determined that dense, closed forest stands, resulting from the past 100 years of fire suppression, have fewer lichens than historic, open forest stands. In the rangeland ecosystem, Quigley, et al., (1997) describes how the seeding of exotic grasses for erosion control and livestock forage has resulted in increased fire frequency. Fire, along with livestock trampling, has reduced the microbiotic crust coverage, and as a result, the fire-adapted, annual exotics can completely saturate the ground, creating a dense, closed stand of annual grasses that out competes the crust communities.

The Northwest Forest Plan addressed the topic of lichen conservation for the forests west of the Cascades, but there have been no such scientific studies on this topic in the Interior Columbia Basin (Quigley, et. al. 1997). Formal lichen surveys have not been conducted in the project area, although biological soil crusts are known to exist. It is unknown how much biological soil crust was present before the unregulated grazing in the early 1900's. The unregulated grazing most likely decreased the amount of biological soil crusts we see today. The invasion of trees into non-forested areas has also enabled a decrease in the total number and the diversity of plant species that inhabited the former non-forested sites; this may include a decrease in the amount of biological soil crusts.

Several ecology plots were established within the project area to determine range condition and trend. None of these plots specifically mention soil crusts but they do mention increases in bare ground and cheatgrass. Because of these poor to very poor conditions it is reasonable to determine there has been a reduction in soil crusts.

Based on this information, crust communities are suspected to exist within the project area and may have been impacted by past management actions. Crust communities are most likely on a slight upward trend because unregulated grazing has ceased and invasion of trees into traditional non-forested areas has also slowed.

Effects on Biological Soil Crusts

Direct and Indirect Effects of the Proposed Action Alternative

Under the Proposed Action Alternative, biological soil crusts would continue their slow recovery since unregulated grazing has ceased and invasion of trees into traditional non-forested areas has slowed. Additionally, resting the allotment for 3-5 consecutive years and reducing the livestock forage allocation by 41% would reduce impacts to biological soil crusts.

Direct and Indirect Effects of the No Grazing Alternative

Under the No Grazing alternative, effects would be similar to the Proposed Action Alternative except with no grazing biological soil crusts may continue their slow recovery at a slightly higher rate.

Cumulative Effects Common to all Alternatives

Past management actions, such as effective fire suppression, has facilitated dense forested stands, and along with livestock trampling of microbiotic crusts, has most likely reduced the densities of forest and rangeland lichens within the project area. The diminished habitat conditions for biological soil crusts attributed to past management actions would not be further diminished by any of the alternatives because unregulated grazing no longer occurs and invasion of trees into traditional non-forested areas has slowed. Future foreseeable actions include thinning of conifers and juniper and landscape scale prescribed burning in both forested and non-forested ecotypes. These future foreseeable activities would not be implemented on every acre of ground within the project area; rather a mosaic of eco-types would be formed. These future foreseeable vegetation treatments combined with past actions would be cumulative in nature and it is likely the diversity and densities of lichens would increase due to more open forest conditions and a mosaic of eco-types.

Sensitive plants

Sensitive plants suspected to occur on the district are derived from the Region 6 Sensitive Plant List. Sensitive plant surveys for past projects were conducted in portions of the project area in the 1970's thru the 1990's. These past surveys reviewed areas by floristic walk-through survey (Nelson 1985) during specific times of the year for peak plant identification periods.

A prefield review was performed to identify all sensitive species that could be encountered within the proposed project area. No sensitive populations exist within the allotment. The prefield review identified potential habitat for two species listed as Sensitive by Region 6 within the allotment: *Carex backii,* and *C. parryana*. For more specific information on sensitive plant species, refer to the Plant Biological Evaluation (BE) located in Appendix F.

Sensitive plant surveys for this project were conducted in 2003, 2004 and 2005. Field surveys focused on areas identified as potential habitat, mainly springs and riparian areas. No new sensitive plant populations were located.

Sensitive Lichens

Two sensitive lichens, *Leptogium burnetiae var. hirsutum* (Hairy Skin Lichen) and *Dermatocarpon luridum* (Silver Skin Lichen) are suspected to occur on the Malheur National Forest. The Emigrant Creek Ranger District is not considered suitable habitat for Hairy Skin Lichen because the district does not have the wettest of the wet coniferous plant associations (e.g. one's with pacific yew) where this sensitive lichen grows. Silver Skin Lichen is semi-aquatic and grows on bedrock or immovable boulders at or near the water level in larger streams like the Malheur River (which is not within the planning area). No suitable habitat for Silver Skin Lichen occurs within the allotment. If suitable habitat did occur, livestock grazing would not affect this lichen. In-stream work (rock structures and woody debris placement) would not affect this lichen, because these proposed activities are on smaller streams that are not considered habitat.

Effects on Sensitive Plants

This section summarizes the effects of the alternatives on sensitive plant species. For a detailed analysis of the effects of the proposed alternatives on sensitive plant species in the planning area, refer to the Biological Evaluation for Sensitive Plant Species (Appendix F).

Direct and Indirect Effects from the Proposed Action Alternative

No impact (NI) to sensitive *Carex* species is expected because none were found within this allotment. Activities proposed (see chapter 2) under this alternative would therefore have no impacts to sensitive *Carex* species.

Direct and Indirect Effects from the No Grazing Alternative

No impact (NI) to sensitive *Carex* species because none were found within these allotments. The No Grazing Alternative may have a beneficial impact (BI) to *Carex* habitat. No livestock grazing would allow springs, bogs and seeps to recover from past affects. Habitat for *Carex* species would improve, but whether these species could occupy this habitat is unknown.

Cumulative Effects Common to All Alternatives

Past domestic grazing, timber harvesting and fire suppression have contributed to changes in riparian habitats and the plant communities they support. The distribution and vitality of sensitive *Carex* species, before these management activities began are unknown.

Historic grazing has resulted in loss of potential habitat for these species through stream downcutting and accelerated erosion processes that alter local surface hydrology. Past timber harvesting has also increased erosion and altered hydrologic relationships. Historic logging practices included skidding logs through riparian areas, which could have destroyed existing plants but could have also provided soil openings for new plants to establish. Fire suppression may have caused a decline in populations through increased competition for soil moisture and nutrients by shade-tolerant plant species.

Future foreseeable activities such as vegetation management in the Wolf Creek Watershed, Calamity Creek Subwatershed (Jane (formerly Van) Vegetation Management Project) would not have cumulative impacts on *Carex* species because activities would most likely not be proposed within riparian areas.

Cumulative Effects Specific to No Grazing Alternative

No livestock grazing would have long-term beneficial effects on *Carex* species habitat.

Noxious weeds

There are about 8 acres of known noxious weed sites located in the allotment. Weeds may be categorized as noxious because of the potential economic consequences of a weed invasion, or because of the threat to native vegetation communities and wildlife. Characteristics of noxious weeds include: a wide range of adaptability, rapid growth rates, abundant seed production, ability to re-sprout, ability to spread from vegetative or root fragments, and long seed viability in the soil. These attributes give noxious weeds a competitive edge over other plants. They are also difficult or impossible to eradicate once established.

Cheatgrass (*Bromus tectorum*) has not been designated as noxious by the Oregon State Department of Agriculture (ODA) or Local Weed Districts. Nevertheless, in general, cheatgrass has the potential to be detrimental or destructive to agricultural production, is difficult to control or eradicate, and is a threat to native vegetation communities. Currently, cheatgrass is present within the allotment and is prevalent in some areas.

The primary mechanism for spread and establishment of noxious weeds are equipment, vehicles, and road work moving reproductive plant parts from infested areas and depositing them in non-infested areas. Animals, which include livestock, terrestrial wildlife, birds, wind, and water are minor mechanisms for spread. Most activities that spread weeds occur during the period of mid June through October. Most infestations occur along travel routes in the planning area. Current strategy emphasizes preventing the establishment of new weeds and slowing the spread of existing infestations. Decreasing the amount of ground disturbance, promoting establishment and proliferation of more desirable vegetation, and reducing the production and spread of reproductive plant parts, are some of the means to implement the current strategy.

Canada Thistle (Cirsium arvense)

Canada thistle is a relatively long-lived creeping perennial. Reproduction occurs from seed and root buds will sprout to form new plants if the weed is disturbed. Canada thistle seed moves readily with vehicles. Presently, Canada thistle is the most prevalent noxious weed inventoried within the planning area. It has become very common across the forest. The majority of sites is along roads, but is increasing in riparian areas. Current treatment includes pulling plants and/or cutting plants at late bud or early bloom to prevent seed dispersal. There are about 0.9 acres of Canada thistle within the allotment.

Dalmatian Toadflax (Linaria dalmatica)

Dalmatian toadflax is a perennial that can reproduce from seed and root rhizomes. New plants will also grow from root segments left in the ground. Dalmatian Toadflax is often found in rock pits, but mainly along roads. Dalmatian Toadflax is prevalent along Forest Road 17. There are about 1.39 acres of Dalmatian toadflax within the allotment.

White Top (Cardaria spp)

White top is a perennial that can reproduce from seed and root rhizomes. New plants will also grow from root segments left in the ground. White top it is extremely difficult to control and is found in disturbed areas (road junctions) and along roads. There are about 6.1 acres of white top within the allotment.

Risk factors

1. The project area has been altered, providing enhanced conditions for establishment of noxious weeds. These conditions include more sunlight to the soil surface, less organic material covering the soil surface, more exposed mineral soil, and increased soil disturbance. These conditions are located in areas such as roads/cut slopes, rock pits, landings, skid trials, and dispersed campsites.
2. There are known noxious weed populations in and adjacent to the project area which constitutes a source of reproductive material for establishment on the Forest.
3. Forest Road 17 and the entire road system have a fair amount of vehicle traffic, especially during big game hunting season.

Effects on Noxious Weeds

Effects of the Proposed Action Alternative

Permitted livestock can introduce noxious weeds by transporting seeds in their hair 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 seed heads are already produced. The probability of domestic livestock transporting seeds in their digestive system is low because cattle do not generally consume the noxious weeds found on the allotment.

Livestock grazing or associated permittee actions are not a major factor in the establishment and spread of noxious weeds in the project area. Reduction of livestock use in identified areas would not change the amount and type of noxious weeds within the allotments.

The chance of noxious weed spread may increase within the allotment because of the potential of ground disturbance with the proposed activities such as construction of new water development at Dry Creek Spring, construction of new fences, and installing rock structures and large wood. Management requirements, constraints and mitigation measures identified in Chapter 2 would help lessen the potential for spread. Specifically, cleaning of equipment and seeding disturbed ground with certified weed free seed would reduce the chances of spread of noxious weeds.

Cheatgrass would continue to be present in the uplands and proposed activities would not cause it to increase in any measurable amounts because of management requirements, constraints, and mitigation listed in Chapter 2.

Permittees and Forest Service Range Management Personnel presence on the allotment assists in detection and control of noxious weeds. In addition, grazing fee funds would be available for noxious weed treatment under this alternative.

The Forest would continue to conduct a noxious weed management program that would minimize the spread of state-listed species (with the tools available) that implements an integrated program focusing on prevention, early detection, and timely treatment of priority species.

District personnel and permittees would continue to work together to develop an accurate and up to date inventory of the noxious weeds present on the allotment within the project area. Once inventoried, each site would be treated.

Effects of the No Grazing Alternative

No Grazing provides the lowest level of risk of new infestation by noxious weeds and the lowest risk of spread and establishment of noxious weeds because no ground disturbing activities would occur. Present treatments of noxious weeds would continue as previously planned.

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. Forest Service funds derived from grazing fees would not be available for noxious weed treatment. Without disturbance and with plant communities moving towards potential natural conditions, there would be fewer opportunities for noxious weed establishment. In the long term (about 15 years) established noxious weed sites would be at a competitive disadvantage from native plants. Roads would continue to be the major conduit and site for weeds, and terrestrial wildlife would be the only ungulate transporter of seed. Cheatgrass would continue to be present in the uplands.

Cumulative Effects Common to all Alternatives

Past management actions have contributed to the establishment and spread of noxious weeds in the allotment. Past timber sales that have likely aided in the establishment and/or spread of noxious weeds include County, Dry Creek, East Wolf, Gabe and Cove because noxious weeds are located along roads that were most likely used during those sales.

Past livestock grazing has likely aided in the establishment and/or spread of noxious weeds in the area because prior to the 1930s, extensive unregulated grazing on public land was a major problem. This period of unregulated grazing resulted in adverse environmental consequences such as soil and vegetation loss that most likely created an environment that favored noxious weeds. To some varying degrees, wild ungulates, birds and rodents may have also spread weeds through ingestion and deposition of seeds.

Some noxious weed populations would 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) would be managed to the extent possible to stop the spread.

Other on going and future activities in the planning area, may contribute to the establishment and expansion of noxious weeds. Roads provide the perfect habitat for establishment from vehicles which transport seed and plant segments. Propagules are transported into the forest and within the Forest by weed contaminated equipment. After establishment, the regular traffic flow enhances the opportunity and ability to spread to other equally good sites. Log landing sites, skid trails, and rock pits provide excellent weed establishment habitat. Future vegetation management projects like Jane (Van) Vegetation, Harney County LLP and Plantation PCT projects would most likely have cumulative effects on noxious weeds because they propose ground disturbing activities in areas where weeds exist. Rates of spread depend on the amount and duration of disturbance and the frequency of vectors.

Existing noxious weed populations would continue to spread onto adjacent or intermingled private and other agency lands; similarly, populations from other-ownership lands would continue to spread onto the Forest. Both conditions require coordination with county weed and pest offices to manage populations and their effects regardless of land ownership and property boundaries. Cheatgrass would continue to be present in the uplands.

Activities proposed in this project would be cumulative in nature with past and future actions but is not expected to be significant because proposed livestock levels are extremely lower than what existed prior to the 1930's and subsequent ground disturbance is also lower, and management requirements, constraints and mitigation measures identified in Chapter 2 would help lessen the potential for spread. Specifically, cleaning of equipment and seeding disturbed ground with certified weed free seed would reduce the chances of spread of noxious weeds. Additionally, permittees and Forest Service Range Management Personnel presence on allotments assists in detection and control of noxious weeds.

Social and Economics

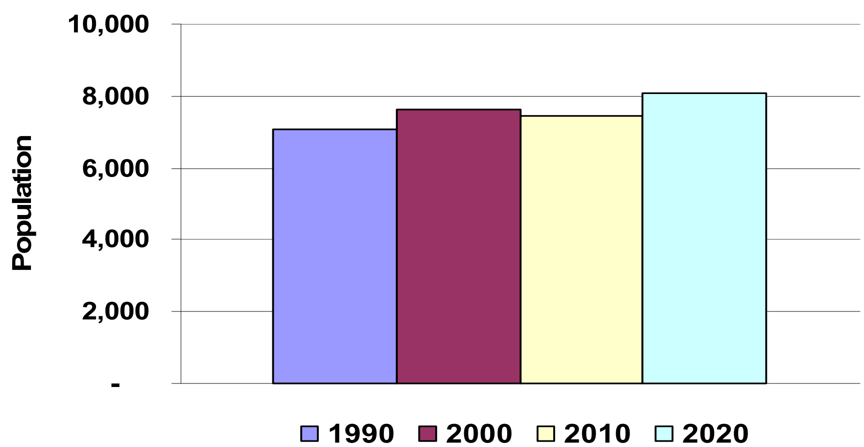
Changes in levels of grazing use associated with the Van Allotment on the Emigrant Creek Ranger District may impact social and economic characteristics in the surrounding area. The primary assessment area for this project consists of Harney County in eastern Oregon. Communities are closely tied to the forest in both work activities and recreation. The local communities in Harney County that are anticipated to be directly or indirectly affected by the proposed action and alternative include Burns-Hines in Harney County. The Van Allotment permittees live within the assessment area.

In this section, we provide an overview of the current social and economic conditions found in the assessment area to provide the context of the effects analysis that addresses the purpose and need and the issues discussed in Chapter 1. Next we look at the potential effects of the alternatives on the issues using the measure identified. The background and the effects analysis helps to inform the decision process about potential social and economic trends and how these trends may affect Van Allotment management and how allotment management activities may affect social and economic conditions in the assessment area including concerns associated with potential environmental justice and civil rights impacts.

Population

Harney County has not seen much overall population change over the past 15 years nor is much growth predicted during the next 15 years. The annual growth rate for the 30-year period ending in 2020 is 0.5 percent (figure 5) compared to Oregon statewide annual rate of 1.5 percent for the same period. With a current population of about 7,500, the population density is very low and less than one person per square mile given the area of the county is over 10,000 square miles. This density compare with a state wide density of 36 persons per square mile.

Figure 5: Past and future population trends for Harney County

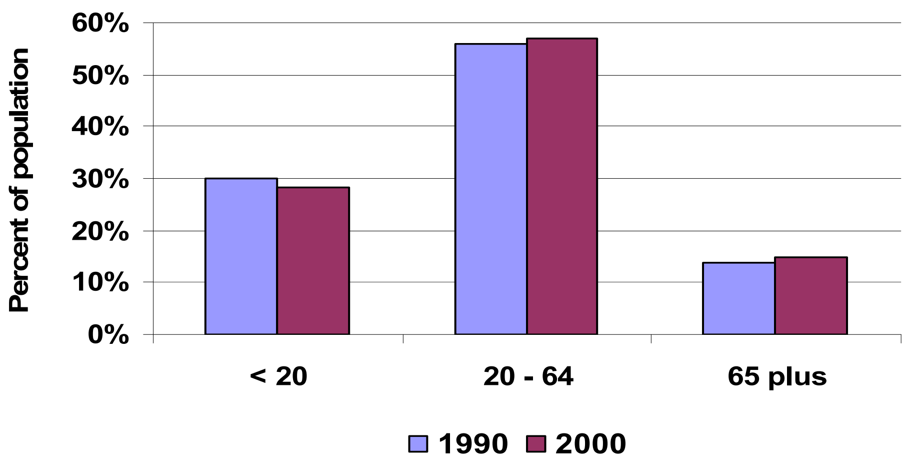


Sources: Headwaters Economics (EPSC) based on 1990 and 2000 Census data. State of Oregon Office of Economic Analysis for 2010 and 2020 projections.

Population structure components such as gender, age and race may influence local attitudes, values and beliefs about Forest management and patterns of use. The gender composition of the general population of the assessment area and each county shows the percentages of the total population are roughly equal with 51 percent male and 49 percent female similar to the gender distribution state-wide of 50 percent.

The age distribution components displayed in figure 6 show very little change between 1990 and 2000. There is a slight loss in the less than 20 year olds and minor increases for those people in the working years (20 to 64) and for those 65 and above.

Figure 6: Age distribution in Harney County for 1900 and 2000



Source: Headwaters Economics (EPSC) based on 1990 and 2000 Census data.

In order to address environmental justice concerns and to identify and address disproportionately high and adverse human health or environmental effects of management activities on minority and low-income populations as well as to address potential civil rights impacts, these components of the population in the assessment area are displayed in table 6.

Harney County's population is predominantly white with only eight percent of the population classified as other than white. The largest component in this group is American Indian totaling about four percent of the total population. This can be compared to Oregon State where whites comprise 86 percent of the population. The Hispanic or Latino component of the population of any race is about four percent in the assessment area compared to eight percent state-wide. Twelve percent of the population was under the poverty line in 1999 which is the same as the state. Overall, Harney County is racially less diverse than the state, but with a higher proportion of American Indians, and it has relatively fewer residents that are Hispanic or Latino.

Table 6. Race, Hispanic or Latino and poverty population components for Harney County

Race	Total Population	Hispanic or Latino	Below Poverty Line
White	6,995	172	701
Black or African American	10	1	-
American Indian & Alaska Native	302	26	96
Asian, Native Hawaiian & Other Pacific Islander	44	1	13
Some other race	99	94	15
Two or more races	159	22	50
Total	7,609	316	875

Source: Headwaters Economics (EPSC) based on 2000 Census data.

Traditional Lifestyles and Trends

Harney County is an attractive place to live, work and play and people value the area for different reasons. A variety of values exist including aesthetic, cultural, economic, historic, recreational, and spiritual values. These different values can coexist and support each other, but at other times they can result in conflict over resource use and management.

Historically, agriculture, ranching and forestry have been dominant cultural forces in this area creating a type of lifestyle that allows people close interaction with natural resources. For some the Malheur National Forest is directly related to personal income and jobs. This includes jobs and income from ranching and grazing livestock on the Forest. In addition, many local residents expect employment and income related to tourism based on the amenities that the Forest provides. However, traditional natural resource based lifestyles especially those associated with forestry and public land grazing have been in decline. There has been a steady increase in the services sector which includes health and social services and tourism. Some people are now working lower-wage highly seasonal jobs. Raising a family often requires more than one wage earner. Children graduating from high school typically depart to urban areas to gain education and employment options.

Heritage Resource Management/Tribal Interests

At present there are approximately 32 known heritage resources within the Van allotment. These sites are primarily prehistoric sites consisting of debitage, the waste flakes generated during stone tool manufacture. These resources are important for their potential to provide an understanding of long-term human adaptation to the environment and their presence on the landscape. They also have the potential to yield information regarding patterns of history and culture.

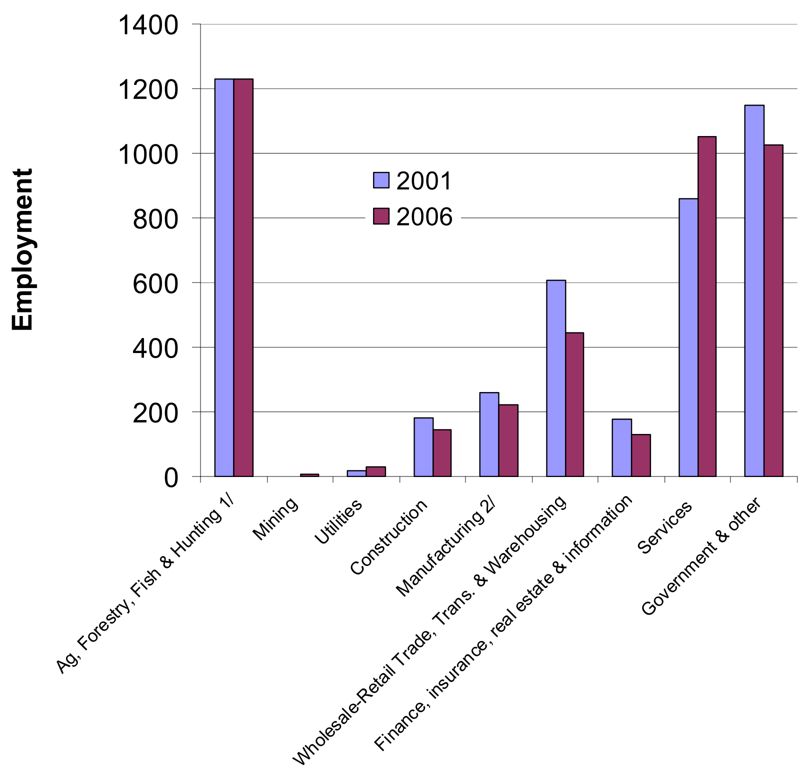
Economic Conditions and Trends

The cattle ranching business has been and continues to be economically important in Harney County. A grazing program on portions of the Malheur National Forest has been around since the forest was establishment as part of the Blue Mountain Forest Reserve in 1906 and as a separate unit in 1908 (Mosgrove, 1980) and the Van allotment has been in existence since the 1940's.

Employment and Income

The sector for agriculture, forestry, fishing and hunting as shown in figure 7 is the largest in employer in Harney County followed by local, state and federal government, and then by services. Most sectors in the economy show declines or no change in employment between 2001 and 2006 except for services. The Implan 2006 data estimates for agriculture are being revised so data for 2001 are used as a proxy. This proxy appears reasonable based on similarities in agriculture employment data for 2001 and 2006 published by Bureau of Economic Analysis Regional Economic Information System (REIS). It should also be noted that the manufacturing employment data for 2006 does not reflect recent closures of wood products processing and motor home manufacturing plants. Employment includes full- and part-time jobs. Cattle production, a component of agriculture, provides core employment for Harney County. In 2006, cattle ranching supported over 400 full- and part-time jobs or about ten percent of all employment.

Figure 7: Full- and part-time employment in Harney County, 2001 and 2006.



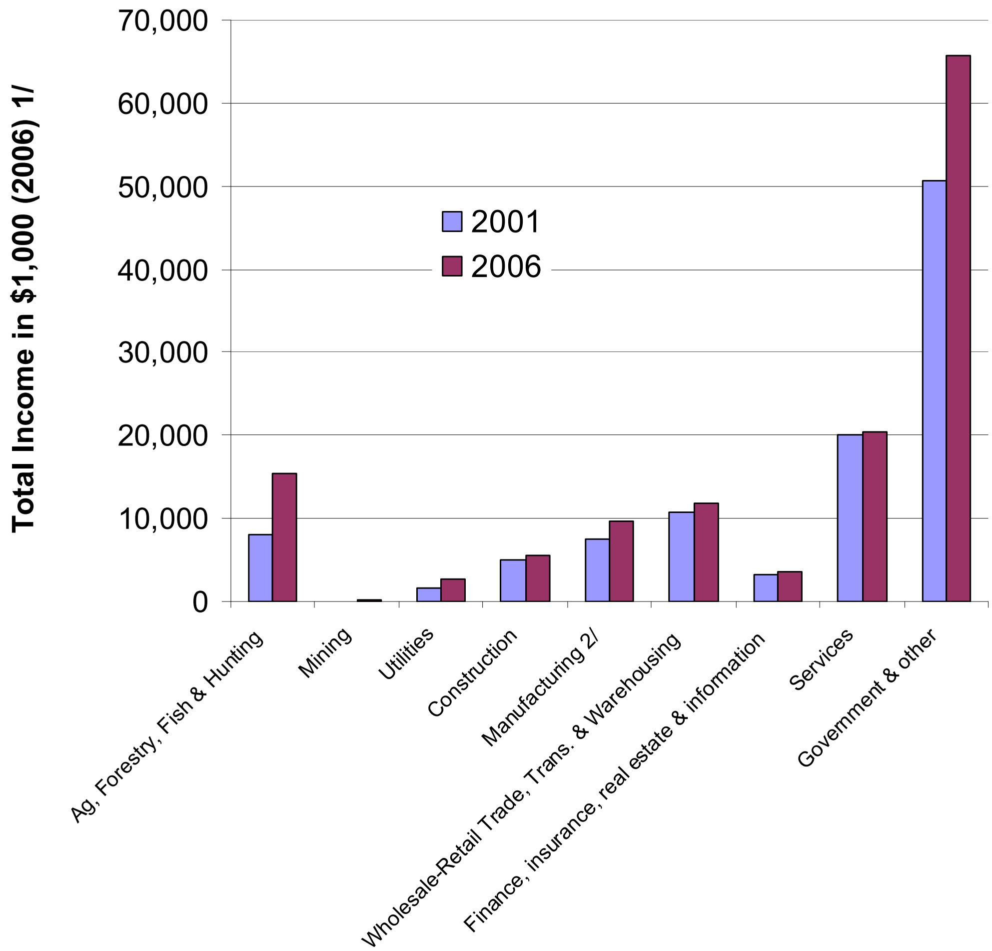
1/ The 2006 data for Ag, Forestry, Fish & Hunting is being revised. The data for 2001 is used as a proxy based on similarities in these industries shown in reports published by Bureau of Economic Analysis.

2/ Manufacturing data for 2006 do not reflect recent closures of wood products mills and motor home manufacturing plants.

Source: Minnesota IMPLAN Group data.

Wage and salary income data in Harney County for the years 2001 and 2006 are presented in figure 8. The importance of different sectors based on income is significantly different then that of employment especially with regards to agriculture. Rankings by income show government related income to be the highest and making up almost 50 percent of wage and salary income. Agriculture related income comprises 10 percent of all wage and salary income compared to about 30 percent of all jobs. Part of this is due to most of the ranches are family run businesses and are not corporately owned. It is often difficult to identify wage and salary component of total farm income. Farm employment is also very seasonal.

Figure 8: Wage and salary income in Harney County, 2001 and 2006.



1/ The 2001 income data was converted to a 2006 base year using implicit price deflators.

2/ Manufacturing data for 2006 do not reflect recent closures of wood products mills and motor home manufacturing plants.

Source: Minnesota IMPLAN Group data.

Ranching Industry and Grazing the Van Allotment

Forage from federally managed lands is important to ranchers in Harney County with federal grazing permits. Forest allotments can be key elements 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. The Van allotment is grazed by the Van Grazing Cooperative. Typically, 2 permittees from the Van Grazing Cooperative graze in the Van Allotment. The allotment is generally grazed for four months during June through September which provides about one-third of the annual forage requirement for the cattle and calves using the allotment. Table 7 displays the permitted numbers and AUMs and actual use AUMs for 1980 through the present. The permittees elected to take non-use for three of the last four years and reduced use in the other year.

Table 7: Permitted and Actual Use, Van Allotment 1980-Present

Year	Permitted Numbers	Permitted AUMs	Actual Use AUMs
1980-2004	142	752	752
2005	Non-Use	752	0
2006	142	752	487
2007	Non-Use	752	0
2008	Non-Use	752	0

Financial institutions have recognized the economic value of federal grazing permits allowing long-term permittees 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 base property will automatically give the permit to the new owner.

Environmental Justice and Civil Rights Impacts

Executive Order 12898 on environmental justice requires federal agencies to identify and address any disproportionately high and adverse human health or environmental effects on minority and low-income populations. Minorities comprise 8.1% of Harney County, of which the majority is American Indian (table 6). The primary American Indian tribe involved is the Burns Paiute Tribe. Poverty rates provide some indication of the percentage of the population in surrounding communities with low-incomes. The poverty rate for Harney County is 12 percent (table 6) similar to the Oregon statewide average.

None of the members of the Burns Paiute Tribe are permittee holders on the Van allotment and data about the minority, poverty, and disability status of permittees and their employees are not available. This project does not appear to generate disparate impacts on minority or low income populations. The project alternatives given the size of potential social and economic effects are also not likely to result in civil rights impacts to Forest Service employees or customers of its programs.

Effects on Social and Economics

This social and economic analysis addresses concerns that changing permitted livestock levels would affect grazing related jobs and income, and that allotment improvements and changes in livestock management can affect costs to the permittees and the Forest Service.

The social and economic analysis focuses on the indicators which include the number of permitted animal unit months (AUMs), change in the associated jobs, and change in cost to the permittees and to the agency. Table 8 displays these indicators by alternative. All costs are average annual costs over a 10-year period.

The effects of the proposed action on permitted AUMs and jobs are broken into two time frames since the allotment is being rested for the first three to five years. This analysis uses zero AUMs for the five year period. Data on actual AUM use are also included in the column titled "Historic Use" to provide a context for the change.

Table 8: Social and economic indicators

Indicator	Historic Use	Proposed Action Alternative	No Grazing Alternative
Actual AUMs (1980-2004)	752		
Actual AUMs (2005-7 average)	162		
Permitted AUMs (Year 1-5)		0	0
Permitted AUMs (Year 6 plus)		441	0
Grazing associated jobs (Year 1-5)		0	0
Grazing associated jobs (Year 6 plus)		0.3	0
Permittee Costs		$3,670	$0
Forest Service Costs		$12,430	unknown
Total Costs		$16,100	unknown

Direct, Indirect and Cumulative Effects from the Proposed Action

The proposed action requires an initial 3-5 year period of no use. There will be no grazing or associated employment. Some costs are being incurred by the permittees and the agency as structural and nonstructural range improvements and restoration activities are being implemented. The proposed action identifies several new fences, in-stream restoration activities and aspen stand treatments. The permittees and the Forest Service would be cooperatively involved in the implementation of these activities.

At year six a 41 percent decrease in permitted AUMs is implemented. The associated employment with this amount of grazing is about three tenths of an average annual job. This job amount includes direct, indirect and induced employment effects. At the same time, an increased level of livestock management is also implemented. The management activity involves changing cattle use and distribution near aspen stands, riparian areas and other areas of concern. Due to the increased management requirements, operational costs to the permittees and operational costs for the Forest Service increase.

These reductions in AUMs and investments in the range resources will also have positive impacts to the environment and associated values such as improved riparian condition, better water quality and restoration of aspen stands. Qualitative and quantitative indicators of these values are provided in the other resource sections of this document.

An indirect effect of reductions in permitted AUMs might be increased prices of private forage as the permittees are to compete in the market place for unmet forage needs. Cumulative impacts can be felt as federal land grazing is being reduced elsewhere in Harney County. The Malheur National Forest has recently completed about 25 allotment plans with little reduction in permitted AUMs. However, the Malheur's strategy was to complete allotments that had no significant issues. Total use is down from historical use on recently revised BLM allotment plans and these declines are expected to continue in the near future on all public lands.

Direct, Indirect and Cumulative Effects from No Grazing

The no grazing alternative would eliminate livestock grazing on the Van Allotment. There will be no grazing associated employment. Range improvements including: fences, water systems and corrals would remain on the allotment but would no longer be the responsibility of the permittees to maintain. Permittees would be reimbursed for their amortized share of cooperative range improvements where they participated in the development (Forest Service Handbook 1109.13 Chapter 70). Allotment boundary fence maintenance would be re-assigned to adjacent permittees.

Subsequent decisions will be needed regarding retention of any improvements for other resource needs such as wildlife or recreational use. Alternative funding sources for maintenance would need to be secured.

The elimination of grazing will have positive impacts to the environment and associated values such as improved riparian condition, better water quality and restoration of aspen stands. Qualitative and quantitative indicators of these values are provided in the other resource sections of this document.

An indirect effect of reductions in permitted AUMs might be increased prices of private forage as the permittees are to compete in the market place for unmet forage needs. Cumulative impacts can be felt as federal land grazing is being reduced elsewhere in Harney County. The Malheur National Forest has recently completed about 25 allotment plans with little reduction in permitted AUMs. However, the Malheur's strategy was to complete allotments that had no significant issues. Total use is down from historical use on recently revised BLM allotment plans and these declines are expected to continue in the near future on all public lands.

Watershed/Soil

The Malheur National Forest is located in Southeast Oregon and is part of the Owyhee Uplands sub-ecoregion of the Intermountain Semi-desert Ecoregion (USDA, 1994). This region is typically sagebrush-steppe with elevations from approximately 4,000 to 9000 ft.

Topography

The Van allotment is located in the Schurtz and Dry Creek sub watersheds of the Middle Fork Wolf Creek watershed and ranges in elevation from approximately 4200 to over 5000 ft. The allotment is composed of upland flats with moderate slopes leading into steeper slopes up ridges and hilltops. Slope aspects are variable. Sections of Middle Fork Wolf Creek, West Fork Wolf Creek, Schurtz Creek, Dry Creek, and Gabe Creek flow through this allotment.

The allotment is divided into two pastures, the Schurtz pasture and the Dry Creek pasture. The Dry Creek pasture has reaches from Dry Creek and the East and Middle Forks of Wolf Creek. The streams flow in a southeast direction. There is a ridge that divides the West Fork Wolf from Middle Fork Wolf Creek in the north and northeast area of the pasture. Another ridge separates Dry Creek from West Fork Wolf Creek. Steep side slopes lead up to the ridge and hill tops from the Wolf Creek stream channels. Stream channels are at 4200 ft. and the highest hilltop elevation is approximately 5300 ft. Slope aspects are generally northeast and southwest. The southern part of the pasture, adjacent to Dry Creek, is primarily upland flats with low to moderate gradient slopes that gradually lead up from the Dry Creek stream bed towards the steeper slopes to the north. South of Dry is Gabe creek. The terrain is a moderately sloped swell between Gabe and Dry Creek, and steeper slopes southeast that divide the Gabe creek drainage area from Schurtz Creek.

The Schurtz Pasture is a low-relief area that contains reaches of Schurtz and Gabe Creeks. The majority of this pasture is contained between these two creeks and is a rolling upland flat with low gradient slopes and low hilltops. The exception to this topography is the gulch through which Schurtz Creek flows and confluences with Calamity Creek at the allotment boundary. The gulch has steep slopes that confine the stream channel to a narrow floodplain at an elevation 300+ ft. below the flat. The lowest point on the Schurtz Creek pasture is approximately 4200 ft., the highest point is approximately 5300 ft. Slope aspects are generally northeast and southwest.

Soils

Soils in the Van allotment are young, poorly developed soils derived from volcanic ash, basalt, andesite, and rhyolite. Upland soils on hill and ridge slopes consist of shallow, rocky, well-drained loam and gravelly loams. Soils in the upland flat areas are primarily gravelly loam and gravelly clay loams. All these soils tend to have high infiltration and moderate permeability rates. Surface soil erosion rates are low to moderate on the flats and high to very high on the slopes.

Soils in the Dry Creek pasture consist of gravelly to cobbly loams on the ridge and hill tops in the north and northeast portion of the allotment. These ridge top soils are shallow, ranging from 5 to 18 inches deep and slightly sticky when wet. There is less than one inch of organic litter/O-horizon and 40 to 60% of the surface is covered with platy angular rock fragments. The side slope surface soils are volcanic ash derived and typically range from 8 to 12 inches deep. Subsoil material is variable. These soils have high infiltration and water holding capacities, but are susceptible to displacement and dustiness when dry and exposed. Soils in and near the stream channels are poorly defined and range from loam to clay with highly variable substrate.

Soils in the Schurtz Creek pasture area are basalt and andesite derived gravelly and cobbly loams overlaying basalt and andesite bedrock. Gravel and cobble content ranges from 30 to 60%. Soil depth range from 8 to 15 inches and are slightly sticky when wet. Surface litter/O-horizon is less than 1 inch, and 30 to 60% of the surface is flat and angular rock fragments. Most soils adjacent to Schurtz Creek are similar to the soils on the upland flats, but depth can increase to 30 inches. Other stream soils are poorly defined and range from loam to clay with highly variable substrate.

Natural processes are slow to restore soil productivity in this semiarid region; therefore, preventing soil degradation is an effective mitigation. Vegetative cover on these shallow soil types is critical for managing potential erosion and improving or maintaining soil water storage that contributes cool soil water to local, summer low flows. Low water storage capabilities limit plant available water in the drier summer months, usually beginning in June. The clayey soils are resistant to erosion but susceptible to compaction when they are wet. Soils in stream channels, riparian zones, and floodplains are unconsolidated materials consisting primarily of gravelly to very gravelly and cobbly loam or clay, reflecting the alluvial nature of stream channel morphology (Carlson, 1974). Soil compaction and vegetative ground cover removal, especially in riparian areas, have the potential to increase direct runoff into streams by reducing the amount of precipitation infiltrating into the ground. Instead of the precipitation being retained and slowly released by soil and vegetation, increased runoff creates peak stream flows with quicker response times and intensity. Less infiltration also decreases groundwater recharge and storage, resulting in lower base flows in streams and decreased groundwater supply to seeps/springs, wet meadows, and riparian areas. This decrease in water quantity would likely have a negative effect on the overall vegetation/forage condition.

Compaction

Soil compaction occurs when moist, wet, or otherwise susceptible soil aggregates are pressed together and the pore space between them is reduced. Pressure, exerted on the soil surface by large animals, vehicles, and people can cause soil compaction. Compaction changes soil structure by reducing pore size and continuity and increasing soil bulk density. Compaction reduces water infiltration rates, water holding capacity, and limits water movement through soil. It also contributes to increased runoff and erosion (Warren et al., 1986). Severe soil compaction can limit plant growth by restricting root growth, limiting roots to the upper soil layers and effectively cutting off access to the water and nutrients stored deeper in the soil.

Water Erosion

The three aspects of water erosion are the availability, detachment, and transport of soil material by water (USDA, Natural Resources Conservation Service, 1998). Erosion can be caused by raindrops impacting bare soil and water running over exposed soil surfaces. Sheet erosion is the more-or-less uniform removal of soil from the surface. Rill and gully erosion occurs when concentrated runoff cuts conspicuous channels into the soil. Accelerated water erosion occurs when vegetative cover is depleted, bare ground area increases, and soil structure is degraded by compaction or reduced inputs of organic matter (Gill et al., 1998). Van allotment surface soil erosion hazard classes range from low to medium on the flats, and high to very high on the slopes (Carlson, 1974).

Vegetation reduces water velocity and protects the soil from water erosion. In the absence of vegetative ground cover, water erosion removes or redistributes topsoil, the most fertile soil layer. The ability of a plant community to recover after topsoil is lost is restricted. Erosion of nutrient-rich topsoil can cause a shift to less desirable plants, such as from grass to shrub species. Erosion of shallow soils can decrease the root zone area and the amount of air, water, and nutrients available to plants. The sediments removed by erosion can accumulate in streams, rivers, and reservoirs; and degrade water quality.

Water erosion in the stream channel, including downcutting and bank erosion, was observed during the 2004/2005 PFC. Headcutting was previously observed on Gabe Creek. This soil erosion in the stream channel is indicative of water erosion due to excessive vegetation removal.

Wind Erosion

Wind erosion is the physical wearing of the earth's surface by wind. Loss of soil by wind erosion is a concern for the same reasons as those for water erosion. Soils susceptible to wind erosion are where disturbance exposes individual soil particles and aggregates to the wind. Moist soils and soils with stable aggregates or rock fragments are less likely to be wind-eroded than other soils. A vegetative cover reduces wind velocity, protecting the soil from wind erosion. The soils on the Van allotment are andisols and highly susceptible to dustiness, displacement and wind erosion when there is little water and sparse or missing vegetative cover. Although wind is a consistent environmental condition in the Harney county area, there is no evidence of significant wind erosion in the Van Allotment.

Trampling

Trampling may occur when large, heavy animals concentrate repeatedly or in large numbers in a small area for water, shade, or other streamside benefits. Hoof impacts may destroy stream bank vegetative cover and shear and slough banks into the water. This sloughed off soil is transported away by water, increasing sedimentation and water turbidity. In addition to adding sediment to the watercourse, streambank trampling may lead to channel widening, creating a high, undesirable width/depth ratio. Channel widening can result in riparian vegetation loss, shallower and warmer streams, and important wildlife habitat destruction. Unstable streambanks and a high width/depth ratio were observed on the creeks in the Van allotment, which could be attributed to trampling.

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

Forest-Wide Standard 126 was developed for timber projects, and the Forest soil scientist and the Regional Soil Scientist have concluded it does not fit range projects well. Reasons for this conclusion include the following:

- The term "activity area" is undefined for range projects. For the purposes of this document, "activity area" is defined as the entire allotment.
- 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.
- Little scientific information is available on compaction and puddling by livestock, as managed on these allotments, and in environments similar to these allotments.
- 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.

Because of the poor fit between Forest Wide Standard 126 and rangelands, and because potential grazing effect on soil and water resources is an issue in this Environmental Assessment, this assessment will focus on representative erosion and compaction conditions. The desired condition is that livestock compaction effects on soil erosion would be negligible, in terms of soil and water quality. Attainment of this desired condition would meet the intent of the Forest Plan, which is to manage the land without permanent impairment of land productivity and to maintain or improve soil and water quality (Forest Service Manual, R-6 Supplement 2500-98-1). Erosion is the detrimental impact that would cause permanent impairment of land productivity; impairment from compaction is reversible.

Methods

In this assessment, "soil" means soil outside stream channels. Compaction can potentially decrease infiltration capacity enough that it increases runoff and erosion from soil. In order to check how common this process is, selected areas of known livestock use were examined for indications of erosion, compaction, and overland runoff between July 27, 2006 and November 1, 2006. Areas where there is no consistent livestock use were also examined. Erosion was determined through visual indicators. Compaction was determined by using a spade and soil structure indicators. Each site has 100 sample points with sampling intensity consisting of 5 20-point transects. A simple percentage from these 100 points was used to determine incidences of soil displacement, erosion, or compaction. The following table lists the areas visited:

Table 9. Soil Examinations

Allotment	Pasture	General Area
Van	Schurtz Creek	Hillslope east of Enclosure
		Schurtz Creek
	Dry Creek	1700-057 rd. stock pond
		Wolf Creek Ridge
		Dry Creek Spring
		Dry Creek Ridge

Soil Examinations

The Van grazing allotment consists of 6,600 acres of variable terrain. Six sites were assessed, with the sites located on different terrain features to represent the overall allotment.

Site 1 was located on a hillslope with a 5% grade approximately 0.25 miles east of the Schurtz Creek enclosure. The terrain is an open ponderosa pine forest with signs of previous timber management activities. The ground cover is almost exclusively pine-needle duff. Vegetative cover, excluding pine needle duff, is 2-5%. There are no obvious signs of livestock use. Soil texture is a slightly gravelly silt loam with 15-20% clay content. Structure is poorly developed, although there are instances of weak granular structure. Compaction occurred as a result of previous timber management vehicular activities. There were no signs of erosion. Forest standards are not exceeded at this site.

Site 2 was located in a small meadow on Schurtz Creek approximately 0.5 mile downstream of the Schurtz Creek enclosure. Bluegrass and ponderosa pine are present. Vegetative cover ranges from 20-90% depending on soil gravel content. Heavy livestock use is evident. Soils are an unconsolidated mix of fine, very gravelly sandy clay, typical in areas of stream and riparian deposition. Structure is unconsolidated near the stream, becoming weakly granular as the transects move out of the flood plain.

No signs of erosion except where streambanks had been sheared by hoof action. Forest standards are exceeded at this site.

Site 3 was located near the 1700-057 road near Gabe Spring and a stock pond. An unnamed category 4 stream channel that is a tributary to Gabe Creek is present. Heavy livestock use is evident. Vegetative cover ranges from 0 – 15%. Vegetation is primarily ponderosa pine, juniper, and sagebrush. The slope gradient for the transects is <2%. Soil texture is a fine gravelly, ashy silt loam. Structure at this site is variable, with thick platy, weak platy, weak granular, and massive all being observed with similar frequency. Incidences of compaction at 4 to 6 inch depths were extremely high. There were no signs of erosion. Forest standards are exceeded at this site.

Site 4 was located on a ridge top between West Fork Wolf and Dry Creeks. Access was via the 1550-123 road. Ponderosa pine and juniper were the primary vegetation. There is 20% vegetative cover mixed with thick pine needle duff. Evidence of moderate livestock use is present. Soil textures are a slightly gravelly silt loam and a gravelly silty clay loam. 10-40% of the surface is rock. Soil structure is poorly developed and ranges from structureless to weak platy. There were no signs of erosion. Forest standards were not exceeded at this site.

Site 5 was located adjacent to Dry Creek at a point where the 1550-804 road intersects the Dry Creek Spring area. Sedges and rushes were the primary vegetation with mixed conifer on the nearby slopes. Evidence of heavy livestock use was present. The hillside and spring area had been churned by hoof action, and the streambanks had been altered by hoof shear. Vegetative cover mostly ranged from 35-50%. Soil textures were clay loam and silty clay loam with 40 – 50% clay and very little gravel or rock. Soil structure was almost exclusively fine to medium platy with spots of medium granular. The soils in were highly compacted. Erosion occurred on the trampled streambanks. Forest standards were exceeded on this site.

Site 6 was located on a moderate slope near Forest Road 1700-055. The assessment area had a 3 percent slope. Forty to sixty percent of the surface is rock fragments. Sparse grass, sagebrush, scattered juniper, and pine were the primary vegetation. Moderate livestock use, primarily in shaded areas, was evident. The soil was a very gravelly silt loam. There was no discernable structure. There were no signs of erosion. The only disturbance was displaced soil from hoof action. Forest standards were not exceeded at this site.

In upland areas, livestock had minimal impact to soil resources. This is probably due to a lack of suitable forage and water in these areas. In riparian areas and areas where stock ponds are located, livestock tended to congregate and have had detrimental impacts to the soil resource. When considering overall soil conditions for the entire allotment area, forest plan standards have not been exceeded.

Hydrology

Precipitation

Annual precipitation on the Malheur N.F. ranges from 15 to 40 inches, with higher elevations receiving the higher annual precipitation. Most precipitation is from winter snowfall and/or rain occurring between the months of October and March with the remainder coming from summertime convective thunderstorms of short duration. The

Middle Fork Wolf Creek Watershed where the Van Allotment is located has an average annual precipitation of approximately 17 inches (USDA, 2004). There are few large streams, and surface water is generally scarce.

Streams

A width/depth ratio of less than 10 is considered ideal for a stream channel (FS 1995). Streams that have low width/depth ratios are narrow and deep and usually have lower water temperatures are better able to transport sediment, and have better channel integrity. During the Proper Functioning Condition survey conducted on November 15, 2004, Schurtz creek, reach 1 segment 1 was determined to have greater than 10 width/depth ratio. This segment has been determined to be functional at risk.

Riparian Vegetation

Streambank vegetation indicates stream bank stability, and determines how well a stream bank could withstand bank erosion during high flows. Stable banks are typically covered by vigorous, dense rooted vegetation and/or have rock material, which armors stream banks from high flows and inhibits soil erosion from the banks. Schurtz Creek vegetation along reach 1 segment 1 was determined to lack riparian vegetation species that protect streambanks, reduce erosion, and stabilize riparian soils.

Livestock grazing can cause soil compaction and vegetative ground cover removal, especially when unmanaged cows linger in wet riparian areas. This has the potential to increase runoff into streams by reducing precipitation infiltration into the soil. Therefore, instead of the precipitation being retained in the soil matrix and being slowly released by soil and vegetation, increased runoff creates high stream flows with quick response times and greater intensity, and less available water during dry summer months. Some effects of this high runoff and low infiltration include decreased groundwater recharge and storage, lower base flows in streams, and decreased groundwater supply to seeps/springs, wet meadows, and riparian areas. The overall decreased plant-available soil water would likely have a negative effect on the condition and type of vegetation, including forage, in these areas. It is not likely that water quantity has been negatively impacted in streams determined to be functional. However, water quantity has likely been impacted in Schurtz Creek, which was determined to be functional at risk. It is likely that grazing has had a detrimental effect on overall water quantity in the project area. The magnitude of this effect is not known, especially since this region has been in a drought for that last several years. Livestock grazing in wildlands is known to have a negative effect on water quality in streams (Belsky 1999, Branson et. al. 1981, Krueger et. al. 2002, Meehan 1991).

Riparian

The riparian area is the area immediately adjacent to water (e.g., streams and ponds) where vegetation communities are strongly influenced by the presence of water. It is a transitional area on the stream banks between the aquatic environment within the stream and the upland environment on the slopes above. Although these areas are typically a minor portion of the landscape, they serve a much larger ecological role. A properly functioning riparian area will filter sediments and nutrients from floodwaters and upland runoff and prevent erosion during flood flows by stabilizing stream banks. They also provide wildlife habitat and thermal cover for aquatic and terrestrial life. A nonfunctioning riparian area would lack some or all of these attributes. Vegetation types typically found in riparian habitats in the project area include, but are not limited to, willow and alder shrubs, cottonwood trees, and graminoids, such as sedges and grass. Bluegrass (*poa pratensis*) has also become prevalent (Crowe and Clausnitzer, 1997).

The Van Allotment contains about 650 acres of Riparian Habitat Conservation Areas. These areas include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological functioning is crucial to maintenance of the streams water, sediment, large woody material, and nutrient delivery systems.

Proper Functioning Condition Surveys

To determine if riparian areas in the project area were functioning properly, assessments were conducted on Schurtz Creek in the Van allotment. PFC surveys were conducted by district personnel on the entire portion of Schurtz Creek within the Van Allotment in 2004. PFC is a qualitative method for assessing the condition of riparian-wetland areas. The PFC assessment refers to a consistent approach for considering hydrology, vegetation, and erosion/deposition (soils) attributes and processes to assess the condition of riparian-wetland areas. A checklist is used for the PFC assessment, which synthesizes information that is fundamental to determining the overall health of a riparian-wetland system.

The on-the-ground condition termed PFC refers to how well the physical processes are functioning. PFC is a state of resiliency that will allow a riparian-wetland area to hold together during high-flow events with a high degree of reliability. This resiliency allows an area to then produce desired values, such as fish habitat, neotropical bird habitat, or forage, over time. Riparian-wetland areas that are not functioning properly cannot sustain these values.

Contract Level 2 stream surveys identified Schurtz Creek from the confluence with Calamity Creek to the 17 road culvert as 1 reach. However, proper functioning condition surveys identified this 1 reach as having two distinct segments. The first segment was from the confluence with Calamity creek to the Schurtz creek riparian pasture fence. This segment of Schurtz Creek was determined to be functioning at risk with no apparent trend. The second segment within the Schurtz Creek riparian pasture was determined to be proper functioning with an upward trend.

In August 2005 at the permittees request, the National Riparian Team performed a PFC review on Schurtz Creek. The National Riparian Team corroborated the functioning at risk call; however the trend was interpreted as upward. The upward trend may be due to resting the allotment during the 2005 grazing season.

The PFC was along one reach divided into 2 segments. The entire reach is 3.79 miles. Segment 1 is 2.24 miles long, beginning at the confluence with Calamity Creek and ending at the enclosure on Schurtz Creek. The hydrology and soils sections of the PFC assessment are summarized below:

- Floodplain above bankfull is not inundated in “relatively frequent” events
- Sinuosity, width/depth ratio, and gradient are not in balance with the landscape setting

- Riparian-wetland area is not widening or has not achieved potential extent
- Upland watershed is contributing to riparian-wetland degradation
- Floodplain and channel characteristics are not adequate to dissipate energy
- Point bars are re-vegetating with riparian-wetland vegetation
- Lateral stream movement is not associated with natural sinuosity
- System is vertically stable
- Stream is in balance with the water and sediment being supplied by the watershed.

Down cutting and widening of the channel is limiting flood flows onto the floodplain, and limiting the natural beneficial hydrologic functions that should be occurring in this reach. This lack of interaction between the channel and the floodplain results in poor energy dissipation across the flood plain and hinders or prevents riparian area recharge. Regular flooding is necessary for maintaining obligate riparian species with dense root systems that retain soil moisture, stabilize banks, and regulate soil water discharge into the channel. Most point bars do not contain riparian wetland species capable of withstanding high flow events. This leaves the point bars vulnerable to degradation. Some areas of vegetation may be limited by lack of sunlight, due to forest canopy. An increase in shallow rooted grasses (bluegrass), and occasionally sagebrush, on the floodplain indicates a narrowing riparian wetland and dropping water table. Width depth ratios are > 10 and overhanging banks are lacking. Most stream banks in this reach are eroded and unstable. Unstable banks and excessive erosion indicate that this segment of the stream is out of balance and is partially due to the lack of riparian plants with deep root masses. District personnel determined this segment of the creek was functionally at risk with no apparent trend.

Segment 2 is 1.55 miles long and was determined be in Proper Functioning Condition. The hydrology and soils sections of the PFC assessment are summarized below:

- Floodplain above bankfull is inundated in “relatively frequent” events
- Sinuosity, width/depth ratio, and gradient are not in balance with the landscape setting
- Riparian-wetland area is widening or has achieved potential extent
- Upland watershed is not contributing to riparian-wetland degradation
- Floodplain and channel characteristics are adequate to dissipate energy
- Point bars are revegetating with riparian-wetland vegetation
- Lateral stream movement is associated with natural sinuosity
- System is vertically stable
- Stream is in balance with the water and sediment being supplied by the watershed
- No headcuts were observed

- Width depth ratios are greater than 10

A headcut on Gabe Creek is located inside a fenced exclosure near the Forest Service boundary that was built in 2001. Livestock grazing has not had an effect on the headcut since 2001 because grazing is no longer permitted in the exclosure.

A headcut on Dry Creek, located near the Dry Creek Spring area, is creating an incised channel approximately four feet deep. Bank disturbance and vegetation loss are retarding headcut stabilization.

Surface Water

The streams that run through the Van allotment originate from snow-fed springs and seeps, flow generally southeast, and eventually reach the Upper Malheur River. Shurtz Creek, Dry Creek, West Fork Wolf Creek, Middle Fork Wolf Creek, Gabe Creek, Calamity Creek, all have reaches that flow through the Van allotment. The West and Middle Fork confluence is located on this allotment. All streams have perennial flows except Gabe and Dry Creeks, which are intermittent.

Stream Temperature

The Malheur National Forest Land and Resource Management Plan (LRMP, 1990) states: "Ensure that temperatures do not increase on Class I streams. Limit temperature increases on Class II and fish-bearing streams to the quantitative criteria in Oregon State standards. Do not allow deterioration of water temperatures on Class III and IV streams when downstream Class I, II, and fish-bearing Class III steam are affected."

Livestock consume and trample riparian vegetation and streambanks, which may contribute to a high width/depth ratio and higher water temperatures due to decreased shade. Elevated water temperatures lead to lower dissolved oxygen concentrations and can be harmful to aquatic life. The Oregon Department of Environmental Quality has determined that the seven-day-average maximum temperature of a stream identified as having Lahontan cutthroat trout or redband trout use in the Malhuer River subbasin may not exceed 20.0 degrees Celsius (68.0 degrees Fahrenheit) (Oregon DEQ, 2003). Redband trout have been found in Schurtz Creek and all forks of Wolf Creek on the Van allotment (Vetter, 2005). Schurtz Creek, and the portions of Wolf Creek and West Fork Wolf Creek that flow through the Van allotment, all exceeded the Oregon State temperature standards in the years they were monitored. However, at this time none of the streams on the Van allotment are on the Oregon DEQ 303(d) list.

Effects on Watershed/Soils

Direct, Indirect and Cumulative Effects from The Proposed Action

The Proposed Action would not allow grazing in areas that are not functioning as desired. Stream, riparian and water quality conditions would likely improve. Restricted grazing in the fenced-off riparian areas would:

- Reduce soil disturbance, compaction, and vegetation loss, resulting in improved streambank stability, improved stream channel morphology, and decreased sedimentation, due to the growth of vegetation along streams.
- Increased vegetative cover, especially in riparian areas, would help control and filter surface run-off, reduce soil erosion, and decrease peak stream flow timing and intensity that can potentially cause catastrophic flood damage.
- Increase recovery rates due to decreased stress from grazing. Informed land management decisions that would maintain or achieve desired stream/riparian and water quality conditions would be made possible by monitoring conditions in the stream/riparian communities.

The intent of the fencing projects throughout the Van allotment is to protect riparian areas and facilitate their recovery. Eliminating grazing is considered a successful and ecologically sensitive approach to improving degraded stream and riparian zones in the Western U.S. (Magilligan and McDowell, 1997). The proposed fencing actions for the Van allotment include fencing off riparian management pastures on Schurtz Creek with water gaps, allowing 3-5 years rest (Frog and Hawthorn pastures) and establishing another riparian pasture with no authorized grazing (Fry Pasture). Herbaceous vegetation can recover within several growing seasons and woody vegetation within 5-10 years if grazing stress is removed from a deteriorated riparian area (Kaufman et al, 2002; Clary and Medin, 1990;). Five years is a minimal recovery time as research shows that, depending on stream type, climate, watershed conditions, and available resources, vegetative recovery can take decades, especially for willows and other woody riparian species (Clary and Medin, 1990; Clary and Webster, 1989; Elmore and Beschta, 1987). Vegetation and geomorphology response tends to be greatest in the oldest exclosures (Kaufman et al, 2002).

Enclosures around selected aspen stands to improve wildlife habitat, and enclosing and developing Dry Creek Spring, without completely dewatering the spring area, will also be part of the fencing action. Fence maintenance and modifications to the Wolf Creek pasture fence would expand the pasture westward and more effectively exclude livestock from riparian areas, with the exception of two planned water gaps. Under the Proposed Action riparian fencing alternative, soil quality indicators for compaction, riparian trampling, and upland trampling are expected to improve and trend upward due to less grazing pressure. Soil nutrients, particularly Carbon, are likely to trend upward due to lower succulent forage utilization rates. The proposed fences combined with reduced livestock AUMs would decrease livestock forage utilization in the riparian areas along Schurtz, Gabe, and Dry Creeks. Negative soil impacts are likely to decrease as livestock utilization in these areas is decreased. Improved plant vigor due to less intense grazing will also enhance soil condition recovery at existing impacted areas.

Due to their structure and composition, riparian zones have the potential for rapid recovery. A decrease in livestock forage utilization would likely increase mesic wetland species, vigor, and root mass production, increase overall vegetative ground cover, (Kaufman et al, 2002; Martin and Chambers, 2001) and increase soil organic matter. Kauffman et al (2004) has found that root biomass and infiltration in exclosures that were from 9 – 18 years old dramatically increased in both dry and wet excluded meadows compared to grazed meadows. Increasing root mass that results from increased aboveground biomass would break up soil compaction, and improve water infiltration and soil water holding capacity. The areas where livestock AUMs is decreased would likely recover from previous grazing effects, while grazing continues. A reduction in grazing would lead to changes in overall allotment management. Light or no grazing has fewer negative impacts on plant vigor, litter, and soil organic matter than heavy grazing (Clary et. al., 2002, Naeth et. al. 1991). Decreased forage utilization has the potential to reduce livestock impact to soils compared to current conditions.

There would be dramatic improvements in stream channel morphology as the excluded reaches become narrower, deeper, and have more pool area. Increased vegetation and reduced bare ground as a response to fencing is an important factor associated with stream channel geomorphic adjustments. Establishing vegetation cover would take five years or more to be effective, with geomorphic adjustments taking longer (Kondolf, 1993). In Eastern Oregon, geomorphology response generally occur within approximately 14 years, although older exclosures showed no geomorphic response after 28 years even though riparian vegetation was well established and abundant (Magilligan and McDowell, 1997).Other variables such as channel constraint, stream power, and sediment supply also influence the ability of a stream channel to respond to fencing treatment. Generally, the longer the exclosure fences are in place, the greater the channel adjustment to desired conditions (Kaufman et al, 2002; Magilligan and McDowell, 1997).

Proposed restoration efforts are placing large woody debris and check dams in Schurtz Creek, Dry Creek, and Gabe Creek. By placing low check dams and large woody debris at carefully selected points along Schurtz, Dry, and Gabe Creeks, the streambed and adjacent water table would rise, reconnecting the stream to the floodplain. Water table level plays a critical role in the structural and functional processes in riparian meadows and their recovery potential. In the absence of grazing, meadows with higher water tables may shift in species dominance from Kentucky bluegrass to Nebraska sedge (Martin and Chambers, 2001). This increase in soil-water and overall plant-available water would result in establishment or re-establishment of deep-rooted riparian vegetation and increased forage. Deep rooted plants would improve soil stability and structure.

Proposed livestock management changes include overall reduction in animal head months, as well as placing two water troughs in existing, but dry, stock ponds (the permittee would haul water to the troughs). The placement of water troughs away from stream and riparian areas would improve stream water quality by providing livestock an alternative water source. This would reduce the presence of livestock in stream and riparian areas and the associated detrimental effects. Existing soil compaction is mostly around the watering troughs, stock ponds, and riparian areas where livestock tend to congregate. The troughs would be placed in dry stock ponds, where the soil surface has little or no vegetative cover. When these soils are wet, especially in zones where there is high clay content, they are highly susceptible to compaction. When dry, these ash-derived Andisols would be highly susceptible to dustiness and physical displacement due to livestock and vehicles.

Developing and fencing Dry Creek springs would allow livestock to utilize water sources in a manner that would not damage the mesic areas surrounding the springs. The sedge communities would have vigorous above ground growth that would increase below ground root mass, stabilizing the streambank and breaking up the compacted soils in the area. Water retention capabilities would improve.

Aspen stands would be thinned of conifers and then enclosed with fence. Most precipitation falling onto a densely forested environment would be intercepted by the canopy with some of that amount evaporating into the atmosphere. Removing conifers from aspen stands would reduce canopy cover and precipitation interception. More water would reach the ground surface. Tree removal can also reduce water loss from transpiration, resulting in higher soil moisture levels. Decreased interception loss would also lead to higher water table levels due to increased infiltration. Consequently, forest cover reduction increases surface streamflow, groundwater recharge, and overall water yield (Hibbert, 1967; Bosch and Hewlett, 1982). Late winter/early spring rainfall can be augmented by increased snowmelt rates to increase the magnitude of peak flows. Removal of forest cover generally increases annual water yield. Low flow streams can increase water flow temporarily but would likely return to normal. Similar effects can be expected from previous overstory removal from the County, Dry Creek, Gabe, and Cove Timber sales. Cumulatively, these effects create beneficial hydrological conditions for aspen.

By placing low check dams and large woody debris at carefully selected points along Schurtz, Dry, and Gabe Creeks, water velocity would slow, and the streambed and adjacent water table would rise, reconnecting the stream to the floodplain. This would increase soil-water levels and increased available water would result in establishment or re-establishment of deep-rooted riparian vegetation (Martin and Chambers, 2001). Deep rooted plants would improve soil stability and structure. In-stream water quality would improve as re-established riparian vegetation filters surface-runoff, decreases streambank erosion, shades the stream, and improves shallow groundwater retention. Depending on multiple factors, including age, vegetation cover, hydraulic conditions, and site geomorphology, stream channel response to livestock exclusion appears to occur after 14 years or more. Newer exclosures show less vegetation difference with the paired grazed reach and are less likely to show geomorphic adjustment. Other watershed conditions and activities, such as road density, logging, channel constraint, and sediment supply may also limit the effectiveness of restoration projects (Magilligan and McDowell, 1997; Kaufman et al, 2002).

Repairing headcuts on Dry and Gabe Creeks would help prevent further stream channel incising and the subsequent water table lowering. Repairing headcuts would also stabilize the stream channel, reduce sedimentation, and aid with improving water quality. Headcut repair would work in conjunction with the large wood and small check dams to maintain, or possibly raise, riparian zone water tables. Raising the water table is critical to preserve wet meadow and riparian zones and the associated water storage capacity, flood control, and habitat.

Direct, Indirect and Cumulative Effects from No Action

The No Action Alternative would terminate livestock grazing in the Van allotment. Associated livestock management practices such as fencing, spring developments, and water troughs would not be implemented. There would be no thinning in aspen stands and headcuts would not be repaired.

Grazing termination would provide the greatest potential to restore soils to desired function and structure, at the most rapid rate, in areas that have been previously impacted by grazing (Belsky, et. al., 1999). With livestock grazing at zero percent, improved soil and plant productivity should occur due to increased plant vigor, increased ground cover, increased root mass, increased organic nutrients, and increased water-holding capacity.

High resiliency areas such as riparian zones would recover more rapidly compared to upland areas with impaired soil conditions. Vegetation recovery in riparian zones may occur as soon as three years after livestock removal (Cole, 1988); however the overall recovery period is dependent upon stream type, climate, watershed conditions, and available resources (Clary and Medin, 1990; Clary and Webster, 1989; Elmore and Beschta, 1987).

Less is known about upland rangeland soil recovery. Upland recovery areas may take longer than riparian areas due to lower resiliency, less moisture, and shallower soils. Soil recovery rates are dependent on many factors, including disturbance type, severity, extent, plant community structure, adjoining substrate condition, and climate during and after disturbance. Recovery may be slower for upland rangeland soils that are sensitive to compaction, trampling, water erosion, wind erosion, or have fragile soils, compared to other, less sensitive upland areas. Areas where native vegetation dominates the plant community would recover more quickly compared to areas where introduced, invasive plant species are dominant. Soil quality recovery for these areas may require several decades (Buol, et al, 2003). These conditions may be present where concentrated livestock use occurs within the allotment area. On sites where critical amounts of topsoil have been lost through water or wind erosion, sites where head cutting has significantly dropped the water table, or sites dominated by undesirable annual or invasive plant species, restoration to original condition may not be ecologically or economically feasible except in a geological time frame (Buol, et al, 2003). Under the "No Action" alternative, soil quality related to compaction, riparian trampling, and upland trampling is expected improve because of the cessation of livestock grazing. Soil nutrients are also likely to improve due to on-site organic matter retention rather than losses caused by compaction, trampling, erosion, and conversion of vegetation into livestock biomass.

This alternative would have the greatest potential to improve, conserve, and maintain soil productivity, structure, and function in the Van allotment due to grazing termination. Roads, off road travel, trails, recreation sites, mining, invasive plants, fire, and naturally occurring actions and events would continue to impact soils.

No Grazing would likely have the most rapid, beneficial effects for riparian/stream and water quality conditions and provide a more rapid recovery for "functional at risk" areas. Without livestock grazing, there would be no adverse impacts caused by grazing as described earlier. There would no extra sedimentation in streams due to livestock trampling streambanks and grazing riparian vegetation. "Functional at risk" stream and riparian areas would trend towards desired conditions at faster rates than the other alternative. The time required for a stream or riparian to move towards desired conditions depends on current conditions, available resources, natural disturbances such as flooding, and other fluvial processes, all of which are variable between reaches and streams. The exception to this general improvement would be existing headcuts. Under the No Action alternative, headcuts would continue to move upstream, leading to continued channel incising and the associated erosion, floodplain disconnection, and water table lowering. Eventually, the stream channel would regain equilibrium through natural processes.

There may be a detrimental effect to private lands under No Grazing. The grazing intensity on these private lands could increase if cattle do not have access to the National Forest. This could lead to greater damage to the soil and water resources on these other lands. Damage would include soil disturbance, compaction, and vegetation loss, resulting in streambank destabilization, sedimentation, and warmer water temperatures due to the removal of shade providing vegetation along streams. Decreased vegetative cover, especially in riparian areas, would increase surface run-off, soil erosion, decrease stream base flows, and increase peak stream flow timing and intensity that can potentially cause catastrophic flood damage. Decreased dissolved oxygen levels due to water temperature increases and increased algae-producing nutrient levels.

Fisheries

This section describes the condition of the aquatic habitat and lists the associated aquatic species in the 6,600-acre project area for the Van Allotment within the east half of the Emigrant Creek Ranger District.

Currently there are no anadromous fish in the analysis area, although the Malheur River system once supported Chinook salmon on the forest, including the drainages associated with this analysis area. The Hells Canyon Dam Complex on the Snake River blocked all upstream migration of anadromous fish in the late 1950s with the creation of 3 dams. Resident aquatic species in the analysis area include redband trout, sculpin, dace, shiners, suckers, spotted frogs and the western pearlshell mussel.

The major limiting factors degrading fish habitat and fish populations in the analysis area are low base flows, excessive summer water temperatures, wide channels, lack of high quality pools, and lack of fish habitat connectivity. Management activities that have impacted streams within the watershed include past timber harvests with associated road construction, and livestock grazing. 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 minimum standards.

Management Indicator 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 project 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 LRMP Standard 61 (p. IV-32) lists species and gives direction to provide for habitat requirements of MIS species. Aquatic MIS species in the project include redband trout.

Threatened and Endangered 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. There are no threatened or endangered fish species in the analysis area.

Sensitive Aquatic Species

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 LRMP Standard 62 (p. IV-32) gives direction to meet all legal and biological requirements for the conservation of threatened, and endangered plants and animals and assess all proposed activities that involve habitat changes or disturbance and have the potential to alter the habitat of threatened, endangered or sensitive plant and animal species. When threatened or endangered species or habitat is present, follow the required biological assessment process, according to the requirements of the Endangered Species Act (Public Law 93-205). MNF LRMP Standard 64 further states, "Meet all consultation requirement with the US Fish and Wildlife Service and state agencies." The following three sensitive aquatic species are documented in the analysis area.

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. Redband trout (Oncorhynchus mykiss gairdneri) are considered the native, resident form of the rainbow trout that are on the FS Region 6 sensitive species list. All perennial fish-bearing streams identified on the Emigrant Creek Ranger District have populations of redband trout including the 3 streams in the analysis area.

Malheur Mottled Sculpin

The taxonomy of the Malheur mottled sculpin supports recognition of two forms in eastern Oregon (*bendirei and hubbsi*), which makes up the *Cottus bairdi* complex. It is considered endemic to the Harney Basin (Silver River and its tributaries, Donner und Blitzen River, its tributaries and isolated southern creeks, Silvies River and its tributaries, and Poison Creek system), Malheur River, and Snake River Basin. Recent fish surveys found sculpin species in several of the streams within the project area.

Columbia Spotted Frog

Columbia spotted frogs (*Rana luteiventris*) 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 and has been documented in all drainages within the project area during fish and stream surveys conducted in 2001 and 2002.

Stream Channel Morphology (Sensitive Stream Reaches)

The majority of streams in the analysis 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. Analysis of a Level II stream surveys conducted in the analysis area in 2002 determined at least 76% of the reaches failed to meet Malheur NF Amendment 29 standards.

Sensitive stream reaches are 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:

1. DMAs are among the most sensitive from the standpoint of fish habitat conditions
2. Contain impacts that result principally from livestock grazing
3. Represent areas used by livestock
4. Have the potential to respond quickly to and measure changes in grazing management

Analysis Methods

The analysis area consists of three subwatersheds within the Wolf Creek watershed, in the Upper Malheur Subbasin; Calamity Creek, Squaw Creek, and Upper Wolf Creek. Information was compiled from the Lower Malheur Watershed Analysis (USDA 1996), stream survey reports and Proper Functioning Condition assessment (USDA 2004 and Pritchard 1999). Region 6 Level II stream and riparian habitat surveys were conducted on most analysis area fish-bearing streams between 1995 and 2002. These surveys quantify fish habitat within reaches that are based on gradient, valley width, or topographic features that make the stream reach somewhat homogeneous and focus on core attributes critical to fish habitat. They generate quantitative estimates of habitat attributes that are statistically valid and repeatable across time and boundaries. They also represent 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 and usually overlap allotments and pastures. 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 standards and guidelines from the Malheur National Forest Land and Resource Management Plan (1990) including amendment 29 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 EA 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 2005) and Management Indicator Species. A

Biological Evaluation (Appendix G) 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 (LRMP) specifies standards and guidelines 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 analysis area hydrologic, riparian and stream habitat indicators most relevant to fish and fish habitat. Reaches that do not meet LRMP standards are likely affecting fish populations.

Table 10. Riparian Management Objectives (RMOs)

Habitat Attribute	Objectives										
Water Temperature	Forest wide standard is not to exceed 68° F; for redband trout										
Large Woody Debris[2]	Ponderosa Pine 20-70 piece per mile, Mixed-Conifer 80-120 pieces per mile; Lodgepole Pine 100 – 350 pieces per mile.										
Pool Frequency	Bankfull Width (ft)	5	10	20	25	50	75	100	125	150	200
	Pools per Mile	151-264	75-132	38-66	30-53	15-26	10-23	8-18	6-14	5-12	4-9
Bank Stability	At least 90% stable, no decrease if above 90% stable										
Width/Depth Ratio	<10, mean wetted width divided by mean depth (all systems)										
Shade/ Canopy Closure	Ponderosa Pine 50-55%; Mixed Conifer 50-65%; Lodgepole Pine 60-75%; Hardwood/Meadow Complex 80% shaded.										

[2] LWD deemed as "functional wood", see Large Wood Debris discussion for further details.

Table 11: Summary of Riparian Management Objectives (RMOs) habitat criteria that has met (M) or failed to meet (F) standards on perennial fish bearing creeks in the analysis area.

	Reaches		
Habitat Attribute	Meets	Fails	% Failed
Water Temperature*	0	3	100
Large Woody Debris	0	3	100
Pool Frequency	0	3	100
Bank Stability	2	1	33
Bank Angle	0	3	100
Width/Depth Ratio	1	2	66
Shade/ Canopy Closure[2]	2	1	33

* Instantaneous reading, Continuous temperature readings did not meet OR DEQ 303(d) standards

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).

Overall, pools in analysis area streams are reduced in quantity and quality and all of the reaches do not meet LRMP Standards (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.

Riffle habitats are locations of sediment deposits with water flowing over them that contain larger substrate such as gravels, cobbles and boulders. These sections produce food for fish but offer few habitats to small fish (Chamberlin et al. 1991). There is no LRMP standard for riffle habitat.

Large Woody Debris (LWD)

Large woody debris (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. Functional LWD was determined to be pieces of LWD at least 12 inches in diameter and have a length of either 35 ft or 2 times the bankfull width of the stream. For purposes of evaluation for Amendment 29 standards, at least 20% of the functional LWD had to be at least 20 inches in diameter. The LRMP standard for LWD is 20-70 pieces per mile in ponderosa pine ecosystems and 80-120 pieces per mile in mixed conifer ecosystems. All of the stream reaches failed to meet the LRMP standard for LWD.

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 LRMP standard 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 of stream bank angle, professional opinion and observations show undercut banks are under-represented in most of the streams in the analysis area, especially in sensitive stream reaches.

Width to Depth Ratios

Wetted width to depth ratios above the LRMP standard 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/depth ratios under 10 provide more habitat depth and accessibility to habitat. Excessive width/depth ratios reduce quality and quantity of fish habitat for spawning and summer rearing. Width/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. One-hundred percent of stream reaches in the analysis area exceed Land and Resource Management Plan (LRMP) standards (Amendment 29) for wetted width to depth ratios.

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 (fish food) to the aquatic ecosystem (Murphy and Meehan 1991).

Fish bearing and perennial streams in and around the analysis area were surveyed for shade in the early and mid 1990s. Thirty-three percent of the stream reaches do not meet Land and Resource Management Plan standards for shade (LRMP Amendment 29). Most of the surveyed streams that meet this standard 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 standard. The riparian hardwood shrub component that would be expected under an open canopy is not incorporated into the standard. 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 (Lower Malheur WA). Consequently, shade in ponderosa pine ecosystems (Dry Forests), is reduced.

Temperature

Excessive water temperatures can modify fish behavior (Bjorn and Reiser 1991). Elevated temperatures at sub-lethal 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. 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. Schurtz Creek, and the portions of Wolf Creek and West Fork Wolf Creek that flow through the Van allotment, all exceeded the Oregon State temperature standards in the years they were monitored. However, at this time none of the streams in the Van allotment are on the Oregon DEQ 303(d) list. Summaries of stream temperature data collected show excessive stream temperatures for redband trout in both 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 LRMP standard. Sediment has filled in pools in analysis 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 down cutting.

Bank Instability

The Malheur National Forest LRMP standard 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. 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 tend to 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. Thirty-three percent of the stream reaches failed the forest standard.

Schurtz Creek

Schurtz Creek is a third order; category 1 fish bearing stream and is a tributary to Calamity Creek. Schurtz Creek is divided into two reaches by a 250-foot culvert installed in 1973 at FS Road 17. The culvert acts as a fish barrier for a short section of fish bearing stream above the road (Wolf Allotment). 2.3 miles of reach 1 flows through the entire west half of the Van allotment, in Schurtz Creek pasture. 0.2 miles flow through Story Fry Allotment and the remainder of reach 1, (0.3 miles) and all of reach 2 (3.3 miles) are in Wolf Mountain Allotment, above the Van Allotment. The upper segment of reach 1 has a riparian pasture in the Van Allotment that was constructed in 1991 to control livestock and allow natural recovery of the stream channel and riparian habitat.

Reach 1 (generally Van Allotment) is classified as a "C4" channel type; a slightly entrenched, low gradient, gravel dominated riffle and pool channel. Pool frequency was calculated to be 27 pools per mile, or an average separation of ~196 ft. Typically pools are separated in C4 channels by 5 – 7 bankfull widths (approximately 81 ft for Reach 1). The wetted width/depth ratio (width/depth) was considered high for Reach 1. High width/depth ratios (i.e. >20) are indicators of very shallow conditions and poor quality rearing habitat. This condition often results in high temperature extremes and decreases in available cover for fish.

C4-type channels are susceptible to bank erosion via lateral adjustment. Rates of lateral adjustment are controlled, in part, by riparian vegetation. Outside of the riparian exclosures, riparian vegetation was generally low in cover and disconnected with the stream channel (Photo 1). It is probable the stream channel will become more incised especially in the sections outside of the exclosures. Bank erosion at the time of the survey was also noticeable from livestock (Photo 2); and bank stability did not meet the Amendment 29 standards of 90% stable for this reach.

Stream survey data from 1995 indicated that moderately heavy grazing caused moderate stream bank damage in reach 1 below the exclosure. The reach passed the forest standard for bank stability in 1995 but not in 2003, that may indicate a downward trend. During the 2003 survey it was noted there was evidence of intensive livestock grazing in this part of the reach.

Overall, data from the 2003 stream survey indicated that Reach 1 failed to meet Amendment 29 standards except for stream shading (40 – 55% for ponderosa pine series). Evidence of intensive livestock grazing was prevalent in the lower section of Reach 1. In general, this section was composed of riparian floodplain meadows that have experienced high degrees of trampling and grazing pressure. Stubble heights of grasses and sedges were typically less than 2 inches in height (exceeding Forest utilization standards for this allotment) and riparian obligate species (e.g. sedges and rushes) were excluded from either entrenchment of stream banks or from excessive trampling in the interactive zone of the riparian floodplain (i.e. within 5 ft of the water edge) (Photos 1 and 2).

Photo 1

Deteriorated riparian habitat, over-utilized vegetation and poor stream channels on Lower Schurtz Creek, reach 1.

Hardwood species in the lower section of Reach 1 have experienced unknown mortality at the older age class, and hedging and low rates of establishment at the younger age class due to grazing. Generally, hardwood growth and regeneration below 5 ft in height was not readily apparent; hardwoods that have achieved heights of at least 5 ft were more apt to survival, although their structures typically favored low crown widths (contributing less shade).

The combined effects of grazing in the lower section of Reach 1 appear to be the largest pressure to limiting habitat for fish, spotted frogs and other aquatic species. A Proper Functioning Condition (PFC) Survey was conducted during the fall of 2004 after a full grazing season. The PFC on Schurtz Creek indicated the segment outside the riparian exclosure is Functioning at Risk with no apparent trend (PFC report, appendix I). The PFC survey also noted that a high number hardwood species predominantly; thinleaf alder, black hawthorn, western chokecherry and willow species, are decadent, heavily browsed and lacking the younger age class. All of these species are important streambank stabilizers that also provide cover, shade, structure and habitat for aquatic insects that support aquatic species. A second PFC survey was conducted in 2005 while the allotment was being rested. The second PFC was conducted by the National Riparian Team, USFS, permittees, permittee representatives, Oregon Natural Desert Association representatives and county commissioners. The second survey also concluded the stream was Functioning at Risk, but with an upward trend.

Photo 2

Unstable banks, over-utilized vegetation, and wide channels on mid sections of Schurtz Creek, reach 1.

The upper section of Reach 1 has one large riparian exclosure. The effects of this livestock exclusion in this section were pronounced; in general there were more wetland obligate species, higher above ground biomass and vegetative cover, and less widespread bank erosion (Photo 3). PFC surveys indicate this segment of the reach 1 and all of reach 2 are functioning properly (PFC Report, Appendix I).

Photo 3
Upper section of reach 1 within the riparian exclosure of Schurtz Creek.

Restorative measures have been taken within the exclosure, with varying degrees of success. Small pieces of juniper wood (3 – 5 inches in diameter have been placed in the stream to slow creek flow, initiate meandering, and create more pool habitat. It is important to note that although some of these pieces of wood are currently functioning as small debris jams to create pools in Schurtz Creek, the size class of this wood is below what would be detected using the stream survey protocol (USFS 2002). During a large, 25 year event this type of woody material would probably wash out. In this section of Reach 1, (above the exclosure and partially in Wolf Mountain Allotment) the limiting factor affecting fish populations is the high-energy water originating at the culvert during high flows that has altered the structure and functioning of the stream channel. It is expected the high-energy flows will eventually alter the vegetative structure and function of the floodplain as well.

The culvert on the Road 17 has substantially altered the hydrologic regime of Schurtz Creek. Evidence of this was clear in the upper section of Reach 1, in Wolf Mountain Allotment, as riffle lengths dramatically increased, sinuosity decreased, the stream became more incised, pool creators were less available, and areas having eroding banks suffered very intense erosion. This culvert is also the most significant barrier to fish migration separating Reaches 1 and 2. This barrier raises concerns about isolationism with resident redband trout in Reach 2. The combined effects of poor rearing habitat in Reach 1 and the isolationism of the population in Reach 2 indicate the entire redband trout population is probably suppressed in Schurtz Creek.

Redband trout (Oncorhynchus mykiss gairdneri) were present throughout Schurtz Creek until river mile 7.02 (Reach 2, SO 732). Redband trout are a Malheur National Forest management indicator species and a Region 6 sensitive species. Malheur Mottled Sculpins, also a Region 6 sensitive species, were observed above the 17 road and dace were observed below the culvert. In addition to fish, macro-invertebrates were common throughout Schurtz Creek, suggesting food sources were not a limiting factor affecting redband populations.

Gabe Creek

Gabe Creek is an intermittent category 4 stream located entirely in the Dry Creek pasture. 1.4 miles flows through Schurtz Creek Pasture and 0.7 miles runs through Dry Creek Pasture, in the eastern part of Van Allotment. The stream flows onto private property. Level II stream surveys were not conducted on Gabe Creek, but fish surveys in 2001 documented redband trout in the lower part of the reach on the Forest. Temperature data collected in 2003 indicated a seven-day running average temperature of 78 degrees, which failed to meet Forest Plan Amendment 29 standards and DEQ 303(d) Standards. A Proper Functioning Condition Analysis was not conducted but active headcuts in the lower part of the creek (Dry Creek Pasture) would indicate the stream may be functioning at risk. This portion of Gabe Creek was fenced in 2003 to exclude livestock and allow natural recovery of unstable banks and the headcut. A non fish bearing tributary of Gabe Creek is legally diverted about 100 feet above the Forest boundary for agricultural purposes.

Dry Creek

Dry Creek is an intermittent category 4 stream located entirely in the Dry Creek pasture. 3.2 miles flows through Dry Creek pasture in the eastern part of Van Allotment. The stream flows into Middle Fork Wolf Creek. Due to the intermittent flow and lack of fish no level II stream surveys were conducted. Riparian surveys indicate that segments of the creek do not meet Forest Plan Amendment 29 standards for bank stability. A headcut exists in the upper part of the creek and indicates the stream may be functioning at risk.

Middle Fork Wolf Creek

Middle Fork Wolf Creek is a fourth-order, category 1, fish-bearing stream and a tributary to the mainstem Wolf Creek within the Wolf Creek watershed in the Upper Malheur River subbasin (HUC 4 level). 1.3 miles of reach 2 flows through Wolf Creek pasture and 0.3 miles flows through Dry pasture in the eastern part of Van Allotment. Reach 2 was classified as a "C" type channel. The remaining reaches above and below Van Allotment flow through Wolf Mountain Allotment

Two water diversions are present near the beginning of Reach 1 and at the time of this survey (June 2002), these water diversions were (at a minimum) a 42% reduction of instream flows. Plans are in process to screen the diversions to eliminate fish from being trapped in the irrigation system (Photo 4).

Photo 4
One of two water diversions on the Middle Fork Wolf Creek

Middle Fork Wolf Creek is best characterized as a forest/meadow transition stream. This type of system is most commonly positioned at a low-to-moderate gradient, with a narrow and interactive floodplain dominated by graminoids in the understory and hardwoods and conifers in the overstory (Brookshire and Dwire 2003).

Riffle dominance was a concern in the lower part of Reach 2. Riffle lengths routinely exceeded 100 and even 200 ft in this section. Pools were also very infrequent and poorly developed in the lower part of Reach 2.

The high sediment loads did not appear to be correlated with bank stability. Banks were generally stable (≥90% stable) but closer examination revealed that areas having active bank erosion had moderate to intensive erosion (~36% active instability).

Malheur National Forest Amendment 29 standards were evaluated for all reaches of Middle Fork Wolf Creek. Of the 6 evaluated standards, Reach 2 met only the standards for bank stability and instantaneous water temperatures. Continuous stream temperature data indicates that maximum stream temperatures are observed in late July and early August. Forest Service data indicates that continuous water temperatures exceed the 68°F maximum in late summer.

Beginning at Reach 3, habitat indicators generally improved and Amendment 29 standards for pool frequency and LWD measures were met. Pool frequency was an important metric that changed. It increased markedly from 12 to 14 channel widths in Reaches 1 and 2 to ~8 channel widths in Reaches 3 and 4. This is important because increased pool frequency and decreased riffle lengths provide fish with necessary low energy refugia. Width-depth ratios were not within the desired range for Reaches 1 through 4. High width-depth ratios generally promote a condition with less thermal and visual cover for fish.

Reach 2 (a "C4" channel type) in Van Allotment, began with the transition to a riparian floodplain meadow environment. C4 channel types are described as slightly entrenched, low gradient, gravel-dominated riffle and pool channels (Rosgen 1996). These channel types are associated with riparian floodplain meadows and are susceptible to bank erosion via lateral adjustment (Rosgen 1996). C-type channels are dependent for stability upon vegetative cover, especially hardwoods and wetland obligate graminoids (e.g., sedges and rushes). Pool frequency, determined to be below FP standards, was calculated to be 41.3 pools per mile, or an average separation of approximately 128 ft. Reach 2 had generally stable banks with moderate amounts of fine materials (11%).

In 2001 Redband trout (*Oncorhynchus mykiss giardneri*) were observed along with mottled sculpin (*Cotus biardi*) and speckled dace (*Rhinichthys osculus*). Both species are Region 6 sensitive species.

In Reaches 1 and 2 the presence of redband trout (*Oncorhynchus mykiss giardneri*) with warmer-water species including mottled sculpin (*Cotus biardi*) and speckled dace (*Rhinichthys osculus*) provides insight into the trout habitat conditions in Middle Fork Wolf Creek. The presence of warm water fishes (particularly speckled dace) in the lower reaches suggests that long-term thermal habitat conditions are not within the desired range for the best trout habitats. These co-dominant fish have also been observed in streams throughout the Malheur National Forest where livestock grazing has been a disturbance mechanism (Bayley and Li 2002).

West Fork Wolf Creek

West Fork Wolf Creek, a third-order, category 1, fish-bearing stream, is a tributary to Middle Fork Wolf Creek within the Wolf Creek watershed in the Upper Malheur River subbasin (HUC 4 level). 1.7 mi. of Reach 1 flows through Dry Pasture in Van Allotment and is best characterized as a riparian floodplain meadow system ("E" type channel) within a forest/meadow transition zone (Rosgen 1996). .

Reach 1 was highly variable and was ultimately classified as an "E3b" channel type, which is typically dominated by cobbles, maintains moderate sinuosity, has a low width-depth ratio, is positioned at a moderate gradient (2 to 4%), and is highly dependant upon interactive riparian floodplain vegetation for bank stability. Reach 1 was dominated by cobble substrates and had the lowest concentration of fine materials of the entire stream. Banks were very stable (98% stable) with only a few locations having >20% active bank erosion (Photo 5). However, riffle lengths were uncharacteristically high for this channel type, averaging 161 ft in this reach, indicating that this reach had few slow-water refugia for fish.

Redband trout (*Oncorhynchus mykiss giardneri*) were the only species observed in this stream. Although some of the habitat attributes discussed in this report are not meeting the RMOs of Amendment 29 (Large woody debris, pool frequency and bank angle), this stream has the potential to provide excellent salmonid spawning and rearing habitat. Bank stability, temperature maximums, and stream shading are far more desirable than in neighboring streams within the watershed that presently contain redband trout (Schurtz, East Fork Wolf, West Fork Wolf, and Beaverdam Creeks, Reports Duck Creek Associates 2004a-d).

Photo 5
LWD and steep slopes in reaches 2-4 of West Fork Wolf Creek prevent most livestock from using the narrow floodplain.

Effects on Fisheries

Both alternatives are consistent with Forest Plan direction and none of the potential combined effects associated with the alternatives are expected to adversely affect INFISH/PACFISH RMOs or population viability on fish and other aquatic species. However the rate of natural recovery to achieve the DFCs varies by alternative. Continued application of INFISH/PACFISH direction is expected to improve fish habitat conditions and move aquatic habitat towards the DFC within the project area. Stream channel conditions are expected to improve with restoration measures completed under these alternatives. The Proposed Action Alternative and the No Grazing Alternative include a combination of aquatic conservation and restoration measures that would improve the quality, quantity, function, sustainable productivity, and distribution of recreational fisheries as directed under Executive Order 12962, Recreational Fisheries (Appendix K).

Potential effects to aquatic species including redband trout, Malheur mottled sculpin and Columbia spotted frog, all of which are forest sensitive species are addressed in the biological evaluation (Appendix G). Redband trout are also a management indicator species which 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. The Malheur National Land and Resource Management Plan (Forest Plan) directs the Forest to improve and increase habitat for these species by ensuring that effects from livestock grazing do not carry over to the following grazing season, thus allowing a “near natural” rate of recovery of riparian areas as defined by PACFISH Enclosure B (Appendix J).

The Forest Plan classifies allotments as either unsatisfactory or satisfactory with appropriate vegetation utilization standards of 0-35% and 45% use, respectively. The goals of these standards are to improve streams and fisheries habitat, to reach a desired future condition (DFC) through a near natural rate of recovery process, as described in INFISH/PACFISH. This classification system combined with the two different levels of utilization should improve stream conditions and allow aquatic habitats to reach the DFC through the natural rate of recovery process. Depending on the specific subwatershed and associated site potential, utilization standards may have to be adjusted to meet the goals of GM-1, which states, the Forest will, “Modify grazing practices (e.g, accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect inland fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objectives”. The rates of recovery and utilization levels are addressed by each alternative.

Currently the Van Allotment is classified as unsatisfactory and utilization standards are set at 0-35%. The Lower Malheur Watershed Analysis also classified Schurtz Creek as a “stream of concern” due to its deteriorated condition. Most of the fish bearing stream channels in the allotment are “sensitive”, (susceptible to disturbance) according to the Rosgen stream classification system. Considering these conditions, the recovery methods, adaptive management techniques, and specific restoration practices described in the

Proposed Action and the NO Grazing alternatives, would stabilize and improve these conditions and eventually DFCs should be achieved. The rate of this recovery would vary, depending on the alternative selected.

Summary of Effects to Aquatic TES

Refer to the Biological Evaluation for Aquatic Species (Appendix G) for more details on effects to Aquatic TES.

Under No Grazing, immediate and long term positive impacts on aquatic and riparian habitats from no livestock grazing would have a Beneficial Impact (BI) to Columbia spotted frogs, redband trout and the Malheur mottled sculpin.

Under the Proposed Action, positive impacts from the 3-5 year rest period, reduced livestock use thereafter, restoration activities, a reduction of livestock numbers and water hauling on the Van Allotment, would improve at the near natural rate of recovery process. Stream flows should stabilize as the result of more vegetation cover and a functioning floodplain. Bank stability and riparian vegetation should improve providing better habitat for Columbia spotted frogs, Malheur mottled sculpin and redband trout. Considering the combination of passive and active restoration activities with continued grazing (at a lower use level), there would be a determination of; 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 (MIIH) of Columbia spotted frogs, redband trout and the Malheur mottled sculpin.

Table 12. Summary of Effects to Aquatic TES

Species	Proposed Action	No Grazing
redband trout (**S**)	MIIH	BI
Malheur mottled sculpin (**S**)	MIIH	BI
Columbia spotted frog (**S**)	MIIH	BI

P = Proposed, **E** = Endangered, **T** = Threatened, **S** = Sensitive, **NI** = No Impact, **BI** = Beneficial Impact, **MIIH** = May Impact Individuals and their Habitat but would not likely contribute to a trend towards federal listing or cause a loss of viability to the populations

Direct and Indirect Effects of the Proposed Action

Riparian areas on Schurtz, Gabe and Wolf creeks and other intermittent streams in the allotment would recover at a near natural rate of recovery. Clary and Webster (1989) determined that 10-12 years was not sufficient for riparian willow community recovery after severe livestock use, but acceptable wildlife habitat may occur after 5 years. Three to five years of rest is probably sufficient in the Van allotment, considering the limited use of riparian pastures thereafter, and 41% livestock reduction when grazing resumes. Other studies indicate that herbaceous vegetation can recover within several growing seasons and woody vegetation within 5-10 years if grazing stress is removed from a deteriorated riparian area (Photo 2), (Platts and Nelson, 1984).

Once grazing resumes in the riparian pastures on Schurtz Creek, a 6-inch greenline stubble height and/or less than 20% bank alteration standards during the current use period (not the end of the growing season, due to unpredictable growth during the late summer and the environmental consequences of assuming vegetation would recover to six inches at some later date) would act as triggers to remove livestock in the riparian areas.

Additionally, stream restoration activities, riparian fencing, water lanes, aspen restoration, spring protection and development, water trough placements and adaptive management strategies (changes or reduction in timing, non grazing periods, intensity, frequency, distribution, and duration of use) to control livestock use in riparian areas would further improve stream and fisheries habitat conditions, on Schurtz, Gabe, Wolf and Dry creeks. When livestock grazing resumes it would be at 35 % use levels, and completely excluded from some of the sensitive reaches on Schurtz and Gabe creeks, allowing the near natural rate of recovery to continue with no carry over effects from grazing to the next year.

Headcuts on Dry and Gabe creeks would be stabilized, stopping channel downcuts and slowly restoring water flow patterns to a natural pattern that would interact with the old floodplain and restore riparian plant species.

Improvements in stream and riparian conditions under the Proposed Action would occur slower than the No Grazing Alternative. Fine sediment levels are expected to be higher under Proposed Action, but lower than current levels due to reductions in livestock use and riparian pastures that should improve streambank stability, undercut banks and riparian vegetation. With improved aquatic habitat conditions, improvement in fisheries reproduction and survivability are expected to occur.

Riparian pastures that would exclude livestock (Gabe and Fry pastures) and controlled riparian grazing on Frog, Hawthorn, Wolf and Schurtz enclosures would allow Schurtz, Gabe, and Wolf creeks to recover at a near natural rate of recovery.

Adjusting the size and shape of Dry Pasture would improve livestock distribution and decrease direct and indirect livestock impacts to fisheries and Columbia spotted frog habitat on Wolf Creek. The combination of riparian livestock exclosures, stabilizing 5 headcuts, installing rock structures, and adding LWD on Schurtz, Gabe and Dry creeks would decrease water energy, stabilize the stream channels and eventually reconnect the stream channel with the floodplain.

Restoration of aspen stands, including livestock fencing, would protect these areas from livestock, increasing stream shade and floodplain water retention resulting in balanced stream flows throughout summer. Eventually beaver may find the restored woody habitat and create damns expanding the riparian area (Chaney, Elmore and Platts) 1990), restoring watertables (Southworth, 1993) and stabilizing stream flows (Minshall, Jensen and Platts 1989).

Prescribed burning, conifer thinning and fencing of aspen stands would increase forage production and ground cover, trapping sediment and preventing possible input into stream channels. A combination of rock structures, and large woody debris would start the process of rebuilding stream channels, and improving the desired composition of grasses and forbs. This would allow stream channels to interact with meadow floodplains and restore soil moisture, for additional stream flows in late summer.

See Appendix G for more information on effects to sensitive aquatic species.

Cumulative Effects common to all Alternatives

Activities that have cumulatively affected aquatic habitats, and specifically redband trout and sculpin habitat within the project area and at the watershed scale outside of the project area include: long term grazing on public and private land, logging, recreation, road construction and maintenance, recreational fishing, mining, water diversions, stocking of non-native fish, and the spread of noxious weeds (refer to Appendix C for a list of specific activities). Cumulatively, livestock grazing and logging are the most widespread activity with the longest duration in the project area, starting the in late 1800's. Impacts to the landscape, as noted previously, have been extensive, and impacts to streams and riparian areas are particularly well documented.

Domestic livestock use within the watershed began in the mid- to late-1800s. High numbers of cattle and sheep grazed within the watershed. Grazing usually occurred in the winter at low elevations and moved upslope in summer to higher elevation meadows and ridges. A pre-1900 report indicated rangelands were dominated by "bunchgrass over the whole territory as high as a horse's knee and very little sagebrush" (USFS, 1996). By the late 1870s, tens of thousands of sheep and approximately 18,000 cattle resided in the area. This area was still officially part of the Blue Mountain Paiute/Snake Indian Reserve until the late 1870s. However, encroachment into the area was common and intensive. After the reserve was forfeited to the federal government in 1879, livestock numbers rapidly increased. Excessive grazing and browsing contributed to an increase in less palatable plant species such as sagebrush, and a decrease in more palatable species such as bitterbrush. Bunchgrass plant associations, which thrived prior to introduced grazing, were rapidly overgrazed within a half-century. Within the last 60 years, improvements have occurred to control the distribution of domestic livestock and their use of vegetation. Fencing, developing upland water sources, controlling numbers and changing the season of use, have all been used by range managers (USFS, 1996).

Three agricultural diversions occur on two streams flowing through the allotment; Gabe (1) and Wolf (2) creeks. The diversions depend on a reliable water supply from upstream sources on the Forest and effects to these water sources such as alterations in channel morphology leading to channel incision can cause changes to water retention, loss of riparian zones and less water being available during low flow periods. Water removal also results in reduced quantity and quality of downstream habitat for trout and in the case of unscreened diversions on the Middle Fork Wolf Creek, (Photo 4), they may trap fish in the irrigation system, leading to eventual mortality as the water spreads out across private downstream pastures.

Fish stocking can also have negative effects to the native fish population and the first known stocking of non-native fish into streams on USFS and BLM occurred about 1935. Since that time rainbow trout, brook trout and other warm water species were stocked into Malheur River subbasin streams. Not all stocking activities have been documented; however, it is assumed that perennial streams with adequate access were stocked with non-native fish. Oregon Department of Fish and Wildlife stopped stocking streams in the entire basin about 1992 due to concerns of hybridization between native redband and hatchery rainbow trout. However, natural environmental conditions favor native redband trout over hatchery fish and over the course of 16 years the rainbow hatchery influence is probably no longer a threat to the native redband population.

Existing roads on public and private, particularly those within RHCAs and riparian areas would continue to impact watersheds in several ways including: alteration of channel morphology, alteration of runoff regimes, increase of fine sediment levels in streams, reduced riparian vegetation and cover, and confinement of channel (particularly when roads are placed directly next to streams on adjacent floodplains). 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 road failure. Recreation (ATVs) and dispersed camping alongside roads have also contributed to stream impacts. Where roads intersect streams in the Wolf Creek and Schurtz creek drainage, culverts create migration barriers or completely block fish movement. Several miles of roads in the project area have been closed or decommissioned under past timber harvest projects to reduce impacts to fisheries habitat.

Timber harvest began on a small scale within the watershed around the turn of the century, mostly to supply local ranch needs. Large-scale timber harvest began within the watershed in the late 1940s and 1950s. Roads were consequently constructed within the watershed to access timber. Approximately 80 percent of the USFS lands within the watershed are forested. Approximately 30 percent of this area has been intensively managed since the early 1970s. Prior to this time logging was selective for large overstory pine (USFS, 1996).

Landscape disturbances from the commercial harvest of trees, especially clear-cut activities and tree removal activities in the floodplain have had a negative affect within the stream channel and floodplain. About 618 acres have been harvested by overstory and commercial thinning across the allotment since 1989 (County, Dry Creek, East Wolf Creek, and Gabe timber sales). Additionally, 316 acres were thinned as fuel treatments involving lop and scatter and hand piling within the same timber sales. However, since 1995 the removal of trees and associated activities in riparian areas has been restricted to the surrounding uplands unless those activities would improve conditions in the riparian area. Removal of timber and associated activities contributed to the current status of RMOs, but unlike grazing those activities have stopped within the riparian areas. It would take over a hundred years to replace old growth trees removed from the floodplain, but harvest restrictions during the past 11 years have improved the rate of recovery from these historic landscape altering events.

Motorized vehicles, recreation activities and livestock grazing provide opportunities for the spread of noxious weeds, which can invade riparian areas, replace native deep-rooted species, cause soil erosion and ultimately impact stream habitat. This has occurred within the allotment, especially around historic timber harvest landings and poor condition riparian areas where livestock tend to congregate. The 3-5 year rest period in alternative 1, and no grazing in alternative 2, would reduce the chance of weed introduction from livestock activities. The control of noxious weeds is discussed further in the vegetation portion of the document.

Natural processes outside the control of the Forest have also contributed to cumulative effects on aquatic resources. These processes include wildfire and drought. The Malheur

NF is particularly susceptible to wildfire due to existing moisture regimes and changes in forest vegetation structure. Fires tend to spread quickly and burn hotter under these conditions. Historically, fire played a significant role in the ecosystem of the Upper Malheur Watershed. Ponderosa pine ecosystems historically had a natural fire disturbance interval consisting of low intensity frequent fires. Since the early 1900s, management practices have suppressed natural wildfires in the watershed. Fire suppression has had a significant impact on composition, health, and distribution of range plant communities. Some rangeland ecosystems, such as bitterbrush, bunchgrass and aspen types, are maintained by low intensity, frequent fires. Without such disturbance these plant communities are at risk from invasion of other plant species (USFS, 1996). The loss of large aspen stands on Gabe and Schurtz creeks has set back the recovery period for both of these creeks. Remnants of these stands indicate the loss of once productive floodplains that buffered high water flows and maintained uniform stream flows during the summer. The Malheur NF has also experienced periods of drought during the past 4 years, which exacerbated these conditions.

It is important to maintain the integrity of wetland environments for amphibians and sensitive species. Wetlands and floodplains have the potential to perform many functions within the Schurtz Creek aquatic ecosystem, including controlling high water flows, creating retention “sinks” of sediments and organic nutrients (Brookshire and Dwire 2003) and providing habitat for sensitive species. Livestock have decreased water infiltration rates by soil compaction and caused bank alteration thus increasing stream channelization and isolation of the floodplain. Both alternatives will allow banks to stabilize and the portions of the floodplain to be reconnected with the stream channel, benefiting aquatic species.

Both alternatives would improve stream and riparian conditions, moving aquatic systems towards a desired future condition (DFC) at a near natural rate of recovery process, as described in INFISH/PACFISH. No measurable carry over effects are expected from livestock that could retard the attainment of Forest INFISH/PACFISH RMOs. However the rate and recovery method will vary between alternatives as discussed in this section. Recovery rates are also affected by channel type and current conditions which vary between streams in the allotment.

Cumulative Effects of the Proposed Action

Cumulative effects of the proposed action would be positive and improve current aquatic habitat conditions across the allotment. Three to five years of no grazing followed by a 41% percent reduction in livestock use, 0-35% utilization on vegetation, improved livestock distribution, additional riparian livestock exclosures, riparian pastures, headcut stabilization, spring protection, aspen restoration and channel restoration activities would improve stream conditions and move these aquatic systems towards a desired future condition (DFC) at a near natural rate of recovery process, as described in INFISH/PACFISH. No carry over effects are expected from livestock that would retard the attainment of Forest INFISH/PACFISH RMOs.

Grazing would resume within riparian pastures on Schurtz Creek when riparian vegetation has sufficient composition and abundance of late seral species in order to protect stream banks and dissipate energy during high flows. This would be determined by the percent of the greenline represented by late seral community types or anchored rocks/logs. The percent of hydric greenline would be approximately 75% of potential (sedges and rushes) expected for a specific capability group representing a channel type based on percent gradient and substrate class (Winward 2000). Six inch greenline stubble heights, or floodplain grasses approaching 3 inch stubble heights (Hall and Bryant 1995) or less than 20% bank alteration standards during the current use period would act as triggers to remove livestock from the riparian areas. This alternative would improve stream and riparian conditions, moving aquatic systems towards a desired future condition (DFC) at a near *natural rate* of recovery process, as described in INFISH/PACFISH

Direct and Indirect Effects of No Grazing Alternative

No grazing would likely see the most immediate and long term improvement in stream and fisheries habitat conditions, as all direct and indirect effects of livestock would be removed from the project area. With the removal of livestock grazing (passive restoration), stream and riparian areas would be restored faster than with Alternative 1. Many studies have shown stream habitats degraded by livestock grazing would improve when grazing is eliminated. Investigations have also shown that fish production increased after grazing was removed (Platts 1991). The rate of recovery of any given stream would vary depending on its current level of interaction with the floodplain, channel type, substrate size, stream flows, condition of riparian vegetation, and upstream supply of sediment (Rosgen 1996). Deer and elk would still have some effect on riparian shrub communities but this is expected to be less when compared to past livestock use. Eventually many streambanks would be covered with grasses and sedges over 20 inches high, overhanging streams, providing shade for cooler water temperatures and cover for aquatic species.

Livestock enclosures on Schurtz Creek, 500 feet below Wolf Mountain Allotment demonstrate the rate of recovery and changes in the stream channel and riparian area in this subwatershed over 16 years of light or no grazing. In this exclosure there is a higher rate of bank stability, vegetation cover, stream shade and interaction between the stream channel and the floodplain. Plants in the exclosure also exhibit higher vigor compared to plants grazed by livestock outside the exclosure. Sedges form dense mats instead of broken clumps or individual plants. This alternative would allow for the fastest opportunity for water temperatures to decrease, with increased stream shade and narrower channels. Based on the rate of recovery in reach one of Schurtz Creek Enclosure, recovery would require at least 2 decades and most likely three. Although this pasture has been excluded from livestock grazing during most of the last 16 years, it has been grazed which may have affected the true recovery rate.

See Appendix G for more information on effects to sensitive species.

Cumulative Effects of No Grazing Alternative

This alternative would eliminate all direct effects from livestock grazing, as compared to the Proposed Action. Disturbances from livestock grazing would be eliminated, including the combined negative effects from feces and urine affecting water quality, hoof damage affecting bank stability, width /depth ratios, pools and cobble embeddedness, and the removal of riparian vegetation affecting stream shade, stream bank stability, and water temperature. Redds in Schurtz and Wolf creeks would not be trampled by livestock.

Herbaceous hydrophytic vegetation such as sedges and rushes would increase in abundance and vigor, moving riparian areas towards a late seral stage at a near natural rate of recovery. Due to natural wild ungulate use some of these affects would continue but at a lower level of disturbance, reflecting near natural levels. Photo 6 documents what the expected vegetation would look like on a stream system similar to Schurtz Creek with no grazing.

Photo 6
An example of grazed and ungrazed landscape on Schurtz Creek

This alternative would improve stream and riparian conditions sooner than alternative 1, moving aquatic systems towards a desired future condition (DFC) at a *natural* rate of recovery. Magilligan and McDowell (1997) indicate that following the elimination of cattle grazing desired stream channel adjustments begin within approximately 14 years, although some streams showed no adjustments after as long as 28 years.

Several indirect carry over affects from livestock would occur under this alternative that may have cumulative effects on other species and their habitat. Six springs that were altered for livestock would remain intact and continue to dewater springs that once formed natural seeps or wallows that benefited amphibians. Older troughs may actually provide aquatic habitat for the larvae form of some aquatic species since lack of maintenance often turns troughs into a micro aquatic ecosystems. However these troughs may drown other species (Avery, Springer and Dailey 1978 and Craig and Powers 1975) attracted to the trough, unless wildlife escape ramps exist. Troughs discovered during this analysis that are lacking escape ramps, would be modified in 2007. Headcuts would not be treated but would probably stabilize at a slower, more natural rate, due to reduced water runoff across the landscape and the lack of bank disturbing hoof action from livestock. Pasture fences and exclosures would remain and benefit riparian areas and streams by restricting stray livestock from other allotments.

Terrestrial Wildlife

Rocky Mountain elk, mule deer and pronghorn antelope are the three wild ungulate species that occur within the project area. 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.

Rocky Mountain Elk (Cervus elaphus)- MIS

Rocky Mountain elk are widely distributed across the District, Forest and the Blue Mountain Region. It is estimated there are approximately three elk per square mile in the project area, for a total population of approximately 30 animals in the Van allotment. Elk will move throughout the allotment depending on the time of year, disturbance, forage availability, weather conditions such as snow depth, and livestock distribution. Elk remain in the Van allotment during the winter months in most years, rather than migrating to lower elevation. (Garner, per comm. ODF&W)

Population Numbers

The project area is the North Malheur River Management Unit (NMRMU). Elk populations are managed by Oregon Department of Fish and Wildlife (ODF&W). Currently, population numbers are at management objectives (MO) for the NMRMU, sustaining approximately 1500 elk.

Habitat

Rocky Mountain elk habitat consists of a combination of forage, cover, water, and specialized areas such calving areas.

Cover

Elk utilize cover primarily during the autumn months for security and escapement of hunters (Irwin and Peck, 1983). Thomas et al (1979) has defined cover as either hiding cover or thermal cover. Malheur Land Resource Management Plan (LRMP) describes thermal cover as either satisfactory or marginal with forest standards listed by watersheds and management areas. Optimal cover to forage ratios are 40:60 (Thomas et al 1979).

Thermal Cover

Thermal cover in the project area has increased compared to historic times due to decades of effective fire suppression, which has accelerated succession. Ponderosa pine, Douglas fir and white fir have expanded their range or composition in most watersheds, increasing thermal cover. Even so, past logging practices have reduced thermal cover in some areas. Past sales that occurred in the late 1980's and early 1990's that reduced thermal cover in the Van Allotment include the following: County, Dry Creek, Cove, Gabe, and East Wolf timber sales. Other past timber sales and treatments are described in Appendix C, Cumulative Effects. When thermal cover is over abundant, forage potential for elk is decreased. Grasses and other forage become shaded from the conifer canopy closure reducing forage for elk.

In 2001, the 660-acre Wolf Creek wildfire occurred in the Wolf Creek drainage, and reduced elk thermal cover where the fire burned at high intensity. However, thermal cover in the Wolf Creek drainage is currently above desired levels. The Squaw Creek subwatershed does not meet forest plan standards for cover. The cover to forage ratio for the Calamity Creek, Squaw Creek and Upper Wolf Creek subwatersheds are 36/64, 26/74, and 67/33 respectively.

Hiding Cover

Elk use dense stands of young conifers for hiding cover as security to escape predators and human disturbance. Elk use hiding cover during migration and within travel corridors between feeding and bedding areas. The most secure areas are those farthest from roads (Rowland et al 2000). Hiding cover is above optimal levels in most subwatersheds. High concentrations of ponderosa pine and juniper have encroached in most of the allotment increasing hiding cover, but reducing forage availability for big game.

Forage

Forage habitat is defined as areas having canopy closure less than 40 percent. Clear cuts, open timbered stands, natural openings, scablands, burned areas, and non-forested ecosystems such as meadows are classified as foraging habitat for elk. Elk are primarily grazers foraging on grasses, forbs, and sedges. Forage needs for elk are estimated at approximately 81,000 pounds dry weight annually for the Van allotment. The calculations were based on a 12 pound per day consumption rate.

Malheur LRMP (Land Resource Management Plan) developed big game winter range management areas (MA-4A) for the forest. Approximately 4,600 acres of big game winter range are within the allotment. The highest potential for forage competition between elk and cattle occur on the winter ranges or spring-fall ranges where animals are compressed into smaller available habitat (Wisdom and Thomas, 1996). Limited forage for elk is more prevalent on winter ranges where concentrated use occurs. Changes in bunchgrass composition can occur from over-utilization of winter range, reducing forage for elk and other ungulates. Based upon the vegetation transect data it appears the Van allotment has been over utilized from grazing, which has affected bunchgrass production.

Forage reduction can be the result of several factors. Isolated watering areas where livestock tend to concentrate show heavy use. For example, riparian areas along the southern portion of Schurtz Creek show heavy browsing on shrubs and lack of shrub production based on the results from Proper Functioning Survey (PFC). Also, juniper expansion has occurred due to lack of fire, further reducing the production of bunchgrasses. Additionally, conifer trees reduce elk forage by shading forbs and grass.

Water Distribution

Water distribution is a key resource in elk utilization of a range. Research by Nelson and Burnell (1975) and others have indicated elk use is reduced at distances greater than 0.5 miles from water during summer months. The amount of annual precipitation, timing and duration of precipitation, and forage determine the dependence on water use by elk.

Water is limited in some areas in the allotment. Stock ponds, reservoirs, and spring developments have been constructed to provide water for livestock in other areas of the allotment. These range improvement projects have benefited wildlife by providing water in arid areas. However, developing isolated springs for livestock use can seasonally displace elk from the area as elk tend to avoid areas of heavy livestock use (Neff, 1980; Mackie, 1970).

Roads

There are about 185 miles of roads in summer range and 49 miles of road in winter range that are open to traffic in the project area. About one-third of the subwatersheds within the project area have road densities above forest standards. Roads increase disturbance to big game displacing elk from habitat near the roads.

HEI (Habitat Effective Index)

The Habitat-Effectiveness Index (HEI) model developed by Thomas et al (1988) is used to evaluate Rocky Mountain elk habitat. Malheur Forest LRMP set standards and minimum values for cover requirements, spatial arrangements, forage quality and quantity, and road density. The primary implications of the model is to illustrate changes in Habitat-Effectiveness Index resulting in changes in vegetation from various treatments to cover or reductions in road densities from access management plans. Data was collected on the Van range allotments using Parker transect data and Ocular Macroplot data to determine forage values for the HEI assessment. The Squaw Creek subwatershed did not meet Forest standards for forage quantity based on the results from the available data. Road density coefficient was not met in the Upper Wolf Creek subwatershed.

Special Behavior Requirements

Calving and fawning areas

Forest Plan emphasizes protection of elk calving sites and prevents harassment from off-road use of ATV's and other motorized vehicles during the calving season from May 1 to June 30 (Forest Standards, IV-29; #'s36, 58). There have been no calving areas identified in the planning area that would require protection. Proper management of riparian areas would meet these special needs for elk.

Wallows

Mature bull elk use wallows during the rutting season for territorial display. Forest Plan requires protection of known wallows and seasonal restrictions during the rutting season. No specific wallowing areas were identified that would warrant protection.

Effects on Rocky Mountain Elk (MIS)

Direct and Indirect Effects from the Proposed Action

No vegetation treatment would occur that would alter cover habitat from this project; therefore, elk thermal and hiding cover would not be directly impacted.

The Proposed Action is similar to the No Grazing Alternative by allowing for plant recovery in Schurtz Creek and other sensitive areas receiving concentrated livestock use. Perennial bunchgrasses would be given time to recover in areas where apparent high livestock grazing occurred. Reversal of long term decline in bunchgrasses is expected in areas where vegetation trend data was collected. An increase in forage production for elk is expected as bunchgrasses become established. Junipers and conifer encroachment may limit the establishment of bunchgrasses in some areas.

Limited use and exclusion of future use in the riparian pastures and exclosure would provide some habitat for elk calf rearing, however high conifer densities on the side slopes of Schurtz Creek and other drainages like Wolf Creek limit forage production in riparian floodplains. This alternative meets the Malheur LRMP standards for non-anadromous riparian areas (MA-3A - #8, IV-56) to "manage composition and productivity of key riparian vegetation with emphasis on riparian hardwood shrubs." Treatment and protection of riparian hardwoods enhances elk habitat when other disturbance factors do not override the improvements in forage. This alternative also meets Malheur LRMP for managing forage allocation on big game winter range (MA-4A). Enough forage should be left on winter range to meet the needs of elk during the late fall and winter months. Without vegetation treatments such as prescribed fire to enhance forage quality, it is highly probable elk would forage on private property where good quality forage is available and the disturbance factor may be lower than on the National Forest.

The HEI may improve slightly in the Squaw Creek subwatershed, because of forage increase with the Proposed Action. The other attributes in the HEI model (cover, spatial arrangements of cover and forage) would remain constant or would gradually increase from increase in cover.

Water development projects along with maintaining water in reservoirs in the Schurtz Creek pasture would benefit big game as well as livestock. Enhancement of elk wallowing areas may occur over time from livestock exclusion around developed springs. Vegetation around isolated water sources would improve in the short term, since concentrated livestock use would be reduced. Water developments would enhance calf-rearing areas.

Livestock use would resume after resting pastures. Livestock tend to concentrate near water sources during the hot season grazing period (Kauffman and Krueger, 1984). Some displacement of elk may occur from the livestock use near isolated water sources. However, with the implementation of riparian pastures, exclosures, water developments and spring improvements, the impacts to elk and other wildlife would be reduced. Maintaining water sources in Schurtz Creek pasture in alternate years would benefit elk and other wildlife during the summer months.

Because the Proposed Action would reduce or exclude livestock in several potential elk wallowing areas such as Schurtz Creek, the effects to elk and elk wallowing areas are reduced.

Direct and Indirect Effects from No Grazing

The No Grazing Alternative would allow an increase in bunchgrass production for bluebunch wheatgrass, Idaho fescue, and other bunchgrasses within the Van allotment. Research by Ganskopp, Svejcar and Vavara (2004) near Burns, Oregon found that light grazing decreased fall standing crop by 32%, while heavy grazing reduced standing crop by about 67% when compared to ungrazed stands. However, the nutritional quality of the grasses increased with grazing, which provided superior forage for fall and winter use. The No Grazing Alternative would allow bunchgrass forage to develop residual growth resulting in "wolfy" plants, which are not palatable to wild ungulates. The establishment of older non-palatable plants would occur over time, unless some type of disturbance such as fire occurred. The quality of grass forage may decline over time as grasses become mature and unpalatable

Competitive displacement would not occur under a No Grazing Alternative. Stewart et al (2002) found elk used lower elevations when cattle were absent and moved to higher elevations when cattle were present, indicating competitive displacement. Elk displacement into higher elevations or steeper slopes prematurely due to livestock introductions on the allotment would not occur. Most of the upper Wolf Creek watershed contains less optimal forage availability with a dominance of cover. With the absence of livestock, elk and mule deer would forage in possibly higher productive areas. Salting, herding, fence and range structure improvement maintenance would not occur, reducing disturbance to wild ungulates.

Regeneration of riparian shrubs would improve in streams where livestock no longer concentrate. Late summer and early fall forage would be more available for elk and mule deer in riparian areas with the absence of livestock on the allotments. A better distribution of wild ungulates may occur around the various water sources with the absence of livestock, since livestock concentrate near water sources during the hotter part of summer. An improvement in calving/fawning areas would occur over time as riparian shrubs and forbs become established.

The HEI may improve slightly in the Squaw Creek subwatershed, because of forage increase with the No Grazing Alternative. The other attributes in the HEI model (cover, spatial arrangements of cover and forage) would remain constant or would gradually increase from increase in cover.

Elk would use water and specialized habitats: ponds, reservoirs and spring developments more, since no livestock grazing would occur. Displacement of cow/calf elk from water sources would not occur with the absence of livestock. Disturbance to elk during the rutting and calving and calf-rearing period would be reduced, since there would not be any livestock operations occurring under the No Grazing alternative. The vegetation around the springs would improve with the absence of livestock use, enhancing these areas for calf rearing. Succulent vegetation would be more available for elk around isolated water sources during late summer months.

Cumulative Effects Common to All Alternatives

Decades of fire suppression, past timber harvesting and associated road construction have altered elk habitat in the Van allotment. Fire suppression has allowed the expansion of juniper and other woody stemmed plants reducing the forage for elk and increasing the probability of forage competition with livestock. Decades of livestock grazing may be inhibiting bunchgrass production in some areas of Van, possibly reducing big game winter range habitat. The reduction of livestock use is expected to improve the bunchgrass production and may improve wintering habitat for elk. Past timber harvesting has created foraging habitat for elk, but regeneration has occurred in most units reducing forage quality for elk. Thinning within old pine plantations scheduled for 2007/8 in the Wolf Mountain allotment, north of Van, may enhance some foraging habitat for elk. Approximately 1300 to 1500 acres are planned to be treated. Vegetation management treatment may occur in the Van allotment under the Jane Vegetation Management Project, which would enhance forage for elk and possibly cattle. Road closures are highly probable in the future in Wolf Creek drainage to bring road densities to more desired levels and meet forest plan directions. Road closures would alleviate elk displacement from cattle and human disturbances provided the areas closed contain forage/cover needs for elk.

Range improvement projects such as water developments have helped in distributing elk through out the project area. Placement of salt for livestock also benefits elk during the summer months.

HEI index would not be further diminished by either Alternative because there are no impacts on cover and road densities.

Mule deer (Odocoileus hemionus)

Mule deer are considered widely distributed across the District, Forest and the Blue Mountain Region and have similar habitat requirements as elk.

Population Numbers

Current mule deer populations estimate are at 10,700 deer for the Malheur River Unit (MRU). The project area occupies approximately 0.4% of the MRU. Mule deer populations are approximately 20% below management objectives and can be attributed to several factors, but low recruitment rates are considered a primary concern by ODF&W biologists.

Habitat

Mule deer habitat consists of a combination of forage, cover, and specialized areas such fawning areas. Optimal habitat contains 55 percent forage, 20 percent hiding cover, 10 percent thermal cover, 10 percent fawn-rearing and 5 percent fawning habitat.

Cover

Thermal cover for deer is defined as canopy cover of at least 75 percent provided by shrubs or trees at least 1.5 meters (5 feet) high. If thermal cover requirements are met for elk, it can be assumed thermal requirements for deer are met. Thermal cover for deer is abundant throughout most of the allotment and would not be limited with any of the alternatives.

Currently, hiding cover in the planning area is considerably higher than the recommended 20 percent based upon field observations. The abundance of hiding cover improves probability of escapement during hunting season.

Forage

Mule deer forage consists of a variety of forbs, shrubs, and, bunchgrasses such as Sandberg's bluegrass depending on the time of year and the condition of the forage. Shrubs and forbs are the primary forage for mule deer. Absence of timber management coupled with fire suppression has resulted in dense stands of ponderosa pine and juniper throughout the project area. This has reduced the forage for mule deer.

Forage production requirements were estimated for mule deer on the Van allotment. ODF&W estimated 75 head of deer occupy the Van allotment for approximately 8.5 months. Forage production needs were estimated at 46,500 pounds for Van. The herbage production is based on a consumption rate of 5.2 pounds per day. The herbage production was adjusted on a 37.5% dietary overlap with cattle in the spring and a 50% dietary overlap with cattle in the summer and fall months (Vavra et al 1989, and personal comm.). Dietary overlap between cattle and mule deer primarily occurs with mesic forbs and various shrubs consumed by livestock during the drier summer months. Bunchgrass such as bottlebrush squirreltail (*Sitanian hystrix*) is also a preferred grass grazed by mule deer during spring green up.

Some of the key shrub deer forage in the project area include: antelope bitterbrush (*Purshia tridentata*), Curl-leaf mountain mahogany (*Cercocarpus ledifolius*), common serviceberry (*Amalanchier ainifolia*), and chokecherry (*Prunus virginiana*). Quaking aspen (*Populus tremuloides*) is valuable forage for mule deer found primarily in the Squaw Creek drainage. The most prominent shrub is common snowberry (*Symphoricarpus albus*). Bitterbrush and mountain mahogany, in most areas in the project area are in poor condition. Decadent and heavily browsed bitterbrush is common where the plants occur. Bitterbrush utilization in the project area is most likely higher than 40% in most areas, which is above desired levels.

Mountain mahogany stands occur throughout the southern end of the allotment and are lacking reproduction. Decadent stands of mahogany are common with little to no regeneration. Fire suppression allows establishment of ponderosa pine and juniper, which compete with mountain mahogany. Juniper and ponderosa pine have shaded some the mountain mahogany areas. Natural fires created soil beds for mountain mahogany propagation. With the lack of shrub production in the uplands, and concentrated livestock use in some riparian areas, forage for mule deer can be limited in some areas.

Estimation of use on different habitat types occurred at randomly selected sites throughout the allotment using the Intensive Browse Method. Shrub browsing was heavy in some areas of Dry Creek and Schurtz Creek pastures. Livestock use was concentrated in riparian areas with minimal foraging occurring on adjacent slopes. Aspen stands received concentrated use by livestock and most aspen suckers received heavy browsing. Given the lack of shrub production in the uplands and concentrated livestock use in some riparian areas, forage for mule deer can be limited in some areas.

Fawning and Rearing Habitat

Compact areas containing a diversity of cover, succulent forbs, and water are needed by does during the fawning and fawn-rearing period (Sheehy, 1978). In rangeland areas hiding and thermal cover for fawn production is limited. In dense timber areas in the project area, lack of succulent forage is common. Riparian areas are key for fawn production, because of variety of succulent plants, including shrubs.

The Wolf Creek drainage and upper Shurtz Creek provide healthy riparian areas that may be good fawn rearing areas; however, the potential for optimal fawning and fawn rearing habitat at some sites within the project area has degraded due to lack of disturbance, timber management, road construction in RHCA's and concentrated livestock grazing in riparian areas.

Effects on Mule Deer

Direct and Indirect Effects from The Proposed Action Alternative

The impacts to mule deer habitat from this alternative are similar to the impacts on elk. Protection of Schurtz Creek to allow for stream restoration would aid in some fawn rearing habitat from the exclusion of livestock. Excluding or limiting livestock utilization on riparian vegetation for other resource objectives would improve foraging and fawn -rearing habitat in this allotment. Enhancement of aspen would improve small foraging areas for mule deer in the future. As previously described, the productivity is limited by high concentration of conifers shading riparian and other high productive areas such as the aspen stand in Gabe Creek.

Late season concentrated livestock use around isolated water sources most likely would occur. Utilization of browse by livestock may occur around the water sources due to heavy grazing pressure. Some forage competition with mule deer would occur. However, the livestock stocking rates for the entire allotment would be reduced to compatible levels, which would reduce forage competition with wild ungulates on the overall allotment. Maintaining 35% forage utilization on herbaceous plants would reduce shrub browsing, thus reducing competition on shrubs.

Aspen stands would respond quickly, in less than five years, with protection and conifer removal. Aspen regeneration provides ideal fawning and fawn rearing habitat. Using slash as a protection measure for young aspen allows some deer foraging opportunity, yet allows for regeneration of aspen.

Direct and Indirect Effects from No Grazing Alternative

The No Grazing Alternative would have both negative and positive affects on mule deer forage. Competition for forage occurs on winter or transitional ranges where animals are concentrated due to weather conditions. Competition for forage between livestock and mule deer occurs primarily on shrubs in riparian areas. Mid to late summer livestock grazing increases shrub utilization, reducing forage for mule deer. Past livestock practices have contributed to decline of riparian shrubs in Schurtz Creek. The No Grazing Alternative would improve the recovery of riparian shrubs faster than the Proposed Action alternative, since no livestock would forage in riparian areas. However, if utilization standards are met on grasses and grass-like plants, browsing on riparian shrubs should be similar with either alternative.

Livestock reduce the riparian vegetation utilized by mule deer during fawn rearing. Kie et al (1991) found female mule deer feed at significantly higher rates during moderate to heavy livestock use in riparian and meadow areas compared to ungrazed areas. As forage for mule deer is limited, the home range increases. Reduction in fawn survivability can occur as habitat for fawning becomes limited. Predation on fawns can occur at a higher rate as fawning and fawn rearing is limited. By reducing the recruitment of riparian shrubs, livestock can negatively affect fawning habitat for mule deer. The fawn rearing habitat would improve best with the No Grazing Alternative because competition in riparian areas would be limited to native ungulates.

Controlled livestock grazing can improve foraging habitat for mule deer. Anderson and Scherzinger (1975) assessed forage quality after seasonal grazing. Nutritional quality and palatability of grass forage is enhanced with proper grazing intensities. Early season grazing can be a tool employed to improve mule deer winter range.

Research by Ganskopp et al (1999) found cattle shifted their diet to bitterbrush once the grass seed ripens. The No Grazing Alternative may lessen the browsing impact on bitterbrush, chokecherry, snowberry, and other upland shrubs. However, the high big game densities and high concentration of conifers and junipers in the area would affect the recovery time for shrubs. In areas where livestock concentration occurs near isolated water sources, browsing occurred on the native shrubs. Late season grazing by livestock increases forage overlap with mule deer, since livestock tend to forage on other plants when grasses are cured.

Cumulative Effects to Mule Deer Habitat

Past timber harvest and other fuels reduction treatments has improved mule deer forage on about 400 acres by creating openings for shrubs and forbs. Fire suppression has reduced mule deer foraging habitat. Fire return intervals have been changed in the transitional ponderosa pine/shrub steppe ecosystems from historic intervals of 12-25 years to more than 100 years since settlement (Miller and Rose, 1999). Lack of fire reduces forage opportunities for mule deer.

Past logging practices and associated road construction have altered riparian vegetation. Riparian shrubs utilized by mule deer have decreased because of degraded riparian areas. Riparian shrubs have also been impacted by over-grazing from livestock, which is most apparent in Schurtz Creek. Degradation of riparian systems can lower water tables and affect streamside vegetation, which is important for fawn production.

Historic grazing practices, where season long grazing occurred, impacted riparian vegetation. Historic grazing along with logging and road construction has changed the plant communities in riparian areas from favorable mesic communities to more xeric. Grazing intensities in the Schurtz Creek drainage appear to have affected the riparian vegetation for mule deer. Shrub utilization was excessive in the Schurtz Creek pasture on willow and alder.

Pronghorn antelope (Antelocapra americana)

Habitat for pronghorn antelope consists of short or mixed grasslands or sagebrush grasslands with average vegetation heights of 15 inches. Vegetation cover is at least 50% with a mix of grasses, forbs, and shrubs such as bitterbrush, sagebrush, and rabbit brush. Tree densities are usually very low on open rolling hills with gentle slopes. Forbs and shrubs are the primary diet for pronghorns.

There is approximately 850 acres of sagebrush and grassland habitat in the Van area that provides habitat for antelope. Most of the habitat is marginal due to the steep slopes and high density of conifers and juniper. Incidental use by antelope occurs in the spring, summer, and fall months. Forb production is limited by poor growing site potential, juniper encroachment, and high density of ponderosa pine in some areas.

Water developments for livestock may have improved distribution of antelope in the drier areas with low tree densities. Some reservoirs are dry during the summer months and are not beneficial for antelope.

Effects on Pronghorn antelope

Direct, Indirect and Cumulative Effects Common to All Alternatives

Because there is limited habitat for pronghorn in the Van allotment, impacts to pronghorn habitat would be negligible. There is very little dietary overlap between cattle and pronghorns. Domestic sheep have the greatest potential to affect pronghorn forage due to diet similarity however there are no sheep on this allotment at the present time. There is potential for competition on shrub species such as bitterbrush. Antelope consume bitterbrush when forbs are cured or unavailable.

A concern with pronghorn is fences and fence repair. It can be assumed that fence maintenance would not occur with a No Grazing Alternative; therefore, the potential for pronghorn to become entrapped in barb-wire may be higher unless fences were removed. Livestock permittees maintain most of the pasture and allotment boundary fences. The existing fences, when maintained, are not antelope barriers. Any new fence construction would allow antelope movement through the fence and spacing of barb wire would meet recommendations to allow for antelope and other ungulate passage.

Fire suppression, which has allowed the expansion of juniper and ponderosa pine is the primary concern affecting pronghorn habitat in Van. Most of the area in Van is not suitable antelope habitat. Incidental use by few antelope occurs as animals migrate through the area. Antelope frequently use the upper Calamity Creek drainage. Fuels reduction treatment and prescribed fire in the former Cove planning area has enhanced habitat for antelope in the Calamity Creek area. Calamity Creek drainage contains more open areas and gentle slopes, which is more conducive for antelope, compared to areas in the Van allotment

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.

Eleven primary cavity excavators require snag habitat in various plant communities. Since tree and snag densities would not be changed by this grazing proposal, snags and downed wood were not evaluated at this time. However, riparian vegetation management can impact the following species.

Downy woodpecker (Picoides pubescens)

This smallest North American woodpecker is found in deciduous stands of alder, cottonwood and aspen. While this species is more common on the west slopes of the Cascades, they do occur in riparian areas in eastern Oregon. Downy woodpeckers are common around dwellings in orchards and hardwood shrubs. Downy woodpeckers are less common in conifer forests. Medin and Clary (1991) found woodpecker densities four times higher in ungrazed willow and aspen communities than in grazed areas. Conifer shading of riparian hardwoods is a conservation concern that may be affecting downy woodpecker populations. Potential habitat may exist in Schurtz Creek and in the aspen groves in Gabe Creek.

Williamson's, Red-Breasted, Yellow-Bellied and Red Naped Sapsuckers (Sphyrapicus thyroids, S. rubber, S. varius and S. nuchalis)

Sapsuckers are associated with riparian hardwood communities and open ponderosa pines. Aspen, willow, and cottonwoods are the primary riparian species sapsuckers utilize for breeding in eastern Oregon. Dobkin et al. (1995) found 72% of the red-naped sapsuckers nests in aspen trees on their study in south-central Oregon. No formal snag surveys were conducted in the riparian areas to assess habitat for cavity nesting birds. However, the recruitment potential for future snags was assessed in aspen stands. Heavy utilization of aspen suckers was noted in aspen stands. Poor recruitment will limit mature aspen trees in the future. The Wolf Creek and upper Schurtz Creek drainages contain diverse riparian plant communities and should provide habitat for sapsuckers. Remnant aspen stands in Dry Creek and Gabe Creek may provide nesting habitat for sapsuckers.

To provide long term sustainability for cavity nesting birds in riparian areas and subsequent secondary cavity nesters, recruitment of hardwood species would need to occur. Aspen restoration to regenerate aspen communities is needed for long term recruitment. Fewer conifers in riparian habitat conservation areas (RHCA's) in the project area would reduce competition with hardwood species. Periodic fires in aspen stands would promote suckering and would improve health of aspen communities.

Establishment of cottonwoods in the Wolf Creek drainage would provide nesting and foraging habitat for sapsuckers and other cavity excavators. Streams maintained in functional condition assure establishment of cottonwood and other riparian hardwoods.

Aspen is addressed in the Unique and Sensitive Habitat section of this report.

Old Growth Dependent MIS, Old Growth and LOS Habitat

Pileated woodpecker, pine marten, and three-toed woodpecker are species that are dependent on habitat characteristics of old growth forests. Northern flicker are associated with open forest or forest edge habitat and are a MIS species for old growth juniper on the neighboring Ochoco National Forest. White-headed woodpecker and Lewis woodpecker are associated with open ponderosa pine and are focal species for managing ponderosa pine. Black-backed woodpecker is associated with burned forests and bark beetle infestations. Because grazing does not affect snag densities or the potential recruitment of conifer snags, none of the proposed alternatives would have an affect on habitat for these woodpeckers, therefore no further analysis is necessary for the above mentioned MIS.

There is no designated old growth in the Van Allotment. Since there is no designated old growth, livestock would not impact species of wildlife that require old growth habitat. No further analysis is warranted on old growth habitat and associated species.

Effects on MIS - Downy Woodpeckers and Sapsuckers

Direct and Indirect Effects from the Proposed Action

The Proposed Action would favor specific MIS woodpecker habitat by treating and protecting riparian and aspen habitats. Long-term recruitment of hardwood and subsequent snags is expected from the release and protection of aspen habitat, which would enhance future recruitment of hardwood snags for MIS primary excavators like red-naped sapsuckers. Willow, alder, aspen, and hawthorn are expected to regenerate in Schurtz Creek in the long term from limited livestock use in the RHCA once the stream becomes functional and browsing of shrubs is reduced.

The felling of conifers in aspen stands and along Schurtz Creek for LWD placement would provide downed logs for insects. Potential foraging habitat for woodpeckers may result from the downed logs. As the restoration takes place in Schurtz Creek from in-stream work and limited or non-use by livestock, regeneration of riparian shrubs is expected. In the long term, once riparian shrubs are established, habitat for these MIS species and several other birds requiring aquatic shrubs would improve. Once livestock grazing resumes, careful monitoring of the Schurtz Creek riparian pasture would need to occur to assure regeneration of the shrubs for future MIS habitat. The utilization standards in the riparian pastures would assure that limited browsing on shrubs and regeneration of shrubs would persist over time. Several authors concur that if utilization standards are met on grasses, then livestock would not impact the shrub component other than incidental trampling.

Direct and Indirect Effects from No Grazing

The No Grazing Alternative would not directly affect habitat for MIS species that occupy aspen and riparian shrub habitat because livestock grazing does not affect dead and dying habitat. However, livestock browsing can negatively affect the recruitment of hardwoods. Most aspen stands and riparian areas have limited recruitment due to browsing and conifer shading. Some stands of aspen would respond favorably to no livestock browsing, but others may remain suppressed until further disturbance occurs. Aspen in Gabe Creek may respond to absence of livestock browsing, but due to high conifer densities, the aspen would continue to be shaded and competition for water would be high, unless conifer treatment occurred.

Mature riparian shrubs are used for foraging and nesting habitat for sapsuckers and downy woodpeckers. Without further recruitment of aspen in Gabe, Schurtz, and Dry Creek within the Van area, habitat would continue to decline for these MIS.

Cumulative Effects on MIS Habitat for All Alternatives

Road construction and subsequent logging in the past have altered habitat for MIS cavity nesting birds. Degraded streams have reduced their ability to retain water for important hardwoods used as nesting and foraging habitat for specific MIS woodpeckers. Present firewood cutting has further contributed to the decline in nesting habitat in some areas. Concentrated livestock use on intermittent and perennial streams has reduced the recruitment of hardwoods.

Fire suppression has allowed conifer densities to exceed levels that displace riparian hardwoods. Historically, fire would maintain most of the aspen and some riparian areas reducing conifer and juniper competition. Currently, shading produced by conifers is reducing recruitment of aspen, alder, and willow in some areas.

Riparian exclosures have provided protection for cottonwood and other riparian hardwoods in Wolf Creek. Future nesting habitat for MIS woodpeckers that nest in hardwoods, would occur as long as exclosures are maintained.

Both Alternatives would not further diminish the potential for snag recruitment within the hardwood species, primarily aspen. This is due to the absence of livestock browsing in aspen stands. The Proposed Action would also increase the recruitment of aspen due to restoration projects.

Featured Species

The Forest Plan defines featured species as “species of high public interest and demand” (Chapter IV-30, 31). Featured species include sage grouse, antelope, blue grouse, upland sandpipers, bighorn sheep, and osprey. Two species, sage grouse and antelope are addressed in the TES section and big game section, respectively.

Mistletoe infected fir providing blue grouse habitat would not be altered by any of the action alternatives, therefore livestock use would not impact blue grouse habitat.

There is no habitat available for upland sandpipers in the project area. The closest habitat for sandpipers is in Logan Valley about 10 miles north of the planning area. Since there are no meadows large enough to provide potential nesting for upland sandpipers in the project area, there would be no effects to upland sandpipers.

There is no habitat for bighorn sheep in or near project area, therefore there would be no effects to bighorn sheep.

There would be no impact to osprey nesting habitat (snags or green tree replacement) from any of the alternatives because livestock grazing does not impact snags or green tree replacement.

Since featured species would not be impacted by any of the alternatives or habitat is not suitable in the project area, no further analysis is necessary for featured species.

Unique and Sensitive Habitats

Unique and sensitive habitats include meadows, rimrock, talus slopes, cliffs, animal dens, wallows, bogs, seeps, springs, and quaking aspen. Rimrock, talus slopes, and cliffs would not be impacted by any of the action alternatives. No animal dens were found that would need protection.

Springs, bogs, and seeps throughout the allotment that are accessible to livestock were impacted by livestock grazing. Most springs, seeps, and bogs that are accessible to livestock are heavily grazed and trampled.

Quaking Aspen (Populus tremuloides)

Quaking aspen habitat supports one of the most diverse wildlife communities in the western United States, yet covers less than 1% of the landmass in the Blue Mountain and Great Basin physiographic provinces. Aspen is one of the most important deciduous tree communities on the Malheur National Forest. Aspen provides aesthetic enjoyment to humans, is a culturally important native plant, adds diversity to the living landscape, and is second only to riparian habitat in importance to wildlife. Aspen provides high quality forage, cover, resting, and breeding habitat for over 50 species of mammals, 150 species of birds, and many amphibians, reptiles, insects and other invertebrates. Leaves, catkins, and buds of aspen, and associated understory grasses, forbs and shrubs provide nutritious forage for elk, deer, grouse, snowshoe hare, and small mammals. Herbaceous cover provides nesting habitat for ground nesters like dark eyed juncos, shrub nesters including *Empidonax* flycatchers and canopy nesters including robin, yellow-rumped warblers and western tanager and others. Insects that feed on aspen provide a rich bounty of food for many species of songbirds. Aspen snags and live aspen trees provide excellent habitat for some species of cavity excavating birds. Aspen is very susceptible to heart rot, which makes the trees more favorable to some of the primary cavity excavators such as sapsuckers.

Aspen has decreased by at least 80 to 90% of its original range prior to European influences in the Blue Mountains of Oregon. The main factors that contributed to the decrease in aspen are:

- Lack of periodic fire
- Past overgrazing by domestic livestock
- Increase in conifers and junipers as a result of a lack of periodic fire
- Road construction has disrupted ground water flows
- Loss of water table from degraded stream channels
- Higher than historic big game populations

There are less than five remnant aspen stands scattered through out the allotment ranging in size from one-tenth of an acre to approximately three acres. The most prevalent aspen is located in the Gabe Creek drainage. The aspen in Gabe Creek is suppressed by high densities of conifers and is heavily browsed by domestic and wild ungulates. Heavy browsing on aspen is limiting growth and vigor of aspen.

At least 90% of the aspen stands are adjacent to roads in the Wolf Creek watershed. Past road construction and logging operations have degraded the streams resulting in a lowered water table.

The existing aspen in the project area are in poor condition due to competition from conifers, primarily ponderosa pine and western juniper, over browsing of aspen suckers from wild and domestic ungulates, and impacts from past road construction affecting water infiltration and run off. Lack of natural disturbances such as fire has enabled an accelerated succession displacing aspen with conifers. Concentrated livestock and big game use in certain areas has reduced recruitment of young aspen by heavy browsing of suckers. Without treatment of conifers and protection of aspen suckers from browsing, aspen will continue to decline in the project area.

Effects to aspen are displayed in MIS and Neotropical bird sections.

Meadows

Approximately 35 acres of meadows were identified in the Schurtz Creek pasture. Approximately 75% of the meadow habitat consists of dry meadow primarily Kentucky bluegrass (*Poa pratensis*). These dry meadow types have evolved from overgrazing or other disturbances. The drier sites historically may have been tufted hairgrass communities prior to disturbance (Crowe and Clausnitzer, 1997). These meadows have highly palatable forage for big game, small mammals, and birds. Kentucky bluegrass meadows provide good cover for ground nesting birds, when residual cover is left in the meadow.

Riparian

Riparian areas are used disproportionately more than any habitat type. In the Blue Mountains of Oregon, it is estimated that 285 species of wildlife are dependent on riparian areas for foraging, reproduction, and loafing. Riparian zones are the most critical habitat in the Blue Mountains for wildlife (Thomas, 1979). These areas are highly productive areas for timber management due productive soil and high moisture content. Vegetation along the stream course is desired forage for livestock.

The Van allotment contains approximately 650 acres of Riparian Habitat Conservation Areas (RHCA's). Not all the RHCA's contain surface water during the summer months. Schurtz Creek and Wolf Creek are two primary streams providing riparian habitat for wildlife. Schurtz Creek was evaluated for Proper Functioning Condition in 2004. It was concluded the riparian shrubs were in poor condition with low plant vigor in the lower reach of Schurtz Creek. The recruitment potential for riparian shrubs is low due to stream channel conditions, conifer shading, and ungulate browsing on the few riparian shrubs available. The lower section of Schurtz Creek was rated Functional at Risk. In contrast, the riparian pasture on Schurtz Creek had limited livestock use and contained several younger aged riparian species predominantly willow (Salix) and alder (Alnus). The wildlife habitat in the enclosure was more diverse and the vegetation provided cover and forage for wildlife.

The Schurtz Creek pasture was rated at Proper Functioning Condition. The Wolf Creek drainage provides a diverse composition of riparian shrubs and good riparian habitat for wildlife. Gabe and Dry Creeks are limited for containing riparian vegetation due the lack of surface water. Both of these creeks contain aspen where water is available.

Effects to Unique and Sensitive Habitats

Direct, Indirect and Cumulative Effects from the Proposed Action

Baltic rush meadow in Schurtz Creek can provide good forage for big game, however the plants are only palatable in the spring when plants are succulent. Livestock use occurs after the spring when conditions are drier. Baltic rush plant communities increase with grazing (Crowe and Clausnitzer, 1997). Since grazing utilizations are monitored in this pasture and the pasture is not used more than two months, this alternative would not negatively affect meadow habitat for wildlife.

Upland meadows containing Kentucky bluegrass would improve with this alternative, since grazing enhances these meadows. However, overgrazing on dry meadows can expose bare ground allowing noxious weeds like cheatgrass to become established. Ocular macroplot samples have indicated an increase in cheatgrass in the Van allotment.

The Proposed Action would favor aspen regeneration by treating conifer densities in the remnant aspen stands in Gabe, Dry, and Schurtz Creeks. Deferred livestock grazing may increase the recovery of aspen in some of the stands depending on wild ungulate browsing intensities. Felling and leaving conifers can provide protection from browsing, which allows growth of aspen suckers. The aspen grove in Gabe Creek has the greatest potential for development into a multi-layered stand, which would provide good reproductive habitat for several wildlife species. Protection of aspen stands from grazing would preserve the understory vegetation of grasses, forbs, and shrubs and maintain a diverse composition. Dense understory in the aspen stands provides good nesting, foraging, and cover for several wildlife species.

The Proposed Action meets the treatment recommendations suggested by Campbell and Bartos (2000) to relieve aspen suckers from browsing. Excessive browsing depletes aspen root reserves, jeopardizes aspen regeneration, and threatens aspen stand survival. They stressed the importance of relieving browsing pressure in conjunction with disturbance treatments for successful aspen regeneration. The Proposed Action complies with the Malheur Forest Plan standard IV #57 to enhance and protect aspen stands as measures for regeneration.

The Proposed Action would regulate grazing intensities in riparian areas to assure recovery of riparian vegetation. Forest standard utilization rates would allow for shrub recovery and would provide nesting, foraging, and cover for wildlife species. Clary and Webster (1989) suggest light to moderate browsing appears to have little adverse effect and may stimulate growth of woody plants. Light to moderate grazing is approximately 30 to 40% utilization.

Placement of LWD in stream channels would provide cover and travel corridors for small mammals and carnivores like weasels and mink. Birds may use the downed wood for nesting habitat and perches. Pools formed behind the logs provide watering areas for several wildlife species, including bats.

Direct, Indirect and Cumulative Effects from No Action

The No Grazing Alternative would provide greater foraging opportunities in meadows for wild ungulates, small mammals, and birds. Absence of livestock may improve habitat for ground nesting birds in dry meadows due to residual grasses that may be present, depending on wild ungulate utilization of the grass.

The No Grazing Alternative would exclude livestock use in the wet meadow located in the Schurtz Creek pasture enabling dense vegetation to accumulate near the stream channels. Absence of grazing would improve cover and forage for small mammals and would enhance prey for raptors (Kauffman and Krueger, 1984; Medin and Clary, 1989).

Browsing on aspen would only occur from wild ungulates. While concentrated browsing may not occur, without vegetation treatment and protection from wild ungulate browsing, regeneration of aspen would be inhibited. Some success of aspen regeneration has occurred on other aspen stands on the district by livestock exclusion. However, conifer treatment was completed prior to livestock exclusion to reduce competition on aspen.

Continued shading of aspen suckers would persist until a disturbance such as mechanical treatment or fire reduced competition to aspen. Restoration projects in Schurtz Creek would not occur, reducing the potential for aspen reestablishment in Schurtz Creek in the future.

No Grazing would allow recovery of native shrubs. The recovery may be delayed by the condition of the stream, especially in drainages like Schurtz Creek where stream functionality is at risk. Conifer densities and juniper may limit establishment of riparian shrubs in some streams. Concentrated or continued browsing on riparian shrubs from domestic ungulates would not occur; therefore recruitment may be improved in the long term. Acceptable wildlife habitat may occur after 5 years, depending on browsing intensity and site potential. Degraded areas may take 1-15 years or longer to recover.

Threatened, Endangered and Sensitive Species (TES)

Terrestrial mammals on the Regional Forest Sensitive Species list with potential habitat in the project area include wolverine, gray flycatcher, western sage grouse and pygmy rabbits. Threatened and endangered species that could occur in the project area include gray wolf and bald eagle. There is no critical habitat for any threatened or endangered species in the project area. Refer to Appendix H for more details on TES in the Biological Evaluation for Wildlife. The following is a summary of the habitat conditions and effects of potential TES species that may occur in the project area.

Gray wolf (Canus lupus)

Prior to European settlement, wolves occupied most habitats in Oregon that contained adequate ungulate populations as food source. The southern portions of the Blue Mountains were no exception for gray wolf occupancy. Wild ungulate populations in eastern Oregon may be higher than pre-settlement times for some species such as mule deer. Potential dispersing wolves from Idaho could reoccupy historic ranges in Oregon, with time and acceptance. However, road densities in the project area, which increase human disturbance, are not favorable for wolves.

Bald eagle (Haliaeetus leucocephalus)

The nearest occupied bald eagle nest occurs approximately 14 miles west of the project area. There are no large bodies of water available near the project area for probable nest sites. It is unlikely bald eagles would nest in the Wolf Creek watershed. Only incidental foraging use is expected.

Wolverine (Gulo gulo)

Wolverines were long thought to be extirpated from Oregon (Bailey, 1936) but recent sightings have confirmed the presence of wolverine. In 1992, skeletal remains and tufts of hair were found in Grant County over 20 miles from Van Allotment on the west side of Silvies valley. The nearest suitable source habitat for wolverines is the Strawberry Mountain wilderness located approximately 17 miles north. High road densities and human disturbance would limit wolverine use in the planning area. Wolverine occurrence in the project area would be rare.

Sage grouse (Centrocercus urophasianus)

There are no known leks (breeding areas) for sage grouse within the allotment. The closest known lek is approximately three miles south. There have been no known sightings of sage grouse in the project area. Brood rearing habitat within the project area is sub-marginal to non-existent. Expansion of ponderosa pine and juniper in the last eight to ten decades has decreased the potential for sage grouse rearing habitat. Sage grouse rear young near agriculture fields south of the National Forest boundary. There have been sightings of sage grouse in the Logan Valley area, approximately five miles north (pers. con. Gonzalez, ODF&W). Sage grouse hens may move their broods through the project area to favorable brooding areas north of the project area.

Pygmy rabbit (Brachylagus idahoensis)

Pygmy rabbits occupy habitat dominated by big sagebrush (*Artemisia tridentata*) on deep friable soils for digging burrows (Green and Flinders, 1980). In an Oregon study, sagebrush cover and soil depth were two primary parameters determining presence of pygmy rabbits. Average soil depths were 51 centimeters (20 inch) and shrub cover averaged 28.8 percent (Weiss and Verts, 1984). There is at least 100 acres of big sagebrush or mixtures of big sage and smaller sagebrush varieties within the Van Allotment, but soil inventories in 1974 recorded shallow rocky basalt or rhyolite cobble loam with depths less than one foot. Soil conditions and sagebrush densities would not be favorable for pygmy rabbits in the project area. The probability of pygmy rabbits occurring in the project area is low.

Gray flycatcher (Empidonax wrightii)

The gray flycatcher breeds in arid woodlands and shrublands in big sagebrush, bitterbrush, mountain mahogany, and juniper. Gray flycatchers are also found in open ponderosa pine with shrub understory (Sterling 1999). Potential breeding habitat exists in the transitional zone at the southern boundary of the Malheur National forest. There has been no bird monitoring in the project area to determine presence or abundance of gray flycatchers. There is approximately 2100 acres of gray flycatcher habitat within the project area predominantly in the Schurtz Creek pasture. Most of the potential habitat is marginal due to high density of trees. Gray flycatchers are susceptible to nest parasitism by brown-headed cowbirds, which are associated with livestock and agriculture.

Summary of Effects to Terrestrial TES

Refer to the Biological Evaluation for Wildlife (Appendix H) for more details on effects to terrestrial TES.

Summary of Effects to Gray wolf

Under the Proposed Action and the No Action Alternatives, the determination is No Effect (NE) because no populations currently occupy the Malheur National Forest, no denning or rendezvous sites have been identified on the Malheur national Forest, prey availability is not a limiting factor, and most management activities are compatible with non-breeding wolf population protection and recovery.

Summary of Effects to Bald eagle

Implementation of the no action alternative would have NO EFFECT (NE) on bald eagles or bald eagle nesting habitat and foraging habitat. Under the Proposed Action the determination is no Effect (NE) for bald eagles because livestock would not affect nesting, roosting, loafing and foraging habitat, there is no nesting or winter roosting areas in the project area, there have been no sightings of bald eagles in the Wolf Creek watershed.

Summary of Effects to Wolverine

Under the No Action Alternative, there would be no management activities; therefore, there would be NO IMPACT (NI) to wolverine or potential habitat. Under the Proposed Action Alternative, there would be No Impact (NI) to wolverine because reductions in livestock levels is expected to have minimal impacts to wild ungulate habitat and reduce impacts to small mammals; therefore would not indirectly affect prey for wolverine.

Summary of Effects to Sage grouse

Under the No Action Alternative, there would be no direct impacts to sage grouse brood rearing habitat. Because there would be a potential improvement in forb production in areas that had historic heavy grazing pressure, a beneficial impact (BI) is determined.

Under the Proposed Action Alternative, seasonal grazing has the probability of reducing forbs in the Schurtz Creek pasture. Since there is approximately 600 acres of potential sage grouse habitat in Van Allotment, and grazing could reduce forage availability for sage grouse the determination is May Impact Individuals and their Habitat but would not likely contribute to a trend towards federal listing or cause a loss of viability to the populations (MIIH).

Summary of Effects to Pygmy rabbit

Under the Proposed Action and the No Action Alternatives, the determination for pygmy rabbit is No Effect (NE) because there is low habitat potential and the low likelihood of pygmy rabbit occurrence in this allotment.

Summary of Effects to Gray flycatcher

Under the No Action Alternative, the determination is No Impact (NI) because there would be no direct or indirect effects on gray flycatchers or their habitat.

Under the Proposed Action Alternative, upland shrub concerns are addressed and should reverse the declining shrub trends in the Van allotment. Potential grazing impacts to upland shrubs still exists in some localized areas. There would also be potential for incidental disturbance of nesting birds, but the impacts to gray flycatcher populations would not be measurable. Because the season of use may conflict with shrub utilization by livestock, (ie. late season grazing) and concentrated use may occur a determination of May Impact Individuals and their Habitat but would not likely contribute to a trend towards federal listing or cause a loss of viability to the populations (MIIH) is determined.

Table 13. Summary of Effects to Terrestrial TES

Species	No Action Alternative	Proposed Action Alternative
gray wolf (**E**)	NE	NE
bald eagle (**T**)	NE	NE
wolverine (**S**)	NI	NI
pygmy rabbit (**S**)	NI	NI
western sage grouse (**S**)	BI	MIIH
gray flycatcher (**S**)	NI	MIIH

P = Proposed, **E** = Endangered, **T** = Threatened, **S** = Sensitive, **NE** = No Effect, **NI** = No Impact, **BI** = Beneficial Impact, **MIIH** = May Impact Individuals and their Habitat but would not likely contribute to a trend towards federal listing or cause a loss of viability to the populations

Species of concern – Northern Goshawk (*Accipiter gentiles*)

Regional Foresters Amendment #2 (1995) interim management directions set standards to protect goshawk habitat to insure species viability. Goshawk reproductive habitat is comprised of three habitat components: nesting, post-fledging, and foraging. The entire home range is approximately 5,000 to 6,000 acres.

Goshawks, like other forest accipiters, prefer to nest in stands with high basal area of large trees in close approximation to water. The fledging, or rearing habitat consists of a diversity of habitats, but late and old structure comprises at least 60% of the habitat. Nest sites in Oregon found by Reynolds et al. (1992) and others were in several forest types including Douglas fir, true firs, lodgepole and ponderosa pines, western larch, and quaking aspen. The utilization of aspen stands for nesting by goshawks occurred in desert regions in sagebrush-steppe habitat. Reynolds et al (1992) recommended various seral stages of trees throughout the post- fledgling area (PFA). Reynolds also recommended grasses and forb utilization should average no more that 20% by weight and not exceed 40% of the area, and shrub utilization should average 40% by weight and not exceed 60% of the PFA area. The purpose is to assure enough vegetation for goshawk prey species. A mosaic of snags, downed logs, small openings and herbaceous understory are common within PFA's. The foraging area should contain a mosaic of large trees, openings, large snags and downed wood. Crocker-Bedford (1990) believes heavy shrub cover inhibits goshawk foraging. High densities of conifer seedlings function similarly to dense shrub cover inhibiting goshawk foraging. High densities of conifer seedlings are common throughout the project area.

Formal surveys for goshawks were conducted in the Wolf Creek watershed in 1995. One goshawk nest was found and other observations of birds were noted. Goshawks were found in the Wolf Mountain Allotment north of the Van allotment. There have been no recent surveys conducted; however surveys would be planned in the future prior to vegetation management. Nearly the entire planning has potential for goshawk foraging habitat. Due to the high canopy density in aspen stands and the potential for bird nesting, the regeneration of aspen is of primary concern for goshawks in the planning area. Degraded riparian areas are of concern also, since goshawk prey species can be more abundant in riparian areas.

Effects on Northern Goshawk (Accipiter gentiles)

Direct, Indirect and Cumulative Effects Common to All Allotments

There has been no confirmation of goshawk nests within the Van allotment from field reconnaissance that occurred during the 2004-2006 field seasons. Therefore, there would be no direct effects to goshawk nests from any alternative. Indirect affects however, could result from habitat modifications for goshawk prey species. Studies have compared small mammal densities on grazed and ungrazed areas and found higher densities of small mammals in ungrazed areas (Medin and Clary, 1989;). Similar results have been presented for avian prey species (Kreuper et al. 1993). However, goshawks are generalists and foraging on squirrels (sciurids) is more common than on other rodents. Grazing does not affect goshawk prey that forages on ponderosa pine cones. Goshawk foraging areas are at least 5,400 acres with a diverse prey selection. Therefore, the alternatives would not impact goshawk foraging habitat.

No removal of conifer nesting habitat would occur under all alternatives, therefore no affects to goshawk nest sites are anticipated. However, the enhancement of potential goshawk habitat increases with proper management of riparian areas and aspen stands. Higher density of riparian shrubs increases bird diversity and small mammals, improving goshawk prey sources. Riparian fencing should maintain good diversity of plants along Schurtz Creek and would meet the recommendations by Reynolds (1992) to maintain plant diversity in foraging habitat. Multi-layered aspen stands could provide nesting habitat for goshawks in the future. Migratory birds and MIS species are prey for goshawk and are addressed in other sections of this report.

Potential nest sites could be disturbed by livestock operations during the nesting period, but it would be unlikely. If a goshawk nest is located in the future, protection measures on all livestock operations would comply with Forest standards. Utilization standards as recommended by Reynolds in PFA's would be administered to assure for prey diversity.

Neo-Tropical Migratory Landbirds

Neo-tropical-migratory landbirds are those that breed in the U.S or Canada and winter south of the Tropic of Cancer, latitude 23 ½ degrees North (Sharp, 1992). Many of our well-known passerine songbirds, hawks, and shorebirds fall in this category. Many migratory landbirds populations are indicating a declining trend. In Oregon 30 species of neo-tropical migratory birds (NTMB) and 36 short distance migrants have experienced declining population trends based on breeding bird survey data from 1966 to 2001.

No surveys were conducted to assess neo-tropical birds within the planning area. Table 14 lists the NTMB that potentially could be found in the project area that are indicating a decline in population with associated habitat. In the project area, 50% of the bird species with declining population trends are associated with riparian habitat.

Nest parasitism by cowbirds can be a factor influencing NTMB in areas where habitat alteration by human activities and livestock operations are frequent. Yellow warbler and song sparrows were the top two host species for cowbird nests in Oregon and both species are indicating a downward trend. These two species tend to nest in riparian areas with densities of willows and ground cover.

The lack of riparian shrubs in sections of Schurtz Creek is a concern for nesting neo-tropical birds in the project area. The areas of concern for riparian conditions described in the aspen, MIS, and big game sections of this report apply to some species of neo-tropical birds.

There is concern for recruitment of shrubs in the shrub-steppe ecosystems at the transitional zones on the southern forest boundary. Heavy browsing of bitterbrush and other shrubs by wild and domestic ungulates has reduced recruitment. Livestock can affect shrub nesters such as sage thrashers and brewers sparrows. Reduction in bunchgrass can reduce nesting cover for ground nesting neo-tropical birds, since minimal residual grass would be available for nesting.

More riparian areas with an abundance of riparian shrubs in areas that are capable of producing shrubs would benefit many neo-tropical migratory songbirds. Improvement in nesting, foraging, and brood rearing habitat for neo-tropical birds would result from an increase in shrub production in Schurtz and Gabe Creek.

Effects to Neo-Tropical Migratory Landbirds

Saab et al (1995) and Tewksbury et al (2002) reviewed the effects of cattle on birds in western North America. Among 68 species of Neo-tropical migrants, 46% decreased in abundance with cattle grazing, 29% increased, and 25% showed no clear response.

Bird species responding positively to grazing include riparian generalists such as aerial foragers associated with open habitat (Lewis woodpecker), ground foragers preferring areas with little cover (American robin), or species directly attracted to livestock (brown-headed cowbirds).

Avian species with negative response to grazing include: yellow warbler, MacGillivray’s warbler, calliope hummingbird, and willow flycatcher. These neo-tropical migrants have shown a decline in populations the past thirty years. Most of the birds affected by livestock grazing nest in riparian shrubs and require dense shrubs for nesting.

Brown-headed cowbirds pose a problem to NTMB where favorable habitat conditions exist from forest fragmentation and livestock grazing. Cowbird brood parasitism has potential to negatively affect nesting NTMB in the allotments where riparian vegetation is limiting.

Direct and Indirect Effects from the Proposed Action

In addition to riparian and aspen affects addressed in the MIS section, another concern for NTMB with this allotment is the shrubs in the shrub-steppe ecosystem. The residual grasses would improve habitat for ground and low vegetation cup nesting birds. Brewer's and vesper sparrows, western meadowlark, and ferruginous hawk habitat would improve with less livestock utilization. The proposed action would reduce the potential for nest trampling and disturbance during nesting season. Light to moderate grazing in most habitat types including shrub-steppe is compatible with most NTMB species. Bird species such as sage sparrow and golden eagle may benefit from livestock grazing in shrub-steppe.

While riparian fences may provide perches for birds, barb-wired fences can incidentally impale birds and bats. Avery et al (1978) listed several avian species that were killed on barbed wire fences. Owls are fairly vulnerable to impalement on fences, especially where foraging may occur near a water source such as Schurtz Creek.

Direct and Indirect Effects from No Grazing

Reduced browsing on aspen suckers enhances regeneration. Multi-layered aspen provide ideal nesting habitat for NTMB. The herbaceous cover beneath the aspen would provide nesting habitat for ground nesting birds such as dark eyed juncos. Herbaceous vegetation in riparian areas would not be reduced with this alternative since no livestock use would occur. In some areas, ground nesting habitat would be affected by conifer densities. Pine trees have shaded out potential habitat for ground and shrub nesting birds.

There would be a minor increase in other shrubs such as serviceberry and chokecherry. These shrubs provide nesting and foraging habitat for NTMB when the berries ripen. Heavy livestock utilization on chokecherries was recorded in 2004 near the southern boundary of the Dry Creek pasture. In some locations shrubs may receive browsing primarily by mule deer, since shrubs are limiting throughout the allotment.

With no grazing, the potential to trample any ground nesting or low shrub nesting birds would not occur. Impacts such as nest trampling vary depending on the livestock timing and use in the riparian areas and bird nesting chronology. Most livestock use in riparian areas is after young birds have fledged. However, ground nesting birds near single water sources such as reservoirs could be vulnerable to trampling by livestock, depending on nesting and grazing periods. With this alternative, nest trampling would only occur from big game.

Cumulative Effects on NTMB for All Allotments

Riparian habitat is the primary concern affecting neo-tropical birds. Riparian areas have been altered with the construction of roads, high recreational use, and concentrated livestock use. The lack of fire to suppress conifer densities has altered ponderosa pine habitat favoring species preferring dense canopies. Loss of several species of deciduous trees has affected nesting and foraging habitat for some NTMB. The absence of beaver in the watershed has changed water-holding capacities. Most streams do not have the riparian shrub component to support beaver in the current condition, with the exception of Wolf Creek.

Riparian pastures and exclosures have proven beneficial to riparian nesting habitat for NTMB. Range improvements for water development have provided water sources for nesting birds during the summer months possibly expanding nesting habitat for some birds. However, some structures have proven to be detrimental to birds. Stock tanks and troughs without escape ramps have been fatal for several species of birds and small mammals. (Craig, T.H. and L.R. Powers. 1975, Enderson, J.H. 1964). Currently there are livestock troughs in the Van allotment that do not contain escape ramps for birds and small mammals. The Proposed Alternative would assure installation of ramps for birds, bats, and small mammals in new spring and water developments.

Roads in riparian areas can impact nesting birds due to recreational activities. Camping and fishing during the nesting period can disturb nesting birds. Off road vehicle use may disturb nesting birds and can reduce shrubs by soil displacement. Within the allotment, recreational disturbance is minimal during nesting season compared to disturbance during hunting seasons in the fall months. Negative impacts from road construction in RHCA's have changed the hydrology of streams consequently affecting riparian vegetation. Approximately 3.5 miles of roads have been constructed in the RHCA's within the project area. Activities associated with roads may have detrimental affects to nesting songbirds due to disturbance during nesting periods. Hydrologic affects to aspen and other riparian shrubs also occur due to the presence of roads.

Both alternatives would not further diminish nesting and foraging for NTMB. This is due to a reduction in livestock browsing and trampling in riparian areas.

Table 14. Neotropical birds potentially found in project area that are indicating a declining population trend.

Species	Nest layer	Habitat association	20 yr	35+ yrs.	Potential factors for declining populations
Killdeer	Ground	Scab flats, roadsides	-3.2	-2.3 (-4.0)	Nest destruction from graders, livestock, & off-road vehicles. Pesticides spraying
Mourning dove	Shrub	Juniper-steppe, open Ponderosa pine	-0.9	-1.0 (-2.2)	Sagebrush conversion to agriculture. Domestic pets, primarily cats
Calliope hummingbird	Canopy	Open forest/edges, Mountain meadows, Riparian shrubs	-1.2	-0.2 (-10.4)	Lack of forest openings for flowering plants Overgrazing riparian areas
Olive-sided Flycatcher	Canopy	Forest burns w/snags Riparian, & edge	2.8	3.5 (-4.9)	Logging OG timber, fire suppression, nest predation
Willow flycatcher	Shrubs	Riparian	-1.4	-1.3 (-5.6)	Loss of riparian shrubs to hydrologic processes & overgrazing. Cowbird parasitism.
American robin	Canopy	Riparian, open forest	0.1	0.3 (-1.5)	Unknown. population decline in Oregon
Yellow warbler	Shrub	Riparian shrubs willow, cottonwood, aspen and alder	0.2	0.2 (-1.8)	Loss of shrubs from grazing & herbicide spraying. Cowbird parasitism.
MacGillivray's warbler	Shrubs	Dense willow thickets	-0.6	-0.4 (-2.1)	Loss of riparian habitat and overgrazing shrubs
Orange-crowned warbler	Ground & Shrub	Under dense willow, aspen, or mountain mahogany	-0.9	-1.2 (-3.9)	Decline in stream side vegetation Decline in aspen from conifer encroachment & browsing.
Chipping sparrow	Shrub	Open conifer forests with grassy openings	-1.0	-1.5 (-3.4)	Cowbird parasitism & competition with house sparrows
Brewers sparrow	Shrub	Big sagebrush	-2.3	-2.8 (-2.0)	Sagebrush conversion to agriculture. Invasion of exotics like cheatgrass.
Song sparrow	Shrub	Willow and riparian thickets	-0.4	-1.0 (-1.1)	Overgrazing of riparian shrubs.
Dark-eyed junco	Ground	Forest openings, aspen groves, nests in cutbanks	-1.9	-1.2 (-1.1)	Could be impacted by spring burning. Needs ground cover for nesting.
Western meadowlark	Ground	Shrub-steppe outside forested areas	-1.3	-1.2 (-0.6)	Shrub steppe conversion to agriculture. Livestock trampling. Pesticides. Conifer encroachment

Numbers indicate percent decline based on breeding bird surveys from Western Region. Numbers in (indicate Oregon population trends).

Recreation

Recreational opportunities within the Van allotment are limited because there are no developed recreation facilities. Recreational use consists primarily of dispersed activities of viewing scenery or wildlife, dispersed camping, hiking, fishing and hunting. Driving for pleasure to look at scenery and wildlife, and picnicking are also popular low-cost activities that may be practiced within the allotment. The Malheur Recreation Strategy defines the "Niche" for the Malheur National Forest as "A Traditional Way of Life". Domestic livestock on the Forest is a traditional way of life.

Recreation Opportunity Spectrum (ROS)

The Forest Service developed the Recreation Opportunity Spectrum (ROS) system to help identify, quantify, and describe the variety of recreational settings available on National Forest system lands. The ROS system provides a framework for planning and managing recreation resources. The ROS settings are classified on a scale ranging from primitive to urban. The National Forest System lands encompassed within the Van Allotment have been inventoried using the ROS system to determine what recreation opportunities and settings are available to visitors. Currently, the area meets roaded natural, and a very small portion is roaded modified. Management direction for recreation as outlined in the Forest Plan is to continue to maintain existing ROS settings.

- Roaded Natural – A predominantly natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high with evidence of other users prevalent. Resource modification and utilization practices are evident but harmonize with the natural environment. Conventional motorized use is allowed.
- Roaded Modified – a natural environment that has been substantially modified by development of structures and vegetative manipulation characterizes. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. Facilities are often provided for special activities. Moderate user densities are present away from developed sites.

The ROS setting of a Recreation place largely determines its attractiveness and utility. Many recreation opportunities, such as viewing scenery, require a natural ROS setting; other activities, such as hunting, may not directly depend on the setting.

Developed Campgrounds

There are no developed campgrounds within the allotment.

Dispersed Campsites

Dispersed campsites are rustic in nature with common features such as meat poles and rock fire rings. Dispersed campsites are easily accessed by roads and are concentrated in flat areas off main transportation systems where water is readily available. Therefore majority of dispersed camp site are near springs or creeks. There is a wide range in size and amount of disturbance for all dispersed campsites. Use of these sites varies throughout the year, with the majority of sites showing heaviest use during the fall hunting season.

Trails

There are no developed trails within the allotment.

Effects on Recreation

Direct, Indirect and Cumulative Effects from the Proposed Action Alternative

With the continuation of grazing the presence and sign of domestic livestock near dispersed campsites would continue to affect some visitors. There would be no affect to visitors in developed campgrounds or trails because there are none within the Allotment. The Proposed Action would not measurably effect the ROS classification. Future vegetation activities described in Appendix C like the Jane Vegetation Management Project would affect the ROS classification of some areas, possibly changing them from roaded natural to roaded modified.

Proposed improvements such as fence construction, aspen regeneration and protection, head cut stabilization, prescribed burning, installing rock structures, and large wood placement would affect some visitors if they are present when activities are taking place.

Direct, Indirect and Cumulative Effects from the No Grazing Alternative

Under the No Grazing alternative, conflicts between grazing and recreation uses would be eliminated. The no Grazing alternative would not measurably effect the ROS classification.

Heritage

The National Historic Preservation Act (NHPA) of 1966, as amended through 2000, states in Section 110, 2b:

> that such properties under the jurisdiction or control of the agency as are listed in or may be eligible for the National Register are managed and maintained in a way that considers the preservation of their historic, archaeological, architectural, and cultural values in compliance with section 106 of this Act and gives special consideration to the preservation of such values in the case of properties designated as having National significance.

In addition, the 1990 Malheur National Forest Land and Resource Management Plan (currently being revised) for Cultural Resource Standards states:

> The Forest will protect National Register and eligible properties from human impacts and natural degradation. Protection plans may include physical protection such as fences and barriers…

Under the NHPA the Area of Potential Effect (APE) for this undertaking is the Van grazing allotment on the Emigrant Creek Ranger District

This project area lies within the south-central margin of the Blue Mountains Physiographic Province and less than fifty miles from the Harney Lake region and Basin and Range Physiographic Province. Obsidian, an important raw material for American Indian tool manufacturing, is locally abundant over much of the project area. Food plants, game animals, and a variety of fish were among the resources available that were used by American Indian groups. Due to the elevation and associated cold winter temperatures and heavy snow pack, prehistoric use of the area probably was most intense during the warmer seasons. Archaeological sites and isolated artifacts within the project area are predominately associated with indigenous obsidian localities and available water. During the historic period the lower foothills were an entrance into the forest for grazing, hunting, homesteading and logging. Except for the steep side slopes of stream channels, much of this project area can be considered high probability for pre-contact Native American and historic Euroamerican period sites.

The existing condition of archaeological sites within the project area varies. Many Euro-American sites, such as wooden structures and log troughs, are generally better protected against logging, livestock grazing, and road building but weathering and wild fires affect their integrity. Many of the prehistoric sites within the project area have experienced disturbance to their ground surface cultural materials from historical livestock grazing, dispersed recreation, logging, road building, and artifact collecting. Typical impacts associated with livestock grazing mentioned in site records include the trampling of surface artifacts, displacement of artifacts from trailing and degradation of sites adjacent to streams, springs, developed ponds and salt licks.

The Van allotment was analyzed for past Heritage survey coverage, and all archaeological sites were identified and analyzed for their eligibility to the National Register of Historic Places (NRHP) with specific impacts listed in their site records from livestock grazing. All areas within the Van allotment where cattle tend to congregate have been adequately surveyed to today's standards (defined in Thomas 1991) for Heritage resources. The following data was compiled:

- Total number of archaeological sites within Project Area: 32
- Number of sites with recorded potential livestock impacts: 2

The two sites with recorded potential livestock impacts were shovel tested for the presence of intact subsurface archaeological deposits in the summer of 2006. The results of these tests are reported in House Creek, Van, West Malheur and Wolf Mountain Cultural Resource Inventory Survey Report 643-02/159 Appendix: 2006 Site Testing Results with Refined Mitigation Recommendations (2007). In brief, one site was not found to have any sub-surface cultural deposits and the other had a limited subsurface component which could not be evaluated as intact (or not intact) based on four shovel tests, only one of which was positive for cultural materials. That site was recommended for monitoring at 3 to 5 year intervals (Haynal 2007).

None of the remaining 30 heritage sites within the Van Allotment have been found to have significant cattle impact issues to a degree that would require subsurface testing or the implementation of mitigation design criteria (see Hann 2006 and appendices).

Native American Tribal Uses

Archaeological evidence, earlier ethnographic work, and historic accounts support the information passed on by elders regarding the traditional and continuing importance of the Planning Area to the Burns Paiute Tribe. All of the Van Allotment lies within the boundaries of the original Malheur Reservation, which continued north to the summit of the Strawberry Mountains, and east to Monument Rock.

The lands within this project area provide important natural resources for Native Americans. Plants such as camas, biscuit-root, bitterroot, onion, wax current, chokecherry and seeds from ponderosa pine trees provide important sources of food. Other plants such as yarrow, wormwood, big sagebrush and juniper are used for medicinal purposes. Many Native American crafts and tools are also made using materials gathered within the project area including willow and red-osier dogwood for basket weaving (USDA Forest Service, December 1996).

Effects on Heritage

The evaluation criteria to be used in analyzing the effects of the alternatives on Heritage Resources is the assessment of the disturbance, from livestock and livestock grazing related activities, to those qualities of an archaeological site that contribute to its eligibility for listing on the National Register of Historic Places (NRHP). The affected resources to be measured are those archaeological sites known to exist within areas where livestock congregate within the project area. For most sites within the Malheur National Forest the qualities that make them potentially eligible for inclusion on the NRHP are the artifacts contained within the sites and the spatial relationships between the artifacts.

Effects to the artifacts themselves are fairly obvious and may include direct crushing and breakage of artifacts through trampling and the increased potential for looting of artifacts through removal of vegetation. Debitage, the waste flakes generated during stone tool manufacture, are the most common artifact type at prehistoric sites on the forest. Although quite fragile, most of their information value can survive through all but the most complete crushing. This would generally be restricted to sites with rocky soils. Patterned stone tools, such as projectile points, knives, drills and scrapers, contain more information regarding the age of the site, the activities that took place there, and in some cases, the culturally affinity of the people who used the site. Damage or loss of these artifacts has a more profound effect on the qualities that make the site potentially eligible for inclusion on the NRHP.

Effects on the spatial relationship between artifacts are more difficult to identify and cause a more significant effect on the quality of the site when it occurs. These spatial relationships occur both vertically and horizontally. The vertical relationships are those in which the artifacts are situated within the soil matrix of the site. In the ideal case this creates a layer cake effect with the oldest artifacts at the bottom and the newest at the top. Unfortunately, in the real world many factors cause the artifacts to get mixed up within the matrix. These include periodic erosion events, animal burrowing, freeze/thaw effects, the growth of trees (pushing artifacts down in the roots) and the falling of trees (pulling artifacts up in their root balls). Over a period of many centuries the cumulative effects of these actions can be extreme. In fact, it is difficult to find intact vertical relationships at archaeological sites on the forest. Sites with intact buried components are rare and extremely important to understanding the prehistoric record of the region. The identification of intact buried deposits generally requires limited test excavation and analysis of soils and artifacts. Where intact buried sites are identified the potential for cattle to impact the deposits can generally be recognized through an understanding the potential effect grazing cattle have on the soil.

Horizontal relationships between artifacts can indicate where various activities took place across the site. For instance, different types of artifacts are associated with stone tool manufacturing, wood working, butchering, plant processing and cooking. These horizontal relationships sometimes also reveal changes in use over time as people in different time periods use different locations on the landscape in response to environmental or cultural changes. For instance, people may have used the same site at a meadow over many centuries but the specific use locations may change as the tree line fluctuates or a creek meanders. On relatively level ground the horizontal relationships between artifacts can remain intact even in areas with very shallow soils. On steeper ground artifacts tend to drift down slope over time. In areas where cattle congregate or trail the horizontal patterning of artifacts can become diffused as animals transport artifacts adhering to their hooves or through water transport along well used trails.

Ground surface historic artifacts (cans, bottles, and other campsite items) can be crushed and broken by trailing and congregating livestock. Standing wooden structures can be damaged and sometimes toppled by livestock rubbing or pushing on them as they congregate for cover from sun, wind, or rain. Buried sites may be close to the surface of the ground, and susceptible to trampling, especially when soils are soft during the early summer. Rock cairns can be toppled by livestock as they rub against the rock.

Direct and Indirect Effects from the Proposed Action

With this alternative, grazing in the allotment would continue using an adaptive management approach as well as physical changes to range improvements and other restoration activities. With this strategy, monitoring would aid in the identification and assessment of livestock damage to archaeological sites. Specific damage from livestock would be documented and mitigation measures would be implemented to protect those qualities of a site that make it eligible to the NRHP. The design criteria proposed with this alternative would reduce the damage currently affecting sites from livestock grazing. With adaptive management, archaeological sites would be protected from further erosion along streams where erosion has already taken place due to livestock congregating. With this alternative, terraces along streams, where archaeological sites are often found and where livestock prefer to congregate, would revegetate faster, helping to conceal surface artifacts.

With the proposed design criteria this alternative conforms to those federal laws and guidelines for the protection of NRHP-eligible sites.

Impacts to tribal uses would continue at existing levels. Livestock would continue to have direct impacts (browsing) to riparian plants such as chokecherry, willow and red-osier dogwood that are used by local tribes. Other plants, such as camas, biscuit-root, bitterroot, onion, wax current, ponderosa pine, yarrow, wormwood, big sagebrush and juniper would not be impacted directly by livestock grazing. This alternative would not prevent continuation of traditional practices.

Local tribal members are reluctant to divulge where they collect plant materials. Therefore it is unknown if activities proposed under this alternative would directly impact collection sites. If proposed activities overlap with collection areas, the effects would be beneficial to riparian vegetation and therefore beneficial to tribal uses. This alternative would not prevent continuation of traditional practices.

Direct and Indirect Effects from No Grazing

With this alternative, those sites presently incurring impacts from livestock would no longer be adversely affected by the trailing of livestock to water sources, however, large wildlife ungulates would continue to use these same trails. Livestock, and large ungulates, would no longer be attracted to salting areas where the surface of the ground is substantially affected. Archaeological sites, in areas along streams where erosion has already taken place due to livestock congregating, may continue to erode unless rehabilitative measures were taken. Terraces along streams, where archaeological sites are often found and where livestock prefer to congregate, would revegetate over a number of years, helping to conceal surface artifacts.

This alternative conforms to those federal laws and guidelines for the protection of NRHP-eligible sites.

Impacts to tribal uses would be beneficial. No grazing would be beneficial to riparian vegetation and therefore beneficial to tribal uses. This alternative would not prevent the continuation of traditional practices.

Cumulative Effects from the Proposed Action

Implementation of the mitigation measures with this alternative should prevent, or at least reduce, impacts that are currently affecting archaeological sites within this allotment. However, the cumulative effects of natural elements, logging, road building, grazing, surface collecting and/or illegal digging, and natural fuels reduction projects could still be reflected in these sites.

Impacts to tribal uses would be cumulative with past and future management of vegetation. Future vegetation projects such as the Jane Vegetation Management Project would have beneficial impacts to tribal uses because proposed activities would have beneficial impacts to vegetation in the long term.

Cumulative Effects from No Grazing

Under this alternative grazing would not contribute to the cumulative effects to cultural resources taking place in this project area. It is possible that additional effects from wild fire could occur when cattle do not annually reduce fine fuels but if this contributed to a return to historic fire regimes it may actually reduce the long term effects on sites.

Impacts to tribal uses would be cumulative with past and future management of vegetation. Future vegetation projects such as the Jane Vegetation Management Project would have beneficial impacts to tribal uses because proposed activities would have beneficial impacts to vegetation in the long term.

Other Required Disclosures

Floodplains and Wetlands

No effects on wetlands and floodplains are expected from implementing any of the alternatives.

Prime Rangeland, Farm Land and Forest Land

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

Environmental Justice

Executive Order 12898 requires all Federal Agencies to make environmental justice part of each agency’s mission, by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects on minority populations or low-income populations. The alternatives do not differ from one another in their effects on minorities, Native Americans, women, or the civil liberties of any American citizen. There would be no disproportionate effects on minority or low-income populations by any of the alternatives for this project.

Energy Requirements and Conservation Potential of Alternatives

The energy consumption associated with the alternatives, as well as the differences between alternatives, is insignificant.

Effects on Public Health and Safety

There would be no adverse or unusual effects on public health and safety from implementing any of the alternatives.

Irreversible and Irretrievable Resource Commitments

Irreversible resource commitments involve nonrenewable resources. Irretrievable resource commitments involve renewable resources. There would be no significant irreversible or irretrievable commitment of resources from implementing any of the alternatives.

Adverse Environmental Effects Which Cannot be Avoided

The implementation of the alternatives would not result in any significant adverse environmental effects and would not affect long-term productivity.

Relationship Between Short-Term Uses and Long-Term Productivity

Due to the use of BMP’s (specific mitigation measures, management requirements and constraints, and Forest Plan (as amended) standards and guidelines), there would be no effects to long-term productivity.

Cumulatively Significant Effects

There would be no cumulatively significant effects from implementing any of the alternatives on the human environment within the scope of the Proposed Action.

CHAPTER 4 – ACROYNMS, GLOSSARY, LIST OF PREPARERS, DISTRIBUTION LIST, AND LITERATURE CITED

Commonly used Acroynms

AMP - Allotment Management Plans

AOI - Annual Operating Instructions

AUM – Animal Unit Month

BA – Biological Assessment

BE - Biological Evaluation

BMP – Best Management Practices

BLM - Bureau of Land Management

CEQ – Council on Environmental Quality

DMA - Designated Monitoring Areas

EA - Environmental Assessment

EIS – Environmental Impact Statement

FONSI – Finding of No Significant Impact

FS - Forest Service

FSH - Forest Service Handbook

FSM - Forest Service Manual

HEI - Habitat-Effectiveness Index

HRV - historical range of variability

IDT – Interdisciplinary Team

IIT - Interagency Implementation Team

LOS - late and old structural stands

LRMP - Malheur Land Resource Management Plan

LWD - large woody debris

MA - Management Areas

MIS - Management Indicator Species

MO - management objective

MOU – Memorandum of Understanding

NEPA - National Environmental Policy Act

NRHP – National Register for Historic Places

NFMA - National Forest Management Act

NTMB - neo-tropical migratory birds

ODA - Oregon Department of Agriculture

PACFISH and INFISH

PAG - Plant Association Groups

PFC - Proper functioning condition

PFA - Post Fledging Area

PVG - Potential Vegetation Groups

RHCA - Riparian Habitat Conservation Areas

RMO - Riparian Management Objectives

TES - Threatened, Endangered and Sensitive Species

USDA – United States Department of Agriculture

USFWS – United States Fish and Wildlife Service

WA - Watershed Assessment

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 is collected over time and “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.
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.

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.
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.

Enclosure - An area fenced to regulate animal use.

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).
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.
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.
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 residual vegetation/stubble height to ensure consistency across the PACFISH, INFISH area is included with IIT monitoring protocol.

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).

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.

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.

Satisfactory Range Condition – On suitable range, forage condition is at least fair, with stable trend, and allotment is not classified PC (basic resource damage) or PD (other resource damage).

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.

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).
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.
Unsatisfactory Range Condition – Allotment does not meet criteria for satisfactory condition.
Upland — Ground elevated above the lowlands along rivers or between hills. The 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:

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.

Y
Yearlong Grazing - Continuous grazing for a calendar year.

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Consultation and Distribution List

The Forest Service consulted with the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the scoping process of this environmental assessment. Those denoted with a [1] are on the Preliminary EA distribution list.

Agencies

BLM, Burns District

[1]County Court for Harney County

County Court for Grant County

Malheur County SWCD

Oregon Dept. of Fish and Wildlife

Oregon Water Resources Dept.

US Fish & Wildlife Service

US EPA Region 10 NEPA Review

Tribes

[1]Burns Paiute Tribe

Confederated Tribes of Warm Springs

Confederated Tribes of Umatilla

Nez Perce Tribe

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Organizations and Businesses

3J Cattle Co.

ACW Inc.

[1] Actin Ranch Inc.

Anchor Cross Ranch

[1] Blue Mountain Biodiversity Project

Boise Cascade Corporation

Drinkwater Ranch

[1] Grant County Conservationists

Harney Rock and Paving Co.

Hi Desert Snow Drifters

H_Ranch

Harney County Gypsum LLC

Hell-N-Gone Ranch

High Desert Fur Takers

Jack and Merilee Young Land Co.

KZZR-AM/KQHC-FM

L. S. & D. Logging

Malheur Timber Operators

Northwest Environmental Defense Center

[1] Oregon Chapter Sierra Club

[1] Oregon Wild (Formerly ONRC)

[1] Oregon Natural Desert Association

Oregon Sheep Growers Association

[1] Oregon Cattlemen's Association

Ponderosa Ranch

Prairie Wood Products

Rutter Cedar Products

Rocky Mountain Elk Foundation

Silver Creek Ranches of Oregon LLC

Southworth Brothers

Upper SF John Day Watershed Council

[1] Van Grazing Cooperative

Literature Cited

Anderson, E.W., and R.J. Scherzinger. 1975. Improving quality of winter forage for elk by cattle grazing. Journal of Range Management. 28:120-125.

Avery, M.L., P.F. Springer and N.S. Dailey. 1978. Avian mortality at man-made structures: An annotated bibliography. USFWS report FWS/OBS-78/58.

Bailey, V. 1936. The mammals and life zones of Oregon. North American Fauna, 55:1-416 in Verts, B.J. and Leslie N. Carraway.1998. Land Mammals of Oregon.

Bosch, J.M. and J.D. Hewlett. 1982. A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. J. Hydrol., 55: 3 – 23.

Belsky, A.J., Matzke, A. and Uselman, S. 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. Journal of Soil and Water Conservation 54(1): 419-431.

Branson, F.A., G.F. Gifford, and R.F. Hadley. 1981. Rangeland Hydrology. Kendall/Hunt Publishing Company, Dubugue, Iowa.

Burns Times-Herald. 2005.Destination Harney County, 2005-2006 Visitor Relocation Information Guide. A Supplement to the Burns Times-Herald, April 27, 2005. Pp 28-30.

Bayley, P.B. and H. Li.. 2002. Analyses of fish responses to exclosures. IN: Kauffman, J.B., P. Bayley, H. Li, P. McDowell, and R.L. Beschta. 2002. Final report research/evaluate restoration of NE Oregon streams: effects of livestock exclosures (corridor fencing) on riparian vegetation, stream geomorphic features, and fish populations. Bonneville Power Administration. Project Nos: 2000-051-00 and 2000-051-01. 87 p.

Behnke, Robert J., Native Trout of Western North America. American Fisheries Society Monograph 6, 1992.

Bjorn, TC and Reiser, DW, 1991. Habitat requirements of salmonids in streams. In: W.R. Meehan, Editor, Influences of forest and rangeland management on salmonid fishes and their habitats, Special Publication vol. 19, American Fisheries society, Bethesda, Maryland.

Borman, Michael M. 2005. *Forest Stand Dynamics and Livestock Grazing in Historical Context. Conservation Biology*, Volume 19, No. 5, October 2005.

Brookshire, E.N.J. and K.A. Dwire. 2003. Controls on patterns of coarse organic particle retention in headwater streams. J. N. Am. Benthol. Soc. 22(1):17-34.

Buol, S.W., R.J. Southard, R.C. Graham, P.A. McDaniel. 2003. Soil Genesis and Classification, Fifth Edition. Iowa State Press, Ames, IA, p. 236.

Campbell, Robert B. and Bartos, Dale L. 2000. Aspen Ecosystems: Objectives for Sustaining Biodiversity. Sustaining Aspen in Western Landscapes: Symposium Proceedings: 13 USDA Proceedings. Grand Junction CO. 15pp.

Carlson, Garwin. 1974. Soil Resource Inventory, Malheur National Forest.

Chamberlin, T.W., R.D. Harr, and F.H. Everest. 1991. Chapter 6: Timber Harvesting, Silviculture, and Watershed Processes. In Chapter 6: Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication 19, pp.181-205.

Chaney, E., W. Elmore and W.S. Platts. 1990. Livestock grazing on western riparian areas. US Environmental Protection Agency document.

Clary, W.P. and B.F. Webster. 1989. Managing grazing of riparian areas in the Intermountain Region. Gen. Tech. Rep. INT-263. USDA-FS, Ogden, UT.

Clary, W.P. and D.E. Medin. 1990. Differences in vegetation biomass and structure due to cattle grazing in a northern Nevada riparian ecosystem. Res. Pap. INT-427. USDA-FS

Clary, Warren P. and Kinney, John W. 2002. Streambank and Vegetation Response to Simulated Cattle Grazing. Wetlands. Vol. 22, no. 1 (Mar. 2002) p 139-148.

Craig, T.H. and L.R. Powers. 1975. Raptor mortality due to drowning in a livestock watering tank. Condor 78:412.

Craig, T.H., and L.R. Powers. 1976. Drowning of Grassland Birds in Stock Tanks. 1976. Condor 78: 412

Crocker-Bedford, D.C. 1990. Goshawk reproduction and forest management. Wild. Soc. Bull. 18: 262-269 in Marshall David B. 1992 Status of the Northern Goshawk in Oregon and Washington p6.

Crowe, Elizabeth A. and Roderick R. Clausnitzer. 1997. Mid-Montane plant associations of the Malheur, Umatilla, and Wallowa-Whitman National Forests. USDA Forest Service, Pacific Northwest Region, Technical Paper R6-NR-ECOL-TP-22-97.

Cole, David N. 1988. Disturbance and Recovery of Trampled Montane Grassland and Forests in Montana. Research paper INT-389. U.S. Department of Agriculture, Forest Service, Intermountain Research Station.

DEQ's 1994/1996 303(d) List of Water Qyality Limited Waterbodies, Oregon Dept. of Environmental Quality, July 1996.

Dobkin, D.S. et al. 1995. Nest-site relationships among cavity-nesting birds of riparian and snowpocket aspen woodlands in the northwestern Great Basin. Condor 97: 694-707 in Marshall 2003 Birds of Oregon p.357.

Duck Creek Associates, Inc. 2004a. Schurtz Creek Stream Survey Report. Submitted to Richard Vetter and Vincent Hunter, Emigrant Creek Ranger District, Hines, OR.

Duck Creek Associates, Inc. 2004b. Calamtiy Creek Stream Survey Report. Submitted to Richard Vetter and Vincent Hunter, Emigrant Creek Ranger District, Hines, OR.

Duck Creek Associates, Inc. 2004c. Vegetation and Fire and Fuels sections IN: Canyon Creek Watershed Analysis. Malheur National Forest, John Day, OR. Available on the Internet at: http://www.fs.fed.us/r6/malheur/canyon-cr/canyon-cr-list.htm.

Elmore, W. and R.L. Beschta. 1987. Riparian Areas: Perceptions in management. Rangelands 9(6):260-265

Enderson, J.H. 1964. A study of the prairie falcon in the central Rocky Mountains region. The Auk., 81 : 332-352.

Ganskopp, Dave, Tony Svejcar, Fred Taylor, Jerry Farstvedt, and Kara Paintner. 1999. Seasonal cattle management in 3 to 5 year old bitterbrush stands. Journal of Range Management. Vol. 52:166-173.

Ganskopp, D., Svejcar, T., and Vavra, M. 2004. Livestock forage conditioning: Bluebunch wheatgrass, Idaho fescue, and bottlebrush squirreltail. USDA-ARS Eastern Ore. Agr. Res. Ctr. 67826-A Hwy 205, Burns, Ore. 97720. J. Range Management. 57:384-392.

Garner, Ron. 2005. Personal Communication. Oregon Dept. Fish and Wildlife District Wildlife Biologist. Hines, OR

Gill, S.I., M.A. Naeth, D.S. Chanasyk and V.S. Baron. 1998. Runoff and sediment yield from snowmelt and rainfall as influenced by forage type and grazing intensity. Canadian Journal of Soil Science. 78:699-706

Gonzales, Dan. 2005. Personal Communication. Oregon Dept. Fish and Wildlife District Habitat Biologist. Hines, OR

Green, J.S., and J.T. Flinders. 1980. Habitat and dietary relationships of the pygmy rabbit. J. Range Managment33:136-142. in Verts, B.J. and Leslie N. Carraway.1998. Land Mammals of Oregon

Hall, Federick C.; Bryant, Larry. 1995. Herbaceous stubble height as a warning of impending cattle grazing damage to riparian areas. Gen. Tech. Rep. PNW-GTR-362. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 9 p.

Hann, Don 2006. House Creek, Van, West Malheur and Wolf Mountain Cultural Resource Inventory Survey Report 643-02/159. Document on file at the Malheur National Forest Supervisor's Office, John Day, Oregon.

Haynal, Patrick 2007. House Creek, Van, West Malheur and Wolf Mountain Cultural Resource Inventory Survey Report 643-02/159 Appendix: 2006 Site Testing Results With Refined Mitigation Recommendations. Document on file at the Malheur National Forest Supervisor's Office, John Day, Oregon.

Hibbert, A.R.. 1967. Forest treatment effects on water yield. In: Forest Hydrology, eds. W.E. Sopper and H.W.Lull, 813 pp., Pergamon, Tarrytown, NY.

Holecheck, Jerry L., Gomes, Hilton, Molinar, Francisco, Glat, Dee, and Valdez, Raul, 2000. Short Duration Grazing:The Facts in 1999. Rangelands. 21(5): 18-22.

Irwin, L.L., J. M. Peek. 1983. Elk habitat use relative to forest succession in Idaho. J. Wildlife Management. 47 664-672 in North American Elk Ecology and Management Toweill and Thomas 2002 p.539.

Kauffman, J.B., Krueger, W.C., 1984. Livestock Impacts on Riparian Ecosystems and Streamside Management Implications.. A Review. Journal of Rang Management. 37(5) 430-438.

Kauffman, J.B., P. Bayley, H. Li, P. McDowell, and R.L. Beschta. 2002. Final report research/evaluate restoration of NE Oregon streams: effects of livestock exclosures (corridor fencing) on riparian vegetation, stream geomorphic features, and fish populations. Bonneville Power Administration. Project Nos: 2000-051-00 and 2000-051-01. 87 p.

Kauffman,-JB; Thorpe,-AS; Brookshire,-ENJ. 2004. Livestock exclusion and belowground ecosystem responses in riparian meadows of Eastern Oregon. Ecological-Applications, 14(6): 1671-1679.

Kie, John G., Evans, Charles J., Loft, Eric R., Menke, John W. 1991. Foraging Behavior by Mule Deer: The Influence of Cattle Grazing. U.S. Forest Service Southwest Research Station., 2081 E. Sierra Ave.. Fresno CA. Journal Wildlife Management 55(4): 665-674.

Kondolf, G.M. 1993. Lag in Stream Channel Adjustment to Livestock Exclosure, White Mountains, California. Restoration Ecology, Dec. 1993, p. 226 - 230.

Korman, Elaine. 2003. Recovery efforts 2002 fires: Social and economic conditions, Malheur National Forest. 1 June. 40 p.

Kreuper, D.J. 1993. **Effects of land use practices on western riparian ecosystems.** In: Saab, Victoria A. and Rich, Terrell D. Large-Scale Conservation Assessment for Neotropical Migratory Land Birds in the Interior Columbia River Basin. 1997 Gen. Tech. Rep. USDA Pac. NW Res. Sta. Portland, OR 56pp.

Kruger, W.C., et al. November 2002. Environmental Impacts of Livestock Grazing on U.S. Grazing Lands. Task Force Issue Paper Number 22. Council for Agricultural Science and Technology, Ames, Iowa.

Leonard, S., Kinch G., Elsbernd V., Borman M., and Swanson S., 1997. Grazing Management for Riparian-Wetland Areas. TR 1737-14. USDI, Bureau of Land Management – Service Center, Denver, CO. 63 p.

Loewen and Schwenke, 2002. Vegetative Management Analysis of Juniper.

Mackie, R.J. 1970. Range Ecology and relations of mule deer, other game animals and livestock in the Missouri River breaks. Montana Wildl. Monogr. The Wildlife Soc., Washington, D.C. 20: 1-79.

Magilligan, FJ and PF McDowell. 1997. Stream channel adjustment following the elimination of cattle grazing. JAWRA, 33(4): 867 – 878.

Martin, DW and JC Chambers. 2001. Restoring riparian meadows: Biomass and species responses. Journal of Range Management, 54:284 – 291.

Miller, R.F., and J. A. Rose. 1999 Fire history and western juniper encroachment in sagebrush steppe. Journal of Range Management 52:550-559.

Minshall, G.W., S.E. Jensen and W.S. Platts. 1989. The ecology of stream and riparian habitats of the Great Basin Region: A community profile. USFWS Biol. Rep. 85(7.24)

Medin, D. E.., and W. P. Clary. 1989. Small Mammal Populations in a Grazed and Ungrazed Riparian Habitat in Nevada. US. Dept. Agr. For Serv. Intermountain Res . Sta. Res. Paper INT-413

_________. 1991. Breeding bird populations in a grazed and ungrazed riparian habitat in Nevada. US. Dept. Agr. For Serv. Intermountain Res . Sta. Res. Paper INT-441.

Mosgrove, Jerry L. 1980. The Malheur National Forest: an ethnographic history. 253 p.

Meehan, W.R., editor. 1991. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19.

Naeth, M.A., Bailey, A.W., Pluth, D.J., Chanasyk, DD.S., and Hardin, R.T. 1991. Grazing impacts on litter and soil organic matter in mixed prairie and fescue grassland ecosystems of Alberta. Journal of Range Management 44(1): 7-13.

Neff, D. J. 1980 Effects of watershed treatment on deer and elk range use. Job Proj. Rept. W-78 R4/5, Arizona Game and Fish Dept. Tucson, AZ 28pp. in Toweill and Thomas. North American Elk Management and Ecology 962pp.

Nelson, J.R., and D.G. Burnell. 1975. Elk-cattle competition in central Washington in Toweill and Thomas. North American Elk Management and Ecology 962pp.

Nelson, J.R. 1985. Rare plant surveys: techniques for impact assessment. Natural Areas Journal, Vol. 5., No. 3, pp 18-30.

Oregon Department of Environmental Quality. 2003. OREGON ADMINISTRATIVE RULES, Chapter 340, Division 041 - Department of Environmental Quality. WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON. Available Online: http://www.deq.state.or.us/wq/wqrules/Div41/OAR340Div41.pdf, pg. 23 – 29.

Oregon Employment Department 2003. Eastern Oregon labor trends. April. http://www.qualityinfo.org/pubs/olt/03/olt-0403.pdf. 14 p.

Prichard, Don. 1999. A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. Technical Reference 1737-16. Denver, Colorado.

Platts, W. S. 1991. Livestock grazing. Pages 389-423 In W. R. Meehan, editor. Influences of forestand rangeland management on salmonid fishes and their habitats. American Fisheries Society, SpecialPublication 19, Bethesda, Maryland

Quigley, Thomas M.; Arbelbide, Sylvia J., tech. eds. 1997. An assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins: volume 3. Gen. Tech. Rep. PNW-GTR-405. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Reeves, GH; Hall, JD; Roelofs, TD; Hickman, TL; Baker, 1991. CO Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. pp. 519-557. American Fisheries Society Special Publication [Am. Fish. Soc. Special Pub.]. no. 19.

Reynolds, Richard T. et al. 1992. Management Recommendations for the Northern Goshawk in the Southwestern United States. Gen Tech. Rept RM-217 USDA Forest Service Rocky Mtn. For. Rang Exp. Stat. Fort Collins CO 90pp

Rosgen D. 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, Colorado.

Rowland, Mary M, Wisdom, Roads USDA Forest Service For.rng Sci. Lab. La Grande OR 37pp Michael J Johnson, Bruce K., Kie, John G. Elk Distribution and Modeling in Relation to Roads. Journal of Wildlife Management 64:33. 672-684.

Saab, Victoria A. and Rich, Terrell D. Large-Scale Conservation Assessment for Neotropical Migratory Land Birds in the Interior Columbia River Basin. 1997 Gen. Tech. Rep. USDA Pac. NW Res. Sta. Portland, OR 56pp.

Stewart, Kelley M., Bowyer, TerryR., Kie, John G., Cimon, Norman J.,and Johnson, Bruce K., 2002. Temporospatial Distributions of Elk, Mule Deer, and Cattle: Resource Partitioning and Competitive Displacement. Journal of Mammalogy: 83 (1): 239-244.

Skovlin, Jon M. and Jack Ward Thomas. June 1995. Interpreting long-Term Trends in Blue Mountain Ecosystems from Repeat Photography. USDA Forest Service, Pacific Northwest Research Station, PNW-GTR-315.

Sharp, Brian E. 1992. Neotropical Migrants on National Forests in the Pacific Northwest: A compilation of existing information. Ecological Perspectives, Portland, OR.

Sheehy, D.P. 1978. Characteristics of shrubland habitat associated with mule deer fawns at birth and during early life in southeastern Oregon. Ore. Dept. Fish and Wldl. Inf. Rep. Ser. , Wldl. 78-1, 31p. Corvallis

Sterling, J.C. 1999. Gray Flycatcher (Empidonax wrightii). In The Birds of North America, No. 458 (A. Poole and F. Gill, eds.)

Southworth, Jack; Capital Press, Feb. 19, 1993. "Riparian enclosures worth taking a chance on". Guest Comment by Jack Southworth

Swanson, David K. 2005. Evaluation of Ecology Monitoring Plots on the House Creek and Van Allotments, Malheur National Forest

Tewksbury, J.J., A.E. Black, N. Nur, V.A. Saab, B.D. Logan, and D.S. Dobkin. 2002. Effects o Anthropogenic Fragmentation and Livestock Grazing on Western Riparian Bird Communities. Studies in Avian Biology. Vol 25 (1) pp 158-202.

Thomas, J.W, et. al. 1979. Wildlife Habitats in Managed Forests the Blue Mountains of Oregon and Washington. USDA Forest Service. Agr. Hnbk. No. 553. 512pp.

Thomas, Suzanne Crowley. 1991. Malheur National Forest Cultural Resource Inventory Plan. Manuscript on file at the Malheur National Forest, John Day, Oregon.Thomas, J.W. et. al. 1988 Habitat- Effectiveness Index for Elk on Blue Mountain Winter Ranges. Gen. Tech. Rpt. PNW-Gtr-218. 28pp

USDA, Natural Resources Conservation Service. 1998. Introduction to Water Quality Student Workbook. National Employee Development Center, FT. Worth, TX.

USDA, 1994. Ecological Subregions of the United States: Section DescriptionsWO-WSA-5. Compiled by W. Henry McNab and Peter E. Avers, Washington D.C., July 1994.

USDA, 2004. Middle Fork Stream Survey, Malheur National Forest, August 2004.

USDA, 2005. USDA Forest Service, Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005

U.S. Drought Monitor. August 2003. U.S. Drought Monitor Map. Available: http://www.drought.unl.edu/dm/monitor.html.]

USDA Forest Service, Pacific Northwest Region. 1990. Final Environmental Impact Statement and Record of Decision, Land and Resource Management Plan, Malheur National Forest.

USDA Forest Service. 1994. "Regional Foresters Amendment No 1". Notice for the Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales. Including Appendices. Signed May 20, 1994 by John Lowe.

USDA Forest Service. 1995. "Regional Foresters Amendment No 2". Decision Notice for the Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales. Including Appendices. Signed June 5, 1995 by John Lowe.

USDA Forest Service, Pacific Northwest Region. 1996. Lower Malheur Watershed Assessment.

USDA Forest Service, Pacific Northwest Region. 1988. General Water Quality Best Management Practices.

USDA Forest Service, Malheur National Forest. 2004. "Malheur contributions to special emphasis programs". August 25. 1 p.

USDA Forest Service. 2004. Draft Environmental Impact Statement, Martin Basin Rangeland Project, Santa Rosa Ranger District, Humboldt-Toiyabe National Forest, Humboldt County, Nevada.

USDA Forest Service, Malheur National Forest. 2004 Proper Functioning Condition Surveys of House and Schurtz Creeks

USDA Forest Service and Oregon Department of Forestry. 2004. Forests, farms and people: Land use change on non-federal land in Eastern Oregon 1975-2001. 42 p.

USDA Forest Service. 2005. Regional Forester's Sensitive Plant List, Pacific Northwest Region.

U.S. Forest Service (USFS). 1994. Amendment 29, Management Area 3A. IN: USFS 1990. Land and resource management plan (LRMP), appendices, and amendments: Malheur National Forest, John Day, Oregon.

U.S. Forest Service (USFS). 1995. Inland Native Fish Strategy (INFISH), Decision Notice/Finding of No Significant Impact, Environmental Assessment, Inland Native Fish Strategy, Interim Strategies for Managing Fish-Producing Watershed in Eastern Oregon and Washington, Idaho, Western Montana, and Portions of Nevada.

U.S. Forest Service (USFS). 2002. Stream Inventory Handbook, Level I & II. PNW-R6. Version 2.2.

USDA. 1995a. Interim strategies for managing anadromous fish-producing watersheds in eastern Oregon and Washington, Idaho and portions of California. [PACFISH]. Decision Notice February 24, 1995.

USDA. 1995b. Interim strategies for managing fish-producing watersheds in eastern Oregon and Washington, Idaho and portions of California. [INFISH]. Decision Notice July 28, 1995

USDA. 1995c. PACFISH Enclosure B; Grazing Guidelines Revision. July 31, 1995.

USDI, 1997. Technical Reference 1737-14. Riparian Area Management, Grazing Management for Riparian-Wetland Areas. TR 1737-14. BLM

Vavra, M. et al. 1989. Implications of Dietary Overlap to Management of Free-Ranging Large Herbivores. Proceedings Western Section, American Society of Animal Science. Vol. 40. Eastern Oregon Agr. Res. Center. Burns OR. 7p.Vetter, Richard. Personal communication March 17, 2005.

Warren, S.D., Thurow, T.L., Blackburn, W.H., and Garza, N.E. 1986. The Influence of Livestock Trampling under Intensive Rotation grazing on Soil Hydrologic Characteristics. Journal of Range Management 39(6): 491-495.

Wilderness Society, The. 2004. Population, employment, earnings and personal income trends: Grant County , OR. Report. Pacific Northwest Office. 27 p.

Winward, Alma H. 2000. Monitoring the vegetation resources in riparian areas. Gen. Tech. Rep. RMRS-GTR-47. Ogden Utah: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 49 p.

Wisdom, M.J., and J.W. Thomas. 1996. Elk. Pages 157-181 in P.R. Krausman (ed.) Rangeland and Wildlife Soc. for Range Management Denver, Co.

Weiss, N.T. and B.J. Verts, 1984. Habitat and distribution of pygmy rabbits in Oregon. The Great Basin Naturalist. 44:563-571. in Verts, B.J. and Leslie N. Carraway.1998. Land Mammals of Oregon.

APPENDIX A

Draft Range Monitoring Guidelines
Malheur National Forest

Malheur National Forest
Range Monitoring Guidelines
June 9, 2005

INTRODUCTION

This document provides clarification and a common understanding of monitoring methods and strategies available for use on the Malheur National Forest.

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. Therefore no one monitoring method can always be applied across the Forest. The monitoring used and associated assessments 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.

Following is a sample of publications that describe many of the monitoring methods available for use on the Malheur National Forest.

- *"Utilization Studies and Residual Measurements"*, Interagency Technical Reference 1734-3;
- *"Sampling Vegetation Attributes",* Interagency Technical Reference 1734-4.
- *"Monitoring the Vegetation Resources in Riparian Areas",* RMRS-GTR-47.
- *"Riparian Area Management",* TR 1737-15; A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas:
- *"Guidelines for Establishing Allowable Levels of Streambank Alteration",* by Ervin R. Cowley (March, 2002).
- Program Manual for *"Implementation Monitoring Program for PACFISH, INFISH and the 1998 Biological Opinions for Salmon, Steelhead, and Bull Trout",* July, 2003.
- *"Monitoring Streambanks and Riparian Vegetation – Multiple Indicators",* Technical Bulletin No. 2005-001; March, 2005.

Resource monitoring usually takes two forms; 1) Implementation Monitoring and 2) Effectiveness Monitoring (commonly referred to as trend monitoring):

1) Implementation monitoring of grazing activities (usually short term) looks at resource indicators to determine if the affects of projects or management actions are within the established parameters set to accomplish resource objectives.

   Implementation monitoring usually looks at utilization of herbaceous (grass and sedges) and browse (shrubs) vegetation plus the impacts of livestock to soils and streambanks to determine if the affects of livestock grazing are within established parameters.

2) Effectiveness (also referred to as trend) monitoring looks at resource indicators over time to determine if we are moving towards, away from, or have met the desired resource objectives.

Effectiveness monitoring usually looks at changes in vegetation types and density and physical characteristics of streams and uplands over a long period of time. This monitoring also may look at species populations and distribution as well as other indicators. Cumulative impacts due to all types of projects or management activities, as well as natural processes such as fire, insect infestations, etc. that have taken place on the area being monitored must be considered when reviewing the monitoring results. The present potential of the area or feature being looked at is also considered.

Because of changes in constraints and priorities over the years, the type and amount of range monitoring used on the Forest has been limited mostly to implementation monitoring. Some effectiveness (long term trend) monitoring has been conducted on the Forest, but mostly on the uplands.

FOREST PLAN STANDARDS & GUIDELINES

The Land and Resource Management Plan for the Malheur National Forest as amended (Forest Plan), provides the direction, goals, objectives, and standards by which this National Forest is to be managed.

Standards for grazing are listed in Chapter IV of the Forest Plan. It established quantifiable utilization standards for grazing Forest Wide and in riparian areas (see Forest Wide standard 87 and Management Areas 3A/3B standard #18). These standards are utilization levels of grass and grass-like species, and shrubs (see Tables IV-2, IV-4, and IV-5).

Two amendments to the Forest Plan (Amendment 29 in 1994 & PACFISH/INFISH in 1995) supplemented existing management direction and standards in the Forest plan by replacing existing conflicting direction that provided less protection for aquatic habitat. PACFISH/INFISH amendment did not replace existing Forest Plan direction where the Forest Plan provided more protection for aquatic habitat (See Attachment A).

PACFISH/INFISH identified six interim Riparian Management Objectives (RMOs).

The RMOs have numeric values for (see Glossary):

- RMO 1. Pool Frequency
- RMO 2. Water Temperature
- RMO 3. Large Woody Debris
- RMO 4. Bank Stability
- RMO 5. Lower Bank Angle
- RMO 6. Width/Depth Ratio

The RMOs were developed for the entire interior Columbia Basin. They were considered interim, anticipating that site-specific objectives would be developed as new data, monitoring, and experience led to understanding of site-specific values and variability. Local RMOs have not been developed for the Malheur National Forest. Some of the RMOs, especially 1, 2, and 3, respond very slowly to changes in management. For example, it can take 80 to 100 years to meet the large woody debris RMO east of the Cascades where trees have been removed. Pool frequency changes mainly occur in response to 10 to 20 year flood events. RMOs 4, 5, and 6 can be more responsive to livestock management practices. Although still not amenable to annual monitoring, changes in these RMOs are generally measurable in 3 to 5 years.

PACFISH/INFISH standards and guidelines GM-1 to GM-4 state that grazing activities will not retard or prevent the attainment of (RMOs). Retard is defined in PACFISH/INFISH as slowing the rate of recovery below the near natural rate of recovery

Additional guidelines for grazing activities were provided in Enclosure B *"Recommended Livestock Grazing Guidelines"* (Revised 7/31/95) of the PACFISH implementation direction letter (August 14, 1995) from Gordon Haugen, Columbia River Basin/PACFISH Coordinator (See Attachment B).

MONITORING GUIDELINES

As previously mentioned implementation monitoring has been the main emphasis on the Forest. This monitoring will continue but it has become evident that effectiveness/trend monitoring is needed to determine the success of current management strategies, particularly in riparian areas (in meeting GM-1). Because of limited funding and personnel, emphasis will generally be placed on monitoring riparian areas. However, the uplands are also important and should not be ignored. The general assumption is that if the riparian areas are managed appropriately and meet, or are moving towards the desired condition (objectives) the uplands, are managed appropriately as well.

When monitoring, invite participation from the permittee and/or their representative where feasible.

Move Indicators/Move Triggers

Move Indicators/Move Triggers will be used to define when livestock should be moved. The livestock should be moved before these indicators are exceeded. They are most often indicators of allowable use in a given riparian area and are designed to maintain livestock effects to stream channels and riparian vegetation at acceptable levels. Common indicators/triggers currently in use are forage utilization, stubble height, streambank alteration, woody browse, and move date. Although they frequently use similar types of parameters as "endpoint indicators," move indicators/move triggers have different purposes and need to be considered separately from endpoint indicators.

An example of move indicators/triggers might be:

Plant Species	**% Max Allowable Use**	**Locations**
Riparian spp. If Available or	35% or 6 inch stubble height, 10% bank alteration	All greenlines of streams
Riparian Shrubs	Un-used or lightly used	Riparian Zones
Grass and Grasslike	35% of available	Area outside of the greenline

Although these may be checked by a Forest Service employee it is the responsibility of the permittee to move their livestock off and keep them off the unit so as not to exceed the move indicators/triggers. These indicators are established so that if they are not exceeded there is a high degree of confidence that the endpoint indicators will be met.

Move Indicators/Move Triggers are set by the land management agency responsible for the allotment and may be changed if the standards or objectives are not being achieved.

Uplands

Effectiveness/Trend Monitoring

In the 1950s and early 1960s Parker Three-Step C&T (Condition & Trend) Transects were installed throughout the Forest. The majority of these were established in the uplands. Over the last five years many of these transects have been re-examined. The procedure has been to read the transect using the original Three-Step method and then reread the transect using a modified Daubenmire cover/frequency method (see Attachment D & Technical Reference 1734-4). This allows comparisons between old and new information to determine trend and establishes a baseline using the more accurate cover/frequency method for gathering future data. The re-examining of these established transects will continue. If new trend transects are established the modified Daubenmire cover/frequency will be used.

Implementation Monitoring

As previously mentioned there are a variety of monitoring methods available for use (refer to previously listed documents). The method or methods to be used will depend on the questions needing to be answered and considering other priorities. In some cases ocular observation (qualitative) will be sufficient, but when specific concerns are identified you may need quantitative methods such as Paired Clipped plots or height weight. Some of the more commonly used methods can be found in *"Utilization Studies and Residual Measurements"*, Technical Reference 1434-4.

Riparian Areas

To attain more information that would better help us determine if riparian resources are moving towards meeting the (RMOs) set forth in the Forest Land Management Plan as Amended, Forest personnel designed a monitoring strategy which combines accepted methods of both implementation and effectiveness/trend monitoring. It includes protocols to qualitatively and quantitatively evaluate the effects of the grazing activities on riparian habitats and stream channels. It uses both multiple indicator monitoring assessments (MIM), which are largely quantitative in nature, and proper functioning condition assessments (PFC), which are largely qualitative. MIM is used on specific monitoring sites, while PFC applies to larger stream reaches. Both are based on sound scientific principles and can be used to establish riparian condition and trend. Refer to **Attachment E** for a detailed description of the ***"Malheur National Forest Riparian Monitoring (Condition & Trend) Strategy.***

This monitoring strategy is very adaptive. The information collected can be used not only to assist in determining what changes may be needed to grazing management but also for NEPA analysis of other Forest management and restoration activities and projects. Also, as new scientific findings or improvements in methodologies occur, the monitoring methods used can be changed or modified.

MIM is applied at (DMAs) that have been established on a stream where usually, but not always, a PFC has been completed. In 2004 a total of 37 miles of PFC assessments were completed and 18

Designated Monitoring Areas (DMAs) were established and assessed with MIM on the Malheur National Forest. Under this monitoring strategy it is planned to reanalyze the DMAs every five years. During years between full MIM monitoring it is planned to do the implementation monitoring annually or semi-annually.

This strategy is planned to be implemented Forest wide. It will be applied on a priority basis and be consistent with available funding and personnel. It is hoped that this strategy can be implemented in about 30 locations per year.

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.

Implementation Monitoring

For those riparian areas where the MIM has not been implemented (baseline established) the following implementation monitoring will be used.

Endpoint indicators are used to determine if the stream and associated riparian areas that were actually used by livestock in the current year's grazing season are in a condition that can be expected to result in a desired trend in aquatic habitat quality.

The monitoring procedure is described in "*Monitoring Streambanks and Riparian Vegetation – Multiple Indicators"*, Technical Bulletin No. 2005-001 (Attachment C). Additional information on the purpose for monitoring endpoint indicators is available in the *"Program Manual, July 1, 2003",* for the Implementation Monitoring Program for PACFISH, INFISH and the 1998 Biological Opinions for Salmon, Steelhead, and Bull Trout.

DMAs will need to be established for this implementation monitoring. The criteria for selecting DMAs is in Technical Bulletin No. 2005-001 (Attachment C).

Setting endpoint indicators and values being monitored for must be determined and **documented though the interdisciplinary team effort**. This includes the Level one Team where appropriate.

General starting points for establishing Desired Riparian Values and End-Point Indicators (see Attachment E)

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 Objectives

- 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)

EndPoint Indicators (Condition Thresholds)
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)

Desired Channel Morphology Objectives (In Development)
Bankfull width/depth ratio:
Percent fines <6mm:

Using the methods described above does not preclude using other methods also as needed.

GLOSSARY

Move Indicators/Move Triggers - define when livestock should be moved. The livestock should be moved before these indicators are exceeded. They are most often indicators of allowable use in a given riparian area and are designed to maintain livestock effects to stream channels and riparian vegetation at acceptable levels. Common indicators/triggers currently in use are forage utilization, stubble height, streambank alteration, woody browse, and move date. Although they frequently use similar types of parameters as "endpoint indicators," move indicators/move triggers have different purposes and need to be considered separately from endpoint indicators.

Move Indicators/Move Triggers are set by the land management agency responsible for the allotment and may be changed if the standards or objectives are not being achieved.

DMAs – A "designated monitoring area" is the location in riparian areas and along streambanks of a livestock grazing unit (pasture), where monitoring takes place. DMAs are not "key areas," under the classic range management definition used for upland monitoring; but are areas representative of grazing use specific to riparian areas used by livestock.

DMAs should not reflect an average amount of use in all riparian areas of the stream reaches in the pasture. Instead, they should reflect typical livestock use where they enter and use vegetation in riparian areas immediately adjacent to the stream. DMAs may be selected where livestock use exceeds the apparent average use of riparian areas in the pasture if, for example, the assumption is made that condition at the monitoring site reflects higher use on than other stream segments within the pasture and the DMA meets objectives, then the rest of the pasture is also meeting the objectives (see Attachment C for further information about DMA selection and use).

Small livestock concentration areas, such as trail crossings and water gaps, usually less than 30 meters (100 feet) in length should not be considered as a DMA. If these sites cause resource problems, they should be treated as a site and not as part of the overall livestock management.

Endpoint indicators – are monitoring parameters that can be linked directly to effects of livestock grazing as well as riparian or channel processes. They are used to determine if the stream and associated riparian areas that were actually used by livestock in the current year's grazing season are in a condition that can be expected to result in a desired trend in aquatic habitat quality.

Endpoint indicators relate the condition of the stream or riparian area, after livestock use, by the typical time of the next flow event that reaches or exceeds bank-full; therefore, the appropriate time to measure and evaluate endpoint indicators is after the end of all grazing use in the pasture and after it is in the condition that it will be in by the time of the next high flow event that reaches or exceeds bank-full.

Although parameters for endpoint indicators may be similar to those for annual move indicators/move triggers, the two are not the same.

To meet the purpose, endpoint indicators should meet the following criteria:

- Relate directly to livestock grazing
- Be relatively easy to monitor
- Provide consistent results

- Provide relatively quick information on likely trend in aquatic habitat conditions
- Be useful across a wide variety of grazing strategies.

Most if not all appropriate indicators for stream/riparian areas will center on (1) vegetation (herbaceous and/or woody riparian species) for protection and building of streambanks and (2) mechanical damage that leaves streambanks vulnerable to increased energies experienced during high flows. For example, residual stubble height is an endpoint indicator that has been correlated with a number of parameters that are beneficial to salmonids on stream types that are dependent on herbaceous vegetation for streambank stability (Clary, 1999). However, in other situations, where streambanks depend on both herbaceous and woody vegetation for stability, streambank alteration or streamside vegetation utilization (woody and herbaceous) may be more appropriate as the endpoint indicator.

GM-1 Standard states:

PACFISH
"Modify grazing practices (e.g. accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives (RMO) or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusting practices is not effective in meeting RMOs and avoiding adverse effects on listed anadromous fish."

INFISH
"Modify grazing practices (e.g. accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect inland native fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objectives."

GM-2 Standard - PACFISH & INFISH states: "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 Riparian Management Objectives. Relocate or close facilities where these objectives cannot be met."

GM-3 Standard - PACFISH & INFISH states: "Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that would not retard or prevent attainment of Riparian Management Objectives or adversely affect inland native fish."

GM-4 Standard - PACFISH & INFISH states: "Adjust wild horse and burro management to avoid impacts that prevent attainment of Riparian Management Objectives or adversely affect inland native fish."

Greenline Vegetation - is the first perennial vegetation closest to the water line at the time of measurement. The greenline is generally composed of rushes, sedges, and riparian grasses, such as bluejoint reedgrass or creeping bentgrass.

Implementation Monitoring Task Team – This team reports to the Deputy Team and provides direction to the field units for implementation monitoring protocols and upward reporting.

Interagency Implementation Team – Sometimes referred to as the IIT (PACFISH/INFISH, PIBO) this oversight team was made up of State Deputies for USFS, BLM, USFWS, NOAA, and EPA. It was dissolved and replaced by the "Implementation Monitoring Task Team."

Key areas – are portions of the range that because of its location and available forage receives more use by livestock than the rest of the range. **It does not reflect an average amount of use.** It serves as a monitoring and evaluation focal point for range condition, trend, and degree of grazing use. Properly selected key areas give an indication of the overall ability of current grazing management to meet all resource management objectives. A key area guides the general management of the entire area of which it is a part.

Key Management Species - Those species, which must, because of their importance within the plant community, be specifically identified and considered in the management program. These species are known to respond to grazing pressure in certain ways and are therefore valuable for determining when it is time to remove the livestock so that long-term objectives can be met. They are normally native species, are palatable to livestock and /or wildlife, and are an important part of the plant community. In other words they are the herbaceous and or shrub species we want or should be there.

PIBO - Is the PACFISH/INFISH Biological Opinion signed and approved in 1998 by the Regional Foresters (R1, R4, R6), Regional Director of the Fish and Wildlife Service, and BLM State Directors (OR/WA, ID, MT, NV).

Riparian - refers to land adjacent to perennial streams, lakes, and reservoirs and including other well developed riparian vegetation (primarily intermittent streams). This land is specifically delineated as the transition between the aquatic ecosystem and the adjacent upland terrestrial ecosystem and is defined by soil characteristics and distinctive vegetation communities that require free and unbound water (water influence zone). This encompasses the flood prone area, which is a zone adjacent to the stream bank that is subject to frequent flooding, i.e. every 1-3 years. "Green line" and riparian area are not identical.

RMOs – Riparian Management Objectives developed in the interim for landscape scale assessment used for describing optimum habitat for anadromous fish. Applied at the watershed scale for streams of moderate to large size (3rd to 6th order streams). The indicators are:

1) Pool Frequency (all systems; PACFISH & INFISH) – varies by channel width,

Wetted width in feet:	10	20	25	50	75	100	125	150	200
Number of pools per mile:	96	56	47	26	23	18	14	12	9

2) Water Temperature PACFISH – No measurable increase in maximum water temperature (7 day moving of daily maximum temperature measured as the average of the maximum daily temperature of the warmest consecutive 7 day period). **Maximum water temperature below 64°F within migration and rearing habitats and below 60°F within spawning habitats.**

INFISH - No measurable increase in maximum water temperature (7 day moving of daily maximum temperature measured as the average of the maximum daily temperature of the warmest consecutive 7-day period). **Maximum water temperature below 59°F within adult holding habitat and below 48°F within spawning and rearing habitats.**

<u>3) Large Woody Debris</u> (forested systems; <u>PACFISH</u>) – East of Cascade Crest in **OR, WA, ID**: > 20 pieces/Mile; > 12 inches diameter; > 35 ft. length.

<u>INFISH</u> – East of Cascade Crest in **OR, WA, ID, NV, and western MT**: > 20 pieces per mile; > 12 inch diameter; > 35 foot length.

<u>4) Bank Stability</u> (non-forested systems <u>PACFISH & INFISH</u>) - > 80 percent stable.

<u>5) Lower Bank Angle</u> (non-forested systems <u>PACFISH & INFISH</u>) - > 75 percent of banks with < 90 degree angle (i.e., undercut)

<u>6) Width/Depth Ratio</u> (all systems <u>PACFISH & INFISH</u>) - < 10 (mean wetted width divided by mean depth)

<u>RHCAs</u> – Riparian Habitat Conservation Areas are portions of watersheds where riparian dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs 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 the stream, and (4) protecting water quality (Naiman et. al. 1992)

<u>University of Idaho Stubble Height Study Report (2004)</u> – A team of scientists, land management agency specialists, ranchers, and consultants was formed in 2003 to review and make recommendations for the use of stubble height monitoring to the Regional Forester, Region 4 Forest Service and the State Director, Idaho BLM.

LITERATURE CITED

Cowley, E.R. and T.A. Burton. 2005. Monitoring Streambanks and Riparian Vegetation – Multiple Indicators. Tech. Bull. No. 2005-002. USDI, BLM, Idaho State Office. Boise, ID.

Hall, Frederick C. & Bryant, Larry. 1995. Herbaceous Stubble Height as a Warning of Impending Cattle Grazing Damage to Riparian Areas. General Technical Report. PNW-GTR-362

Interagency Technical Reference. 1999. Utilization Studies and Residual Measurements. Interagency Technical Reference. BLM/RS/ST-96/004+1730

Interagency Technical Reference. 1999. Sampling Vegetation Attributes. Interagency Technical Reference. BLM/RS/ST-96/002+1730

Prichard, D. 2003. Riparian Area Management: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas. Tech. Ref. 1737-16. 1999, revised 2003. USDI, BLM. Denver, CO.

Prichard, D. 1998. Riparian Area Management: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. Tech. Ref. 1737-15. USDI, BLM. Denver, CO.

Technical Report. 1998. RIPARIAN AREA MANAGEMENT. A User Guid to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. TR 1737-15

University of Idaho Stubble Height Review Team. 2004. University of Idaho Stubble Height Study Report. U. of I. Forest, Wildlife and Range Experiment Station, Contribution No. 986.

Winward, Alma H. 2000. Monitoring the Vegetation Resources in Riparian Areas. General Technical Report RMRS-GTR-47.

ATTACHMENTS

APPENDIX B

Draft Riparian Monitoring Strategy
Malheur National Forest

Draft 5/16/2005

Malheur National Forest
Riparian Monitoring (Condition & Trend) Strategy

Photo by Tom Friedrichsen

Middle Fork John Day River

Tom Friedrichsen
Brian Hoefling
Alan Miller

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Malheur National Forest
Riparian Monitoring (Condition & Trend) Strategy

[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. Moreover, risk analyses and prioritization should be completed in all areas prior to initiating monitoring in order to determine the level and intensity of quantitative data collection. PFC assessments serve as the risk analyses/prioritization step.

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 stream reach (geomorphic or unit specific)
    - Multiple Indicator Monitoring (MIM) – quantitative assessment of a site specific location
    - Analysis – interpretation and evaluation of information to assess current riparian condition and trend)
    - Channel cross-section, streambed particle size distribution, and reach description measurements (i.e. Rosgen Channel Type)

2. Determinations – demonstrate compliance with Forest Plan, including PACFISH & INFISH amendments. See Appendix A for further discussion of Forest Plan standards and objectives related to riparian areas, water quality and fish habitat.
    - Standards are GM 1-4 in PACFISH & INFISH; standards 15-21 in Forest Plan (see Chpt. IV).
    - Management Objectives for stream and riparian areas are described in PACFISH & INFISH amendments (RMO's) and in Amendment 29 of Forest Plan for MA3A/B (DFC's).

3. Recommendations
    - Shows linkage between condition, trend, and past/current management activities
        - A process that provides support for decisions
            - Allows annual adjustment of management strategies, as needed, to achieve desired riparian objectives

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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 a journey level interdisciplinary team. One purpose of these assessments is to help correlate the findings with the trend towards 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 B 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 2005 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 C 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 C for the procedures used to collaboratively 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 MONITORING - ENDPOINT INDICATORS

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 to refine and make annual adjustments to livestock grazing management practices necessary to meet long-term management objectives (adaptive management). See Appendix C for sampling procedures used.

Effectiveness Monitoring - Riparian Objectives

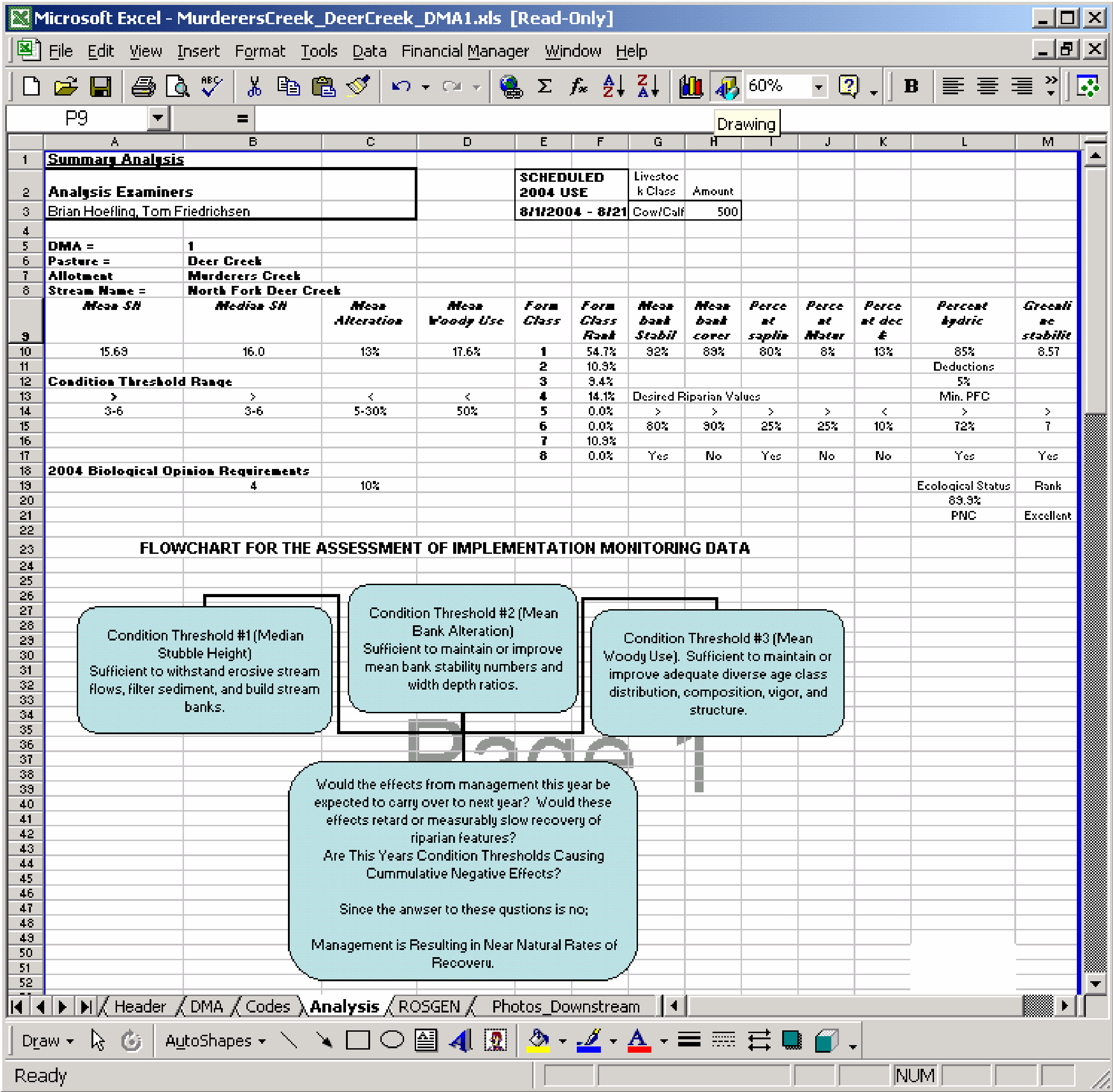
Effectiveness (riparian objective) monitoring is designed to address the question of whether or not management practices currently applied to the area are achieving the desired results. These procedures are designed to measure changes in vegetation and streambank stability over time, i.e., trend. The goal is to conduct effectiveness 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, although unusually wet years and/or flood events may result in short-term changes that validate the need to monitor more frequently, or at least at the time of the event. 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 C for sampling procedures used.

In 2005, additional information collected will include: **Channel morphology objectives (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 D 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 and channel morphology objectives) monitoring data in order to determine riparian and channel conditions and compare them over time. The primary purpose of the decision flowchart is to assess implementation and effectiveness 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

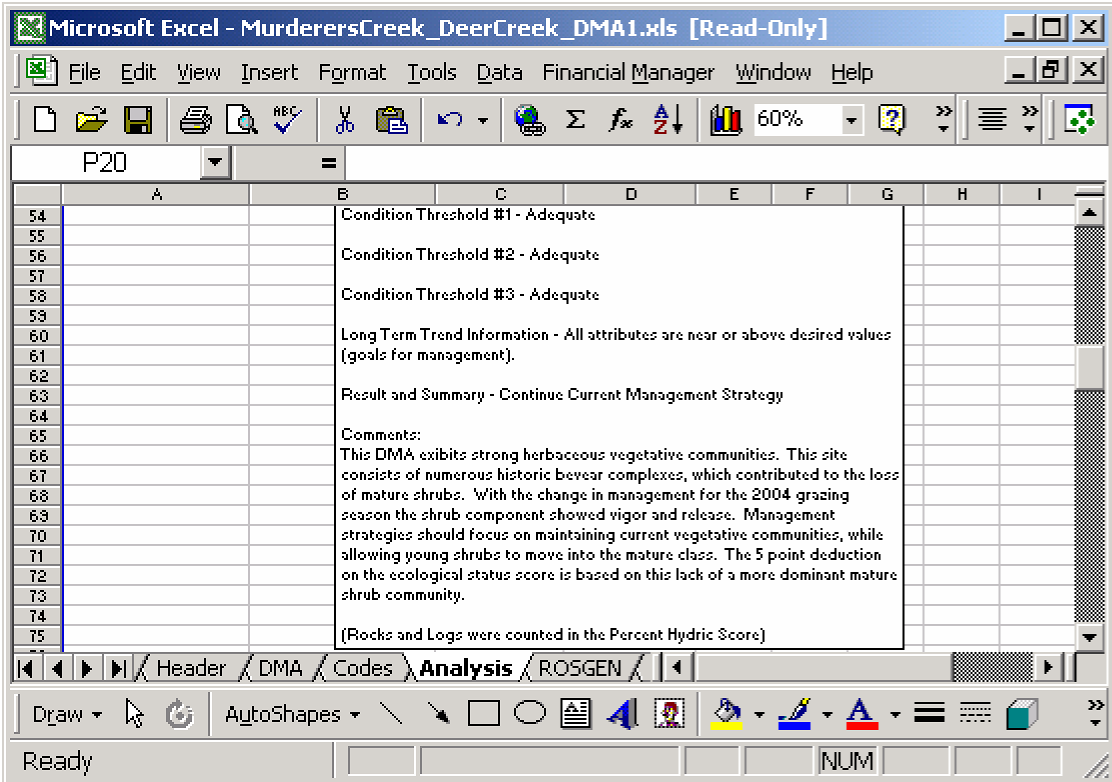


Microsoft Excel - MurderersCreek_DeerCreek_DMA1.xls [Read-Only]

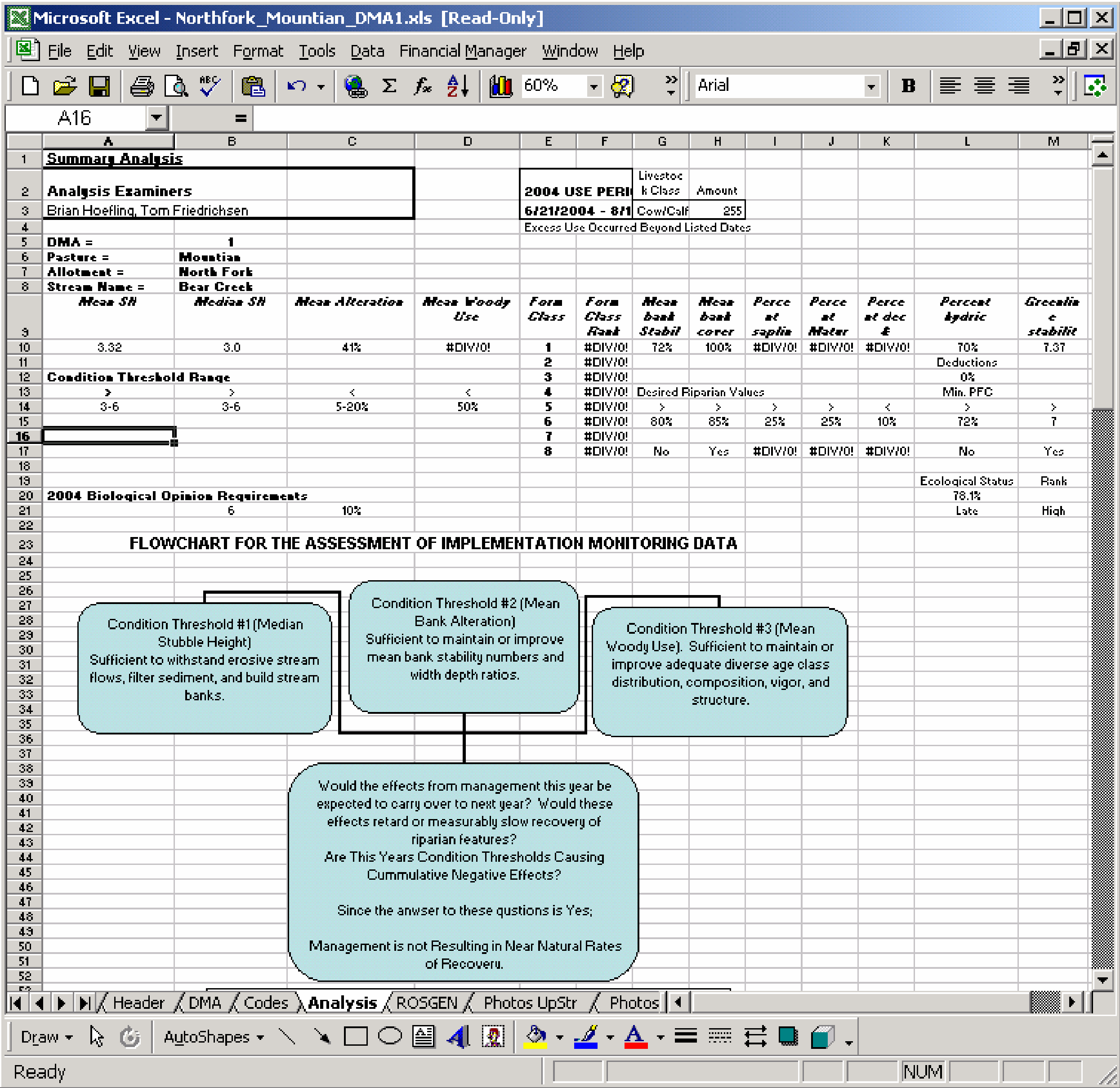
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Summary Analysis**												
2	**Analysis Examiners**				**SCHEDULED 2004 USE**		Livestock Class	Amount					
3	Brian Hoefling, Tom Friedrichsen				**8/1/2004 - 8/21**		Cow/Calf	500					
4													
5	**DMA =**	**1**											
6	**Pasture =**	**Deer Creek**											
7	**Allotment**	**Murderers Creek**											
8	**Stream Name =**	**North Fork Deer Creek**											
9	***Mean SH***	***Median SH***	***Mean Alteration***	***Mean Woody Use***	***Form Class***	***Form Class Rank***	***Mean bank Stabil***	***Mean bank cover***	***Perce nt saplin***	***Perce nt Matur***	***Perce nt dec d***	***Percent hydric***	***Greenli ne stabilit***
10	15.69	16.0	13%	17.6%	**1**	54.7%	92%	89%	80%	8%	13%	85%	8.57
11					**2**	10.9%						Deductions	
12	**Condition Threshold Range**				**3**	9.4%						5%	
13	>	>	<	<	**4**	14.1%	Desired Riparian Values					Min. PFC	
14	3-6	3-6	5-30%	50%	**5**	0.0%	>	>	>	>	<	>	>
15					**6**	0.0%	80%	90%	25%	25%	10%	72%	7
16					**7**	10.9%							
17					**8**	0.0%	Yes	No	Yes	No	No	Yes	Yes
18	**2004 Biological Opinion Requirements**												
19		4	10%									Ecological Status	Rank
20												89.9%	
21												PNC	Excellent

FLOWCHART FOR THE ASSESSMENT OF IMPLEMENTATION MONITORING DATA

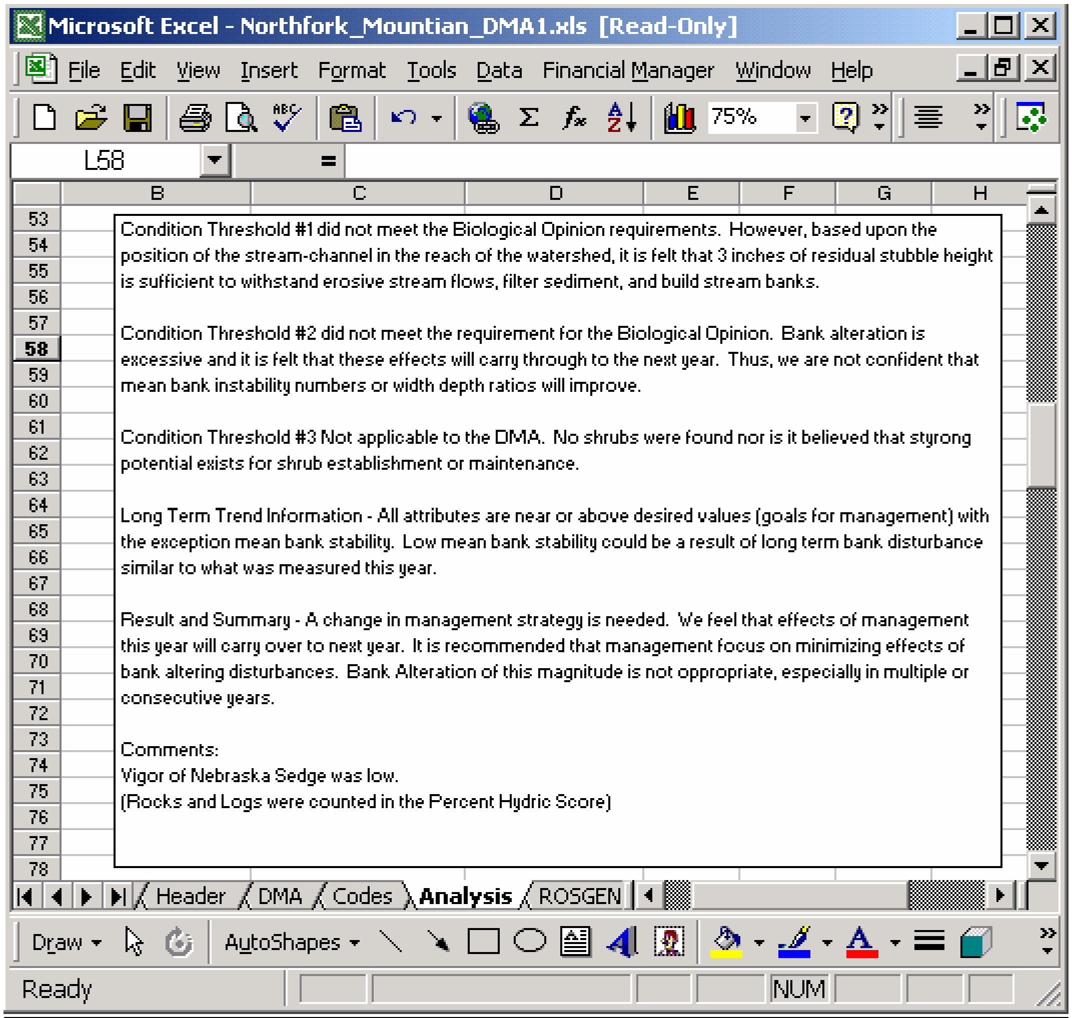
DECISION FLOWCHART EXAMPLE



DECISION FLOWCHART EXAMPLE



DECISION FLOWCHART EXAMPLE


Microsoft Excel - Northfork_Mountian_DMA1.xls [Read-Only]

Condition Threshold #1 did not meet the Biological Opinion requirements. However, based upon the position of the stream-channel in the reach of the watershed, it is felt that 3 inches of residual stubble height is sufficient to withstand erosive stream flows, filter sediment, and build stream banks.

Condition Threshold #2 did not meet the requirement for the Biological Opinion. Bank alteration is excessive and it is felt that these effects will carry through to the next year. Thus, we are not confident that mean bank instability numbers or width depth ratios will improve.

Condition Threshold #3 Not applicable to the DMA. No shrubs were found nor is it believed that styrong potential exists for shrub establishment or maintenance.

Long Term Trend Information - All attributes are near or above desired values (goals for management) with the exception mean bank stability. Low mean bank stability could be a result of long term bank disturbance similar to what was measured this year.

Result and Summary - A change in management strategy is needed. We feel that effects of management this year will carry over to next year. It is recommended that management focus on minimizing effects of bank altering disturbances. Bank Alteration of this magnitude is not oppropriate, especially in multiple or consecutive years.

Comments:
Vigor of Nebraska Sedge was low.
(Rocks and Logs were counted in the Percent Hydric Score)

Header / DMA / Codes / Analysis / ROSGEN

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 as amended by PACFISH and INFISH. While the RMOs are largely quantitative and rely on physical measurements taken using appropriate scientific methods (such as Level II Stream Survey), 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 structure and function of riparian areas and stream channels to determine if grazing management is retarding attainment of RMOs. 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 current grazing management practices are being successful in meeting a "Near Natural Rate of Recovery" as required by standard GM-1. 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 from early to late-seral vegetative communities, as determined during the PFC assessment process, can be a reliable indicator of successful management towards a "Near Natural Rate of Recovery". 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/DFC Categories	Comparable Attributes & Processes Addressed by PFC Assessment	Relation
Pool Frequency/Mile	3, 9, 11, 13	When properly functioning riparian areas and stream channels are adequately processing streamflows and sediment yields, the streams physical potential can be expressed.
Water Quality (Temperature)	3, 4, 6, 7, 8,11,15	Properly functioning riparian vegetation, channel condition, and channel sinuosity contribute to maintenance or improvement of water temperature
Large Woody Debris (LWD)	6, 12, 13	For riparian areas with the potential for large woody debris, the indicators compare existing to potential
Bank Stability	3, 4, 9, 11, 13, 15, 17	As the vegetation composition of a riparian areas moves towards plants with large dense root structures and physical and biological factors are able to keep streamflow energy and sediment yields in balance, bank structure and geometry can approach site potential
Lower Bank Angle	3, 9, 11, 15, 17	
Channel Width/Depth Ratio	3, 4, 8, 9, 11, 13, 15, 17,	
Sediment/Substrate	1, 3, 5, 15, 16, 17	
Riparian Vegetation (% of bank cover)	11	

PACFISH/INFISH grazing guidelines (Enclosure B Rev. 8/14/95) state that the "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 trend towards attainment of RMOs, 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 affects 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 grazing 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, effectiveness (riparian and channel morphology objectives) 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 (endpoint indicator) 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 through the ID Team process.

When Multiple Indicator Monitoring is included to address if management practices related to livestock grazing are meeting near natural rates or recovery (i.e. 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.

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 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. In 2004, where overlap occurred in the same stream reach, there was a strong correlation (identical results) between the two methods. Based on these results, the Malheur National Forest utilized the strong correlation to make highly supported determinations of riparian condition and trend, even on reaches where only a PFC assessment was conducted. 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 B and C, 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 C, 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):

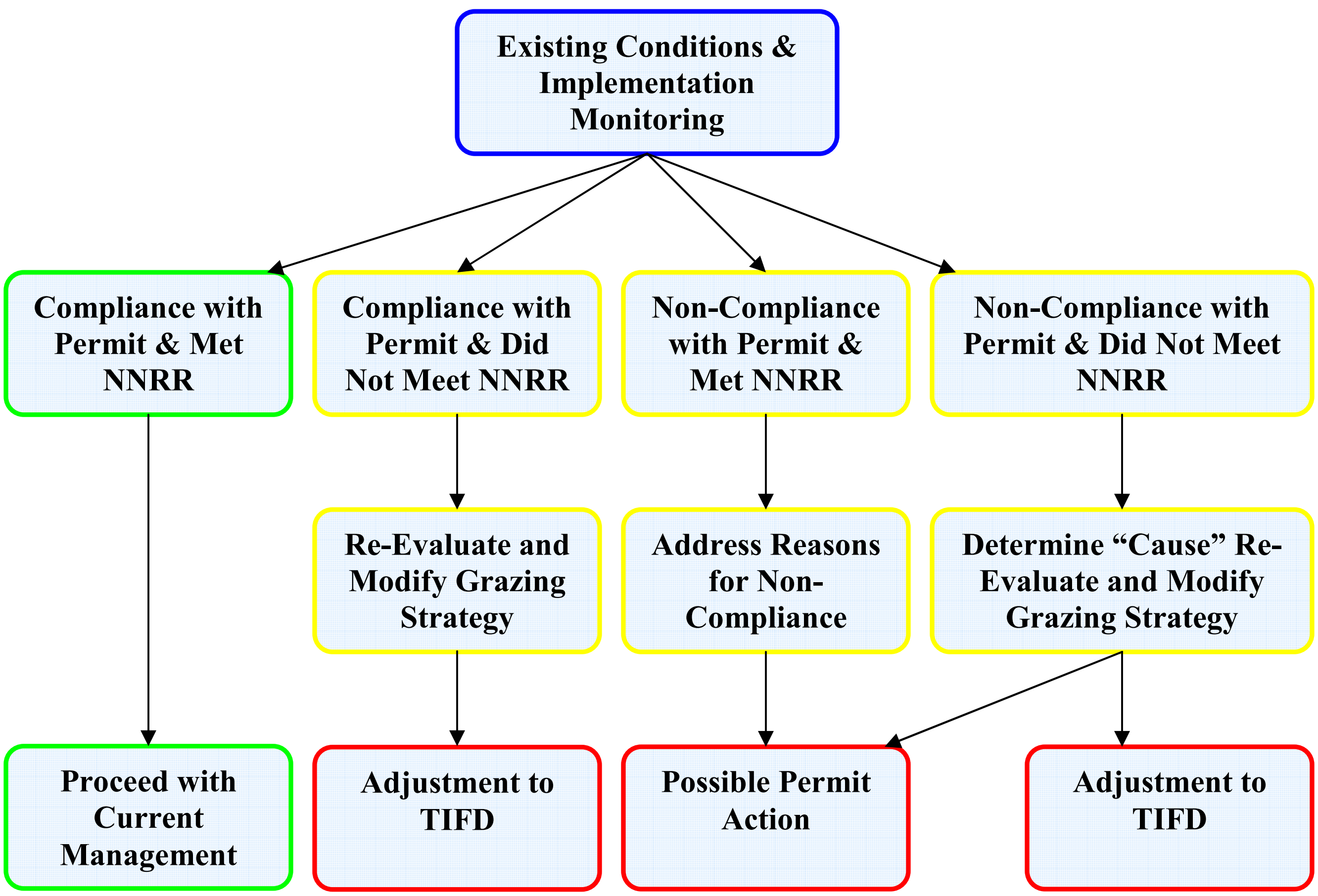
1. Floodplains are inundated by relatively frequent events (i.e., 1-3 years).
2. Stream sinuosity, width/depth ratio, and pool frequency reflect the capabilities of the setting (i.e., landform, geology, and bioclimatic region).
3. Lateral stream movement is associated with natural sinuosity, (i.e., streambank 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 the available 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.

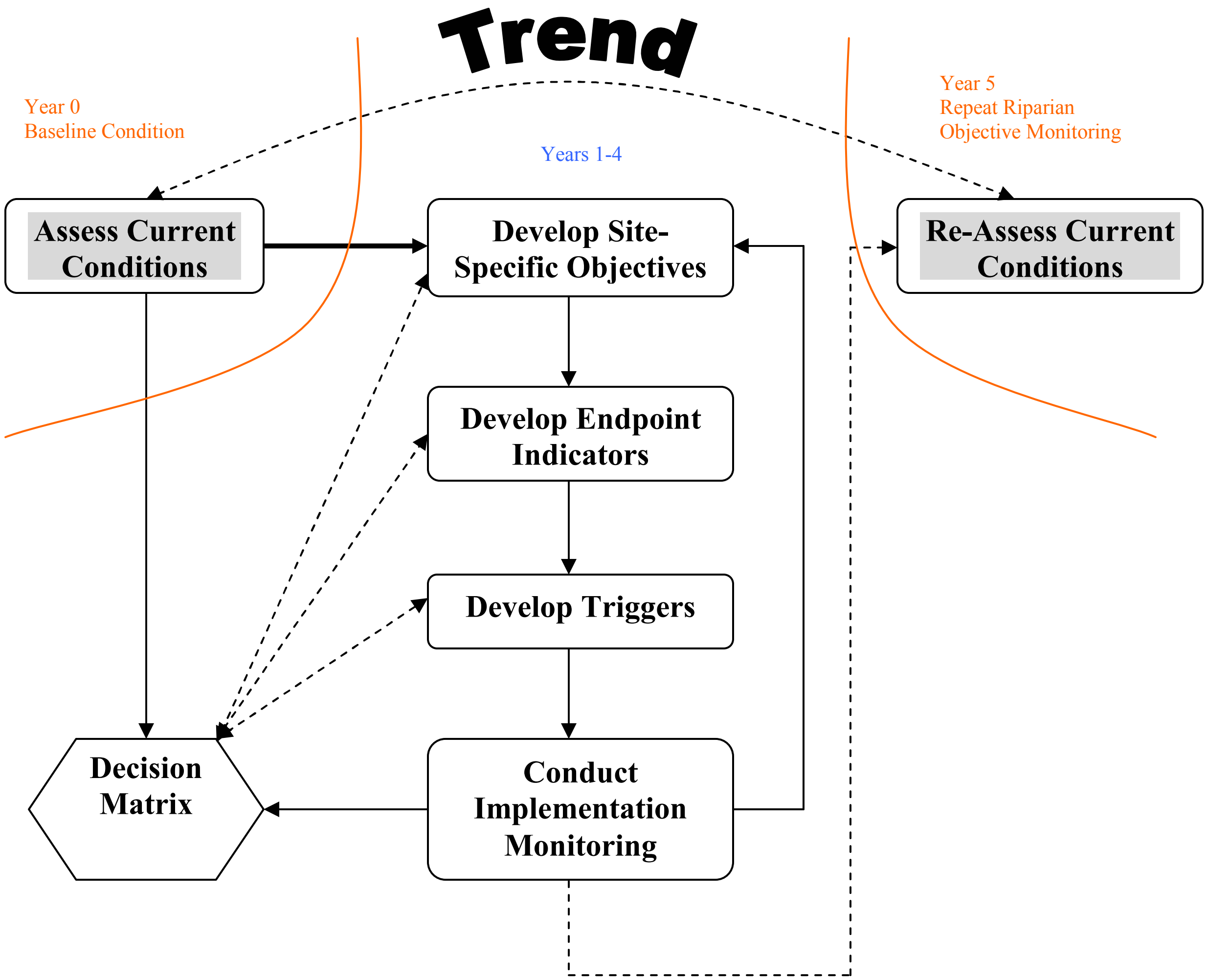
3. Recommendations

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 to develop a decision matrix (see below); the end product of which is a roadmap displaying the current ecological condition, a determination of whether or 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 riparian vegetation and channel morphology objectives 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.
   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 provide individual desired riparian values (riparian vegetation and stream channel attributes) that may be adjusted as more information is gathered. 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 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 (goal is to repeat the measurements every 5 years). 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 Objectives
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 (Condition Thresholds)
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)

Desired Channel Morphology Objectives (In Development)
Bankfull width/depth ratio:
Percent fines <6mm:

APPENDIX C

Past, Present and Future Activities in the Cumulative Effects Area

Appendix C
Past, Present, and Future Activities in the Cumulative Effects Area of the Van Allotment

Past Activities

Background

The last Range Environmental Analysis (REA) for the Van Allotment was completed in 1981. Due to the heavy livestock utilization on primary ranges and the poor condition of Schurtz Creek riparian zone, an environmental assessment and decision notice for the Van Allotment was prepared in 1985. This work formed the basis for management changes associated with the Van Allotment Range Management Plan developed and signed in 1985.

Grazing records for this area date back to 1949 when the Van Allotment was created. The east-west division fence was completed in the spring of 1970, creating two pastures, North (Dry Creek) and South (Schurtz Creek) pastures. The units are rotated and used first on alternative years. Grazing pressure from 1949 to 1954 was season long consisting of 175 cattle or 700 AUM from June 16 to October 16. From 1955 to 1969, season long grazing of 142 head, or 568 AUM were permitted for the same season. In 1970, a division fence was constructed splitting the Van Allotment into two pastures. A system of two-pasture deferred-rotation was initiated at that time. A complete history of this allotment can be found in the Emigrant Creek Ranger District 2210 files. Field data records and allotment maps are also filed at the District.

Range Management Plan

A Range Management Plan for the Van Allotment was completed in 1967-8 and again in 1985. The 1967-8 plan was based on data obtained from a 1957 range analysis. At that time, it was estimated the allotment contained 6,648 acres of National Forest Lands and 2,134 acres (32%) were considered unsuitable for grazing. Of the suitable acres (4,514 acres), 62% (2,789 acres) were considered primary range and 38% (1,725 acres) were considered secondary range. Twenty-six percent of the suitable range was considered to be in very poor condition. Additionally, Schurtz Creek stringer meadow was identified as eroding and in very poor condition.

The 1957 range analysis estimated grazing capacity for the allotment to be 265 AUM on primary range and 207 AUM on secondary range for a total of 472 AUM. Livestock forage allocation at the time provide for 142 head from 6/16 to 10/15 (568 AUM), thus exceeding the estimated maximum capacity by 15% based on combined primary and secondary range.

In 1981 a range analysis for the Van Allotment indicated the allotment was overstocked by 21%. A total of 568 AM's were permitted with only 450 AM's of forage available. This range analysis also noted heavy livestock utilization on primary ranges and the poor condition of Schurtz Creek riparian zone. For these reasons, an environmental assessment and decision notice for the Van Allotment was prepared in 1985. This environmental assessment and decision notice formed the basis for management changes associated with the 1985 Van Allotment Range Management Plan. The selected alternative identified new improvements such as a guzzler (water development), two new water troughs, 4 ponds, and a minor fence modification between the Van/Wolf Mountain Allotment boundary to help mitigate overstocking and distribution problems. No reduction in AM's was proposed in the 1985 environmental assessment.

Allotment Use Records

The allotment is managed on a deferred rotation using two units. The units are rotated and used first on alternative years. This grazing strategy was initiated in 1970 when the division fence was constructed. Table 1 displays actual use records for the Van Allotment from 1949 to present.

Table 1: Actual Use, Van Allotment 1949-Present

Year	Season of Use	Number Grazed
1949-1954	6/16-10/30	175
1955-1969	6/16-10/16	142
1970-1979	6/10 – 9/30	142
1980-2004	[1]	142
2005	N/A	Non Use
2006	6/16 – 8/20	142

[1] - 6/1-9/30 when Dry Creek is grazed first and 5/26-9/25 when Schurtz Creek is grazed first.

Past Vegetation Activities

Since 1989, about 364 acres of timber were harvested mainly by overstory removal in the Van Allotment (County, Dry Creek and East Wolf Timber Sales). Since 1993, about 254 acres have been harvested by commercial thinning (Gabe and Cove Timber Sales).

Past fuels treatments within the Allotment consisted of about 294 acres of lop and scatter (County, East Wolf and Gabe Timber Sales), and 132 acres of hand piling (East Wolf Timber Sale). For the most part, these acres occurred on the same acres as the timber harvest mentioned above.

Past Large Wildfires

In August 2001, the Wolf Creek fire burned approximately 661 acres within the West Malheur Allotment, Cougar and Pierpont pastures, and the Van Allotment, Wolf Creek Pasture. A June 24, 2002 Decision Notice authorized about 45 acres of harvest, 25 acres of planting, riparian hardwood planting and fencing at Bedrock Spring, riparian spot hardwood planting and caging on East Fork Wolf Creek, mountain mahogany planting and caging, large woody development on East Fork Wolf Creek and contour falling.

Salvage harvesting in the Wolf Creek fire was never implemented because it was not economically feasible. Riparian hardwood planting and fencing at Bedrock Spring, riparian spot hardwood planting and caging on East Fork Wolf Creek, and large woody development on East Fork Wolf Creek and contour falling have all been implemented.

Future Vegetation Activities

Van Vegetation Project

The Van Vegetation Project now called the Jane Vegetation Management project, located within the Calamity Creek Subwatershed, Wolf Creek Watershed is in the early planning stage. The draft purpose of this project would be to

- Improve watershed conditions by reducing road related-impacts
- Improve riparian and overall watershed conditions through enhancement of riparian vegetation, and management of upland and riparian vegetation structure and composition
- Improve the health, vigor, and resiliency of vegetation to insects, disease, wildfire, and other disturbances, to more closely resemble historical conditions in order to promote long-term forest sustainability and wildlife species diversity
- Capture the economic value of those trees that are surplus to other resource needs on suitable lands

To meet the draft purpose, the following types of projects are being considered for action alternatives:

- Access and Travel Management Activities, such as road closures and decommissions
- Vegetation Activities, such as prescribed burning, commercial and precommercial thinning, aspen restoration, juniper reduction, and noxious weed treatments.

Dragon’s Head Plantation PCT Project

The Dragon’s Head Plantation PCT Project would pre-commercially thin seedlings and saplings of 10 to 20 year old plantations established in the northeast portion of the Emigrant Creek Ranger District.

Coyote Creek Flow Enhancement Project

Coyote Creek Flow Enhancement Project proposes to thin juniper trees on about 120 acres in the West Malheur Allotment, Rock Springs Pasture. Juniper is currently distributed far beyond sites historically occupied, and the density far exceeds what the site can sustain. Encroachment of juniper has reduced native vegetation of perennial grasses and mountain mahogany.

Parasol Vegetation and Watershed Management Project

The Parasol Vegetation and Watershed Management Project Decision Notice, signed 9/18/1998, authorized commercial harvest, precommercial thinning, mechanical fuels activities, aspen management, fire reintroduction, road closures and decommissions, relocation of designated old growth, designation of replacement old growth, and watershed and fisheries improvement projects. One aspect of this project that has not yet occurred is the fire reintroduction. Fuels will be burned in 7 blocks totaling about 6,700 acres. Of these acres, about 900 acres are within the House Creek Allotment and will be burned in the near future.

APPENDIX D

Post-Fire Grazing Interim Guidelines
Malheur National Forest

United States Department of Agriculture
Forest Service
Malheur National Forest
P.O. Box 909
John Day, OR 97845
(541) 575-3000
Fax (541) 575-3001
TDD (541) 575-3089

File Code: 2200-3
Route To:

Date: December 2, 2003

Subject: Post-Fire Grazing Interim Guidelines

To: District Rangers

Enclosed is the Post-Fire Grazing Interim Guidelines. These guidelines will be used for all project analysis involving grazing in areas that have been burned by wildfire, and do not currently have a signed decision document. This document will replace the letter issued by me on June 16, 2003 regarding post-fire grazing.

ROGER W. WILLIAMS
Forest Supervisor

Enclosure

cc: Nancy Phelps, R6

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 <u>Plant Association of the Blue and Ochoco Mountains</u> (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 E

Range Improvements
Van Allotment

Appendix E
Range Improvements
Van Allotment

Improvement #	Type
16406	Trough
16408	Reservoir
16409	Reservoir
16410	Reservoir
16412	Reservoir
16413	Pond
16414	Reservoir
16415	Reservoir
16416	Pond
16417	Trough
16419	Trough
16420c	Pond
16420d	Pond
16421	Trough
16422	Pond
16423	Pond
16425	Pond
16426	Pond
16429	Trough

APPENDIX F

Plant Biological Evaluation

United States
Department of
Agriculture

Forest Service

Malheur National
Forest,
Emigrant Creek
Ranger District

February 2007

Forest Service
Van Range Allotment

Plant Biological Evaluation

Prepared by: *Lori Bailey* Date: *February 9, 2007*
Lori Bailey
NEPA Coordinator

Reviewed by: ______________________ Date: ____________

Forest Range/Botany Staff

Approved by: ______________________ Date: ____________
Jerome Hensley
District Ranger

Summary

Table 1--Threatened, endangered and sensitive (TES) plant species considered in the analysis of the Van Range Allotment project.

Species (Status[2])	Scientific Name	Presence on the Malheur National Forest	Occurrence[3] in the Project Area	Effects[4]	
				Proposed Action	No Action
Silver Skin Lichen (S)	*Dermatocarpon luridum*	Suspected	HN	NI	NI
Hairy Skin Lichen (S)	*Leptogium burnetiae var. hirsutum*	Suspected	HN	NI	NI
Henderson's Ricegrass (S)	*Achnatherum hendersonii*[1]	Suspected	HN	NI	NI
Wallowa Ricegrass (S)	*Achnatherum wallowaensis*[1]	Suspected	HN	NI	NI
Transparent Milkvetch (S)	*Astragalus diaphanus var. diurnus*	Suspected	HN	NI	NI
Deschutes Milkvetch (S)	*Astragalus tegetarioides*	Documented	HN	NI	NI
Upswept Moonwort (S)	*Botrychium ascendens*	Suspected	HN	NI	NI
Dainty Moonwort (S)	*Botrychium crenulatum*	Documented	HN	NI	NI
Triangle Moonwort (S)	*Botrychium lanceolatum*	Documented	HN	NI	NI
Mingan Moonwort (S)	*Botrychium minganense*	Documented	HN	NI	NI
Mountain moonwort (S)	*Botrychium montanum*	Documented	HN	NI	NI
Northwestern Moonwort (S)	*Botrychium pinnatum*	Documented	HN	NI	NI
Peck's Long-Bearded Mariposa (S)	*Calochortus longebarbatus* var. *peckii*	Documented	HN	NI	NI
Dwarft Suncup (S)	*Camissonia pygmaea*	Suspected	HN	NI	NI
Back's Sedge (S)	*Carex backii*	Documented	**HD/N**	**NI**	**NI/BI**
Inland Sedge (S)	*Carex interior*	Documented	HN	NI	NI
Parry's Sedge (S)	*Carex parryana*	Documented	**HD/N**	**NI**	**NI/BI**
Clustered Lady Slipper (S)	*Cypripedium fasciculatum*	Suspected	HN	NI	NI
Northern Twayblade (S)	*Listera borealis*	Documented	HN	NI	NI
Red-Fruited Lomatium (S)	*Lomatium erythrocarpum*	Suspected	HN	NI	NI
Raven's Desert Parsley (S)	*Lomatium ravenii*	Documented	HN	NI	NI
Colonial Luina (S)	*Luina serpentina*	Documented	HN	NI	NI
Fleeting Monkeyflower (S)	*Mimulus evanescens*	Documented	HN	NI	NI
Bridge's Cliff-Brake (S)	*Pellaea bridgesii*	Suspected	HN	NI	NI
Least Phacelia (S)	*Phacelia minutissima*	Documented	HN	NI	NI
Oregon Semaphore Grass (S)	*Pleuropogon oregonus*	Suspected	HN	NI	NI
Arrow-Leaved Thelypody (S)	*Thelypodium eucosmum*	Documented	HN	NI	NI

[1]*Achnatherum hendersonii* and *Achnatherum wallowensis* = *Oryzopsis hendersonii* (Vasey).
[2]Sensitive species from Regional Forester's List
[3]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
[4]Effect Determinations for 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

Introduction

This Biological Evaluation (BE) analyzes the potential effects of the proposed action for the Van Range Allotment Project, 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:

- 2005 Region 6 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
- Sensitive Plants of the Malheur, Ochoco, Umatilla, and Wallowa-Whitman National Forests (1991)
- Forest or district sensitive species database(s) and the GIS mapping layer(s)
- Project area maps (topographic maps and aerial photographs).

Project Description

The Van Range Planning Area is located on the Malheur National Forest, Emigrant Creek Ranger District, approximately 30 miles northeast of Burns, Oregon (see Figures 1 and 2). The allotment, encompass approximately 6,600 acres of National Forest Lands. The allotment is within the Wolf Creek Watershed.

The Emigrant Creek Ranger District, Malheur National Forest proposes to continue authorization of livestock grazing on the Van Allotment.

For more information on the proposed activities, refer to the Environmental Assessment for the Van Range Allotment Project, Chapters 1 and 2.

Prefield Review

The following sources of information were consulted during the prefield review to determine the presence/absence of TES species, or their habitats, within the Project Area:

- Regional Forester's Sensitive Species List
- Malheur National Forest Sensitive Species Plant List
- Sensitive Plants of the Malheur, Ochoco, Umatilla, and Wallowa-Whitman National Forests (1991)
- 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 (2001)
- Project area maps (topographic maps and aerial photographs)
- Pertinent Literature (On file or borrowed from other sources)

The prefield review was performed to identify all sensitive species that could be encountered within the proposed project area. No existing sensitive plant populations are documented in the Van Allotment. The prefield review identified potential habitat for two species listed as Sensitive by Region 6: *Carex backii,* and *C. parryana.*

Field Survey

To identify habitats that may harbor sensitive plants, the physical and biological features in the project area are correlated with those in which sensitive plants are known or suspected to occur (Nelson 1985). Habitats suspected of harboring sensitive plant populations are identified based on aspect, elevation, and ecoclass (plant association). Brooks et al. (1991) describes specific habitat features for Malheur National Forest sensitive species. Forest botanists have compiled habitat data from field surveys for the remainder of species with potential occurrence, listed since the above book was written.

Sensitive plant surveys for past projects were conducted in portions of the project area in the 1970's thru the 1990's. These past surveys reviewed areas by floristic walk-through survey (Nelson 1985) during specific times of the year for peak plant identification periods. Surveys completed before the 2005 Region 6 Sensitive Plant List was released may be incomplete because species on the list have changed.

Sensitive plant surveys for this specific project were conducted in 2003, 2004 and 2005. Field surveys focused on areas identified as potential habitat, mainly springs and riparian areas and were reviewed by floristic walk-through survey (Nelson 1985) during specific times of the year for peak plant identification periods. No new sensitive plant populations were located. Table 1 lists the species considered in this analysis.

Species Considered In Analysis

The following sensitive species were considered in this analysis.

Carex backii (C. cordillerana)

Carex backii is a tufted sedge that grows in lowlands to mid-montane elevation. Its range extends across southern Canada to British Columbia and south to Utah and Colorado. In Oregon it grows in dry forests and riparian woods at mid elevations, occurring in the Wallowa, Blue, and Steens Mountains and adjacent ranges. It is superficially grass-like in appearance and the inflorescence tends to be hidden in the foliage. Therefore, it is likely that this species is often overlooked when searching for sensitive sedges, and may be much more common in our area than believed.

Carex backii is found in a variety of habitats from north to southeastern Oregon. In the Wallowa uplands, it is most common on steep southerly aspects in open ponderosa pine savannahs near thickets of *Symphoricarpos albus.* In the northern Blues, it has commonly been found closely associated with streambanks and gravel bars. In the southern Blues, it is also found in ponderosa pine forests on rocky ridgetops, or growing in the proximity of basaltic rock outcrops with Great Basin wildrye, chokecherry, and snowberry. In the Steens, it is found in quaking aspen/grass associations adjacent to the major streams on steep slopes. These sites all show evidence of disturbance from substrate movement on steep slopes or in streambeds, or are closely associated with rock outcrops. They also are always in dappled to deep shade and have a shrub component. These sites are between 4900-6400' in elevation. Associated species include: *Juniperus occidentalis, Alnus incana, Cornus stolonifera, Ribes aureum, R. hudsonianum, Carex praticola, C. geyeri,* and *Poa pratensis.*

Carex backii does not have creeping rhizomes, therefore, only reproduces by seed production.

Carex parryana

Carex parryana is a loosely tufted sedge that grows from lowlands to moderate elevation. Its range is chiefly east of the continental divide, but it extends onto the Pacific slope in central and east Idaho and northern Utah; it is also known from northeast Oregon and central Nevada.

Carex parryana grows in the driest communities of moist meadows, swales, and moist, low ground around streams and lakes, and on prairies and high plains as well. Associated plants found on a wetland classification plot on the Emigrant Creek RD were *Poa pratensis, Agrostis stolonifera, Juncus balticus,* and *Carex praegracilis*.

Carex parryana can reproduce via creeping rhizomes, and by seed production.

Carex species

Potential habitat for *Carex backii,* and *C. parryana*, is present within the allotment, however no individuals have been located. Potential habitat for these species would include many of the springs and riparian areas within the allotment.

Effects and Determinations of Effects for Sensitive Species

The three possible types of effects to TEPS (Threatened, Endangered, Proposed, or Sensitive) species that a Biological Evaluation or Biological Assessment can identify, and the corresponding "determinations of effect" to use, are given for TEP species in the 1986 Endangered Species Act regulations (50 CFR Part 402) and the March 1998 FWS/NMFS Endangered Species Consultation Handbook; and for sensitive species in FSM 2670 and in the May 15 and June 11, 1992 Associate Chief/RF 2670 letters on this topic.

Effects Analysis

Direct and Indirect Effects from the Proposed Action

No impact (NI) to sensitive *Carex* species is expected because none were found within the allotment. Activities proposed (see chapter 2) under this alternative would therefore have no impacts to sensitive *Carex* species.

Direct and Indirect Effects from No Grazing

No impact (NI) to sensitive *Carex* species is expected because none were found within this allotment. The No Grazing Alternative may have a beneficial impact (BI) to *Carex* habitat. No livestock grazing would allow springs, bogs, seeps and riparian areas to recover from past affects. Habitat for *Carex* species would improve, but whether these species could re-occupy this habitat is unknown.

Cumulative Effects Common to All Alternatives

Past domestic grazing, timber harvesting and fire suppression have contributed to changes in riparian habitats and the plant communities they support. The distribution and vitality of sensitive *Carex* species, before these management activities began are unknown.

Historic grazing has resulted in loss of potential habitat for these species through stream downcutting and accelerated erosion processes that alter local surface hydrology. Past timber harvesting has also increased erosion and altered hydrologic relationships. Historic logging practices included skidding logs through riparian areas, which could have destroyed existing plants but could have also provided soil openings for new plants to establish. Fire suppression may have caused a decline in populations through increased competition for soil moisture and nutrients by shade-tolerant plant species.

Future foreseeable activities such as vegetation management in the Wolf Creek Watershed, Calamity Creek Subwatershed (Jane Vegetation Management Project) would not have cumulative impacts on *Carex* species because activities would most likely not be proposed within riparian areas.

Cumulative Effects Specific to No Grazing Alternative

No livestock grazing would have long-term beneficial effects on *Carex* species habitat.

References

Brooks, P., K. Urban, and G. Yates. 1991. *Sensitive Plants of the Malheur, Ochoco, Umatilla, and Wallowa-Whitman National Forest*, R6-WAW-TP-040-92, USDA Forest Service, Pacific Northwest Region.

Nelson, J.R. 1985. *Rare plant surveys: techniques for impact assessment*. Natural Areas Journal, Vol. 5., No. 3, pp 18-30.

Oregon Natural Heritage Program. 2001. *Rare, Threatened and Endangered Plants and Animals of Oregon*. Oregon Natural Heritage Program, Portland, Oregon. 94 pp.

USDA Forest Service. 2005. *Regional Forester's Sensitive Plant List*, Pacific Northwest Region.

APPENDIX G

Aquatic Biological Evaluation

Biological Evaluation/Assessment for PETS Species
that may occur in or would be affected by the

VAN GRAZING ALLOTMENT

Malheur National Forest
Emigrant Creek Ranger District

Table 1.
Summary of Conclusion of Effects
(Rationale for conclusion of effects is contained in the body of this document)

Species	Proposed Action (Alternative 1)	No Grazing (Alternative 2)
redband trout (**S**)	MIIH	BI
Malheur mottled sculpin(**S**)	MIIH	BI
Columbia spotted frog (**S**)	MIIH	BI

Table 2.
Sensitive Species Impact Definitions (Appendix A)

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

Prepared By: __Rick Vetter__________, Fisheries Biologist Date:__August 1, 2008__

Reviewed By: ____________________, District Ranger Date:_______________

I. Introduction

This combined BE (Biological Evaluation)/BA (Biological Assessment) analyzes the potential effects of the proposed action and alternatives developed for the EA, which are fully described in the EA Chapter 2. Effects on PET (Proposed, Endangered, or Threatened) species listed under ESA (Endangered Species Act, as amended) and those species identified as sensitive by the FS (United States Department of Agriculture-Forest Service) that do or may occur in the project area would be considered (Appendix B) as required by FSM (Forest Service Manual) 2672.42.

PET species considered include:

1. • those known to occur within the planning area
2. • those likely to occur within the planning area, based on the distribution of the species, the habitat conditions required or used by the species, and the current habitat conditions of the planning area
3. • those that could be affected by management actions, due to known species occurrence adjacent to, or immediately downstream from the planning area.

The BE includes documentation of how PETS (proposed, endangered, threatened, or sensitive) species were identified for, or excluded from, the effects analysis. The following sources were reviewed during a prefield data base review to gather evidence of or potential for PETS and/or their habitats to occur within the area of the proposed project or action:

1. Current Regional Forester's (R6) Sensitive Plant and Animal Lists
2. Malheur National Forest and Burns Ranger District PETS Species Database
3. Burns District WildObs Database
4. Oregon Department of Fish and Wildlife
5. Oregon State University, Department of Fish and Wildlife
6. ORNHP (Oregon National Heritage Program) Database records
7. District Stream Surveys
8. Current and historical species distribution maps

In addition, field reconnaissance was conducted to:

1. Assess the project area to identify potential PETS habitat
2. Search suitable habitat for PETS species occurrence (if present)
3. Confirm known habitat is suitable (if present)
4. Refine knowledge of how habitat exists on the landscape and how species use their habitat

Field reconnaissance to determine the presence of PETS was conducted between 2000 and 2004.

This combined BE/BA is prepared to satisfy the requirements of FSM 2672.42. This requires the Forest Service to review all its planned, funded, executed, or permitted programs and activities for possible effects (beneficial, adverse, or lack of effects) on PETS species.

The BE process is intended to review proposed Forest Service programs or activities in sufficient detail to determine how an action or proposed action may affect PETS species and to ensure that proposed management actions would not:

- jeopardize the continued existence, or cause adverse modification of habitat, for species listed or proposed to be listed as endangered or threatened by the FWS (United States Department of the Interior-Fish and Wildlife Service) (FSM 2672.41) or;
- contribute to the loss of viability for species listed as sensitive by FS-Region 6, or any native or desired non-native species; nor cause any species to move toward federal listing (FSM 2672.41).

This process is conducted to provide a standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process.

II. Summary of Alternatives

The project area is located on the east side of the Emigrant Creek Ranger District and is comprised of Upper Wolf Creek, Squaw Creek, Calamity Creek, subwatersheds (6th level HUC) which make up the Wolf Creek, (5th level HUC) in the Upper Malheur subbasin.

The project area contains about 6,600 acres of National Forest lands. All acres listed herein are approximate. In most cases, pastures have been delineated using the most up to date information available and acreages have been determined through computer analysis. Acreages are considered approximate until actually verified on the ground.

The alternatives described in this EA were developed by the interdisciplinary team in response to the issues that were brought up during project scoping. Two alternatives are considered in detail: Proposed Action (Alternative 1), and No Grazing (Alternative 2).

See Chapter 2 of the EA for a complete description of alternatives. Project area maps of all alternatives considered in detail are provided in the EA. Large-scale maps are also available in the project planning record. Appropriate mitigation measures have been developed as needed for the action alternatives.

Table 3.
Federally listed and proposed endangered and threatened fish species that occur within the Malheur National Forest but are NOT present in the project area or watershed.

Species	DPS/ESU (fish)
bull trout (**T**)	Columbia River DPS
Mid Columbia River summer steelhead (**T**)/critical habitat	mid-Columbia ESU

Table 4.
Sensitive species documented in the project area, and potentially impacted by actions considered.

Animals	Fish	Invertebrates	Plants
Columbia spotted frog	redband trout Malheur mottled sculpin		

IV. Potential Effects on Sensitive Species

Columbia Spotted Frog
Population 3-Great Basin
(*Rana luteiventris*) Thompson, 1913

Status

Federal Status: Candidate for listing under the U.S. Endangered Species Act (USFWS 1998)
USDA-Forest Service (Region 6) Status: Sensitive (USFS 2000)
Malheur National Forest Status: Sensitive (USFS 2000)
Oregon State Status: Undetermined Status (ORNHP 2000)
Oregon Natural Heritage Program Status: S2 Imperiled (ORNHP 2000)

Major Threats

Great Basin population has been adversely affected by habitat degradation resulting from mining, livestock grazing, road construction, agriculture, and direct predation by bullfrogs and non-native fishes (NatureServe 2000).

Degree of Threat

Moderately threatened range-wide, habitat or community lends itself to alternate use

Population Status and Trend

Recent intensive surveys indicate declines in the Great Basin populations.

Fragility

Fairly resistant and tolerant of nondestructive intrusion.

Habitat and Life History

Spotted frogs are highly aquatic; and are rarely found far from permanent water. They are usually found along the grassy margins of streams, lakes, ponds, springs, and marshes. 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.

Every life history stage of Rana luteiventris, from embryo to adult, has the potential to be affected by cattle grazing. Spotted frogs deposit floating egg masses that are not dependent on the support of vegetation (Nussbaum et al. 1983), so the simple removal of aquatic and riparian vegetation by cattle is unlikely to affect egg masses. However, egg masses can be damaged or stranded as a result of trampling, and water chemistry changes and introduced bacteria in feces have the potential to do harm as well. As larvae, spotted frogs are restricted to the same aquatic habitats that serve as the primary watering source for cattle in this area. Particularly important to larvae are changes in water quality that result from cattle urination and defecation as well as physical disturbance of the water. Larvae could be positively affected by enhancement of food supply that might result from increased nutrient input. Metamorphs may be particularly susceptible to trampling because they are not able to swim well enough to escape in deep water, and they occur only in moist areas next to water bodies, the same place that cattle are concentrated. As adults, spotted frogs depend heavily on riparian vegetation for cover and as a resource for their insect prey. Therefore, the removal of vegetation by grazing might make them more vulnerable to predators and deplete their available food source.

Distribution

Green et al. (1997) determined that frogs from the vicinity of the type locality of *Rana pretiosa* (Oregon spotted frog) are conspecific with the species residing in south-central Washington and the Cascade Mountains of Oregon. They concluded that populations from southwestern British Columbia, western Washington, western and central Oregon, and northeastern California are Oregon spotted frog whereas spotted frogs from the remainder of the range are Columbia spotted frogs (NatureServe 2000).

This species occurs in extreme southeastern Alaska, southwestern Yukon, northern British Columbia, and western Alberta south through Washington east of the Cascades, eastern Oregon, Idaho, and western Montana to Nevada (disjunct, Mary's, Reese, and Owyhee river systems), southwestern Idaho (disjunct), Utah (disjunct, Wasatch Mountains and west desert), and western and north-central (disjunct) Wyoming. Disjunct populations occur on isolated mountains and in arid-land springs.

In Oregon, the Columbia spotted frog appears to be widely distributed east of the Cascade Mountains. This frog is present in all subbasins on the Malheur National Forest. It is assumed widely distributed in the project area. Confirmed sightings occur in all watersheds within the project area.

Existing Condition

No habitat surveys have been conducted specifically for spotted frogs. However, habitat for spotted frogs has been degraded due to past management activities such as livestock grazing, road construction along streams, and timber harvest adjacent to streams, lakes ponds, springs, and marshes. Many of these activities have resulted in incised stream channels that reduce the interaction with the floodplain and result in the loss of riparian plants and wetlands.

Stream surveys in the project area indicate the majority of surveyed reaches are not meeting Forest Plan riparian management objectives (INFISH RMOs 1995) for pool habitat, LWD, and fine sediment (Fisheries Specialist Report). Most streams do meet Oregon water temperature standards and the lower reach of Schurtz Creek in Van allotment is "Functioning at Risk" (USDI BLM 1998).

Great Basin redband trout
Population 18
(Oncorhynchus mykiss spp.) Walbaum 1792

Status

Federal Status: Species of Concern (list 1-7-00-SP-588).
Forest Service (Region 6) Status: Sensitive (USFS 2003)
Malheur National Forest Status: management indicator species
State Status: Vulnerable-Listing of Species not imminent and can be avoided (ODFW 1997).
Oregon Natural Heritage Program Status: NA (ORNHP 2000)

Major Threats

In the Great Basin, agricultural development has resulted in extensive diking, channeling, draining, and loss of marshlands. Irrigation diversions have been constructed on most streams, causing habitat dewatering and physical blockage for both upstream and downstream migration trout. Because of these developments, lake and marsh trout rearing habitat has been lost and population productivity has been compromised. Timber harvest, livestock grazing, and road building have adversely affected aquatic habitats in forested areas and rangelands throughout the range of Great Basin redband trout (USFWS 2000).

The introduction of nonnative fish species such as brook trout, common carp and smallmouth bass, and the stocking of hatchery rainbow trout have also negatively impacted this species (USFWS 2000).

Habitat and Life History

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 trout, however, the four population types do not face the same level of threats from management activities. Subpopulations of the Great Basin redband trout are probably at the greatest threat of being listed as threatened under the ESA. Redband trout in the project area are of the Great Basin population. 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.

Native trout found in the internal basins of Oregon are redband trout derived from the Columbia River system. Malheur Lake Basin is the largest of the Oregon desert basins and contains the greatest amount of trout habitat associated with the Great Basin population. The Silvies River is one of six sub-basins feeding into the lake. Basin fish fauna show little difference from the Columbia River fauna, suggesting a rather broad and geologically recent connection between Malheur Lake and Malheur River; which flows east into the Snake River system. Berg (1987) found a relatively high frequency in genetic likeness between the Silvies River and the Columbia River sub-groups. J.O. Snyder was the first researcher to sample Malheur redband trout in 1904, taking them from the Silvies River and Silver Creek.

It is not known if pure native trout populations exist in the Malheur basin (Behnke 1992). The last specimen collected that was thought to be pure native came from Smyth Creek in 1968. Hatchery introduction of rainbow trout in streams stopped about 1992 and it is believed that most of their genetic affects have dissipated. The project Area's climatic extremes of high summer temperatures and low flow conditions frequently produce oxygen depletion in the water. Malheur redband trout are a genotypic sub-species adapted to these unstable, harsh, environments and because they are more adapted to variable water conditions, they probably have resisted hybridization with hatchery fish or native cutthroat. Observations in the Silvies and Upper Malheur watersheds have verified this adaptive nature by finding redband trout in some very marginal waters late in the summer. They tend to be small in size and are better suited for the microhabitats being maintained by base flows of less the 0.3 cfs. Hatchery rainbows would not be able to tolerate the harsh water conditions.

Interior redband trout (sensitive) are assumed to be the resident form of the anadromous steelhead. Most redband trout 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.

Redband trout of the interior Oregon basins inhabit isolated desert watersheds that vary widely in size. Populations residing in small isolated streams are vulnerable to climatic fluctuations and habitat disturbance due to their isolation from neighboring streams. During wet years, marshes and lakes can provide connections between populations of adjacent streams.

Redband trout are sensitive to changes in water quality and habitat. Redband trout of interior Oregon basins are believed to be best adapted to cold (<21° C), clean water, but possess a hereditary basis to function at high temperatures (Behnke 1992). Adult redband trout are generally associated with pool habitats, although various life stages require a wide array of habitats for rearing, hiding, feeding, and resting. Pool habitat is important refugia during low water periods. An increase in sediment lowers spawning success and reduces the quantity and quality of pool and intersticial habitat. Other important habitat features include healthy riparian vegetation, undercut banks and LWD (large woody debris).

Spawning occurs during the spring, generally from March to June. Redds tend to be located where velocity, depth and bottom configuration induce water flow through the stream substrate, generally in gravels at the tailouts of pools. Water temperatures influence emergence of fry, which is typically from June through July.

Distribution

Interior redband trout are widely distributed across Oregon east of the Cascade Mountains and in the Klamath Basin (Behnke 1992). The U.S. Fish and Wildlife Service has classified the populations of redband trout inhabiting the Great Basin as a single distinct population segment (DPS) (USFWS 2000). This DPS is referred to as the “Great Basin redband trout DPS”. The range of Great Basin redband trout in Oregon includes the Warner, Catlow, Goose Lake, Fort Rock, Chewaucan, and Harney basins.

Great Basin redband trout are widely distributed in the Silvies, Upper Malheur and Harney-Malheur Lakes subbasins on the Emigrant Creek and Blue Mountain Ranger Districts of the Malheur National Forest. This species has been documented in Schurtz, Gabe and Wolf creeks within the project area. They also move seasonally in the spring, into many of the intermittent streams.

Existing Conditions

Stream surveys in the project area indicate the majority of surveyed reaches are not meeting Forest Plan riparian management objectives (INFISH RMOs 1995) for pool habitat, LWD, and fine sediment (Fisheries Specialist Report). Most streams do meet Oregon water temperature standards and the lower reach of Schurtz Creek in Van allotment is ”Functioning at Risk” (USDI BLM 1998).

Malheur mottled sculpin

(Cottus bendireii) Girard 1850

Status

Federal Status: Species of Concern (list 1-7-00-SP-588).
Forest Service (Region 6) Status: Sensitive (USFS 2000)
Malheur National Forest Status: Sensitive (USFS 2000)
State Status: Sensitive species, critical category (SC) (ODFW 1998).
Oregon Natural Heritage Program Status: T3 very rare or locally restricted (ORNHP 2000)

Major Threats

Major threats to the Malheur mottled sculpin include destruction, modification and contraction of habitat from livestock grazing, timber harvest, and water withdrawals.

Habitat and Life History

Mottled sculpin require water temperatures below 26°C with high dissolved oxygen and low turbidity. They are found in streams with moderate to rapid current and are associated with rubble, gravel, or rocky bottoms. They seldom are found in silted areas. Malheur mottled sculpins are sensitive to changes in water quality including increases in water temperature and sediment. Spawning occurs in early spring generally from February through May. Females deposit adhesive eggs in a crevice or under rocks in clusters of 20 to 150. The male guides her to the nest area and guards the nest after she leaves the area. The female produces from about 50 to 300 eggs, depending on her size. Eggs hatch in about 4 weeks. They feed on a variety of aquatic invertebrates, mostly insects, but also shrimp, snails, fish eggs and fish fry. They were thought to be serious predators of trout eggs and fry, but results of studies on their food habits have revealed that few trout eggs or fry are actually eaten. Mottled sculpins are much more important as forage for trout.

Sculpin are a bottom dwelling fish that generally favor streams dominated by riffles or glides with cool water and clean, silt free, gravels, although the "bairdi" complex can tolerate temperatures up to 70 degrees F. Many of the streams within the project area do not meet the preferred habitat conditions; therefore, water temperature is more likely a key factor in structuring and controlling seasonal distribution patterns.

Distribution

The taxonomy of mottled sculpin (*Cottus bairdi* complex) in Harney County, Oregon was recently reviewed by Markle and Hill (2000). Based on available literature and current data, Markle and Hill support recognition of two species, Malheur mottled sculpin (*C. bendirei*) and Columbia mottled sculpin (*C. hubbsi*). The regional foresters sensitive species list recognizes the Malheur mottled sculpin as *Cottus bairdi* but recent literature recognizes the species as *Cottus bendirei,* which will be used in this report. Both species occur in northern Harney Basin and hybrids were found at contact zones in the Silver and Silvies Rivers. The Columbia mottled sculpin appears dominant in the mainstem of the Silvies River with the Malheur mottled sculpin found upstream and in isolated creeks. The Malheur mottled sculpin was the only species found in southern Harney Basin. Both species also occur in Harney Basin in the Malheur and Snake Rivers, lower Columbia Basin, and probably the upper Columbia Basin.

The Malheur mottled sculpin was first reported in Rattlesnake Creek near Camp Harney but, apparently disappeared from that locality about 1960 (Bond 1983). Malheur mottled sculpin populations are currently reported to be present in Smyth Creek, Riddell Creek, Poison Creek, Devine Creek, upper Silver Creek, Donner und Blitzen River, Silvies River, and in the Malheur River system. They have been documented in Schurtz and Wolf creeks within the project area. The composition of fish from the Silvies River system has changed dramatically from predominantly *hubbsi* forms in 1955-68 to predominantly *bendirei* and intergrades more recently.

There is a possibility that these sculpin represent a single polymorphic species or ecotype. Markle and Hill (2000) reject this hypothesis because the congruence of morphology and distribution was consistent with two species meeting in a narrow hybrid zone. A better understanding of reproduction, development and the dynamics of sculpin hybrid contact zones is needed o resolve this question.

Existing Conditions

Stream surveys in the project area indicate the majority of surveyed reaches are not meeting Forest Plan riparian management objectives (INFISH RMOs 1995) for pool habitat, LWD, and fine sediment (Fisheries Specialist Report). Most streams do meet Oregon water temperature standards and the lower reach of Schurtz Creek in Van allotment is "Functioning at Risk" (USDI BLM 1998).

Combined Effects and Determination by Alternative for Van Grazing Allotment for the Columbia Spotted Frog, Redband Trout and Malheur Mottled Sculpin

Because of the similarity of habitat requirements for the Columbia spotted frog, redband trout, and Malheur sculpin, the effects and determination analysis for these species are combined for each alternative.

Alternative 1 Proposed Action

Direct and Indirect Effects

The Proposed Action alternative would eliminate livestock grazing for 3-5 years, followed by a 41% livestock reduction in the permit when grazing resumed. During this 3-5 year period riparian areas on Schurtz, Gabe and Wolf creeks and other intermittent streams in the allotment would recover at the near natural rate of recovery due to the temporary absence of livestock. Clary and Webster (1989) determined that 10-12 years was not sufficient for riparian willow community recovery after severe livestock use, but acceptable wildlife habitat may occur after 5 years. Three to five years is probably sufficient in the Van allotment, considering the limited use of riparian pastures, and the 41% livestock reduction when grazing resumes. Other studies indicate that herbaceous vegetation can recover within several growing seasons and woody vegetation within 5-10 years if grazing stress is removed from a deteriorated riparian area (Photo 2), (Platts and Nelson, 1984 and Skovlin).

Additionally, stream restoration activities, riparian fencing, water lanes, aspen restoration, spring protection and development, water trough placements and adaptive management strategies (changes or reduction in timing, non grazing periods, intensity, frequency, distribution, and duration of use) to control livestock use in riparian areas would further improve stream and fisheries habitat conditions, on Schurtz, Gabe, Wolf and Dry creeks. When livestock grazing resumed it would be at 35 % use levels, and completely excluded from some of the sensitive reaches on Schurtz and Gabe creeks, allowing the near natural rate of recovery to continue with no carry over effects from grazing to the next year. Headcuts on Dry and Gabe creeks would be stabilized, stopping channel downcuts and slowly restoring water flow patterns to a natural pattern that will interact with the old floodplain and restore riparian plant species.

Improvements in stream and riparian conditions under the Proposed Action would occur slower than the No Grazing Alternative. The proposed action allows for riparian areas to be grazed at higher levels (35%) than the no grazing (0%) except in two riparian exclosures that would not be grazed (Fry on Schurtz Creek and Gabe on Gabe Creek), in order to achieve DFCs. Fine sediment levels are expected to be higher under proposed action, but lower than current levels due to reductions in livestock use and riparian pastures that should improve streambank stability, undercut banks and riparian vegetation. With improved aquatic habitat conditions, improvement in fisheries reproduction and survivability are expected to occur.

Creating two riparian pastures that would exclude livestock (Gabe and Fry pastures) and controlled riparian grazing on Frog, Hawthorn, Wolf and Schurtz enclosures would allow Schurtz, Gabe, and Wolf creeks to recover at a near natural rate of recovery after the 3-5 year no grazing period, benefiting sensitive species .

Adjusting the size and shape of Dry Pasture would improve livestock distribution and decrease direct and indirect livestock impacts to sensitive fish and Columbia spotted frog habitat on Wolf Creek. The combination of stabilizing headcuts, installing rock structures, adding LWD and constructing livestock exclosures on, Schurtz, Gabe and Dry creeks would decrease water energy, stabilize the stream channels and eventually reconnect the stream channel with the floodplain. These combined actions will improve pool quality and undercut banks benefiting sensitive aquatic species.

Restoration of aspen stands, including livestock fencing, would protect riparian areas from livestock, increasing stream shade and floodplain water retention resulting in balanced stream flows throughout summer. Eventually beaver would find the restored woody habitat and create damns expanding the riparian area (Chaney, Elmore and Platts) 1990), restoring watertables (Southworth, 1993) and stabilizing stream flows (Minshall, Jensen and Platts 1989).

Prescribed burning, conifer thinning and fencing of aspen stands would increase forage production and ground cover, trapping sediment and preventing possible input into stream channels. A combination of rock structures, and large woody debris would start the process of rebuilding stream channels, and improving the desired composition of grasses and forbs. This would allow stream channels to interact with meadow floodplains and restore soil moisture, for additional stream flows in late summer.

Cumulative Effects of the Proposed Action

Cumulative effects of the proposed action would be positive and improve current aquatic habitat conditions across the allotment. Three to five years of no grazing followed by a 41% percent reduction in livestock head months, 35% utilization on vegetation, improved livestock distribution, additional riparian livestock exclosures, riparian pastures, headcut stabilization, spring protection, aspen restoration and channel restoration activities would improve stream conditions and move these aquatic systems towards a desired future condition (DFC) at a near natural rate of recovery process, as described in INFISH/PACFISH. No carry over effects are expected from livestock that would retard the attainment of Forest INFISH/PACFISH RMOs.

A 3-5 year rest period corresponds with studies that indicate herbaceous vegetation can recover within several growing seasons and woody vegetation within 5-10 years, if livestock grazing stress is removed from a deteriorated riparian area (Platts, Nelson, and Skovlin 1984). Other authors indicate livestock exclusion may be appropriate to begin stream recovery, and that livestock and riparian systems can coexist, if season and intensity of use is controlled. Under this type of recovery management streams improved in 8-16 years with livestock exclusion and/or some grazing (Elmore and Beschta, 1987). However, (Clary and Webster 1989) determined that 10-12 years was not sufficient for riparian willow community recovery after severe livestock use, but acceptable wildlife habitat may occur after 3-5 years. Degraded areas may require rest upto15 years or longer.

Determination

Positive impacts from the three to five year rest period, reduced livestock use, restoration activities, a reduction of livestock numbers and water hauling on the Van Allotment, will improve the near natural rate of recovery process and move stream attributes towards DFCs. Stream flows should stabilize as the result of more vegetation and LWD placement in the channel. Bank stability and riparian vegetation should improve allowing the channel to narrow, providing better habitat for Columbia spotted frogs, Malheur mottled sculpin and redband trout. Other activities, like recreation may continue, but would have insignificant effects on these streams due to low disturbance level.

Overall the restoration process may require several decades before most Forest RMO's are met. This time period may vary depending on the current condition, site potential, fires, and precipitation. During this time livestock grazing would continue along most stream reaches, unfenced riparian areas and springs across the allotment, but at a reduced level. Bank alteration would be limited to less than 20%. Riparian vegetation in these areas would be grazed at 35% use standards resulting in green line stubble heights of about 6 inches and floodplain stubble heights of 3 inches, compared to natural heights of 12-16 inches, as documented in the Schurtz Creek exclosure. However, continued livestock grazing will have some effects on these sensitive species, by reducing streambank vegetation, and altering streambanks, thus affecting aquatic cover and habitat.

Considering the combination of passive and active restoration activities with the reduced effects of continued grazing (at a lower use level), there would be a determination of; **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 (MIIH)** of Columbia spotted frogs, redband trout and the Malheur mottled sculpin.

Alternative 2 No Grazing

Direct and Indirect Effects

No grazing would likely see the most immediate and long term improvement in stream and fisheries habitat conditions, as all direct and indirect effects of livestock would be removed from the project area. With the removal of livestock grazing (passive restoration), stream and riparian areas would be restored faster than with Alternative 1. Many studies have shown stream habitats degraded by livestock grazing would improve when grazing is eliminated. Investigations have also shown that fish production increased after grazing was removed (Platts 1991). The rate of recovery of any given stream would vary depending on its current level of interaction with the floodplain, channel type, substrate size, stream flows, condition of riparian vegetation, and upstream supply of sediment (Rosgen 1996). Deer and elk would still have some effect on riparian shrub communities and stream banks, but this is expected to be negligible compared to past livestock use. Eventually many streambanks would be covered with grasses and sedges over 16 inches high, overhanging streams, providing shade for cooler water temperatures, cover for aquatic species and their prey, and allowing stream channels to narrow and deepen with undercut banks. All of these changes would benefit the three sensitive species.

Livestock enclosures on Schurtz Creek, 500 feet below Wolf Mountain Allotment demonstrate the rate of recovery and changes in the stream channel and riparian area in this subwatershed over 16 years of no grazing. In this exclosure there is a higher rate of bank stability, vegetation cover, stream shade and interaction between the stream channel and the floodplain. Plants in the exclosure also exhibit higher vigor compared to plants grazed by livestock outside the exclosure. Sedges form dense mats instead of broken clumps or individual plants. This alternative would allow for the fastest opportunity for water temperatures to decrease, with increased stream shade and narrower channels. Based on the rate of recovery in reach one of Schurtz Creek Enclosure, recovery would require at least 2 decades and most likely three. Although this pasture has been excluded from livestock grazing during most of the last 16 years, it has been grazed by unauthorized livestock which may have affected the true recovery rate.

Cumulative Effects

Since grazing would cease, this alternative would eliminate all direct effects from livestock grazing, as compared to the Proposed Action. Disturbances from livestock grazing would be eliminated, including the combined negative effects from feces and urine affecting water quality, hoof damage affecting bank stability, width /depth ratios, pools and cobble embeddedness, and the removal of riparian vegetation affecting stream shade, stream bank stability, and water temperature.

Herbaceous hydrophytic vegetation such as sedges and rushes would increase in abundance and vigor, moving riparian areas towards a late seral stage at a near natural rate of recovery. Due to natural wild ungulate use some of these affects would continue but at a lower level of disturbance, reflecting near natural levels.

Magilligan and McDowell(1997) indicate that following the elimination of cattle grazing desired stream channel adjustments begin within approximately 14 years, although some streams showed no adjustments after as long as 28 years.

Several indirect carry over affects from livestock will occur under this alternative that may have cumulative effects on other species and their habitat. Six springs that were altered for livestock would remain intact and continue to dewater springs that once formed natural seeps or wallows that benefited amphibians like Columbia spotted frogs. Headcuts would not be treated but would probably stabilize at a slower, more natural rate, due to reduced water runoff across the landscape and the lack of bank disturbing hoof action from livestock. Pasture fences and exclosures would remain and benefit riparian areas and streams by restricting stray livestock from other allotments.

Determination

Due to the immediate and long term positive impacts on aquatic and riparian habitats in the shortest time period (15-20 years) from no livestock grazing there would be a **Beneficial Impact (BI)** to Columbia spotted frogs, redband trout and the Malheur mottled sculpin. Some activities other than grazing (recreation and wildlife) may continue, but would have insignificant effects in this project area.

Cumulative Effects Common to Both Alternatives

Activities that have cumulatively affected aquatic habitats, and specifically redband trout and sculpin habitat within the project area and at the watershed scale outside of the project area include: long term grazing on public and private land, logging, recreation, road construction and maintenance, recreational fishing, mining, water diversions, stocking of non-native fish, and the spread of noxious weeds. (refer to Appendix C for a list of specific activities).

Cumulatively, livestock grazing and logging are the most widespread activity with the longest duration in the project area, starting the in late 1800's. Impacts to the landscape, as noted previously, have been extensive, and impacts to streams and riparian areas are particularly well documented.

Domestic livestock use within the watershed began in the mid- to late-1800s. High numbers of cattle and sheep grazed within the watershed. Grazing usually occurred in the winter at low elevations and moved upslope in summer to higher elevation meadows and ridges. A pre-1900 report indicated rangelands were dominated by "bunchgrass over the whole territory as high as a horse's knee and very little sagebrush" (USFS, 1996). By the late 1870s, tens of thousands of sheep and approximately 18,000 cattle resided in the area. This area was still officially part of the Blue Mountain Paiute/Snake Indian Reserve until the late 1870s. However, encroachment into the area was common and intensive. After the reserve was forfeited to the federal government in 1879, livestock numbers rapidly increased. Excessive grazing and browsing contributed to an increase in less palatable plant species such as sagebrush, and a decrease in more palatable species such as bitterbrush. Bunchgrass plant associations, which thrived prior to introduced grazing, were rapidly overgrazed within a half-century. Within the last 60 years, improvements have occurred to control the distribution of domestic livestock and their use of vegetation. Fencing, developing upland water sources, controlling numbers and changing the season of use, have all been used by range managers (USFS, 1996).

Three agricultural diversions occur on two streams flowing through the allotment; Gabe (1) and Wolf (2) creeks. The diversions depend on a reliable water supply from upstream sources on the Forest and effects to these water sources such as alterations in channel morphology leading to channel incision can cause changes to water retention, loss of riparian zones and less water being available during low flow periods. Water removal also results in reduced quantity and quality of downstream habitat for trout and in the case of unscreened diversions on the Middle Fork Wolf Creek, (Photo 3), trap fish in the irrigation system, leading to eventual mortality as the water spreads out across private downstream pastures. The Forest Service, ODFW and other partners plan on installing fish screens on the Wolf Creek diversions in 2008.

Fish stocking can also have negative effects to the native fish population and the first known stocking of non-native fish into streams on USFS and BLM occurred about 1935. Since that time rainbow trout, brook trout and other warm water species were stocked into Malheur River subbasin streams. Not all stocking activities have been documented; however, it is assumed that perennial streams with adequate access were stocked with non-native fish. Oregon Department of Fish and Wildlife stopped stocking streams in the entire basin about 1992 due to concerns of hybridization between native redband and hatchery rainbow trout. However, natural environmental conditions favor native redband trout over hatchery fish and over the course of 16 years the rainbow hatchery influence is probably no longer a threat to the native redband population.

Existing roads on public and private, particularly those within RHCAs and riparian areas would continue to impact watersheds in several ways including: alteration of channel morphology, alteration of runoff regimes, increase of fine sediment levels in streams, reduced riparian vegetation and cover, and confinement of channel (particularly when roads are placed directly next to streams on adjacent floodplains). 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 road failure. Recreation (ATVs) and dispersed camping alongside roads have also contributed to stream impacts. Where roads intersect streams in the Wolf Creek and Schurtz creek drainage, culverts create migration barriers or completely block fish movement. Several miles of roads in the project area have been closed or decommissioned under past timber harvest projects to reduce impacts to fisheries habitat.

Timber harvest began on a small scale within the watershed around the turn of the century, mostly to supply local ranch needs. Large-scale timber harvest began within the watershed in the late 1940s and 1950s. Roads were consequently constructed within the watershed to access timber. Approximately 80 percent of the USFS lands within the watershed are forested. Approximately 30 percent of this area has been intensively managed since the early 1970s. Prior to this time logging was selective for large overstory pine (USFS, 1996).
Landscape disturbances from the commercial harvest of trees, especially clear-cut activities and tree removal activities in the floodplain have had a negative affect within the stream channel and floodplain (Photo 4). About 618 acres have been harvested by overstory and commercial thinning across the allotment since 1989 (County, Dry Creek, East Wolf Creek, and Gabe timber sales). Additionally, 316 acres were thinned as fuel treatments involving lop and scatter and hand piling within the same timber sales. However, since 1995 the removal of trees and associated activities in riparian areas has been restricted to the surrounding uplands unless those activities would improve conditions in the riparian area. Removal of timber and associated activities contributed to the current status of RMOs, but unlike grazing those activities have stopped within the riparian areas. It would take over a hundred years to replace old growth trees removed from the floodplain, but harvest restrictions during the past 11 years have improved the rate of recovery from these historic landscape altering events.

Motorized vehicles, recreation activities and livestock grazing provide opportunities for the spread of noxious weeds, which can invade riparian areas, replace native deep-rooted species, cause soil erosion and ultimately impact stream habitat. This has occurred within the allotment, especially around historic timber harvest landings and poor condition riparian areas where livestock tend to congregate. The five year rest period in alternative 1, and no grazing in alternative 2, will reduce the chance of weed introduction from livestock activities. The control of noxious weeds is discussed further in the vegetation portion of the document.

Natural processes outside the control of the Forest have also contributed to cumulative effects on aquatic resources. These processes include wildfire and drought. The Malheur NF is particularly susceptible to wildfire due to existing moisture regimes and changes in forest vegetation structure. Fires tend to spread quickly and burn hotter under these conditions. Historically, fire played a significant role in the ecosystem of the Upper Malheur Watershed. Ponderosa pine ecosystems historically had a natural fire disturbance interval consisting of low intensity frequent fires. Since the early 1900s, management practices have suppressed natural wildfires in the watershed. Fire suppression has had a significant impact on composition, health, and distribution of range plant communities. Some rangeland ecosystems, such as bitterbrush, bunchgrass and aspen types, are maintained by low intensity, frequent fires. Without such disturbance these plant communities are at risk from invasion of other plant species (USFS, 1996).

The loss of large aspen stands on Gabe and Schurtz creeks has set back the recovery period for both of these creeks. Remnants of these stands indicate the loss of once productive floodplains that buffered high water flows and maintained uniform stream flows during the summer. The Malheur NF has also experienced periods of drought during the past 4 years, which exacerbated these conditions.

Both alternatives would improve stream and riparian conditions, moving aquatic systems towards a desired future condition (DFC) at a near natural rate of recovery process, as described in INFISH/PACFISH. Recovery rates are also affected by channel type and current conditions which vary between streams in the allotment. No measurable carry over effects are expected from livestock that could retard the attainment of Forest INFISH/PACFISH RMOs.

Reasonable Foreseeable Activities

Potential effects from alternatives 1 and 2 would be cumulative with additional effects from non-federal activities within the project area and all activities outside the project area on federal, state and private lands but within the Malheur and Silvies River drainage. Aside from this project, other activities that may contribute to cumulative effects include; timber harvest activities, wildfires, livestock grazing, road use, non functional roads acting as streams, flood irrigation, and vegetation alteration. These activities occur on an annual basis with the exception of timber harvest and wildfire and are known contributors of stream dewatering and sediment, affecting water quality and aquatic species to an unknown degree.

Water diversions for flood irrigation occur on Gabe and Wolf creeks, on the forest. A channel spanning rock dam blocks the Wolf Creek flow and diverts water onto the private floodplain for livestock grazing and hay production. These diversions restrict seasonal fish movement during the spring and summer and trap fish in the unscreened irrigation ditch, resulting in the death redband trout. The Gabe Creek diversion is on a non fish bearing reach of the stream and does affect fish. The Wolf Creek diversion is on a list of basin screen projects with Oregon Department of Fish and Wildlife. The Forest permit for this diversion is also under review.

References

Behnke, R. J. 1992. Native Trout of Western North America. American Fisheries Society. Monograph 6, pp. 175-185.

Bond, C. E. 1983. General reports on Oregon Lakes. *in* E. P. Peister, (ed.). Proceedings of the desert fishes council. Vol. III-IV.

Green, D.M., H. Kaiser, T.F. Sharbel, J. Kearsley, and K.R. McAllister. 1997. Cryptic Species of Spotted Frogs *Rana pretiosa* Complex, in Western North America. Copeia 1997(1):1-8.

Markle, D. F., and D. H. Hill, Jr. (2000). Taxonomy and Distribution of the Malheur Mottled Sculpin, *Cottus bairdi*. Northwest Science, Vol. 74, No. 3.

NatureServe: An online encyclopedia of life [web application]. 2000. Version 1.1. Arlington, Virginia, USA: Association for Biodiversity Information. http://www.natureserve.org

Oregon Department of Fish and Wildlife. 1997. Sensitive Species List.

USDA Forest Service. 2000. Region 6 Sensitive Animal List. Revised November 2004.

USDA Forest Service, USDI Fish and Wildlife Service 1995. Decision Notice/Decision Record, FONSI, EA, Appendices for Inland Native Fish Strategy (INFISH).

USDA Forest Service and USDI Bureau of Land Management. 1995. Decision Notice and Decision Record for the Interim Strategies for Managing Inland Native Fish (INFISH) in Eastern Oregon and Washington, Idaho, and Portions of California. USDA Forest Service and USDI Bureau of Land Management. 13pp.

USDI Bureau of Land Management (BLM). 1998. Riparian Area Management: Process for Assessing Proper Functioning Condition. Technical Reference 1737-15. USDI Bureau of Land Management Service Center, Denver, CO.

USDI-Fish and Wildlife Service. Federal Register. 1998 Volume 68, Number 62, pages 15804-115875.

Appendix A

Status Definitions

Federal Status Definitions

Endangered Species, which are in danger of becoming extinct within the near future throughout all or a significant portion of their range

Threatened Species those likely to become endangered within the foreseeable future.

Species of Concern Former USFWS C2 candidate that have sufficient information to support a proposal to list under the ESA or by ODFW under the OEAS.

Oregon's Threatened and Endangered Species Program Definitions
(under the authority of ORS 496.172, the Oregon Endangered Species Act, 1987)

Sensitive species are broken into four categories defined as follows:

Critical Species for which listing as threatened or endangered is pending; or those for which listing as threatened or endangered may be appropriate if immediate conservation actions are not taken. Also considered critical are some peripheral species that are at risk throughout their range, and some disjunct populations.

Vulnerable Species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring. In some cases, the population is sustainable, and protective measures are being implemented; in others, the population may be declining and improved protective measures are needed to maintain sustainable populations over time.

Peripheral or Naturally Rare Peripheral species refer to those whose Oregon populations that are on the edge of their range, Naturally rare species are those which had low population numbers historically in Oregon because of naturally limiting factors. Maintaining the status quo for the habitat and population of these species is a minimum requirement. Disjunct populations of several species that occur in Oregon should not be confused with peripheral.

Undetermined Status Animals in this category are species for which status is unclear. They may b susceptible to population decline of sufficient magnitude that they could qualify for endangered, threatened, critical or vulnerable status, but scientific study will be required before a classification can be made.

Conservation Status Ranking

5 Secure-Common, demonstrably widespread and abundant. Typically with considerably more than 1000 occurrences and more than 10,000 individuals.

Secure in Oregon, and essentially ineradicable under present conditions.

4 Apparently Secure-Uncommon but not rare, and usually widespread. Possibly, cause for long-term concern. Typically more than 1000 occurrences and more than 10,000 individuals.

Not rare, and usually widespread in Oregon. Usually more than 100 occurrences.

3 Vulnerable-Vulnerable globally because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

Vulnerable in Oregon either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 1000 occurrences.

2 Imperiled-Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or stream miles (10 to 50).

Imperiled in Oregon because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. Typically 21 to 100 occurrences.

1 Critically Imperiled-Critically imperiled globally because of extreme rarity or because of some factor(s) making is especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000) or acres (<2,000) or stream miles (<10).

Critically Imperiled in Oregon because of extreme rarity or because or some factor(s) making it especially vulnerable to extirpation for the state. Typically 5 or fewer occurrences or very few remaining individuals or acres.

DETERMINATION OF CONCLUSION DEFINITIONS FOR BIOLOGICAL EVALUATIONS.

Sensitive Species

NO IMPACT (NI)

Applied when an activity would have no effect on habitat, individuals, a population or a species.

MAY IMPACT INDIVIDUALS OR HABITAT, BUT WILL NOT LIKELY CONTRIBUTE TO A TREND TOWARD FEDERAL LISTING OR CAUSE A LOSS OF VIABILITY TO THE POPULATION OR SPECIES (MIIH)

Activities or actions that have effects that are immeasurable or minor, or that are consistent with Conservation Strategies or conservation of the species would receive this conclusion.

For populations that are very small, or vulnerable, each individual may be important for the short and long term viability.

Because sensitive species have been designated based on concerns for their viability, impacts on either individuals or populations are best managed under the umbrella of a Conservation Strategy. Without a Conservation Strategy, the best hierarchical level to base effects of management activities or activities is usually the population, metapopulation or fish stock level.

WILL IMPACT INDIVIDUALS OR HABITAT WITH A CONSEQUENCE THAT THE ACTION WILL CONTRIBUTE TO A TREND TOWARD FEDERAL LISTING OR CAUSE A LOSS OF VIABILITY TO THE POPULATION OR SPECIES (WIFV)

Loss of individuals or habitat can be considered significant when the potential effect may be:

1. contributing to a trend towards federal listing,

2. results in a significantly increased risk of loss of viability to a species,

3. or results in a significantly increased loss of viability to a population (stock).

Activities that adversely affect many individuals, or even a few individuals in vulnerable populations, should probably receive this determination unless there is a Conservation Strategy. Activities that are in conflict with the Conservation Strategy or Conservation Agreement would receive this determination.

Significant adverse impacts to sensitive species must not occur until a Conservation Strategy, or similar plan for species conservation, is prepared (FSH 2672.1) The purpose of a Conservation Strategy is to ensure cumulative effects do not result in reduced viability or conditions that result in the need for federal listing.

BENEFICIAL IMPACT (BI)

Applied when an activity would benefit a sensitive species.

APPENDIX H

Wildlife Biological Evaluation

Biological Evaluation for Terrestrial PETS Species

that may occur in or will be affected by the

Van Range Analysis

Malheur National Forest
Emigrant Creek Ranger District

Table 1. Summary of Conclusion of Effects
(Rationale for conclusion of effects is contained in the body of this document)

Species	No Grazing Alternative	Proposed Action
gray wolf (**E**)	**NE**	**NE**
bald eagle (**T**)	**NE**	**NE**
wolverine (**S**)	**NI**	**NI**
pygmy rabbit (**S**)	**NI**	**NI**
western sage grouse (**S**)	**BI**	**MIIH**
gray flycatcher (**S**)	**NI**	**MIIH**

P = *Proposed,* **E** = *Endangered,* **T** = *Threatened,* **S** = *Sensitive*
(Definitions of effects determinations provided in Appendix A)

Prepared By: Roy Sutcliffe — August 1, 2008
Roy Sutcliffe
Wildlife Biologist — Date

Reviewed By: ______________________ ______________________
Richard Vetter
Supervisory Biologist — Date

______________________ ______________________
Jerome Hensley
District Ranger — Date

I. Introduction

This combined BE (Biological Evaluation)/BA (Biological Assessment) analyzes the potential effects of the proposed action and alternatives developed for to the Van Range Analysis, which are described below. Effects on PET (Proposed, Endangered, or Threatened) species listed under ESA (Endangered Species Act, as amended) and those species identified as sensitive by the FS (United States Department of Agriculture-Forest Service) that do or may occur in the project area would be considered (Appendix B) as required by FSM (Forest Service Manual) 2672.42.

PET species considered include:

- those that are known to occur within the planning area,
- those that are likely to occur within the planning area, based on the distribution of the species, the habitat conditions required or used by the species, and the current habitat conditions of the planning area,
- those that could be affected by management actions, due to known species occurrence adjacent to, or immediately downstream from the planning area.

The BE includes documentation of how PETS (proposed, endangered, threatened, or sensitive) species were identified for, or excluded from, the effects analysis.

The following sources were reviewed during a prefield data base review to gather evidence of or potential for PETS and/or their habitats to occur within the area of the proposed project or action:

- Current Regional Forester's (R6) Sensitive Plant and Animal Lists
- Malheur National Forest and Burns Ranger District PETS Species Database
- Burns District WildObs Database
- Oregon Department of Fish and Wildlife
- Oregon State University, Department of Fish and Wildlife
- ORNHP (Oregon National Heritage Program) Database records

- Current and historic species distribution maps
- Site-specific habitat present within the analysis area that is suitable or may be potential habitat
- GIS data base

This combined BE/BA is prepared to satisfy the requirements of FSM 2672.42. This requires the Forest Service to review all its planned, funded, executed, or permitted programs and activities for possible effects (beneficial, adverse, or lack of effects) on PETS species.

The BE/BA process is intended to review proposed Forest Service programs or activities in sufficient detail to determine how an action or proposed action may affect PETS species and to ensure that proposed management actions would not:

- jeopardize the continued existence, or cause adverse modification of habitat, for species listed or proposed to be listed as endangered or threatened by the FWS (United States Department of the Interior-Fish and Wildlife Service) (FSM 2672.41) or;
- Contribute to the loss of viability for species listed as sensitive by FS-Region 6, or any native or desired non-native species; nor cause any species to move toward federal listing (FSM 2672.41).

This process is conducted to provide a standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process.

II. Summary of Alternatives

The project area is located on the north side of the Burns Ranger District and is comprised of Calamity Creek, Upper Wolf Creek, and Squaw Creek, subwatersheds (6th level HUC). The watershed occurring in the project area includes Wolf Creek Watershed (5th level HUC).Table 2 provide the legal description of the project area.

Table 2 Project Area for Van allotment by Location by Township/Range/Section.

Allotment	Township	Range	Section
Van	17S	33E	35,36
Van	18S	33E	1-3,10-16,21-23,26-28-

The project area contains about 6,650 acres of Forest Service managed land. All acres listed herein are approximate. In most cases, pastures and allotments have been delineated using the most up to date information available and acreages have been determined through computer analysis. Acreages are considered approximate until actually verified on the ground.

The alternatives described in the Range Analysis were developed by the interdisciplinary team in response to the issues that were brought up during project scoping. Two alternatives are considered in detail: the No Action and the Proposed Action

See Chapter 2 of the EA for a complete description of alternatives. Project area maps and foldout maps of all alternatives considered in detail are provided in the EA. Large-scale maps are also available in the project planning record.

III. Species Considered

Table 3. Federally listed species (documented or suspected to occur in the project area, or otherwise impacted by actions taken) considered.

Species	Effects Determination	Informal Consultation	Biological Assessment
gray wolf (**E**)	**No Effect**	**NO**	**NO**
bald eagle (**T**)	**No Effect**	**NO**	**NO**

Table 4. Sensitive Terrestrial species (documented or suspected to occur in the project area, or otherwise impacted by actions taken) considered.

Animals
wolverine
pygmy rabbit
western sage grouse
gray flycatcher

See Appendix B for full list of PETS found or suspected to occur on the Burns Ranger District.

IV. Potential Effects on Listed and Proposed Species and Critical Habitat

Gray wolf
(*Canis lupus*) Linnaeus 1758

Status

Federal Status: Endangered (list 1-7-00-SP-588). The northern Rocky Mountain gray wolf was listed as endangered on June 4, 1973, and a recovery plan was released in 1987. Service down listed gray wolf in April 2003 to threaten and adopted a special “4(d) rules” allowing the take of wolves under certain circumstances. January, 31, 2005, the U.S. District Court vacated a U.S. Fish and Wildlife Service rule on gray wolves. Therefore, gray wolves are currently listed as endangered.

Forest Service (Region 6) Status: Endangered

State Status: Endangered (last revised 12/1998)
Conservation Plan accepted, February 11, 2005.

Oregon Natural Heritage Program Status: List 2-extribated (ORNHP 2000)

Conservation Status Ranking

(The Association for Biodiversity Information 2000)

- **Global Rank= G4** (November 15, 1996)
- **National Rank=N4** (September 05, 1996)
- **Oregon State Rank=SX** (resumed extirpated)

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. Roads increase human presence in wolf habitat and increase 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 wolf mortalities.

“Thurber and others (1994) cite three studies (Jensen and others 1986, Mech and others 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

Currently there are experimental populations of gray wolves established in Idaho and Montana. There are no known wolf packs in Oregon but dispersing wolves could establish in remote areas within the state.

Before wolves would be down listed in Oregon, four breeding pairs need to exist for three consecutive years in eastern Oregon. A breeding pair is defined as an adult male and female with at least two pups surviving to the end of December. The number of wolves associated with a breeding pair can vary from 6-14 wolves (USFWS 2002-3). Based on data from Idaho, four breeding pairs is 6-7 packs of wolves, which is a population of 40-50 animals. It is estimated it would take decades to reach this population objective in Oregon.

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 ERUs, (Ecological Reporting Unit) where habitat is more patchily distributed then 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, a collared wolf (B-45-F) from the experimental, non-essential Idaho population traveled to the three Blue Mountain National Forests and stayed until it was captured and returned to Idaho. Another wolf was found dead near Baker City in the spring of 2000.

This indicates that the three Blue Mountain Forests are probably suitable habitat for wolves. Over time, wolves dispersing from the growing experimental, non-essential central Idaho wolf population could return to the Blue Mountains and establish packs. Current aerial surveys were conducted in the spring of 2006 and did not find any wolves during the flight. There is no current confirmation of wolves in Oregon.

Effects and Determination

Common to All Alternatives

Wolves are limited by prey availability and are threatened by negative interactions with humans. Generally, land management activities are compatible with wolf protection and recovery, especially actions that manage ungulate populations. Habitat and disturbance effects are of concern in denning and rendezvous areas. No such habitat is currently occupied in Oregon.

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.
- Most management activities for non-breeding populations are compatible with wolf protection and recovery.

bald eagle
(*Haliaeetus leucocephaslus*)
Linneaus 1766

Federal Status: Threatened

On February 14, 1978 the bald eagle was federally listed as endangered in all of the conterminous United States except Minnesota, Wisconsin, Michigan, Oregon and Washington, where it was classified as threatened. No critical habitat was designated at the time of listing. On August 11, 1995, it was downlisted to threatened in all of the conterminous United States.

Conservation Status Ranking

(Csuti et al. 1997)

- **Global Rank=G4**
- **Oregon State Rank=S3**

Major Threats: Lethal and non-lethal exposure to organochlorides pesticides, predator control (shooting and poisoning), habitat degradation, human disturbance, loss of nest sites and winter roost habitat.

Habitat

In Oregon, breeding habitat is associated with large bodies of water which support fish populations and have large trees for nesting nearby (Marshall 1992). Nesting bald eagles are rare on the Malheur National Forest. As of 2006, only two documented active nest site has been found on the Emigrant Creek District

These birds are more common in the area during the winter. Wintering habitat is not nearly as specific as nesting habitat. It is located wherever there is an adequate supply of carrion or dying animals and has protected sites for roosting. Roost sites can be 20 miles or more from feeding areas and are most commonly in stands of mature or old-growth conifers. Roost sites contain trees which are larger in diameter than those generally found in the area. Roost sites provide thermal cover and wind protection and may be used by many birds. Major roost sites are still being discovered and vary as to location and use, according to food supply and availability of roost trees (Marshall 1992). Several communal winter roost and potential winter roost sites have been identified on the Emigrant Creek District.

Distribution

The bald eagle is the only North American representative of the fish and sea eagles (Brown and Amadon 1968), and is endemic to North America. Other sea and fish eagles occur as vagrants to the Bering Strait Islands and along the coast of Alaska, or occur in Greenland. The breeding range of bald eagles formerly included most of the continent, but now nest mainly in Alaska, Canada, the Pacific Northwest states, the Great Lakes states, Florida, Chesapeake Bay and rarely in the Desert Southwest.

Pacific Population

Bald eagle populations in the 7-state recovery area (California, Idaho, Montana, Nevada, Oregon, Washington and Wyoming) are less than what would be expected from historical perspectives. Breeding populations in Oregon and Washington are still widely distributed, but historic information suggests significant declines and changes in distribution. (USFWS 1986).

Bald eagles occur throughout the 7-state recovery area, but nesting distribution is more restricted than wintering distribution. In 1985, 527 of 635 nesting territories surveyed were occupied by breeding pairs, for an occupancy rate of 83%. More than 25% of all the wintering bald eagles in the lower 48 states occur in the Pacific recovery area. As many as 4,588 birds have been counted during midwinter surveys conducted between 1979 and 1984 (USFWS 1986).

Breeding populations of bald eagles in Oregon and Washington are still widely distributed, but historical information suggests significant declines and changes in distribution. Oregon has the second highest population of nesting bald eagles in the Pacific Northwest recover area. Breeding pairs occupied 132 of 149 traditional nesting territories surveyed in 1985. At that time, approximately 60% of eagle pairs nested on public land. The Klamath Basin contained the highest concentration in the state (60 pair), but significant numbers (24 pair) nest near high Cascade lakes (USFWS 1986). The Oregon coastline and lower Columbia River Basin have the most of the remaining pairs in the state (Isaacs et al. 1983).

The Pacific Bald Eagle Recover Plan (USFWS 1986) defines the minimum number of nesting territories and breeding pairs needed for a recovered bald eagle population. The Pacific Recovery area has been divided into 47 recovery zones. Each of the zones has a corresponding "habitat management goal" (number of nesting territories) and a "population goal" (number of breeding pairs) expected to occur if the population were considered recovered. These numbers were determined for each zone by considering the current eagle population and the amount of potentially suitable eagle habitat available within the zone.

The Silvies River nesting territory falls within the Harney Basin/Warner Mountains recovery zone (RZ21) which has a habitat management goal of 16 nesting territories and a population goal of 10 breeding pairs of bald eagles. The Silvies River site is the third documented nesting territory and breeding pair in RZ21. Another bald eagle nest was discovered on the former Snow Mountain District in 2001. Two other existing territories identified in the Pacific Bald Eagle Recover Plan occur in the Modoc Plateau, California.

The Silvies River nest was located in July of 1991. Over the last 13 years of nest monitoring the nest has been occupied each year, except in 2001-2003. It has produced young 8 out of 13 years and has averaged 0.85 young fledged per year since discovery. The eagle nest on former Snow Mountain District has produced six young in the past four years with 1.5 young per year fledging average.

Existing Condition

An active bald eagle nest is located approximately 14 air miles southwest of the Schurtz Creek pasture. The BEMA (Bald Eagle Management Area) is centered on the main channel of the Silvies River. This primary area is used for roosting, loafing, and foraging.

The nearest consistently occupied bald eagle winter roosts (MA-5) on the forest is the Rattlesnake Creek roosts located approximately 17 miles south of Van allotment. Bald eagle foraging occurs along the Silvies River located approximately 14 miles from Van. There is no observations of bald eagles foraging, roosting, loafing, or nesting within the planning area.

Effects and Determination

Based on a preliminary assessment of alternatives, implementation of the no action alternative would have **NO EFFECT** (**NE**) on bald eagles or bald eagle nesting habitat and foraging habitat.

Proposed Action

Direct and Indirect Effect

There would be no direct effects on bald eagles from livestock operations in Van due to rarity of bald eagle use in the area. There has not been any documented evidence of bald eagles foraging, roosting or nesting in the allotment. There would be no indirect effects on foraging habitat since there are no large rivers, lakes or reservoirs providing foraging habitat for eagles. Any bald eagle foraging in the allotment would be incidental and would be short term.

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There would be no removal of roosting or nesting trees in the project area. The nesting habitat is limited in the project area and the likelihood of bald eagles nesting in the area is very low.

Determination

Based on the following a No Effect **(NE)** determination is given for bald eagles for Van Range Analysis

- Livestock would not affect nesting, roosting, loafing and foraging habitat
- There is no nesting or winter roosting areas in the project area.
- There have been no sightings of bald eagles in the Wolf Creek watershed.

V. Potential Effects of the Proposed Action on Sensitive Species

The two criteria for evaluating potential effects to sensitive species are:

1. would implementation contribute to the loss of viability for species listed as sensitive (**S**) by USDA-Forest Service Region 6, or any native or desired non-native species, or
2. would implementation cause any species to move toward federal listing (FSM 2672.4) under the Endangered Species Act.

Sensitive Animals

California wolverine

(*Gulo gulo luteus*) Elliot 1904

Status

Federal Status: Species of Concern (list 1-7-00-SP-588). On April 19, 1995 (50 CFR part 17), the USDI Fish and Wildlife Service published a 90-day finding for a petition to add the contiguous United States population of the wolverine (*Gulo gulo luscus*) to the List of Threatened and Endangered Species. The Service found the petition did not present substantial information indicating that listing the wolverine in the contiguous United States may be warranted.

Forest Service (Region 6) Status: Sensitive (USDA 2000)

State Status: Threatened (ODFW 2000)

Oregon Natural Heritage Program Status: List 2 (ORNHP 2000)

Conservation Status Ranking

(NatureServe 2000)

- **Global Rank=G4T3** (Nov 18, 1996)
- **National=N3** (Jan 15, 1997)
- **Oregon State Rank=S2**

Major Threats

Wolverine populations are suspected to be small, especially sensitive to disturbance and vulnerable to local extinction. 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 (snowmobiling) are contributing factors (TNC 1999, Witmer et al. 1998).

Population Status and Trend

"Hash (1987) described 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 1987)." (Wisdom et al. 2000). Through the mid-1970s, numbers appeared to be increasing in California, Oregon, and Washington (NatureServe 2000).

Current population status is not well known in many portions of the range and it may be extirpated from most of its historic range in the contiguous 48 states. Verts and Carraway (1998) believe that while there is a possibility of self-maintaining population of wolverine in Oregon, most animals seen or collected are likely dispersers from Washington and Idaho populations.

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).

They 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 upper montane and sub-alpine habitat during most of the year, they may follow migrating big game herds to lower elevation winter range.

Wolverines are typically opportunistic predators and use a wide variety of foods including roots, berries, small and medium size rodents, birds, bird eggs, fish, and carrion (especially ungulate carcasses) (Wisdom et al. 2000, NatureServe 2000). They are known to attack moose, caribou, and deer hampered by deep snow.

Carrion often makes up a large percentage of the diet ((Wisdom et al. 2000, NatureServe 2000). Copeland (1996) found that carrion related food supplied 46 percent of wolverine diets in Idaho during both summer and winter. Banci (1987) 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 ArchInfo 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.

Results: Large areas of potential denning habitat were identified in the Strawberry Wilderness, Monument Rock Wilderness, and in some northern portions of the Malheur National Forest. Isolated potential denning habitat areas were identified on the Emigrant Creek Ranger District. Most of these areas are not suitable denning habitat because of size or position on the landscape in relationship to developments, roads or natural landscape conditions.

Distribution

The California wolverine (geographic subspecies) appears to occur in California, Oregon, Washington, and part of southern British Columbia (NatureSource 2000).

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.

A query of the Oregon Natural Heritage Program 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).

Records of wolverine occurrence on the Malheur National Forest are very limited. Confirmed and high confidence observations on Malheur National Forest and adjacent areas include:

- Collection of an animal from Steens Mountain, Harney County, (1973)
- Hair and track collection on the former Snow Mountain Ranger District, Ochoco National Forest (1992)
- A partial skeleton and tufts of fir found near Canyon Mountain, Grant County (1992)
- Tracks and a probable denning site found in the Strawberry (1997)

  Observers located probable wolverine tracks leading to and from a potential wolverine natal or maternal den in the northwest corner (T.14S., R.32E.) of the Strawberry Wilderness. Additional aerial reconnaissance of the area located additional tracks leading to and from the potential denning site.

  Tracks observed showed the correct gait pattern and size for wolverine but physical evidence (track casts or detailed photos) could not be collected to confirm the sighting. Reliability of this observation is considered high.
- Tracks in Monument Rock Wilderness (1997).

  A set of tracks was observed in the Monument Rock Wilderness (T.14S., R.36E.) near the crest of Table Rock. No obvious denning or feeding locations were found associated with these tracks.
- A set of probable wolverine tracks were found in the Pine Creek drainage near the Lost Fork of Pine Creek (1997). No obvious denning or feeding locations were found associated with these tracks.

There are at least 8 "unconfirmed" sightings of wolverines on the Emigrant Creek Ranger District; Hall Creek (1983), Gilbert Ridge (1990), Crooked Creek (1991, 2006), Paine Creek (1991), Gold Hill (1993), and Silvies River (1994). One additional unconfirmed sighting was made on the former Snow Mountain Ranger District, along Burnt Cabin Creek (1987). In August of 2006 a fuels technician for BLM saw a wolverine cross the road near Crooked Creek. Camera bait stations were unable to detect or confirm presence.

Existing Condition

Source habitat is very limited on the district. There are no subalpine forest types with or without talus surrounded by trees in or adjacent to this area. The nearest area that approximates this habitat type is located in the Strawberry Mountain wilderness, over 16 miles north of the Wolf Mountain.

Montane forest types within the northern portion of the district may provide marginal or poor (winter) foraging habitat for wolverines. High levels of human disturbance (recreational use, firewood cutting, and management activities) make most of this area unsuitable for wolverine.

The Van allotment is potential dispersal habitat, since Wolf Creek would provide a potential corridor for dispersing wolverine from the Strawberry Mountain wilderness. However, south of Van is sagebrush non-forested habitat unlikely to provide dispersal habitat. Van does provide winter range habitat for ungulates.

Effects and Determination

(No Action Alternative)

Direct and Indirect Effect:

Under the No Action Alternative, there would be no management activities; therefore, there would be no direct or indirect effects to wolverine or potential habitat. Long term reduction in big game habitat may occur as forage for big game is reduced by overstory vegetation and unpalatable grasses.

. **Determination**

Due to the nature of the no action alternative, there would be **NO IMPACT (NI)**.

Proposed Action,

Direct Effect

There are no confirmed records of this species occurring in the project area; therefore, there would be no direct effect to this species. The probability of any livestock grazing actions influencing wolverine is anticipated to be extremely low. There is no denning habitat in the project area, therefore no indirect effects to reproductive habitat for wolverine is expected.

Indirect effects on potential foraging habitat

Under this alternative, there would be no measurable change to plant composition and cover. Therefore, the impacts to small mammals and ungulate prey would be immeasurable. However, human disturbance related to proposed management activities herding, salting, fence maintenance, and watering livestock might displace transient dispersing wolverine from potential foraging habitat during the duration of the project. The probability would be low.

Areas of high ungulate density and especially winter range are key to identifying suitable wolverine foraging habitat (Witmer et al. 1998). Management recommendations by Banci (1987)) suggest that management activities should incorporate strategies that improve the ungulate forage base for wolverine, without significantly changing vegetation structure. Under the Propose Action alternative, grazing strategies would improve forage for ungulates without drastically changing vegetation structure, thereby improving the potential forage base for wolverines.

Because of competition with other carnivores (coyotes and bear), and scavenging birds (ravens, magpies and vultures), the probability of carrion being available for wolverines is low.

Determination

Due to adjustments of livestock levels in the Proposed Action Alternative and the 3-5-year resting period, impacts to wild ungulate habitat is expected to be minimal from livestock grazing. Since livestock grazing would have minimal impacts to big game habitat, it can be concluded a **No Impact (NI)** determination for wolverine. The adjustments in livestock levels in the Proposed Action would reduce impacts to small mammal habitat; therefore, livestock grazing would not indirectly affect prey for wolverine. There could be some minor disturbance to wolverine during livestock operations, but the probability would be low and the disturbance would be short term, localized, and insignificant since no source habitat is available in the allotment.

pygmy rabbit

(*Brachylagus idahoensis*) Merriam 1891

Status

Federal Status: Species of Concern (list 1-7-00-SP-588).

Forest Service (Region 6) Status: Sensitive (USDA 2000)

State Status: Vulnerable (ORNHP 2000)

Oregon Natural Heritage Program Status: List 2 (ORNHP 2000)

Conservation Status Ranking

(The Association for Biodiversity Information 2000)

- **Global Rank=G4** (November 2, 1998)
- **National=N4** (December 05, 1996)
- **Oregon State Rank=S2?**

Major Threats

Threats include range wildfire, sagebrush eradication to improve range conditions for livestock grazing, invasion of exotic annuals, conversion of shrub-steppe to cropland, and fragmentation of remaining suitable and occupied habitat (WDFW 1995).

Population Status and Trend

Moderately threatened range-wide, habitat or community lends itself to alternate use

Washington Department of Wildlife reports that the pygmy rabbit had declined greatly in eastern Washington. Washington Department of Fish and Wildlife (1995) estimated that the state's population is less than 250 rabbits in five areas.

Little information is available on population trend in other states.

Source Habitat Trend

The trend for Great Basin shrubsteppe habitats is generally downward due to fire, grazing, invasion of exotic annuals, and agricultural conversion, which likely correlate with downward trends for sagebrush obligate species such as the pygmy rabbit (Whisenant 1990; Knick and Rotenberry 1995, 1997).

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Habitat

Pygmy rabbits are closely tied to habitats dominated by big sagebrush (*Artemisia tridentata*) growing on deep, loose, friable soil types (Verts and Carraway 1998, WDFW 1995). Sagebrush is a key habitat element for this species because is provides both forage and cover. When 10 habitat variables were submitted to discriminant analysis, shrub cover was the most important variable distinguishing site occupancy by pygmy rabbits from adjacent sites. Soil depth was the second most important variable of importance (WDWF 1995).

The principal food of this species is big sagebrush, even where other tall shrubs such as bitterbrush (*Purshia tridentata*) are common. On an annual basis, sagebrush composes 67% of the diet, grasses 26% and forbs only 6% (Verts and Carraway 1998).

Sagebrush present on occupied sites characteristically forms tall and very dense stands. Occupied sites have an average shrub height of 33 $\pm$ 2 inches and an average overall shrub cover of 28.8 $\pm$ 1.4%, with sagebrush making up almost 24% of the total (Verts and Carraway 1998).

In southwestern Wyoming, pygmy rabbits selectively used dense and structurally diverse stands of sagebrush that accumulated a relatively large amount of snow; the subnivean environment provided access to a relatively constant supply of food and provided protection from predators and thermal extremes (Katzner and Parker 1997).

Soil type is also a major factor in habitat suitability. Soils need to be of the proper depth and texture to excavate for burrows. Burrows are most commonly found in loose coarse-silty and fine-loamy soil types derived from loess or glacial parent material. Burrows usually extend to no more than 3 feet in depth (WDFW 1995).

Occupancy of potential habitats is likely related to a combination of availability of forage, security from predators, and ease of burrow construction.

Distribution

This species can be found in the southeastern third of Oregon to east-central California, east to western Utah and southwestern Montana. Isolated populations occur in east-central Washington (WDFW 1995). Within its range the distribution is not continuous but patchy, primarily in areas of Great Basin big sagebrush dominated plains and alluvial fans where plants occur in tall and dense clumps, and the soil relatively deep and friable NatureServe 2000)

In Oregon, pygmy rabbits have been documented at 37 sites east and south of a line connecting Klamath Falls, Klamath County; Fremont, Lake County; Redmond, Deschutes County; and Baker City, Baker County (Verts and Carraway 1998). Sighting within Harney County indicate that this species occurs mainly in the sagebrush basin south of Burns Oregon. An isolated locality record documents a historic occurrence in Silvies Valley (near Seneca, Oregon).

Existing Condition

A survey for the presence of pygmy rabbits has not been done but an analysis of potential habitat was conducted using current data. GIS analysis indicates that there is about 100 acres of mountain big sagebrush in the project area. The remaining sagebrush area contains shallow rocky soil not conducive for burrowing rabbits. There is no connectivity habitat between Van and any known population of pygmy rabbits. The closest known population is over 40 miles from the project site.

Effects and Determination

(No Action Alternative)

Direct and Indirect Effect

Under the No Action Alternative, there would be no new management activities; therefore, there should be no direct or indirect effects to limited potential pygmy rabbit habitat present in the watershed.

Pygmy rabbits have evolved in the presence of native ungulate grazing. Historic heavy livestock grazing has apparently lowered the resilience of sagebrush plant communities across much of this species range.

The influence of ongoing cattle grazing on pygmy rabbit habitat is not well understood. In general, grazing is known to affect the characteristics of sagebrush communities. The effects depend on a variety of factors including timing and intensity of grazing, stocking densities, location of water sources and salting areas, and other factors that would concentrate cattle use in suitable habitat (WDFW 1995).

It is speculated that livestock grazing may result in forage competition during the spring and summer when pygmy rabbits preferentially select grasses, and heavy grazing can cause breakage of sagebrush plants because of trampling. On the other hand, grazing can increase sagebrush densities and vigor when grazing animals selectively graze on perennial forbs and grasses and reduce competition for limited resources.

Proposed Action Alternative

Direct and Indirect Effects

Based on the scattered distribution of mountain big sagebrush habitat, its small size and lack of suitable linkage corridors, the likelihood of pygmy rabbit occupying these habitat blocks is very low.

Determination

Because these sites are already considered “very low in potential”, any activities that alter vegetation structure or availability would not likely further reduce its very limited potential. Because of this low habitat potential and the low likelihood of pygmy rabbit occurrence in these areas, there would be **NO IMPACT (NI)** from implementation of the Proposed Action Alternative.

western sage grouse

(*Centrocercus urophasianus phaios*)
southeast populations
Bonaparte 1827

Status

Federal Status: Species of Concern (list 1-7-00-SP-588).

Forest Service (Region 6) Status: Sensitive (USFS 2000)

Malheur National Forest Status: Featured Species

State Status: Oregon state sensitive in Blue Mountains, Upland game bird with limited harvest.

Oregon Natural Heritage Program Status: List 3 (ORNHP 2000)

Conservation Status Ranking

(The Association for Biodiversity Information 2000)

- **Global Rank=G5T3Q** (Nov 25, 1996)
- **National Rank=N3** (Jan 05, 1997)
- **Oregon State Rank=S3**

Major Threats

Conversion of sagebrush cover types to agricultural lands and conversion of shrubsteppe 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 contribute to the decline of sage grouse numbers and habitat. Juniper encroachment due to fire suppression is also factors in habitat modification for sage grouse.

Population Status and Trend

Prior to the 1950s, estimates of abundance were anecdotal, and historical population levels are unknown (Braun 1998). 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 (Braun 1999). 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 (Braun 1998). Population declines have continued to present day with accumulating loss and degradation of sagebrush habitats.

Distribution has contracted by approximately 50 percent since European settlement, and these species has been extirpated from five states and one province (Kansas, Nebraska, Oklahoma, Arizona, New Mexico, and British Columbia) (Braun 1998).

Wisdom et al. (2000) reports that sage grouse populations have shown significant, steep declines since the 1940s in Idaho. The rates of decline in Oregon, and Washington are not significantly different, suggesting common, widespread factors affecting these populations. In eastern Oregon, long-term population declines have averaged 30 percent since 1950 (Interagency Interdisciplinary Sage Grouse Planning Team 2000).

Braun (1998) estimates a current total of fewer than 142,000 grouse rangewide, and population levels for each state and province as follows:

- Estimated 500 in Alberta and Saskatchewan.
- Fewer than 2,000 in North Dakota, South Dakota, and Washington.
- Fewer than 5,000 in California.
- Fewer than 15,000 in Colorado and Utah.
- Fewer than 20,000 in Idaho and Nevada.
- 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 (Braun 1999). There have been no sustained population increases in any part of the range (Braun 1998).

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, respectively (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, including: (Schroeder et al. 1999)

- 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 association 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 (February-May), leks may be on bare areas, such as swales, irrigated fields, meadows, burns, and roadsides (Klebenow 1973), 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 (Wallestad 1975).

After mating, hens usually nest near lek grounds, but some fly as far as 12 to 20 miles to favorable nesting sites. They prefer sagebrush 14 to 25 inches tall with an open canopy, 10-50%, for nesting (Klebenow 1973). During the nesting season, cocks and hens without nests use relatively open areas for feeding, and roost in dense sagebrush patches (Klebenow 1969).

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) (Martin 1970). Sage grouse apparently do not require open water for day-to-day survival if succulent vegetation is available, but they utilize free water if 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. 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 20 percnet (less than 25 percent total shrub cover), 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 2000).

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 (Interagency Sage Grouse Planning Team 2000). Sagebrush constituted less than 60 percent of the diet only between June and September (Wallestad 1975). 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 (NatureServe 2000) 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 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, and western Colorado (NatureServe 2000).

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). Populations in most of California and western Nevada are intergrades between subspecies, *phaios* and *urophasianus*. (NatureServe 2000)

Taxonomic validity questionable due to introduction of nominate subspecies into range of *phaios*, Validity may be impossible to determine. (NatureServe 2000)

Existing Conditions

There are no known leks in any of the allotments in the Wolf Creek watershed on U. S. National Forest lands. Active grouse leks have been found south of the Van allotment approximately three miles on BLM lands (ODF&W). The potential for leks to occur in the project area is highly unlikely due to tree densities and terrain.

Potential marginal early season brood rearing summer habitat exists in the south end of the Schurtz Creek pasture. Hens with broods may move into the Van area when lower elevation areas dry and succulent forage is unavailable. Seasonal sage grouse use may occur on the Schurtz Creek pasture.

There is no documented occurrence of sage grouse in the project area. It is likely that adult sage grouse with young occasionally use the non-forested portions of the watershed. There is no key late brood-rearing habitat identified in the watershed on the Malheur National Forest land.

Effects and Determination

(No Action Alternative)

Direct and Indirect Effect

Under the No Action Alternative, there would be no grazing activities; therefore, there should be no direct or indirect effects to sage grouse or their habitat. However, with absence of livestock grazing the rate of recovery of forbs in the potential brood rearing areas in Van would be higher than the Proposed Action in the mid-term (5-10 years). With the absence of livestock, sage grouse brood rearing habitat in the uplands, would improve at a near rate of recovery. Herbaceous forage competition would only occur from wild ungulates.

Determination

Due to the nature of a No Grazing Alternative, there would be no direct impacts to sage grouse brood rearing habitat. Because there would be a potential improvement in forb production in areas that had historic heavy grazing pressure, a beneficial impact **(BI)** is determined. Oregon Department of Fish & Game biologist concurs with the determination.

Proposed Action Alternative

Direct and Indirect Effect:

Grazing Management

The Proposed Action Alternative would reduce grazing pressure in the Van allotment. The reduction in livestock use from past stocking rates should allow for recovery of forbs in the mesic areas, which are potential forage for sage grouse. Late season grazing would resume in the Van allotment after a 3-5-year rest. Light grazing has shown to be effective in upland meadows for improving sage grouse habitat by increasing succulent leaves preferred by grouse (Evans, 1986). Conversely, excessive grazing in meadow and riparian habitats reduce herbaceous plants and negatively affects sage grouse habitat (Klebenow, 1982.). The proposed change in riparian management and conditions would improve sage grouse foraging habitat by limiting livestock use in the Schurtz Creek riparian areas.

Determination

Seasonal grazing has the probability of reducing forbs in the Schurtz Creek pasture. Since there is approximately 600 acres of potential sage grouse habitat in Van, and grazing could reduce forage availability for sage grouse a **MIIH** (May Impact Individuals and their Habitat) determination is given for sage grouse brood rearing habitat.

Light to moderate grazing could slightly improve habitat for sage grouse brood rearing habitat reducing competition for desired succulent forbs. The impacts will vary on the distribution and intensity of livestock grazing in the potential sage grouse habitat in Van.

The potential for sage grouse broods to be in the area are low. High density of juniper and conifers may limit sage grouse use in Van. Incidental brood rearing may occur as birds move through the allotment to areas more suitable for sage grouse. Sage grouse may move through the Van area prior to livestock entering the allotment. Livestock use would have insignificant impacts on sage grouse populations in the Wolf Creek watershed within the Van allotment.

gray flycatcher
(*Empidonax wrightii*) Baird 1858

Status

Federal Status: N/A

Forest Service (Region 6) Status: Sensitive (USDA 2000)

State Status: N/A

Oregon Natural Heritage Program Status: N/A

Conservation Status Ranking

(NatureServe 2000)

- **Global Rank= G5** (December 2, 1996)
- **National Rank=N5B, NZN** (March 19, 1997)
- **Oregon State Rank=S4**

Focal Species for Mature Juniper Woodland with Regeneration.(Landbird Conservation Plans- Columbia Plateau (Altman, Holmes 2000)

Major Threats

This species is vulnerable to land clearing, but is generally found in very arid environments not usually converted to agriculture (USDA Forest Service 1994). Clearing of pinyon-juniper in favor of grassland for livestock grazing or widespread harvesting of pinyon-juniper could be detrimental. Other conservation issues include pesticide use for insect control and cowbird parasitism.

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 5.0 percent average per year (n = 29) during the 1966-1996 period (Sauer et al. 1999). A dramatic annual population increase of 37% in National Forests between 1980 and 1994 has been contributed to thinning of forests (Sharp, 1996).

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 in 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 winters in arid scrublands, riparian woodlands, and mesquite groves in the southwest (USGS 2000).

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 2000). 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 2000).

Existing Condition

Confirmation of the presence and general abundance (0.01 birds/route-very low abundance) (USGS 2000) of gray flycatchers was done for the Silvies Valley during roadside abundance surveys on BBS route Ore-248: Silvies. Presence and density information is not available for the Wolf Creek Watershed.

An analysis of potential habitat was conducted using current GIS data. GIS analysis indicates that there are about 2300 acres of shrublands and ponderosa pine/shrub habitat in the project area. Most of the habitat is in the southern portion of the allotment.

Effects and Determination

(No Action Alternative)

Effect

Under the No Action Alternative, there would be no grazing activities; therefore, there should be no direct or indirect effects resulting from management on gray flycatchers or their habitat. There could be a slight increase in some of the upland shrubs such as bitterbrush or mountain mahogany that received historic livestock browsing. These areas tend to be near water sources and occurred late season when livestock use was concentrated. Because bitterbrush and mountain mahogany are a small component for gray flycatcher habitat, the benefits of no grazing would be immeasurable.

. **Determination**

Due to the nature of a no action alternative, there would be NO IMPACT (NI). A slight benefit to the upland shrub composition from the absence of livestock may occur in localized areas. Since this area may receive big game winter use, any benefits of livestock absence may be offset by big game browsing.

Proposed Action

Direct and Indirect Effects

The Proposed Action Alternative addresses the upland shrub concerns and should reverse the declining shrub trends in the Van allotment. Potential grazing impacts to upland shrubs still exists in some localized areas. There would also be potential for incidental disturbance of nesting birds, but the impacts to gray flycatcher populations would be immeasurable. Because the season of use may conflict with shrub utilization by livestock, (ie. late season grazing) and concentrated use may occur a May Impact Individuals or Habitat, **(MIIH)** is determined**.** This is a conservative estimate based upon the variability of the grazing impacts and the lack of surveys to determine gray flycatcher presence.

There is no proposal to remove any of the upland junipers or sage brush for livestock forage enhancement. These fuels reduction or range management activies have a more negetative impact on gray flycatcher habitat than livestock grazing.

References

Bailey, V. 1936. The Mammals and Life Zones of Oregon. North American Fauna, No 55. USDA, Bureau of Biological Survey, Washington DC.

Banci, V. 1987. Ecology and behavior of wolverine in Yukon. Burnaby BC M.S. thesis in Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski tech eds. 1994.

Braun, C.E. 1998. Sage Grouse Declines in Western North America: What are the Problems? Proc. Western Association of Fish and Wildlife Agencies. 78:139-156.

Braun, C.E. 1999. Conservation plans. Western Sage Grouse Status Conference, Jan. 14-15, 1999, Boise, ID http://www.rangenet.org/projects/grouse.html.

Brown, L. and D. Amandon. 1968. Eagles, Hawks, and Falcons of the World. McGraw Hill Book Co., NY.

Copeland, Jeffrey P. 1996. Biology of the Wolverine in Central Idaho. Master thesis Univ. of Idaho Moscow

Csuti B., A. J. Kimerling, T. A. O'Neil, M. M. Shaughnessy, E. P. Gaines, and M. M. P. Huso. 1997. Atlas of Oregon Wildlife, Distribution, Habitat and Natural History. Oregon State University Press, Corvallis, Oregon.

Edelmann, F. B. and J. Copeland. 1997. Wolverine Survey in the Seven Devils Mountains of Idaho, as part of the ODFW/IDFDG/USFS/IPCo Cooperative Wolverine Survey (CCS 6-16-97-392). Unpubl.

Evans, C.C. 1986. The relationship of cattle grazing to sage grouse use o meadow habitat on the Sheldon National Wildlife Refuge. Masters thesis. Univ. of Nevada, Reno in. Miller and Eddleman 2001. Spatial and Temporal Changes of Sage Grouse Habitat in the Sagebrush Biome.

Forest Service Manual 2672.42 (USDA 1991)

Hash, H. S. 1987. Wolverine. *in* Novak, M., J. A. Baker, J. A. Obbard, (eds.). Wild Furbearer Management and Conservation in North America. Toronto: Ontario Ministry of Natural Resources.

Hornocker, M. G. and H. S. Hash. 1981. Ecology of the Wolverine in Northwestern Montana. Canadian Journal of Zoology. 59:1286-1301.

Isaacs, F. B., R. G. Anthony and R. J. Anderson. 1983. Distribution and Productivity of Nesting Bald Eagles in Oregon, 1978-1982. Murrlet 64:33-38.

Interagency Interdisciplinary Sage Grouse Planning Team. 2000. Draft Interim Management Guidelines for Sage Grouse and Sagebrush-steppe Ecosystems.

Johnson, C. G, and R. R. Clausnitzer. 1992. Plant Associations of the Blue and Ochoco Mountains. Tech. Report R6-ERW-TO-036-92. USDA, Forest Service, Pacific Northwest Region, Wallowa-Whitman National Forest. 164 pp.

Katzner, T. E., and K. L. Parker. 1997. Vegetative Characteristics and Size of Home Ranges Used by Pygmy Rabbits (*Brachylagus idahoensis*) During Winter. Journal of Mammalogy 78:1063-1072.

Klebenow, D. A.1969. Sage Grouse Nesting and Brood Habitat in Idaho. Journal of Wildlife Management. 33(3):649-62.

________. 1973. The Habitat Requirements of Sage Grouse and the Role of Fire in Management *in* Proceedings from Annual Tall Timbers Fire Ecology Conference. Tall Timbers Research Station, Tallahassee, FL.

________, 1982. Livestock grazing interactions with sage grouse. In J.M. Peek and P.D. Dalke ed. Proc. Wildlfe Livestock Relationships Symposium Univ. of ID For., Wldl, and Range Exp. Stat. Moscow. 113-123.

Knick, S. T., and J. T. Rotenberry. 1995. Landscape Characteristics of Fragmented Shrubsteppe Habitats and Breeding Passerine Birds. Conservation Biology 9:1059-1071.

Knick, S. T., and J. T. Rotenberry. 1997. Landscape characteristics of disturbed shrubsteppe habitats in southwestern Idaho (U.S.A.). Landscape Ecology 12:287-297.

Martin, N. S. 1970. Sagebrush Control Related to Habitat and Sage Grouse Occurrence. Journal of Wildlife Management. 34(2):313-320.

Marshall, D. B. 1992. Threatened and Sensitive Wildlife of Oregon's Forests and Woodlands. Audubon Society of Portland. Draft monograph.

Marshall, D.B. et. al. 2003. Birds of Oregon. Oregon State University Press. Corvalis OR 752pp.

NatureServe: An online encyclopedia of life [web application]. 2000. Version 1.1. Arlington, Virginia, USA: Association for Biodiversity Information. http://www.natureserve.org

Oregon Department of Fish and Wildlife. 2000. Oregon List of Threatened and Endangered Fish and Wildlife Species.

Oregon Department of Fish and Wildlife, 2007. Pers. Comm. with Dan Gonzales, Habitat Biologist.

Oregon Department of Fish and Wildlife. 1997. Sensitive Species List.

Oregon Natural Heritage Program (ORNHP). 2000. Rare, Threatened, and Endangered Plants and Animals of Oregon. Portland, OR.

Pagel, J. 1992. Analysis of Potential Peregrine Falcon Reintroduction Sites on the Malheur National Forest. USDA-Forest Service. Unpubl.

Saab, V.A., Boxk, C.E., Rich, T.D., Dobkin, D.S. 1995. Livestock grazing effects in western North America. In Finch, D.M. Martin,. Ecology and Management of Neotropical Birds.

Sauer, J.R., J.E. Hines, G. Gough, I. Thomas, and B.G. Peterjohn. 1997. The North American Breeding Bird Survey Results and Analysis. Version 96.3. Online. Patuxent Wildlife Research Center, Laurel, MD. http://www.mbr.nbs.gov/bbs/bbs.html.

Schroeder, M. A., J. R. Young, and C. E. Braun. 1999. Sage Grouse (*Centrocercus urophasianus*). *In* A. Poole and F. Gill, editors, The Birds of North America, No. 425. The Birds of North America, Inc., Philadelphia, PA.

Rausch, R. L. and A. M. Pearson. 1972. Notes on the Wolverine in Alaska and the Yukon Territory. Journal of Wildlife Management. 36:249-268.

Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski tech eds. 1994. The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx, and Wolverine in the Western United States. Gen. Tech. Report RM-254. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 184 pp.

Ryser, F.A. 1985. Birds of the Great Basin: a natural history. University of Nevada Press, Reno, NV.

The Nature Conservancy (TNC). 1999. Natural Heritage Conservation (BioSource) Database. Accessed by USDA Forest Service under Grant No. 97-CC2-230.

The Association of Biodiversity Information. 2000. NatureServe, Natural Heritage Central Databases. The Association for Biodiversity Information, Arlington, VA (August 06, 2000).

USDA Forest Service. 2000. Region 6 Sensitive Animal List. Revised November 2000.

USDA Forest Service. 1994. Neotropical Migratory Bird Reference Book. USDA Forest Service, Pacific Southwest Region. 832 pp.

USDI Bureau of Land Management (BLM). 1998. Riparian Area Management: Process for Assessing Proper Functioning Condition. Technical Reference 1737-9. USDI Bureau of Land Management Service Center, Denver, CO.

. 1997. Federal Register: May 27, 1997, Volume 62, Number 101.

USGS-Patuxent Wildlife Research Center. 2000. Oregon Trend Results: North American Breeding Bird Survey Trend Comparative Results. www.mbr-pwrc.usgs.gov

Verts, B. J. and L. N. Carraway. 1998. Land Mammals of Oregon. University of California Press, Berkeley and Los Angles, CA. Pp. 455-458.

Wallestad, R. 1975. Male Sage Grouse Responses to Sagebrush Treatment. Journal of Wildlife Management 39:482-484.

Washington Department of Fish and Wildlife. 1995. Washington State recovery Plan for Pygmy Rabbit. Wildlife Management Program. Olympia. 73pp.

Whisenant, S. G. 1990. Changing Fire Frequencies on Idaho's Snake River Plains: Ecological and Management Implications. pages 4-10 *in* E. D. McArthur, E. M. Romney, S. D. Smith, and P. T. Fuller, editors. Proceedings of a Symposium on Cheatgrass Invasion, Shrub Die-off, and Other Aspects of Shrub Biology and Management. USDA Forest Service, Intermountain Research Station, Ogden, Utah.

Willis, J. M., G. P. Keister, Jr., D. A. Immell, D. M. Jones, R. M. Powell, and K. R. Durbin. 1993. Sage grouse in Oregon. Wildlife Research Report Number 15. Oregon Department of Fish and Wildlife, Wildlife Research Section, Portland, OR. 54pp.

Wisdom, M. J., R. S. Holthausen, B. C. Wales, C. D. Hargis, V. A. Saab, D. C. Lee, W. Hann, T. D. Rich, M. M. Rolland, W. J. Murphy, and M. R. Eames. 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale Trends and Management Implications. Gen. Tech Rep. PNW-GTR-485 (CD-ROM, Draft Version, March 2000). USDA Forest Service, Pacific Northwest Research Station, Portland, OR.

Witmer G. W., S. K. Martin, and R. D. Sayler. 1998. Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Correlates. Gen. Tech. Report PNW-GTR-420. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. 51 pp.

Appendix A

Determination of Conclusion Definitions for Biological Assessments and Biological Evaluations.

Listed Species

NO EFFECT (NE)

Applied when a project or activity will not have any "effect" on a listed species, or critical habitat.

Conferencing with the US Fish and Wildlife Service or National Marine Fisheries Service is not required.

MAY EFFECT-LIKELY TO ADVERSELY AFFECT (LAA)

If all Forest Plan standards and guidelines, interim direction and Recovery Plan conservation recommendations to protect threatened or endangered species cannot be implemented, a "May Effect-Likely to Adversely Affect" situation likely exists. Informal consultation should be begun to determine if this determination can be avoided.

If this determination is made, formal consultation must be initiated (50 CFR 402.12). Formal consultation must be requested in writing through the forest supervisor (FSM 2670.44) to the appropriate US Fish and Wildlife Service state or field supervisor, or National Marine Fisheries Service office.

MAY EFFECT-NOT LIKELY TO ADVERSELY AFFECT (NLAA)

A situation where a "May Effect-Not Likely to Adversely Affect" conclusion could be made if there are possible effects such as displacement or habitat modification, but those effects are insignificant or discountable.

If this determination is made, then written concurrence by the US Fish and Wildlife Service or National Marine Fisheries Service is required (50 CFR 402.13). Requests for concurrence must be initiated in writing from the forest supervisor to the state or field supervisor.

BENEFICIAL EFFECT (BE)

A situation where an activity or project is determined to substantially improve the habitat or status of a threatened or endangered species, or its habitat.

Written concurrence from the US Fish and Wildlife Service or National Marine Fisheries Service is required. Requests for concurrence must be initiated in writing from the forest supervisor to the state or field supervisor.

Proposed Species

NO EFFECT (NE)

Applied when a project or activity will not have any "effect" on a proposed species, or proposed critical habitat.

Conferencing with the US Fish and Wildlife Service or National Marine Fisheries Service is not required.

NOT LIKELY TO JEOPARDIZE THE CONTINUED EXISTENCE OF THE SPECIES OR RESULT IN DESTRUCTION OR ADVERSE MODIFICATION OF PROPOSED CRITICAL HABITAT (NLJR)

This determination is used when there are effects or cumulative effects, but where such effects would not have the consequence of losing key populations (stocks), would not adversely modify proposed critical habitat, or would not irreversible or irretrievable commit resources that might foreclose options to recovery, should the species be listed.

Conferencing with the US Fish and Wildlife Service or National Marine Fisheries Service is not required but may be initiated.

LIKELY TO JEOPARDIZE THE CONTINUED EXISTENCE OF THE SPECIES OR RESULT IN DESTRUCTION OR ADVERSE MODIFICATION OF PROPOSED CRITICAL HABITAT (LJR)

This determination is used when there are significant effects that could jeopardize the continued existence of the species, result in adverse modification or destruction of proposed critical habitat, and/or result in irreversible or irretrievable commitments of resources that could foreclose options to avoid jeopardy, should the species be listed.

Conferencing with the US Fish and Wildlife Service or National Marine Fisheries Service is required if this determination is made.

Sensitive Species

NO IMPACT (NI)

Applied when an activity would have no effect on habitat, individuals, a population or a species.

MAY IMPACT INDIVIDUALS OR HABITAT, BUT WILL NOT LIKELY CONTRIBUTE TO A TREND TOWARD FEDERAL LISTING OR CAUSE A LOSS OF VIABILITY TO THE POPULATION OR SPECIES (MIIH)

Activities or actions that have effects that are immeasurable or minor, or that are consistent with Conservation Strategies or conservation of the species would receive this conclusion.

For populations that are very small, or vulnerable, each individual may be important for the short and long term viability.

Because sensitive species have been designated based on concerns for their viability, impacts on either individuals or populations are best managed under the umbrella of a Conservation Strategy. Without a Conservation Strategy, the best hierarchical level to base effects of management activities or activities is usually the population, metapopulation or fish stock level.

WILL IMPACT INDIVIDUALS OR HABITAT WITH A CONSEQUENCE THAT THE ACTION WILL CONTRIBUTE TO A TREND TOWARD FEDERAL LISTING OR CAUSE A LOSS OF VIABILITY TO THE POPULATION OR SPECIES (WIFV)

Loss of individuals or habitat can be considered significant when the potential effect may be:

1. contributing to a trend towards federal listing,
2. results in a significantly increased risk of loss of viability to a species,
3. or results in a significantly increased loss of viability to a population (stock).

Activities that adversely affect many individuals, or even a few individuals in vulnerable populations, should probably receive this determination unless there is a Conservation Strategy. Activities that are in conflict with the Conservation Strategy or Conservation Agreement would receive this determination.

Significant adverse impacts to sensitive species must not occur until a Conservation Strategy, or similar plan for species conservation, is prepared (FSH 2672.1) The purpose of a Conservation Strategy is to ensure cumulative effects do not result in reduced viability or conditions that result in the need for federal listing.

BENEFICIAL IMPACT (BI)	Applied when an activity would benefit a sensitive species.

Appendix B

Terrestrial Mammalian TEPS Species List for the Emigrant Creek Ranger District and Occurrence in the Wolf Creek Watershed

common and *scientific name*	status	Habitat Associations and availability in Van	occurrence in project area
gray wolf/ *Canis lupus*	Endangered	*Generalist No denning or rendezvous sites in the watershed.*	Historic! No documented wolves in Oregon**.**
northern bald eagle/ *Haliaeetus leucocephalus*	Threatened	Nests- Large conifers usually by large bodies of water near foraging habitat.	Suspected in Wolf Creek Other streams in project too small for eagles.
Lynx/ *lynx canadensis*	Threatened	No critical habitat in Oregon.	N/A
American peregrine falcon *Falco peregrinus anatum*	R-6 Sensitive	No cliffs available for nests sites. No large streams in project area for foraging.	N/A
western sage grouse/ *Centrocercus urophasianus phaios*	R-6 Sensitive	No breeding habitat in project area. Low potential brooding areas in sagebrush, riparian, and meadows within Schurtz Creek pasture.	Suspected Incidental use
gray flycatcher/ *Empidonas wrightii*	R-6 Sensitive	Nests in big sagebrush, juniper, and open pine stands. About 2,000 acres of habitat available.	Suspected
Bobolink/ *Dolichonyx oryzivorus*	R-6 Sensitive	No moist meadows large enough in Van to provide habitat.	N/A
Bufflehead/ Bucephala albeola	R-6 Sensitive	*No large bodies of water present. Stock ponds are not suitable habitat.*	N/A
Wolverine/ *Gulo gulo luseus*	R-6 Sensitive	No reproductive habitat in watershed. Potential dispersal habitat, but it limited due to lack of connectivity to the south- private lands, sagebrush.	Suspected Incidental transitory use only.
pygmy rabbit/ *Brachylagus idahoensis*	R-6 Sensitive	Big sagebrush with deep friable soils. Most of Van has shallow rocky soils. Fragmented habitat and no connectivity to known populations.	Suspected Low probability
Pacific fisher/ *Martes pennanti*	R-6 Sensitive	No mesic mature conifer habitat in Van. Riparian areas are too small and dry habitat types.	N/A
Upland sandpiper/ Bartramia longicauda	R-6 Sensitive	*No large meadows present in project area.*	N/A
Tricolored blackbird/ Agelaius tricolor	R-6 Sensitive	*No marshes available in project area.*	N/A

Documented=in project area, or adjoining lands **Suspected**=potential habitat present **N/A=Not Applicable**

Appendix C
Status Definitions

Federal Status Definitions

Endangered Species, which are in danger of becoming extinct within the near future throughout all or a significant portion of their range

Threatened Species those likely to become endangered within the foreseeable future.

Species of Concern Former USFWS C2 candidate that have sufficient information to support a proposal to list under the ESA or by ODFW under the OEAS.

Oregon's Threatened and Endangered Species Program Definitions
(under the authority of ORS 496.172, the Oregon Endangered Species Act, 1987)

Sensitive species are broken into four categories defined as follows:

Critical Species for which listing as threatened or endangered is pending; or those for which listing as threatened or endangered may be appropriate if immediate conservation actions are not taken. Also considered critical are some peripheral species that are at risk throughout their range, and some disjunct populations.

Vulnerable Species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring. In some cases, the population is sustainable, and protective measures are being implemented; in others, the population may be declining and improved protective measures are needed to maintain sustainable populations over time.

Peripheral or Naturally Rare Peripheral species refer to those whose Oregon populations that are on the edge of their range, Naturally rare species are those which had low population numbers historically in Oregon because of naturally limiting factors. Maintaining the status quo for the habitat and population of these species is a minimum requirement. Disjunct populations of several species that occur in Oregon should not be confused with peripheral.

Undetermined Status Animals in this category are species for which status is unclear. They may be susceptible to population decline of sufficient magnitude that they could qualify for endangered, threatened, critical or vulnerable status, but scientific study will be required before a classification can be made.

Conservation Status Ranking

5 Secure-Common, demonstrably widespread and abundant. Typically with considerably more than 1000 occurrences and more than 10,000 individuals.

Secure in Oregon, and essentially ineradicable under present conditions.

4 Apparently Secure-Uncommon but not rare, and usually widespread. Possibly, cause for long-term concern. Typically more than 1000 occurrences and more than 10,000 individuals.

Not rare, and usually widespread in Oregon. Usually more than 100 occurrences.

3 Vulnerable-Vulnerable globally because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

Vulnerable in Oregon either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 1000 occurrences.

2 Imperiled-Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or stream miles (10 to 50).

Imperiled in Oregon because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. Typically 21 to 100 occurrences.

1 Critically Imperiled-Critically imperiled globally because of extreme rarity or because of some factor(s) making is especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000) or acres (<2,000) or stream miles (<10).

Critically Imperiled in Oregon because of extreme rarity or because or some factor(s) making it especially vulnerable to extirpation for the state. Typically 5 or fewer occurrences or very few remaining individuals or acres.

Oregon Natural Heritage Program List (ONHP 2000)

List 1 contains taxa that are threatened with extinction or presumed to be extinct throughout their entire range.

List 2 contains taxa that are threatened with extirpation or presumed extirpated from the state of Oregon. These often peripheral or disjunct species are of concern when considering species diversity within Oregon's borders. They can be very significant when protecting the genetic diversity of a taxon. ORNHP regards extreme rarity as a significant threat and has included species that are very rare in Oregon on this list.

List 3 contains species for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

List 4 contains taxa that are of conservation concern but are not currently threatened or endangered. This includes taxa that are very rare but are currently secure, as well as taxa that are declining in numbers or habitat but are still too common to be proposed as threatened or endangered. While these taxa currently may not need the same active management attention as threatened or endangered taxa, they do require continued monitoring.

APPENDIX I

Proper Functioning Condition Surveys

Proper Functioning Condition Assessment
Standard Checklist and Evaluation

Name of Riparian-Wetland Area: Schurtz Creek, Van and Story-Fry Allotments, Reach 1, Segment 1

Date: 11/15/04

Miles: Segment 1=2.24 mi. of Reach 1= 3.79 mi. (from confluence with Calamity Creek to the enclosure on Schurtz Creek)

ID Team Observers: Zelley-Range specialist, Rick Vetter- Fisheries Biologist, Lori Bailey-Planner/Botanist, and Barbara Howard and Alfred Dunten, permittees for the Van Allotment.

Acres: 7,834 acres Schurtz Creek Subwatershed

Stream Overview:

Schurtz Creek is a third order stream and a tributary to Calamity Creek located in the Calamity Creek subwatershed within the Wolf Creek watershed of the Upper Malheur sub-basin and lies entirely within the Malheur National Forest. (In 2003 the Schurtz Creek watershed was incorporated into the Calamity Creek watershed) Segment 1 represents that part of Reach 1, which is below the Schurtz Creek enclosure. This segment also includes the portion of Schurtz Creek that is fenced into the Story-Fry allotment, as a water gap.

Yes	No	N/A	HYDROLOGY
☐	☒	☐	**1)** Floodplain above bankfull is inundated in "relatively frequent" events
This reach has a combination of short segments consisting of rocky steep gradients with narrow channels and short wide areas with less gradient and wider floodplains. Overall the gradient was about 2%. This answer pertains mostly to the unconfined channels with relatively wide floodplains since parts of the floodplain in the steep narrow segments are limited in size and function due to the natural character of the narrow rocky confined channel and steep valley slopes. **Large infrequent events may enter the floodplain, but frequent events appear to be restricted to the channel. The amount of channel deposition, bank erosion and debris jams, indicates a lack of energy dissipation across the floodplain. There is a lack of interaction between the channel and the floodplain. The lack of surface flow in the lower segment of this reach may also indicate a lack of frequent flooding of the floodplain. Frequent flooding of the floodplain allows riparian areas to be recharged, maintaining obligate riparian species with dense root systems that retain soil moisture and slowly dissipate the water during the summer into the channel. Down cutting and widening of the channel is limiting flood flows onto the floodplain, reducing the interaction of the stream with the adjacent floodplain and limiting the natural beneficial hydrologic functions that should be occurring in these areas.**			
☐	☐	☒	**2)** Where beaver dams are present they are active and stable
☐	☒		**3)** Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bio-climatic region)
Sinuosity and gradient are closer in balance with the natural landscape, but overhanging banks are lacking. Width depth ratios are greater than 10.			
☐	☒	☐	**4)** Riparian-wetland area is widening or has achieved potential extent
There is an increase in shallow rooted grasses (bluegrass) and in some cases sagebrush, on the			

floodplain which indicates the riparian wetland is narrowing and the water table is falling. This usually occurs with the lack of floodplain development as described in question # 1. Parts of the lower segment in the confined channel would be a NA since the landform dictates the functionality, and there is no potential for wetland vegetation.			
☐	☒		**5)** Upland watershed is not contributing to riparian-wetland degradation
There is evidence of cementing of the streams substrate and overloading of point bars which indicate a no answer. However without further studies it is unclear what amounts of sediment, and overland flows are being contributed from uplands or altered streambanks. The uplands are overstocked with timber, and encroached with western juniper resulting in a degraded understory of shrubs, forbs and grasses. Soils may be compacted beyond the normal range of variability which would also affect runoff. Bulk density evaluations of soils and water infiltration rates may also help determine if the uplands and or riparian floodplains are contributing to the wetland degradation. It should be noted that this item pertains to whether uplands are contributing to the degradation of riparian wetland areas, and not the condition of the uplands.			

Yes	No	N/A	VEGETATION
☐	☒	☐	**6)** There is diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery)
There is a non-continuous pattern of sedges scattered along the banks and the mid age class of shrubs is lacking. There are more old decadent alder and willow, and few young .			
☐	☒	☐	**7)** There is diverse composition of riparian-wetland vegetation (for maintenance/recovery)
Due to the condition of the vegetation it was difficult to identify all plant species, but it was evident that there were not sufficient numbers of the existing riparian plants for timely recovery.			
☐	☒	☐	**8)** Species present indicate maintenance of riparian-wetland soil moisture characteristics
The water table is not being maintained due to the lack of wetland species (sedges) and the abundance of upland species (sagebrush, bluegrass) on the floodplain.			
☐	☒	☐	**9)** Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high-streamflow events
Narrow steep reaches have older willows, alders and hawthorns that are providing some stabilization (subsurface flow segments) but the majority of the streambanks associated with surface flow are lacking plants that have root masses capable of withstanding high stream flows thus the reason for the amount of altered banks observed along this reach segment. Bank stability standards are not met in this reach.			
☐	☒	☐	**10)** Riparian-wetland plants exhibit high vigor
The size and shape of the riparian plants indicate that plants are not vigorous. There are more high-lined and mushroom shaped plants than robust well rounded plants. Sedges tend to occur in broken clumps rather than dense continuous mats, except at several small seeps associated with springs.			
☐	☒	☐	**11)** Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows
Streambanks associated with surface flows are dominated by upland plant species that do not dissipate energy from high flows.			
☒	☐	☐	**12)** Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery)
There is an adequate source of LWD but it is not in the stream channel interacting with the water flow and forming pools.			

Yes	No	N/A	EROSION/DEPOSITION
☐	☒		**13)** Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) are adequate to dissipate energy
Overall there is a lack of large woody debris that would help dissipate energy and create pools.			

Where wood is interacting with the water flow, pools are being created and stream energy is being dissipated. Rocks were stabilizing parts of the channel in the steeper gradients.			
☐	☒	☐	**14)** Point bars are re-vegetating with riparian-wetland vegetation
The majority of the point bars do not contain riparian wetland species with root masses capable of withstanding high flow events. Some areas of vegetation may be limited by lack of sunlight, due to the encroaching forest canopy.			
☐	☒		**15)** Lateral stream movement is associated with natural sinuosity
Although there is some natural lateral movement the majority of the stream banks are eroded and unstable. This reach does not meet bank stability standards.			
☒	☐		**16)** System is vertically stable
No head cuts were observed			
☐	☒		**17)** Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)
Unstable banks and excessive erosion indicate that this segment of the stream is out of balance. This is partially due to the lack of riparian plants with deep root masses.			

Remarks

This evaluation is for the entire length of Schurtz Creek, in reach 1, Segment 1, from Calamity Creek to the downstream end of the enclosure at the upper end of the Van allotment. This includes a small fenced portion of the Story-Fry allotment, in the center of the Van allotment on Schurtz creek. The team noted less utilization of the riparian plants in the Story-Fry allotment and more interaction between the stream channel and the riparian area.

Forty-seven photos were taken during this PFC evaluation on Schurtz and are noted as:
Set-A Van Allotment, Calamity Ck. to Story-Fry Allotment, 8 photos misc. #s 9930 thru 9937
Set-B Story-Fry Allotment water gap, 16 photos misc. #s 9938 thru #9956
Set-C Van Allotment, Story-Fry fence to enclosure fence, 23 photos misc. #s 9957 thru #9992

This portion of Schurtz Creek lacks the resiliency that allows a riparian wetland area to withstand (hold together during) high water events. During high water flow events this stream segment has a high probability of further degradation. Floodwater retention is minimal in this segment. This reach segment failed to meet 5 of the six riparian management objectives in the Forest Plan Amendment 29, dealing with water temperature, bank stability, large woody debris, pool frequency, width/depth ratio. Canopy closure was met.

Due to stubble heights of about 2-3 inches it was difficult to identify some riparian plants to species, however we could identify broadleaf sedges, rushes and grasses as plant communities and other key species with deep root masses such as Nebraska Sedge vs shallow rooted grass like species as bluegrass. Identifying these key species allowed us to answer the vegetation questions. Trend is often a difficult determination to make unless previous data exists. At this time the trend is considered "Not Apparent".

Alfred Dunten informed us that the lower part (the steeper gradient and partially confined channel) of Schurtz Creek (starting at a point about ½ way between Calamity and Story Fry allotment) is dry during the late summer.

Thinning selected conifers in the riparian area would provide more sunlight for riparian species and shrubs. Felled trees could be positioned in the stream channel (and floodplain) to increase the large woody debris component creating pools and dissipating stream energy.

Summary Determination

Functional Rating:

Proper Functioning Condition	
Functional-At Risk	X
Nonfunctional	
Unknown	

Trend for Functional-At Risk:

Upward	
Downward	
Not Apparent	**X**

Are factors contributing to unacceptable conditions outside the control for the manager?

Yes	
No	**X**

If yes, what are those factors?

______Flow regulations
______Channelization
______Augmented flows
______Mining activities
______Road encroachment
______Other (specify) _____
______Upstream channel conditions
______Oil field water discharge

Proper Functioning Condition Assessment
Standard Checklist and Evaluation

Name of Riparian-Wetland Area: Schurtz Creek, Van Allotment, Reach 1, Segment 2

Date: 11/15/04

Miles: Segment 2=1.55 mi. of Reach 1= 3.79 mi.

ID Team Observers: Zelley-Range specialist, Rick Vetter- Fisheries Biologist, Lori Bailey-Planner/Botanist, and Barbara Howard and Alfred Dunten, permittees for the Van Allotment

Acres: 7,834 acres Schurtz Creek subwatershed

Stream Overview:

Schurtz Creek is a third order stream and a tributary to Calamity Creek located in the Calamity Creek subwatershed within the Wolf Creek watershed of the Upper Malheur subbasin and lies entirely within the Malheur National Forest. (In 2003 the Schurtz Creek watershed was incorporated into the Calamity Creek watershed) Segment 2 represents that part of Reach 1, which is in the large fenced enclosure at the upper end of the pasture.

Yes	No	N/A	HYDROLOGY
☒	☐	☐	1)Floodplain above bankfull is inundated in “relatively frequent” events
The stream and riparian area are interacting.			
☐	☐	☒	2)Where beaver dams are present they are active and stable
☐	☒		3)Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
Sinuosity and gradient are closer in balance with the natural landscape but overhanging banks are lacking. Width depth ratios are greater than 10.			
☒	☐	☐	4)Riparian-wetland area is widening or has achieved potential extent
☒	☐		5)Upland watershed is not contributing to riparian-wetland degradation

Yes	No	N/A	VEGETATION
☒	☐	☐	6)There is diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery)
☒	☐	☐	7)There is diverse composition of riparian-wetland vegetation (for maintenance/recovery)
☒	☐	☐	8)Species present indicate maintenance of riparian-wetland soil moisture characteristics
☒	☐	☐	9)Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high-streamflow events
☒	☐	☐	10)Riparian-wetland plants exhibit high vigor

☒	☐	☐	11)Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows
☒	☐	☐	12)Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery)
This part of the reach contains large meadows thus large wood debris (LWD) is not as important a factor in the formation of pools as meander scours.			

Yes	No	N/A	EROSION/DEPOSITION
☒	☐		13)Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) are adequate to dissipate energy
This part of the reach contains large meadows thus LWD is not as important a factor in the formation of pools as meander scours.			
☒	☐	☐	14)Point bars are revegetating with riparian-wetland vegetation
☒	☐		15)Lateral stream movement is associated with natural sinuosity
☒	☐		16)System is vertically stable
No headcuts were observed			
☒	☐		17)Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Due to stubble heights of less than 5 inches on the floodplain it was difficult to identify some riparian plants to species, however we could identify sedges, rushes and grasses as plant communities and other key species with deep root masses as Nebraska Sedge vs shallow rooted grass like species as bluegrass.

Alfred Dunten mentioned that this the first time his cattle have grazed the enclosure since it was established about 1990. However, when he moved his cattle in this year there were already cattle present, and they utilized a significant portion of the riparian forage. Therefore, Alfred did not leave his cattle in the enclosure as long as he anticipated. (18 photos, Van enclosure, Photoset D misc. photo #s 9992-0020)

Summary Determination

Functional Rating:

Proper Functioning Condition	**X**
Functional-At Risk	
Nonfunctional	
Unknown	

Trend for Functional-At Risk:

Upward	**X**
Downward	
Not Apparent	

Are factors contributing to unacceptable conditions outside the control for the manager?

Yes	
No	**X**

If yes, what are those factors?

______Flow regulations	**______Mining activities**	**______Upstream channel conditions**
______Channelization	**______Road encroachment**	**______Oil field water discharge**
______Augmented flows	**______Other (specify) _____**	

Proper Functioning Condition Assessment
Standard Checklist and Evaluation

Name of Riparian-Wetland Area: Schurtz Creek, Wolf Allotment, Reach 1, Segment 3

Date: 11/15/04

Miles: Segment 3=.25 mi. Reach 1= 3.79 mi.

ID Team Observers: Zelley-Range specialist, Rick Vetter- Fisheries Biologist, Lori Bailey-Planner/Botanist, and Barbara Howard and Alfred Dunten, permittees for the Van Allotment

Acres: 7,834 acres Schurtz Creek subwatershed

Stream Overview:
Schurtz Creek is a third order stream and a tributary to Calamity Creek located in the Calamity Creek subwatershed within the Wolf Creek watershed of the Upper Malheur subbasin and lies entirely within the Malheur National Forest. (In 2003 the Schurtz Creek watershed was incorporated into the Calamity Creek watershed) Reach 1, Segment 3 represents that part of Reach 1, in the Wolf Creek allotment above the Van enclosure to FS Road 17.

Yes	No	N/A	HYDROLOGY
☒	☐	☐	1)Floodplain above bankfull is inundated in "relatively frequent" events
The stream and riparian area are interacting.			
☐	☐	☒	2)Where beaver dams are present they are active and stable
☒	☐		3)Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
☒	☐	☐	4)Riparian-wetland area is widening or has achieved potential extent
☒	☐		5)Upland watershed is not contributing to riparian-wetland degradation

Yes	No	N/A	VEGETATION
☒	☐	☐	6)There is diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery)
☒	☐	☐	7)There is diverse composition of riparian-wetland vegetation (for maintenance/recovery)
☒	☐	☐	8)Species present indicate maintenance of riparian-wetland soil moisture characteristics
☒	☐	☐	9)Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high-streamflow events
☒	☐	☐	10)Riparian-wetland plants exhibit high vigor

☒	☐	☐	11)Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows
☒	☐	☐	12)Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery)

Yes	No	N/A	EROSION/DEPOSITION
☒	☐		13)Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) are adequate to dissipate energy
☒	☐	☐	14)Point bars are revegetating with riparian-wetland vegetation
☒	☐		15)Lateral stream movement is associated with natural sinuosity
☒	☐		16)System is vertically stable
No headcuts were observed			
☒	☐		17)Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Good establishment of woody shrubs along the stream banks, improved bank stability, stream channel narrows. Cottonwood were observed at waypoint 11T 0359354;4874870. (4 photos, between Van/Wolf allotment fence and FS road 17, photoset E, misc. photo #s 0021- 0025)

Summary Determination

Functional Rating:

Proper Functioning Condition	X
Functional-At Risk	
Nonfunctional	
Unknown	

Trend for Functional-At Risk:

Upward	X
Downward	
Not Apparent	

Are factors contributing to unacceptable conditions outside the control for the manager?

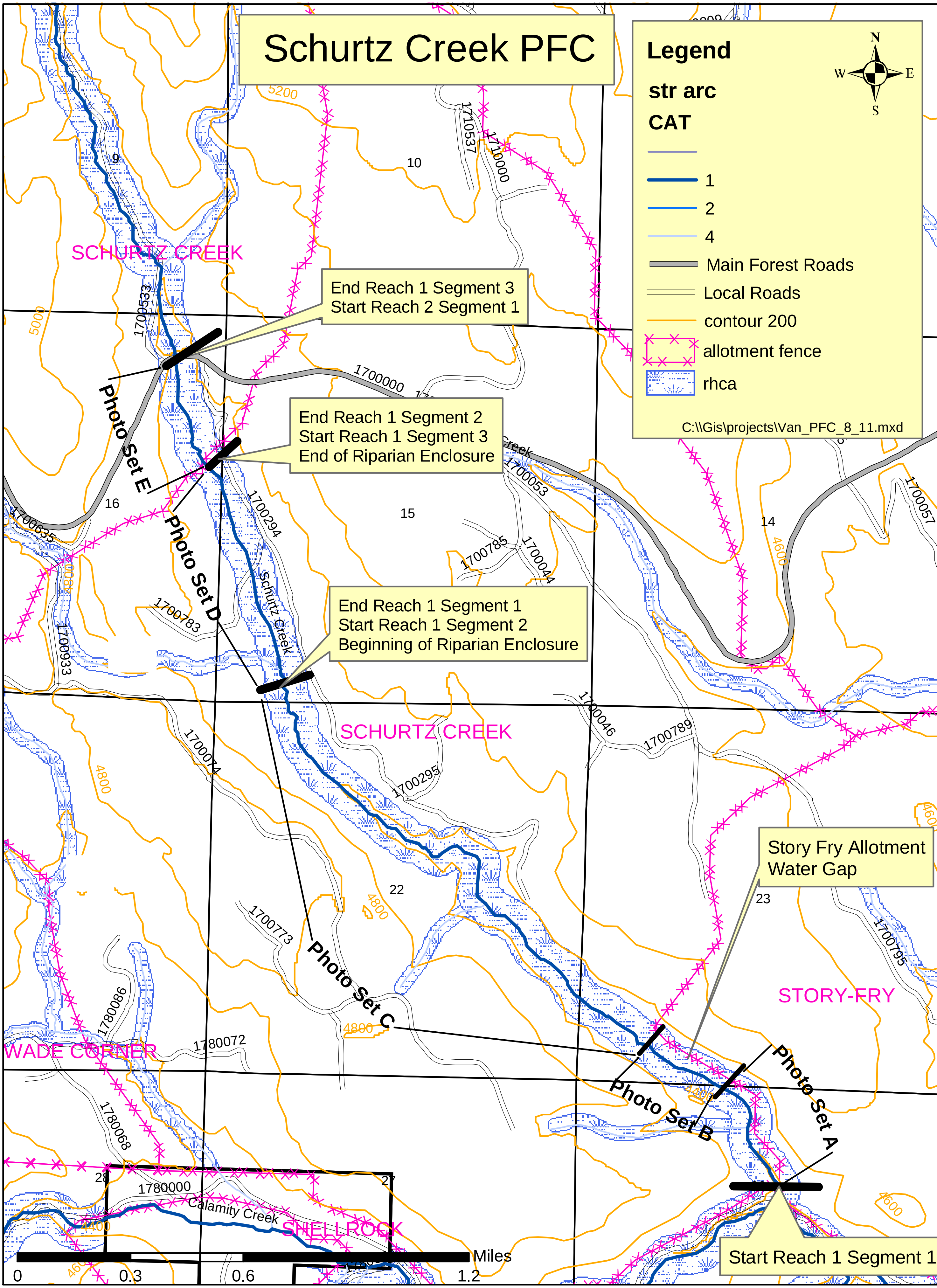
Yes	
No	X

If yes, what are those factors?

______Flow regulations **______Augmented flows** **______Mining activities**
______Channelization **______Road encroachment**

______Other (specify) ______

______Upstream channel conditions
______Oil field water discharge


Schurtz Creek PFC
Legend
str arc
CAT
1
2
4
Main Forest Roads
Local Roads
contour 200
allotment fence
rhca
C:\\Gis\projects\Van_PFC_8_11.mxd
N
S
E
W
End Reach 1 Segment 3
Start Reach 2 Segment 1
End Reach 1 Segment 2
Start Reach 1 Segment 3
End of Riparian Enclosure
End Reach 1 Segment 1
Start Reach 1 Segment 2
Beginning of Riparian Enclosure
Story Fry Allotment
Water Gap
Start Reach 1 Segment 1
Photo Set A
Photo Set B
Photo Set C
Photo Set D
Photo Set E
SCHURTZ CREEK
SCHURTZ CREEK
STORY-FRY
WADE CORNER
SHELLROCK
Schurtz Creek
Calamity Creek
1700000
1700053
1700294
1700785
1700044
1700057
1700635
1700783
1700933
1700074
1700295
1700046
1700789
1700773
1700795
1700533
1710537
1710000
1780086
1780072
1780068
1780000
5200
5000
4800
4600
9
10
14
15
16
22
23
27
28
0
0.3
0.6
1.2
Miles

Name of Riparian-Wetland Area: **Shurtz Creek**

Date: **August 16, 2005** Segment/Reach ID: **Upper Reach**

ID Team Observers: **ORT, USFS, Permittees, ONDA**

Yes	No	N/A	HYDROLOGICAL
X			1) Floodplain above bankfull is inundated in "relatively frequent" events It is small but will expect more
		X	2) Where beaver dams are present are they active and stable No Beavers or beaver dams
	X		3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) Too wide so width to depth wrong,
X			4) Riparian-wetland area is widening or has achieved potential extent Is widening
	X		5) Upland watershed is not contributing to riparian-wetland degradation To dense of forest

Yes	No	N/A	VEGETATION
X	X		6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) Herbaceous yes – woodies no. low to moderate recruitment for the most part. Where woodies exist not much recruitment or development. Low energy of the system could be limiting woodies.
X			7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) (*species present*) Several sedges, rushes, moist grasses spp. 2+ species of willows where they exist
X	X		8) Species present indicate maintenance of riparian-wetland soil moisture characteristics There is a transition from the upper end to the lower end with the upper end being dry. Rushes were observed in the middle of the reach with sedges observed in the lower end.
X	X		9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events (*community types present*) See above
X			10) Riparian-wetland plants exhibit high vigor Mid to lower end responding well nothing above. Cattle off July 15
	X		11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows (*enough*) Nothing above – marginal at the lower end
		X	12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) Not needed for physical function

Yes	No	N/A	EROSION DEPOSITION
	X		13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy

			Few, small overflow channels and few rock. Too narrow of a floodplain
	X		14) Point bars are revegetating with riparian-wetland vegetation Few above, some below
X			15) Lateral stream movement is associated with natural sinuosity Within C slope boundaries
X			16) System is vertically stable (*not downcutting*) No incision
X			17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) Some banks are breaking down in the upper section, item to monitor

Remarks

FAR lower end Range Specialist said that the area is improving

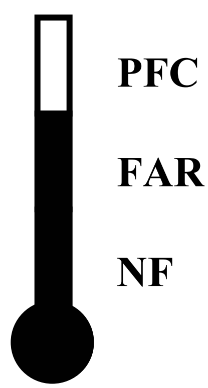
SUMMARY DETERMINATION

___ Proper Functioning Condition

__**X**_ Functional - At Risk

___ Nonfunctional

___ Unknown



Trend for Functional - At Risk:

_**X**__ Upward
___ Downward
___ Not Apparent

Are factors contributing to unacceptable conditions outside the control of the manager?

Yes ___
No __x_

If yes, what are those factors?

___ Flow regulations
___ Mining activities
___ Upstream channel conditions
___ Channelization
___ Road encroachment
___ Oil field water discharge
___ Augmented flows
___ Other (specify) ____________________

Name of Riparian-Wetland Area: **Shurtz Creek**

Date: **August 16, 2005** Segment/Reach ID: **Water Gap**

ID Team Observers: **ORT, USFS, Permittees, ONDA**

Yes	No	N/A	HYDROLOGICAL
X			1) Floodplain above bankfull is inundated in "relatively frequent" events
		X	2) Where beaver dams are present are they active and stable No Beavers or beaver dams
	X		3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) Too wide
	X		4) Riparian-wetland area is widening or has achieved potential extent Variable from bend to bend
	X		5) Upland watershed is not contributing to riparian-wetland degradation To dense of forest

Yes	No	N/A	VEGETATION
X	X		6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) No upper end transitioning to yes lower end. Herbaceous recruiting lower end – nearly bare on upper end
X	X		7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) (*species present*) Very little upper end, rush dominating middle, sedge dominating lower. Some islands of diversity
X	X		8) Species present indicate maintenance of riparian-wetland soil moisture characteristics There is a transition from the upper end to the lower end with the upper end being dry. Rushes were observed in the middle of the reach with sedges observed in the lower end.
X	X		9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events (*community types present*) See above
X			10) Riparian-wetland plants exhibit high vigor Mid to lower end responding well nothing above. Cattle off July 15
	X		11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows (*enough*) Nothing above – marginal at the lower end
		X	12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) Not needed for physical function

Yes	No	N/A	EROSION DEPOSITION
	X		13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy Few, small overflow channels and few rock. Too narrow of a floodplain

	X		14) Point bars are revegetating with riparian-wetland vegetation Few above, some below
X			15) Lateral stream movement is associated with natural sinuosity Within C slope boundaries
X			16) System is vertically stable (*not downcutting*) No incision
X			17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) Some banks are breaking down in the upper section, item to monitor

Remarks

FAR lower end Range Specialist said that the area is improving

SUMMARY DETERMINATION

___ Proper Functioning Condition

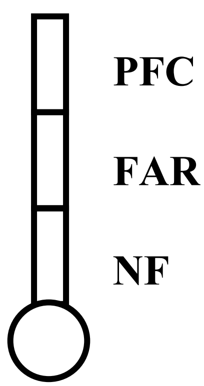
__X_ Functional - At Risk

___ Nonfunctional

___ Unknown

Trend for Functional - At Risk:

_X__ Upward
___ Downward
___ Not Apparent



Are factors contributing to unacceptable conditions outside the control of the manager?

Yes ___
No __x_

If yes, what are those factors?
___ Flow regulations
___ Mining activities
___ Upstream channel conditions
___ Channelization
___ Road encroachment
___ Oil field water discharge
___ Augmented flows
___ Other (specify) ____________________________

(Revised 1998) (7/12/04)

APPENDIX J

PACFISH Enclosure B

Appendix J
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 <u>recommended</u> threshold is 30% of the current year's growth, measured as incidence of use.

<u>Early Season Grazing</u>: 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.

<u>Ecological Status</u>: 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.

<u>Early Seral</u> *

-Percent similarity of riparian vegetation to the potential natural community/composition ≤ 25%; or,
-Stream bank/channel condition rating "poor".

<u>Mid-Seral</u> *

-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".

<u>Late Seral</u> *

-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.

Greenline: 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.

Late Season Grazing: 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.

Near Natural Rate of Recovery: 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.

Residual Herbaceous Vegetation Height: 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.")

APPENDIX K

Recreational Fisheries

Appendix K

Executive Order 12962 - Recreational Fisheries

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D.C. 20240

Effective: June 7, 1995
Expires: Indefinite

NATIONAL POLICY ISSUANCE #96-07

SUBJECT: Executive Order 12962 - Recreational Fisheries

A. PURPOSE: To conserve, restore and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide.

B. PRIMARY PROVISIONS:

1. Federal Agencies shall, to the extent permitted by law and where practicable, and in cooperation with States and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities.

2. A National Recreation Fisheries Coordination Council is established, consisting of seven members from the Departments of the Interior, Commerce, Agriculture, Energy, Transportation and Defense and the Environmental Protection Agency. The representatives from the Departments of Commerce and the Interior will co-chair the Coordination Council.

3. The Coordination Council, in cooperation and consultation with others, will develop a comprehensive Recreational Fishery Resources Conservation Plan setting forth a 5-year agenda for Federal agencies.

4. All Federal agencies will aggressively work to identify and minimize conflicts between recreational fisheries and their respective responsibilities under the Endangered Species Act. The Fish and Wildlife Service and the National Marine Fisheries Service will develop a joint agency policy towards this end.

5. The role of the Sport Fishing and Boating Partnership Council will be expanded to assist in the implementation of the Order.

C. INCORPORATION: In order to assure that the provisions of the Executive Order (Appendix) are known throughout the Service, it is hereby incorporated in the National Policy Issuance system. The Executive Order was signed by the President on June 7, 1995.

Date: 12/20/96

Bruce Blanchard
Deputy Director - Staff