UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Burns District Office
Andrews Resource Area
Finding of No Significant Impact

South Steens Allotment Management Plan
Environmental Assessment
OR-06-027-060

INTRODUCTION

Andrews Resource Area, Burns District, has prepared an Environmental Assessment (EA) to analyze modification of the South Steens Allotment Management Plan (AMP) and effects to wild horses, grazing, and Wilderness Study Area (WSA) management in South Steens Allotment (#6002) from implementing Section 113 (e) (2), Section 202 (d) (2) and Title VI of the Steens Mountain Cooperative Management and Protection Act (Steens Act) of 2000. These sections apply to the land exchanges and establishment of the No Livestock Grazing Area, which encompasses approximately 97,229 acres within the designated Cooperative Management and Protection Area (CMPA). The General Location Map attached depicts the CMPA and the location of the No Livestock Grazing Area and South Steens Allotment Pastures.

There are currently 9,577 Animal Unit Months (AUMs) of active grazing preference for livestock within South Steens Allotment. The allotment consists of four pastures (Home Creek, Tombstone, Hollywood Field, and Steens) containing 94,565 acres of public (89,501 acres or 95 percent) and private lands (5,054 acres or 5 percent). Public lands within the allotment are inside the boundary of the CMPA. Livestock grazing use is currently authorized from April 1 to October 31. In summer 2008 the allotment was assessed for Rangeland Health Standards (Standards) and Guidelines for Livestock Grazing Management (Guidelines). All Standards are present; however, Watershed Function - Riparian/Wetland Areas and Water Quality Standards for Steens Pasture were not achieved due to livestock, wild horses, and juniper encroachment. All other Standards in all other pastures were achieved and grazing management practices conformed to Guidelines.

South Steens Allotment is a Management Category "I" (Improve) allotment (H-1734-2 – Rangeland Monitoring Handbook). The "Improve" category identifies allotments with management or resource issues or concerns. These allotments receive priority for funding, project implementation and monitoring. South Steens Allotment was designated an I Category allotment due to resource concerns such as riparian, water quality, greater sage-grouse, bighorn sheep, noxious weeds, WSA, Wild and Scenic Rivers, wilderness, recreation, and juniper encroachment [Appendix J-10, CMPA Resource Management Plan (RMP)].

SUMMARY OF THE PROPOSED DECISION

Implement the modified South Steens AMP as outlined in the attached EA and issue a 10-year grazing permit. Modification of the AMP was required due to creation of the No Livestock Grazing Area and land exchanges as outlined in the Steens Act. No changes to the permitted number of AUMs would occur. In addition, the following range improvements are proposed:

- Construct 13 new reservoirs.
- Decommission 5 reservoirs.
- Rehabilitate 14 reservoirs.
- The riparian vegetation at the dugout at Weaver Place would be enhanced because livestock and wild horses would be excluded from the dugout area by exclosure fencing. Two metal troughs would be placed outside the exclosure and installation of approximately 0.4-mile of pipeline would occur.
- The riparian vegetation at the dugout along Three Springs Road would be enhanced because livestock and wild horses would be excluded from the dugout by exclosure fencing. Two metal troughs would be placed outside the exclosure and installation of approximately 0.4-mile of pipeline would occur. The existing route would be realigned approximately 20 feet west of the dugout (upper end) for a distance of 20 yards. The current route would be abandoned for an approximate distance of 20 yards.
- Three Springs located primarily on private land would also be rehabilitated and fenced off from livestock and wild horse use. Four metal troughs would be installed outside the exclosure along with approximately one-eighth mile of pipeline.
- Three wells would be drilled. Wells W3 and W7 (on private land) would have associated pipelines and troughs installed along existing routes and buried storage tanks. No pipelines, troughs or storage tanks would be installed in association with Well W16.
- Riparian condition in an unnamed riparian-capable intermittent tributary and associated meadow complex in T. 34 S., R. 32½ E., Section 36 (tributary to Dry Creek) would be enhanced and maintained by construction of an exclosure around the riparian area.
- No water gaps are proposed. Other than riparian exclosure fencing necessary to protect spring sources and associated emergent vegetation and the riparian-capable intermittent tributary and associated meadow complex, no additional fences would be constructed and no fences would be removed.

All projects implemented within WSAs would be constructed to reduce impacts to wilderness values on a site-specific, case-by-case basis, and measures would be taken to ensure a more natural appearance including but not limited to the design features as described in the EA.

FINDING OF NO SIGNIFICANT IMPACT

Consideration of the Council on Environmental Quality (CEQ) criteria for significance (40 CFR 1508.27), both with regard to context and intensity of impacts, is described below:

Context

The Proposed Decision would occur in South Steens Allotment and would have local impacts on affected interests, lands, and resources similar to and within the scope of those described and considered in the Andrews Management Unit (AMU)/CMPA Proposed Resource Management Plan (PRMP)/Final Environmental Impact Statement (FEIS). There would be no substantial broad societal or regional impacts not previously considered in the PRMP/FEIS. The actions described represent anticipated program adjustments complying with the CMPA RMP/Record of Decision (ROD) and the Steens Act, and implementing ongoing range management programs within the scope and context of those documents.

Intensity

The CEQ's ten considerations for evaluating intensity (severity of effect):

1. *Impacts that may be both beneficial and adverse.* The EA considered potential beneficial and adverse effects (see pages 38-118 of the EA). Project Design Features (pages 12-20 of the EA) were incorporated to reduce impacts. None of the effects are beyond the range of effects analyzed in the AMU/CMPA PRMP/FEIS, to which the EA is tiered.

2. *Degree to which the Proposed Decision affects public health and safety.* No aspect of the Proposed Decision would have an effect on public health and safety.

3. *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.* Other unique characteristics for the CMPA include wilderness and WSAs. Unique characteristics present within South Steens Allotment include:

   Cultural - Effects on sites located near (within 100 yards) or within proposed development locations can be mitigated through various means such as avoidance, surface collection, mapping, test or full-scale excavation and would be applied as appropriate.

   Wild and Scenic Rivers and Wilderness - No changes to wilderness values or Wild and Scenic River outstandingly remarkable values would be expected under the Proposed Decision.

   Wilderness Study Areas - The Proposed Decision was developed to meet the long-term objectives of the Steens Act, Federal Land Policy and Management Act of 1976 (FLPMA) and the Wild Free-Roaming Horses and Burros Act. While the Proposed Decision may not be viewed as following all specific guidelines of the Interim Management Policy and Guidelines for Lands Under Wilderness Review (IMP), it was developed in a manner so as not to impair the suitability of WSAs for preservation as wilderness and to prevent unnecessary or undue degradation of the lands and their resources as required under Section 603(c) of FLPMA.

Cumulatively, the area influenced by both existing and proposed developments would be approximately 10.2 percent (3,239 acres) for Blitzen River WSA and 11.8 percent (3,298 acres) for South Fork Donner und Blitzen WSA. If implemented and after rehabilitation has occurred, the removal of four existing reservoirs in South Fork of Donner und Blitzen WSA would reduce the total influence of unnatural features in this WSA to 11.6 percent (3,238 acres). No rehabilitation of reservoirs would occur within the Blitzen River or Home Creek WSAs. In comparison this would still be less than the area influenced by unnatural features in two other WSAs (12 percent in both Bridge Creek and Stonehouse WSAs) within the CMPA at the time they were established (Volume I of the Oregon BLM Wilderness Study Report, 1991). Both Bridge Creek WSA (14,325 acres) and Stonehouse WSA (22,765 acres) are also smaller in size. The area influenced by existing unnatural features in Home Creek WSA is approximately 14 percent and no new developments would be implemented under this decision.

There would be some temporary and short-term (days) loss of solitude and disturbance to recreational activities in the immediate area during the installation of any development. Direct encounters between visitors and developments are expected to be limited to minutes as they pass by foot, horseback or vehicle. Disturbance associated with the presence of the developments and their use by livestock may displace some visitor if dispersed campsites are located nearby. These effects are expected to be low for the WSAs as a whole, given the limited number of campsites potentially affected. Overall effects to naturalness and solitude are expected to be low given effects described above and no reduction in the availability or quality of recreation in the WSA as a whole is expected.

Given benefits to wilderness values and the limited area affected individually and cumulatively by the proposed developments in comparison to other WSAs as described above, it is not expected that implementing this Proposed Decision would impair any of the three WSA's suitability for preservation as wilderness by Congress and as such would comply with Section 603(c) of FLPMA.

4. *The degree to which effects on the quality of the human environment are likely to be highly controversial.* Controversy in this context means disagreement about the nature of the effects, not expressions of opposition to the proposed action or preference among the alternatives. No unique or appreciable scientific controversy has been identified regarding the effects of the Proposed Decision.

5. *Degree to which possible effects on the human environment are highly uncertain or involve unique or unknown risks.* The analysis has not shown there would be any unique or unknown risks to the human environment nor were any identified in the AMU/CMPA PRMP/FEIS to which this proposal is tiered.

6. *Degree to which the action may establish a precedent for future actions with significant impacts or represents a decision in principle about a future consideration.* This project neither establishes a precedent nor represents a decision in principle about future actions.

The Steens Act provided a unique opportunity to conserve, protect, and manage the long-term ecological integrity of the CMPA. In addition, range improvements, implementation of AMPs and issuance of 10-year grazing permits are ongoing and expected actions as outlined in the CMPA RMP/ROD and as analyzed in other EAs. No long-term commitment of resources causing significant impacts was noted in the EA or RMP.

7. W*hether the action is related to other actions with individually insignificant but cumulatively significant impacts.* The EA described the current state of the environment (Affected Environment by resource, Chapter III) which included the effects of past actions. Other than continued livestock grazing and the North Steens Ecosystem Restoration Project, no other Reasonably Foreseeable Future Actions were identified. Effects of implementing the Proposed Decision are not considered significant. In addition, the environmental analysis did not reveal any significant cumulative effects beyond those already analyzed in the AMU/CMPA PRMP/FEIS or the North Steens Ecosystem Restoration Project EIS which encompasses the South Steens Allotment.

8. *Degree to which the action may adversely affect districts, sites, highways, structures or objects listed in or eligible for listing in the National Register of Historic Places.* There are no features within the project area listed or eligible for listing in the National Register of Historic Places. However, as part of the Project Design Features identified in the attached EA, new range improvements would be inventoried for cultural resources prior to improvement construction. Sites eligible for listing to the National Register of Historic Places within the area of effect of range improvements would be avoided to mitigate potential effects. If avoidance is not a viable mitigation option, other measures such as surface collecting and mapping, testing and full-scale excavation could be used.

9. *The degree to which the action may adversely affect an endangered or threatened species or its habitat.* There are no known threatened or endangered species or their habitat affected by the Proposed Decision. However, Special Status Species (SSS) occurring within this Project Area include greater sage-grouse, two species of bats (fringed myotis and Townsend's big-eared bat), diverse-leaved pondweed and redband trout.

   Disturbance from construction of the different projects would have minor, temporary effects on SSS during actual construction and should have minimal impact on SSS use of the habitat. Since not all projects would likely be constructed or completed at the same time, these minimal effects would be spread out over several years and disturbance would be localized. Once individual projects are completed, SSS would likely use the areas again.

   Most project construction work would occur after sage-grouse nesting season (April 1 to June 15) due to limited access to the area (muddy roads). Based on location of new water sites, greater sage-grouse could be affected through the loss of nesting habitat.

However, exclusion of livestock and wild horses from existing spring sources would improve these areas for sage-grouse use by providing water and restoring riparian/wetland vegetation which sage-grouse depend on during the late summer months. Spreading out water sources would reduce impacts to spring areas, but it would also allow for later season use in areas around new water sources. This late-season use would reduce the amount of residual grass near these sites and reduce horizontal cover for nesting sage-grouse the following spring. Reduction in horizontal cover could affect nest success for sage-grouse through increased predation. Livestock would use areas early, during the growing season or after seed ripe (deferred) on a rotational basis (Table 2: Proposed Grazing System of the EA) so effects of livestock use on grasses for residual horizontal cover would occur only on years when use occurred in a pasture during these timeframes. Only grazing during the early graze period with no other grazing occurring afterward would allow for grasses to reach full height depending on the timing of precipitation each year. Wild horses would have access to these water sources yearlong and could have more effects on residual nesting cover from late-season use. Reduction and maintenance of wild horse populations within the Appropriate Management Level range would lessen late-season effects of grazing by wild horses on residual grass cover for sage-grouse nesting habitat.

Cumulative effects of the Proposed Decision would be some increased late season livestock and wild horse use in sage-grouse habitat. Removal of two troughs and pipelines near known sage-grouse nesting habitat would preserve these areas as nesting habitat and would not have the effects of late-season livestock and wild horse use on residual nesting cover. Late season use in other areas would still have some effect on residual cover the following spring but it is not known if these areas are used by sage-grouse for nesting. Fencing of several spring sources for protection and spreading of livestock and wild horse use to other areas would provide more late-season, brood-rearing areas for sage-grouse. While the number of yearlong water sources is increased from the No Action Alternative, several water sources already present in and near this allotment have provided possible breeding sites for West Nile Virus (WNV) carrying mosquitoes. There have been no known outbreaks of WNV in this part of the Steens Mountain so the probability of an outbreak is small. Other actions, mainly implementation of North Steens Ecosystem Restoration Project will have a positive effect on sage-grouse habitat by removing encroaching juniper from what was probably suitable nesting and brood-rearing habitat. Removal of juniper may also increase the amount of forage available for livestock, wild horses, and certain wildlife species. This would leave more residual nesting cover in the long term for sage-grouse. Removing juniper may also increase the amount of water available in seasonally wet areas that would improve sage-grouse brood-rearing habitat.

The Proposed Decision would comply with the Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (Hagen 2005); Greater Sage-Grouse and Sagebrush-Steppe Ecosystems Management Guidelines (USDI-2000); and BLM National Sage-Grouse Habitat Conservation Strategy (2004).

Increased late-season water could benefit bat species by providing more watering areas. This may lead to some increased population numbers but this would be dependent on available roost/maternity sites as well as available insect populations. Bats may use new water sources such as troughs and reservoirs for watering spots during evening foraging. Whether this would affect bat populations is not known since roosting sites (day roosts, maternity colonies) may already be fully occupied. Cumulative effects for bats would be the increased water sources available for watering and foraging in the long term.

The persistence of diverse-leaved pondweed in any individual reservoir is not responsive to management control, since water availability from runoff is not predictable. As long as some plants remain in the pond, and it does not completely dry-out, the population would persist and possibly provide a source for distribution elsewhere in the Project Area. Construction of new reservoirs could have a beneficial effect for the species by providing more habitat and allowing the plants to spread naturally to new areas. New populations could be established in reservoirs that hold water for at least most of the year.

No effects to redband trout are anticipated.

10. *Whether an action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.* The Proposed Decision does not threaten to violate any law. The Proposed Decision is in compliance with the CMPA RMP, which provides direction for the protection of the environment on public lands. The Steens Act also directs BLM to:

    - Maintain the cultural, economic, ecological, and social health of the CMPA;
    - Promote viable and sustainable grazing on private and public lands within the CMPA; and
    - Conserve, protect, and manage the long-term ecological integrity of the CMPA.

On the basis of the information contained in the AMP/EA and all other information available to me, it is my determination that: 1) the implementation of the Proposed Decision will not have significant environmental impacts beyond those already addressed in the AMU/CMPA PRMP/FEIS (August 2004) or the North Steens Ecosystem Restoration Project (September 2007); 2) the Proposed Decision is in conformance with the CMPA RMP/ROD; 3) there would be no adverse societal or regional impacts and no adverse impacts to affected interests; and 4) the environmental effects, together with the proposed Project Design Features, against the tests of significance found at 40 CFR 1508.27 do not constitute a major Federal action having a significant effect on the human environment. Therefore, an EIS is not necessary and will not be prepared.

/signature on file/ *January 7, 2009*

Joan M. Suther
Andrews Resource Area Field Manager

Date

SOUTH STEENS ALLOTMENT MANAGEMENT PLAN/ ENVIRONMENTAL ASSESSMENT

OR-06-027-060

Bureau of Land Management
Burns District Office
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ALLOTMENT MANAGEMENT PLAN/
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CHAPTER I: INTRODUCTION, BACKGROUND, PURPOSE OF AND NEED FOR ACTION

A. Introduction

The Andrews Resource Area, Burns District, has prepared this Environmental Assessment (EA) to analyze modification of the South Steens Allotment Management Plan (AMP) and effects to wild horses, grazing, and Wilderness Study Area (WSA) management in South Steens Allotment (#6002) from implementing Section 113 (e) (2), Section 202 (d) (2) and Title VI of the Steens Mountain Cooperative Management and Protection Act (Steens Act) of 2000. These sections apply to the land exchanges and establishment of the No Livestock Grazing Area, which encompasses approximately 97,229 acres within the designated Cooperative Management and Protection Area (CMPA). The general location map attached depicts the CMPA and the location of the No Livestock Grazing Area and South Steens Allotment Pastures.

There are currently 9,577 Animal Unit Months (AUMs) of active grazing preference for livestock within South Steens Allotment. The allotment consists of four pastures (Home Creek, Tombstone, Hollywood Field, and Steens) containing 94,565 acres of public (89,501 acres or 95 percent) and private lands (5,054 acres or 5 percent). Public lands within the allotment are inside the boundary of the CMPA. Livestock grazing use is currently authorized from April 1 to October 31. In summer 2008 the allotment was assessed for Rangeland Health Standards (Standards) and Guidelines for Livestock Grazing Management (Guidelines) (collectively referred to as S&Gs) by an Interdisciplinary Team (IDT) (see Chapter IV for a list of members). All Standards are present; however, Watershed Function - Riparian/Wetland Areas and Water Quality Standards for Steens Pasture were not achieved due to livestock, wild horses and juniper encroachment. All other Standards in all other pastures were achieved and grazing management practices conformed to Guidelines (see Table 1 below).

South Steens Allotment is a Management Category "I" (Improve) allotment (H-1734-2 – Rangeland Monitoring Handbook). The "Improve" category identifies allotments with management or resource issues or concerns. These allotments receive priority for funding, project implementation, and monitoring. South Steens Allotment was designated an I Category allotment due to resource concerns such as riparian, water quality, greater sage-grouse, bighorn sheep, noxious weeds, WSA, Wild and Scenic Rivers (WSRs), wilderness, recreation, and juniper encroachment [Appendix J-10, CMPA Resource Management Plan (RMP)]. The RMP identified upland trend in three of the four pastures as being static with one pasture showing upward trend. Overall RMP objectives for South Steens Allotment are described as follows:

1. Improve the ecological condition of upland vegetation communities;
2. Maintain the ecological condition of upland vegetation communities; and
3. Maintain/improve the condition of riparian vegetation communities.

Tombstone and Home Creek Pastures have water quality limited streams; 1.3 miles of (perennial/intermittent) streams in Proper Functioning Condition (PFC), and 2.5 miles of streams functioning at risk. Springs and mesic/wet meadows evaluated within Steens Pasture since the RMP was completed are not in PFC at this time.

B. Background/Issues

South Steens Allotment is located 65 miles south of Burns, Oregon, east of Highway 205 and west of Donner und Blitzen WSR. In 1995, when the South Steens AMP/EA was written, the allotment included portions of Donner und Blitzen WSR (designated in 1988) and Blitzen River, South Fork Donner und Blitzen, and Home Creek WSAs. The AMP allowed for livestock grazing and watering along Donner und Blitzen WSR and within the WSAs. A District Court final judgment which recognized a time limited settlement agreement and passage of the Steens Act would later preclude grazing within the WSR corridor. Both of these actions indirectly prevented most of the historic livestock access to necessary water sources.

Prior to the Steens Act, the Bureau of Land Management (BLM) prepared the Donner und Blitzen National WSR Management Plan EA (May 1993) allowing livestock grazing within the Donner und Blitzen WSR corridor. The Decision was challenged in Federal District Court (ONDA v. Green) and in 1997 a Final Judgment from District Court Judge Haggarty recognized a settlement agreement barring BLM from authorizing grazing in the river corridor, from building parking lots and improving roads, and from constructing any water diversions in the river corridor until a new river plan and Environmental Impact Statement (EIS) were prepared. The judgment also required BLM to construct the "Blitzen protection fence," analyzed in the South Steens AMP/EA, and within 3 years remove an equal amount of obsolete fence from WSAs. (The Steens Act permanently established the No Livestock Grazing Area along the river area in October 2000, prior to completion of an EIS and river plan. The Steens Mountain Wilderness and WSRs Plan was completed in July 2005, and includes recognition of the No Livestock Grazing Area.)

The Blitzen protection fence was built in fiscal year 1998 excluding livestock use on the southeastern edge of Steens Pasture. Roaring Springs Ranch, Inc., retained access to the river from a private land parcel located in T. 34 S., R. 32¾ E., Section 20, S½ and Section 29, N½. The remainder of Donner und Blitzen WSR was not fenced as it was believed at the time topography would prohibit livestock from watering on the river.

Under the 1995 AMP, the grazing system was an adaptive rotational system that took 4 years to make a complete cycle. The first 2 years cattle would start grazing the southern end of the allotment and make their way north then return south. The following 2 years cattle would start on the north end, graze south and return. This plan allowed for growing season rest for uplands as well as riparian vegetative species. In this plan, Steens Pasture, which included the existing Home Creek, Tombstone, and Hollywood Pastures, was grazed on the way to higher country where cattle generally summered. South Steens Allotment consisted of 10 pastures, 7 of which were mixed public and private lands and the remaining 3 were 98 percent private.

In 2000 Congress enacted the Steens Act creating a 97,071-acre (current acreage is 97,229) No Livestock Grazing Area. The Steens Act states, upon cancellation of grazing permits "*…future grazing use in that designated area is prohibited. The Secretary shall be responsible for installing and maintaining any fencing required for resource protection within the designated no livestock grazing area*" (Section 113).

The western boundary of the No Livestock Grazing Area is formed by the Donner und Blitzen WSR corridor which is also the western boundary of the largest portion of Steens Mountain Wilderness. Tombstone and Steens Pastures of South Steens Allotment within Blitzen River and South Fork Donner und Blitzen WSAs lie directly west of the No Livestock Grazing Area. The western portions of Tombstone and Steens Pastures have numerous water developments constructed in the 1950s and 1960s which were not designed to be unnoticeable or natural in appearance, while the eastern portions relied on Donner und Blitzen River for water. In summary, Roaring Springs Ranch, Inc. (and preceding ranch owners), had complete access to livestock grazing and water from Donner und Blitzen River from as early as the turn-of-the-century until the time of Judge Haggerty's Final Order in ONDA v. Green and implementation of livestock exclusion fencing following passage of the subsequent Steens Act.

In 2001 BLM completed an EA [*Projects for Implementation of the Steens Mountain Cooperative Management and Protection Act of 2000*, EA OR-027-01-27 (Implementation EA)] analyzing environmental effects of installing range improvements to implement the Steens Act including projects to exclude livestock from the No Livestock Grazing Area. The purpose and need of these prior actions was to "implement the 'no livestock grazing area,' install and maintain fencing required for resource protection within this area, provide replacement forage within and outside the CMPA, and construct fencing and water systems to allow for viable livestock operations and sustainable livestock grazing which promotes the long-term ecological integrity within the CMPA and meets the Standards for Rangeland Health and the Guidelines for Livestock Management."

The Decision Record for the Implementation EA approved the construction of four water gap fences (two at Bradeen Crossing and two at Burnt Car) to exclude livestock from the No Livestock Grazing Area and a waterhole west of Bradeen Crossing within Steens Pasture. Topography of the area along Donner und Blitzen River was believed to be steep enough that livestock would not water at the river, so no additional fencing along the river was needed. The Implementation EA recognized in the Reasonably Foreseeable Future Actions section that, "Although no other projects are being considered at this time, the addition of other gap fences where livestock are continually accessing the no livestock grazing area is possible." The No Livestock Grazing Area boundary would be monitored for cattle intrusions.

Two years of monitoring showed cattle were accessing the No Livestock Grazing Area on the west side of the river. Although documentation is limited, two to six reports each year were provided to the Andrews Resource Area Field Manager indicating 4 to 30 head of cattle were in the area. In 2006, BLM amended the Decision Record for the Implementation EA to construct a 2.5-mile fence (previously analyzed in the 2001 Implementation EA but not immediately selected) between Tabor Cabin and just south of Bradeen Crossing located in T. 34 S., R. 32¾ E., Sections 7, 17, 18, and 20 to prevent cattle from entering the No Livestock Grazing Area for water. Roaring Springs Ranch, Inc., appealed the decision to the Department of the Interior's Office of Hearings and Appeals (OHA). The BLM and Roaring Springs Ranch, Inc., entered into a joint motion to stay the decision and proceedings for one year. The BLM and Roaring Springs Ranch, Inc., also entered into a Cooperative Range Improvement Agreement. Subsequently, Roaring Springs Ranch, Inc., withdrew their appeal and the OHA dismissed the matter. The BLM constructed this fence in fall 2007.

The Steens Act (Title VI) also provided for five land exchanges including a land exchange with Roaring Springs Ranch, Inc. Through this exchange, BLM acquired the private Roaring Springs parcel located in T. 34 S., R. 32¾ E., Section 20, S½ and Section 29, N½ along Donner und Blitzen WSR. However, Roaring Springs Ranch, Inc., reserved a "nonexclusive easement" to use and maintain the water gap in the Tabor Cabin area within Donner und Blitzen River "…for livestock, wild horse and wildlife watering purposes." This easement is recognized as a legal use of this portion of the No Livestock Grazing Area for said purposes.

The land exchanges also created a loss of public lands within South Steens Herd Management Area (HMA). The Andrews Management Unit (AMU) and CMPA Resource Management Plans/Records of Decision (RMP/ROD) increased the inactive acres in the Herd Area (HA) to reflect the decreased size (1,106 acres) of the HMA. Approximately 60,055 acres were placed in inactive HA status to reflect loss of public land resulting from the land exchanges. The land exchanges and subsequent fencing as described above have restricted horse movement into their historic summer and winter ranges and access to live water (Donner und Blitzen River).

C. Purpose of and Need for Action

In the cooperative spirit of the Steens Act [Section 102 (b) (1) and (b) (5)] the purpose of this EA is to analyze the need for replacement of live, reliable, late-season water for livestock and wild horses within South Steens Allotment while preventing impairment of wilderness suitability. Additional sources of live, reliable, late-season water would replace water historically used from Donner und Blitzen River by wild horses and Roaring Springs Ranch, Inc. (and preceding ranchers cumulatively over 100 years), and help provide a similar manner and degree of grazing occurring prior to exclusion of the river. Additional water sources would help distribute wild horses and livestock throughout the four pastures in South Steens Allotment to conserve, protect and manage the long-term ecological integrity, as stated in the Steens Act [Section 102 (a)], while promoting viable and sustainable grazing [Steens Act, Section 1 (b)(11)] and healthy wild horse populations. As proposed, design features to prevent impairment of wilderness suitability or to enhance wilderness values would be used to assure conformance with Section 204(b) of the Steens Act and Section 603(c) of the Federal Land Policy and Management Act of 1976 (FLPMA). Additional purposes include analyzing effects of modifying the 1995 South Steens AMP due to changes in landownership and creation of the No Livestock Grazing Area subsequent to the Steens Act; issuance of a new 10-year grazing permit; and modifying livestock use so progress can be made toward achieving Standards for Uplands-Riparian/Wetland Areas and Water Quality within Steens Pasture (see Table 1 below).

Table 1: 2008 Standards for Rangeland Health Determinations

Standard	Achieved	Not Achieved	Casual Factors	Comments
1. Watershed Function - Uplands	All pastures			Western juniper has contributed to a moderate departure from expected conditions for hydrologic function and biotic integrity in invaded portions of Tombstone, Home Creek, and Steens Pastures. However, overall soil and site stability are still essentially intact.
2. Watershed Function - Riparian/Wetland Areas	Hollywood, Home Creek, and Tombstone Pastures	Steens Pasture	Wild horses and livestock and expansion juniper	Use of springs by cattle and wild horses has prevented development of riparian communities and altered flows supporting downstream meadows. Stages II and III expansion juniper have also likely altered hydrologic cycles sufficient to reduce the period during which subsurface flows contribute to these meadows.
3. Ecological Processes	All pastures			Western juniper has contributed to a moderate departure from expected conditions for plant composition and community structure where present.

Standard	Achieved	Not Achieved	Casual Factors	Comments
				However, nutrient cycling is still at or near potential for now.
4. Water Quality	Hollywood, Home Creek, and Tombstone Pastures	Steens Pasture	Wild horses and livestock	Springs receive heavy use from livestock when present and year-round from wild horses, which results in poor-quality drinking water for horses, livestock, and wildlife.
5. Native, Threatened and Endangered (T&E), and Locally Important Species	All pastures			Habitat for greater sage-grouse is in fairly good condition except areas which have Stage II/III juniper establishment in both big and low sagebrush areas and ephemeral wet meadows.

Following the legislated land exchanges and further implementation of the Steens Act and subsequent RMP, Roaring Springs Ranch, Inc., has utilized on average 4,359 AUMs per year (2003-2007) of their permitted 9,577 AUMs due to lack of water; approximately 60,055 acres of the South Steens HA were placed in inactive HA status; additional fencing was constructed along the Donner und Blitzen River restricting horse movement between summer and winter ranges and access to live water; and fencing also eliminated livestock access to reliable, late-season water (Donner und Blitzen River). The full effects of the Steens Act and subsequent fencing were not fully realized until implementation was complete followed by several years of drought. In addition, juniper encroachment has rapidly expanded into plant communities over the last 130 to 140 years increasing erosion, reducing stream flows, reducing forage and overall modifying the habitat [North Steens Ecosystem Restoration Project Final Environmental Impact Statement (FEIS) (July 2007)].

The BLM would also need to meet the following goals/objectives:

- Maintain, restore or improve the integrity of desirable vegetation communities including perennial, native, and desirable introduced plant species. Providing for their continued existence and normal function in nutrient, water and energy cycles (RMP-30).
- Manage rangeland habitats so forage, water, cover, structure and security necessary to meet the life history requirements of wildlife are available on public lands (RMP-31).
- Maintain, restore or improve Special Status plant populations and animal habitats; manage public lands to conserve or contribute to the recovery of threatened or endangered species; and prevent future Endangered Species Act listings. (RMP-35).
- Manage public lands to provide social and economic benefits to local residents, businesses, visitors, and future generations (RMP-46).

- Manage and maintain healthy wild horse herds in established HMAs at Appropriate Management Levels (AMLs) to maintain a thriving natural ecological balance between wild horse populations, wildlife, livestock, vegetation resources, and other resource values. Enhancing and perpetuating the special or rare and unique characteristics that distinguish the respective herds (RMP-50).
- Manage and maintain a viable population of wild horses with livestock, wildlife, recreation and watershed resource values (South Steens HMA Plan, Page 1).
- Maintain/improve year-round water sources to sustain wild horse herds (RMP-50).
- Maintain herd viability, genetic diversity, and the genetic and physical characteristics that distinguish individual herds (RMP-50).
- Maintain water sources critical to wild horses; develop additional water sources to improve animal distribution and provide more stable water sources during periods of drought if needed to protect wilderness resources and wilderness values; and seek cooperative management agreements for access to or acquire legal access to private water sources critical to wild horses (Steens Mountain Wilderness and WSRs Plan, P-49).
- Manage for a sustained level of livestock grazing while maintaining healthy public land resources (RMP-53).
- Implement administrative solutions and rangeland projects to provide proper management for livestock grazing while meeting resource objectives and requirements for Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands in Oregon and Washington (S&Gs) (RMP-53).
- Manage existing WSAs so as not to impair their suitability for preservation as wilderness (RMP-80).
- Protect and enhance the Outstandingly Remarkable Values (ORVs) of the designated WSRs (RMP-82).
- Provide adequate quality forage, maintain satisfactory riparian conditions and improve riparian conditions where less than satisfactory conditions exist (South Steens Wild Horse HMA Plan Update, Appendix E).

Decision Factors (outside laws and regulations):

- Is the cost of implementing the alternative reasonable?
- Would the alternative meet the goals and objectives as stated above?
- Is implementation of the alternative practical?
- What is the adaptability of the alternative?

Decision to be Made:

The BLM will decide 1) whether or not to construct additional water developments and where, 2) whether or not to issue a 10-year grazing permit and under what terms and conditions, and 3) how to modify the 1995 AMP to achieve Standards for Uplands-Riparian/Wetland Areas and Water Quality within Steens Pasture.

D. Conformance with Land Use Plans, Laws, Regulations and Policy

1. Steens Mountain CMPA RMP and ROD (August 2005). Please see Purpose and Need discussion above for goals and objectives to be achieved.

2. Steens Mountain Wilderness and WSRs Plan (August 2005). See Purpose and Need above for goals and objectives to be achieved.

3. State, local, and Tribal land use plans and regulations. *Harney County Land Use Plan* recognizes livestock grazing as one of two main contributors to the Harney County economy.

4. Steens Act. The Steens Act is the directing legislation for the CMPA and also refers to other laws including the FLPMA, Wilderness Act, and WSR Act.

   Multiple sections of the Steens Act provide direction to both manage for social and ecological health and for economic purposes. The following is a summarized list of pertinent sections:

   SEC. 1: Maintain the cultural, economic, ecological, and social health; provide for and expand cooperative management activities between public and private landowners; maintain and enhance cooperative and innovative management practices between public and private land managers; and promote viable and sustainable grazing on private and public lands.

   SEC. 102: Conserve, protect, and manage the long-term ecological integrity; maintain and enhance cooperative and innovative management projects between public and private; promote grazing that is sustainable; promote cooperation with private landowners; ensure the conservation, protection, and improved management of the ecological, social, and economic environment; and promote and foster cooperation, communication, and understanding and reduce conflict between users and interests.

   SEC. 112: Use of motorized or mechanized vehicles is not prohibited if the Secretary determines such use is needed for administrative purposes, or is appropriate for the construction or maintenance of agricultural facilities or ecological restoration projects, except in areas designated as wilderness or managed under the provisions of section 603(c) of the FLPMA. No new road or trail for motorized or mechanized vehicles may be constructed unless determined necessary for public safety or protection of the environment.

SEC. 113: The Secretary shall be responsible for installing and maintaining any fencing required for resource protection within the designated no livestock grazing area. No new facilities may be constructed on Federal lands unless determined the structure will be minimal in nature, is consistent with the purposes of this Act, and is necessary for the management of livestock.

SEC. 204: Under Section Title II, Section 204 (b), WSAs "shall continue to be managed under Section 603(c) of the Federal Land Policy and Management Act of 1976 [43 U.S.C. 1782(c)] in a manner so as not to impair the suitability of the areas for preservation as wilderness."

5. The FLPMA (1976), Section 603(c) - mandates the Secretary to manage lands with wilderness characteristics so as not to impair the suitability of such areas for preservations as wilderness, subject; however, to continuation of existing grazing uses in the same manner and degree as was being conducted on the date of the approval of the FLPMA.

6. The FLPMA and Public Rangelands Improvement Act of 1978 mandate the management of public land for multiple use and sustained yield. Specifically, the regulations implementing these acts call for rangeland management strategies that provide forage for economic use as well as for maintenance or restoration of watershed function, nutrient cycling, water quality and habitat quality for Special Status Species (SSS) and native plants and animals. These management strategies have been supported and implemented by development of national policies and Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington (1997).

7. Taylor Grazing Act - Provides the basic legislative authority for livestock grazing on public lands with provisions for protection of the lands from degradation, for orderly use and improvement of public rangelands, and established standards for rangeland improvements.

8. Wild Free-Roaming Horses and Burros Act of 1971 - Requires the BLM to protect and manage wild horses in areas they were found at the time the act was passed and in a manner designed to achieve and maintain a thriving ecological balance in keeping with the public land, multiple-use concept.

The project has also been designed to conform to the following:

- The National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4347), 1970.
- Endangered Species Act (16 U.S.C. 1544), 1973.
- August 12, 1997 Standards for Rangeland Health and Guidelines for Livestock Management for Public Lands Administered by the BLM in the States of Oregon and Washington.

- 1998 Burns District Noxious Weed Management Program Environmental Assessment (OR-020-98-05).
- Greater Sage-Grouse and Sagebrush-Steppe Ecosystems Management Guidelines (USDI-2000).
- Bureau of Land Management National Sage-Grouse Habitat Conservation Strategy (2004).
- Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (Hagen 2005).
- 2007 Steens Mountain Travel Management Plan (EA OR-05-027-021).
- 2007 North Steens Ecosystem Restoration Project Record of Decision.

E. Interim Management Policy for Lands under Wilderness Review

Under Section Title II, Section 204 (b) of the Steens Act and Section 603(c) of FLPMA (see pertinent sections described above), the Secretary shall manage lands according to his authority and other applicable laws in a manner so as not to impair the suitability of such areas for preservation of wilderness and prevent unnecessary or undue degradation of the lands and their resources or to afford environmental protection. Section 102 of the Steens Act emphasizes conserving, protecting and managing the long-term ecological integrity of Steens Mountain and to promote grazing, recreation, historic and other uses that are sustainable. The BLM must also comply with the Wild Horse and Burro Act as described above.

Compliance with Section 603(c) of FLPMA is based on guidance provided in BLM's Manual Handbook H-8550-1 Interim Management Policy for Lands under Wilderness Review (IMP). The only provisions the IMP makes for approving new permanent water developments are if "they truly enhance wilderness values", they "are substantially unnoticeable", and they "must not require motorized access if the area were designated as wilderness." Based on the analysis provided in Chapter III of this EA for sections related to WSAs and other resources, there would be benefits to wilderness values associated with protecting sensitive riparian vegetation around springs and ecological benefits associated with better distribution of livestock, especially horses which are present year round. There would also be benefits to wild horses, which are generally considered to be a special feature enhancing the wilderness experience of some visitors. To achieve these benefits, the Proposed Action would add several water developments to two WSAs while removing some nonfunctioning water developments. This EA analyzes and discloses the impacts (both adverse and beneficial) of proposed water developments.

At the end of the process, the Finding of No Significant Impact and Decision Record will need to make a finding of consistency with the IMP, based on the analysis of impacts in this EA.

F. Scoping

On December 22, 2006, the BLM initiated a public comment period to receive input on EA development and to identify issues to be addressed. Forty-nine comment letters were received. Issues/concerns to be addressed include:

- WSA suitability and nonimpairment
- Increases or decreases in grazing management
- Riparian and uplands vegetative impacts
- Motorized use and miles of roads associated with development
- Wild horse gathers
- Reliable, year-round water for wild horses
- Water distribution, quality and quantity
- Sage-grouse and habitat and other SSS
- Mule deer and their habitat and other wildlife
- Integrity of WSR and No Livestock Grazing Area
- Historical water usage, more water v. less water
- Monitoring
- Fencing v. no fencing
- Balancing grazing, access, preservation and other uses
- Invasive species and noxious weeds
- Socioeconomics
- Recreation
- Consistency with FLMPA, Steens Act, WSA IMP, RMP, WSR Act
- Soils and Biological Soil Crusts (BSCs)
- Visual resources

In addition, this project has been discussed at Steens Mountain Advisory Council (SMAC) public meetings and a tour was provided in August 2007.

On July 24, 2008, a subcommittee of the SMAC provided additional scoping comments (not an official recommendation) to the BLM regarding this EA after touring the allotment on July 17 and 18, 2008. These comments were taken into consideration and addressed if applicable. It is anticipated a SMAC recommendation will be made at their September meeting which will coincide with the 30-day public comment period on this environmental analysis.

G. Issues Considered but not Analyzed Further

An intensive inventory evaluating the presence of wilderness characteristics on the BLM-administered lands in the Project Area that fall outside of WSAs and Steens Mountain Wilderness was documented in November of 1980. The final intensive inventory decision (Wilderness Inventory - Oregon and Washington, Final Intensive Inventory Decisions, November 1980) found that wilderness characteristics were not present on these lands. In 2003 inventory maintenance was completed by an IDT who reviewed current conditions and citizen information submitted for the area. Changes that had occurred since the original inventory were evaluated against the

wilderness criteria and documented. No changes to conditions were identified that would modify the findings of the 1980 inventory for lands within the Project Area; therefore, wilderness characteristics have been determined not to be present. This issue will, therefore, not be analyzed in this EA.

CHAPTER II: ALTERNATIVES

A. Project Design Features

Project Design Features were developed to aid in meeting project goals and objectives. These features are nonexclusive and are subject to change based on site-specific terrain characteristics (topography and vegetation). Changes, additions or deletions would be made through coordination with appropriate BLM specialists or grazing permittee or SMAC and approved by the Authorized Officer. Applicable features would be applied as appropriate following advice and recommendations from the IDT or grazing permittee or SMAC on a site-specific basis. All projects implemented within WSAs would be constructed to reduce impacts to wilderness values on a site-specific basis, and measures would be taken to ensure a more natural appearance including but not limited to the features described below.

Fencing

Fences would be constructed to BLM specifications for a 4-strand, barbed-wire fence, including 22-foot post spacing. Where metal posts are used in WSAs, they would be solid green in color (no white tops). Wire spacing would be 16 inches, 22 inches, 30 inches, and 42 inches up from the ground, with a smooth bottom wire. Green steel braces or wooden "H" braces would be used rather than rock cribs at the corners and gates for fences within WSAs. No blading, grading, or vegetative brushing of routes for the fenceline would occur within the WSAs and spot removal of rock or vegetation would only occur when necessary. Pickups (if accessible) and four-wheel All-Terrain Vehicles (ATVs) would generally be used in construction. Most new fence proposed in WSA is adjacent to an existing road, so cross-country travel by motorized equipment would be minimal and occur along the outer edges of the WSA. If any cross-country travel does occur within WSA, travel would be done in a manner that reduces establishment of tracks and any tracks adjacent to a road or way would be hand raked the distance necessary to deter the establishment of unauthorized routes. New fence construction costs approximately $5,000/mile.

Fences are generally checked yearly either by horse or ATV. Fences within WSA would be checked by foot or horseback if not along an open road or way. Fence maintenance consists of restretching wire, replacing clips, replacing or adding wood or steel posts, and straightening or replacing stays. Based on location, labor and materials to maintain fences are approximately $1,500/mile.

Fence removal would be completed using a motorized fence roller hauled by an ATV. All posts and wire would be removed from the site with the ATVs. Cross-country use of ATVs in WSA would be conducted in the same manner as that described for fence construction above. Removal of existing fence would be accomplished as part of the contract to build the new fence or within one year of building the new fence. Fence removal costs are expected to be the same as fence construction.

Water Gap Fencing

Three options are available for water gap fence construction - barbed wire, Powder River-type panels and floating logs. Water gaps could be built entirely with panels, floating logs or barbed-wire or a combination of panels, logs, and wire. Barbed-wire water gaps require a great deal of maintenance each year due to high water flows, ice, debris, wildlife and rust; therefore, barbed wire would be considered as the last choice. The transport of materials and tools allowed for construction of water gaps would be determined following a minimum tool analysis.

Barbed-wire fencing for any water gaps would use the same design features as those described for fencing above.

Water gap fences constructed using Powder River-type panels would be painted to blend into the surrounding environment. Each panel would be 12 to 16 feet long and 4 to 6 feet high. Panels are anchored to either rocks or existing juniper trees with cable or chain. Depending upon size of the water gap, two to four panels would be placed 8 to 12 feet into the river and would form a "V." Additional panels above the river would be used to funnel livestock into the water gap area to allow use of the water at Donner und Blitzen River. Number of panels would be determined site specifically based upon terrain features. Installation of panels would occur manually. Each panel costs approximately $100. It is estimated it would take four people 3 days to install all water gaps. If materials need to be flown to the Project Area, the associated costs would be approximately $3,200. Maintenance costs are expected to be minimal requiring a yearly inspection and occasional replacement of panels.

Floating juniper logs cabled together in a "V" formation and anchored to rocks or juniper or both could create a different type of water gap. Logs would be placed 8 to 12 feet into the river. Additional juniper would be used to funnel livestock to the water gap area to allow use of the water at Donner und Blitzen River. Juniper logs would be piled to create this funnel. Number of logs would be determined site specifically based upon terrain features. It is estimated it would take four people 5 days to install all water gaps. Maintenance costs are expected to be minimal requiring a yearly inspection and occasional replacement of logs due to wood rot or from logs coming loose and floating down the river. Water gap "V" formations would be opened when livestock are not in the area to allow passage of wild horses.

The water gap immediately north of Bradeen crossing (F3) would consist of approximately 100 yards of fence. Two water gaps (F2) located 2 to 3 miles north of Bradeen Crossing (T. 34 S., R. 32½ E., Section 2 and T. 33 S., R. 32½ E., Sections 35 and 36) have been identified for construction. Only one of these water gaps would be constructed depending upon the alternative or components of an alternative selected and the other water gap location would be completely fenced from use. There is no intent to construct both water gaps.

Reservoirs

Reservoir embankments could be less than 10 to 20 feet high, and depending on the site, would likely be less than 150 feet in length. Slope on the downstream side would be a 2 to 1 ratio (2:1) and the upstream side would be 3:1. Spillways would generally be 15 feet wide or less and most would be 100 to 150 feet in length. Water volume and reservoir depth affect the length and width of the spillway. Reservoirs within WSAs would be designed and constructed to the extent possible to provide for a more natural-looking appearance. Construction would include removing brush and topsoil in the area of the reservoir and borrow area (an area with clay-type material). Most borrow areas are adjacent to the site. Material from the borrow area would be removed by a steel-tracked crawler and scraper and placed in layers at the reservoir site. There would be a disturbed area of approximately 2 acres. All disturbed areas would be reseeded after construction using a native/nonnative mix in areas outside WSA. Within WSAs, only native seeds would be used and vegetation (especially trees) providing screening to reservoirs would be left where possible. Other naturalization measures within WSAs such as shrub plantings and rock placement may occur as needed to reduce visual effects on a site-specific basis. Following seeding, the permanent footprint would be approximately 1-acre depending upon the depth of the reservoir. Access to the sites would be by existing road where available. If no access road is available, cross-country travel would occur. No access roads would be constructed. Within WSAs, any cross-country travel with equipment would be done in a manner that reduces establishment of tracks and any tracks adjacent to a road or way would be hand raked the distance necessary to deter the establishment of unauthorized routes. Reservoir construction for dams over 10 feet high costs approximately $15,000 to $25,000 depending on height. Reservoirs with less than a 10-foot high dam would cost approximately $5,000 to $8,000.

Maintenance usually occurs approximately once every 20 years or following a wildland fire event in the area. Reservoirs are cleaned out using a dozer and if the reservoir is not holding water, bentonite is applied. One trip a year with an ATV would be necessary to monitor and treat any weeds found, any cross-country travel would be conducted in a manner to reduce disturbance to soil and vegetation. This frequency may decline if no weeds are identified after several years of monitoring. Cost for reservoir maintenance averages $2,000/reservoir once every 20 years.

Decommissioning of Reservoirs

Where reservoirs proposed for decommissioning have well-established upland vegetation, more of the dam would be left intact and earth moving would be limited to the minimum necessary to ensure the berm would not fail in the future. Where reservoirs have not reestablished upland vegetation and active erosion is occurring or is likely, the existing dam would be breached, and the berm would be recontoured to more closely resemble the setting. Bare soil would be seeded using native seed in WSAs or a native/nonnative mix outside WSAs. Within WSAs, any cross-country travel with equipment would be done in a manner that reduces establishment of tracks and any tracks adjacent to a road or way would be hand raked distance necessary to deter the establishment of unauthorized routes.

Where two reservoirs exist in close proximity to one another in the southern portion of the Project Area, one reservoir would be decommissioned while the other reservoir would be rehabilitated. Through site visits, specialists would determine reservoirs to be rehabilitated and reservoirs to be decommissioned. For analysis purposes, an assumption as to the reservoirs' status was made as depicted on the Alternative B map.

Rehabilitation of Reservoirs

Reservoirs proposed for rehabilitation would have spillways fixed by pushing rubble and rock from below the spillway with a dozer; dams would be repaired by sealing and packing material on top the dam with a dozer; and depth of reservoirs would be increased using a dozer to offset the effects of evaporation. Material may be obtained onsite or hauled in with a dump truck. Some reservoirs may require bentonite or alkali/clay material to be hauled to the site and packed with a dozer to seal the reservoir's bottom. Within WSAs any cross-country travel with equipment would be done in a manner that reduces the establishment of tracks and any tracks adjacent to a road or way would be hand raked the distance necessary to deter establishment of unauthorized routes.

Wells

Access for well-drilling equipment would use existing roads and ways. Depending upon the site, some roads may need to be upgraded using a dozer, backhoe or grader for oversized trucks approximately 26 feet long. Only designated routes outside WSA would be upgraded as necessary in accordance with the Transportation Plan (TP) and Travel Management Plan (TMP). Any needed materials (rocks or soil) would be hauled with a dump truck. Ways may receive spot maintenance in accordance with the TP and TMP, which would generally consist of removing rocks, tree limbs or trees preventing safe passage by vehicles and providing drainage where there is potential for excessive soil erosion.

The well site would consist of a disturbed area of approximately 100 by 100 feet within approximately 30 feet of a route. An 8 to 12-inch diameter hole would be drilled at each well site to accommodate 6-inch casing (pipe). Casing would be used for the entire depth of the hole unless solid rock is encountered. If rock is encountered, the hole would not be cased within this section. The cost of drilling the well is $3.75 per pipe diameter inch per foot (e.g., 6-inch hole would be $22.50/foot). The average cost of drilling a well and all ancillary materials is approximately $35,000 for a 100-foot well.

To retrieve water from the wells a pump generated by either solar or fuel would be utilized. Pump size would be dependent upon depth of well and location of storage tank. Most fuel-powered generator pumps average 3 to 5 horse power, while solar-powered pumps are ½ to 2 horse power.

Fuel-powered generators would likely be 5000 kilowatt and would operate July 1 to December 1 as necessary within small enclosed trailers the size of a standard truck bed with a canopy. Within WSAs terrain features could also be utilized to help in minimizing visual and audio effects. Generators would likely run 8 to 16 hours a day depending on water consumption when in use and may be audible up to one-quarter mile. Technology is now available to use satellites to start, stop and notify when problems arise with the generators. The generator would be parked within 30 feet of an existing road or way and in an area already disturbed by installation of the tank or well. When portable generators are not in use, they would be removed.

Panels for solar energy would be installed using manual labor. Poles would be concreted in the ground and solar panels mounted upon the poles. Ideal pole height is 16 feet and 8 inches in diameter. Each pole would hold approximately 12 panels to accommodate up to a 400-foot well producing 12 gallons per minute. Panels vary in size from 16 to 40 inches in length by 40 to 70 inches in width. One solar panel is called a module and several panels (3 to 12) are an array. If the water depth is greater than 400 feet, solar may not be feasible. Also, solar may not be feasible if a large volume of water (more than 20 gallons per minute) is needed. A 2200 watt array would cost approximately $16,000 including the pump and delivery.

Windmills are approximately 20 feet high, placed on 8 by 8 foot concrete bases and installed directly over the well head using a boom truck. Equipment required would also include a backhoe and a concrete truck. Labor and installation cost approximately $25,000 for a 100-foot well.

Within WSAs, solar panels/arrays and windmills would be located to utilize topographic and vegetative screening where possible. Solar or windmill structures would be painted as feasible or necessary to blend in with the surrounding area.

Maintenance consists of checking the well yearly by pickup or ATV and replacing pumps as needed (life expectancy is 5 to 10 years). Replacing a pump would require a 1½ ton truck with a short tower capable of pulling pipe and pump from the well. To remove pipe casing a well rig would be required. Maintenance costs are difficult to calculate, but could be as high as $5,000.

The warranty on solar panels is 25 years; however, vandalism remains the main reason for replacement.

Maintenance on windmills consists of two inspections per year at a cost of $500 per trip.

Pipelines

Pipeline trenches would be constructed using a steel-tracked crawler with ripper and plastic pipe laying apparatus and a rubber-tired backhoe within approximately 30 feet of a route. A trench would be dug with a simple ripping tooth to a depth of 18 to 24 inches and approximately 2 feet wide. A 2-inch black plastic (polyethylene) pipe would then be placed in the trench through the end of a ripper tooth. All disturbed areas would be reseeded after construction using a native/nonnative mix in areas outside WSA. Within WSAs, only native seeds would be used. The area would be further naturalized by returning most rocks (mossy side up) disturbed by pipeline installation to reduce the appearance of rock berms and to break up the linear shape of the pipeline. To install underground pipe costs approximately $7,500 per mile.

It is possible a portion of the steel or black plastic pipe may lie directly on the ground or just beneath the ground's surface. Efforts would be made, however, to cover the pipes with dirt and vegetation. Steel pipe and installation costs are unknown as BLM standards are to install pipe underground. The cost of 1½-inch galvanized pipe is $3.18 per foot.

Pipelines would be drained every fall/early winter. Inspections would occur annually at a minimum, using an ATV or pickup along existing trails. Pipelines would be replaced as necessary. Life expectancy for pipe is 20 years under good conditions. Yearly maintenance costs are site specific, but could be as much as $2,000 per mile.

Troughs

Bottomless troughs would be circular, 30 feet in diameter with a 4 to 6-inch concrete bottom, a 2 to 4-foot concrete apron to aid in erosion control, and hold 10,000 gallons of water. The sides of the trough would be 2 feet high and constructed of galvanized metal and could be painted to blend in with the surrounding environment. Within WSAs other more natural-looking or prefabricated troughs (rock) could also be considered on a case-by-case, site-specific basis. A rubber-wheeled backhoe would be used to scrape dirt to form the area for a tough within approximately 30 feet of a route except for troughs associated with spring developments/rehabilitation. A concrete truck would haul concrete to the site to construct the apron and add the 4 to 6-inch concrete bottom.

The area disturbed during installation of the trough would be approximately 50 by 50 feet. A wildlife escape ramp would also be installed in the trough. Escape ramps could be fabricated of metal or may be a pile of rocks in one part of the trough. Larger bottomless troughs would have more than one escape ramp since there is more surface water, about 700 square feet (sq. ft.) compared to smaller troughs (50 sq. ft.). Approximate cost for installation is $7,000/trough. These troughs are relatively maintenance free except for replacing trough floats and can last for several decades. Trough replacement would be the same as described above for original installation.

Metal troughs require the area to be leveled using a backhoe. Rock hauled by a dump truck is then put around the trough using a backhoe to reduce soil compaction by livestock and assist in blending the site with the surrounding area. Most troughs are 4 by 12 feet resulting in a disturbed area of approximately 10 by 20 feet. Wildlife escape ramps would be installed in all troughs. Metal troughs cost approximately $1,200 each and do not last as long as bottomless troughs.

Trough floats are the biggest maintenance concern and some may need replacing every year. Troughs are inspected at a minimum of once per year using an ATV or pickup along an existing trail and are expected to last 10 years. Troughs not located on an existing way in WSA would be inspected by foot or horseback. Trough replacement would require the use of a rubber-wheeled backhoe. Maintenance costs as needed average $200 per trough.

Troughs may be partially buried using a rubber-wheeled backhoe. If not buried, troughs could be painted to blend in with the surrounding environment.

For analysis purposes, bottomless troughs would be constructed in all proposed trough locations except when associated with spring development/rehabilitation. Spring developments/rehabilitation may have metal 4 by 12 feet troughs installed.

Storage Tanks

Storage tanks would be 8 feet high by 28 feet in length and hold 10,000 gallons of water. Storage tanks would be associated with wells and troughs, except those wells drilled within a reservoir footprint or where water is pumped into a reservoir, and would be buried within approximately 30 feet of a route. Buried tanks would disturb approximately a 12-foot wide by 36-foot long area. Areas disturbed would be contoured to blend in with the surrounding area and seeded with native/nonnative vegetation except in WSAs where only native seed would be used. Equipment necessary includes an excavator or backhoe, low-boy truck and trailer. Access would require use of a well-maintained road. Total cost for installation would be approximately $25,000 per tank.

Maintenance consists of at least yearly inspections. Life expectancy is 20 years. Annual maintenance is approximately $1,000.

Spring Development/Rehabilitation

For Alternatives B and D spring development(s)/rehabilitation would consist of surrounding the spring(s) with fencing and installing a spring box to gather water, a pipe (extended for human consumption as well) and a 4 by 12-foot metal trough. Depending upon the area, the fence exclosure would be 2 to 6 acres (0.32 to .4-mile of fence).

Fences would be built to BLM specifications as described above (barbed wire) or constructed by felling juniper within the immediate area and stacking them to create a barrier and additional wildlife cover. Juniper branches would remain intact. Juniper logs and stumps obtained in WSAs would be rough-cut and moved by hand or with equipment already onsite. Spring boxes consisting of a 1½-foot diameter aluminum culvert and river rock would be installed using a rubber-wheeled backhoe. In WSAs the culvert would be painted to blend in with the surrounding environment. Pipe installation and trough placement are described above. Length of pipe would be determined by exclosure size, but should not be more than 0.4-mile. Costs of developing/rehabilitating springs average $4,500 per spring.

Spring development/rehabilitation under Alternative C would be the same as described above; however, Spring S-3 would have additional pipeline and four metal troughs.

Maintenance is minimal as spring developments should last 25 years. No maintenance would be required for juniper fencing. Any associated maintenance costs would be approximately $500 including labor.

Dugout Development

Weaver Springs Dugout would be rehabilitated under Alternative C only. Rehabilitation would consist of digging out the area with a rubber-wheeled backhoe, piling silt around the dugout to create a berm, and rocking the sides and top of the dugout to help protect it from erosion. Cost to rehabilitate the dugout is estimated to be $1,000. The dugout would be periodically (approximately every 20 years depending upon use) maintained. Maintenance costs would likely be the same as the rehabilitation cost.

Seeding

Seeding of areas disturbed by construction would occur with an ATV with a seeder attachment or by hand using a seed thrower. Within WSAs, seeding would be completed by hand. The cost is approximately $28/acre by contract if BLM supplies the seed. Native seed costs $40 to $100 per acre and nonnative seed is $35 to $40 per acre.

Route Realignment

Three Springs route passes directly through the spring (dugout) located at T. 34 S., R. 32¾ E., Section 19. Under all action alternatives this spring is proposed for rehabilitation. In order to effectively rehabilitate this spring, the existing route would be realigned approximately 20 feet west of the spring (upper end) for a distance of 20 yards. The new portion of this route would be created primarily by passage of a vehicle. However, to provide safe access, large rocks may need to be moved with equipment followed by filling of holes with soil. This would be the only work allowed with equipment. The old route could be barricaded using downed juniper from the immediate area and reseeded using native seed if necessary.

Other Design Features

1. Vehicles and equipment would be cleaned prior to entry to the site for project work to aid against spread of noxious weeds.
2. The BLM would inventory the project site for noxious weeds. Any weeds found would be treated, and the site would be monitored for new weed introductions. Any new weeds found would be treated using the most appropriate methods.
3. The proposed pipeline trench would be left open long enough for cultural resource review studies to occur before project completion.
4. A cultural resource inventory is required prior to any range or other project construction. Certain fence locations such as adjacent to riparian areas (rivers, streams, and springs) will be inventoried for cultural sites. Clearances or monitoring will be needed at existing range developments that will be used or retired. Direct effects to sites located near (within 100 yards) or within proposed developments can be mitigated through various means such as avoidance, surface collection, mapping, testing or full-scale excavation.
5. Cultural resources inventory will be needed in the allotment to locate and evaluate archaeological sites that could be within the additional livestock and wild horse congregation areas. Sites eligible for listing to the National Register of Historic Places within congregation areas will be avoided to mitigate potential effects. If avoidance is not a viable mitigation option, other measures such as surface collecting and mapping, testing and full-scale excavation could be used.

B. Adaptive Management

Adaptive management is a system of management practices based on clearly identified outcomes and monitoring to determine if management actions are meeting desired outcomes; and, if not, facilitating management changes that will best ensure outcomes are met or reevaluated. Adaptive management recognizes that knowledge about natural resource systems is sometimes uncertain and, in this context, adaptive management affords an opportunity for improved understanding. Knowing uncertainties exist in managing for sustainable ecosystems, changes to the proposal may be authorized for reasons such as, but not limited to:

- √ Failure of existing reservoirs in which case decommissioning of other reservoirs may not occur
- √ Failure of rehabilitated reservoirs in which case decommissioning of other reservoirs may not occur
- √ Adjustment on the number of water developments constructed

    - o Water developments may be constructed in a phased-in approach using adaptive management practices and taking budget constraints into consideration.

Criteria for determining success of rehabilitated or new reservoirs include:

- √ The ability of the reservoir to hold water from July through October (dry season).
- √ The ability of the reservoir to accommodate 20 to 100 head of livestock or horses during the dry season depends upon:

    - o Size of reservoir,
    - o Size of surrounding area it will serve,
    - o Topography of the area,
    - o Forage available, and

- √ The reservoirs show no signs of maintenance issues such as erosion, ability to handle flow capacity, or inadequate overflow.
- √ Size of reservoir would be dependent upon amount of available material with which it is constructed.

Determination of reservoir functionality would be in cooperation between the range management specialist and the grazing permittee.

C. Assumptions Common to All Alternatives

The *Projects for Implementation of the Steens Mountain Cooperative Management and Protection Act of 2000*, EA OR-027-01-27 (Implementation EA) analyzed environmental effects to improve a spring in the Burnt Car area (see Alternative A map for location). The spring development consists of installation of 0.25-mile of pipeline, a trough or waterhole, and a 0.5-mile exclosure fence. The EA Decision Record did not originally select this spring development as part of the Proposed Action; however, an amended Decision Record will be prepared to allow for this development. This spring development will occur under all alternatives and will be depicted on maps as existing.

In addition to this spring development, the Implementation EA analyzed and selected in the Decision Record installation of two gap exclusion fences at the end of the Burnt Car Road area. These gap fences have yet to be constructed; however, for purposes of this EA, the gap fences will be shown in all alternatives as existing.

The 2.5-mile fence (Amended Decision Record, February 3, 2006, EA OR-027-01-27) between Tabor Cabin and just south of Bradeen Crossing located in T. 34 S., R. 32¾ E., Sections 7, 17, 18, and 20 was constructed in November 2007 to prevent cattle grazing in the No Livestock Grazing Area. This fence shows on maps as existing.

Also, Roaring Springs Ranch, Inc., reserved a nonexclusive easement at Tabor Cabin, T. 34 S., R. 32¾ E., Section 20, S½ and Section 29, N½ along Donner und Blitzen WSR "…for livestock, wild horse and wildlife watering purposes." This easement is recognized as a legal use of this portion of the No Livestock Grazing Area for said purposes and use will continue under all alternatives.
All route maintenance would be consistent with the CMPA TP.

Juniper treatments authorized in the North Steens Ecosystem Restoration Project ROD (2007) will be implemented under all alternatives.

D. Actions Common to Alternatives *except* the No Action Alternative

Renewal of the 10-year grazing permit for 9,577 AUMs would occur in accordance with the following Proposed AMP:

South Steens Allotment Management Plan

Goals and Objectives: The 1995 South Steens AMP contained 10 sets of goals and objectives; some are being brought forward as they are still applicable while others have been modified due to changes in landownership and land designation. Please see the following table:

1995 AMP Goals/Objectives	2008 AMP Goals/Objectives
1. Riparian: Improve/Maintain riparian habitat by increasing herbaceous and desired woody species. √ *Objective*: Improve trend to upward on Home Creek and Threemile Creek; change riparian condition from 3.2 miles in poor condition and 8.7 miles in fair condition on Ankle Creek, Deep Creek and South Fork Blitzen River to good and excellent condition within 10 years; improve trend in riparian condition on these streams within 3 years; maintain good and excellent condition on 5.2 miles of these streams; maintain good and excellent condition on 6.5 miles of Donner und Blitzen River; and Skull Creek will be slower on recovery, upward trend in riparian condition should be measurable within 3 years after implementation.	**Modified -** Ankle Creek, Deep Creek, South Fork Blitzen River, Donner und Blitzen River, Threemile Creek, and Skull Creek are no longer part of this allotment. **Riparian**: Goal – Maintain or improve riparian functioning condition of perennial and intermittent streams, and restore and maintain natural and free-flowing characteristics of wet meadows and associated springs √ *Objective:* Maintain PFC of 1.4 miles of two unnamed perennial tributaries to Donner und Blitzen River in Tombstone Pasture assessed for PFC in 1999. √ *Objective*: Maintain an upward trend in riparian vegetation on 2.4 miles of Home Creek in Home Creek Pasture so that wetland plant species continue to replace upland species within the greenline (refer to the riparian inventory study performed in 2003 for baseline information). √ *Objective*: Improve vigor of woody riparian species on 2.4 miles of Home Creek in Home Creek Pasture so all age classes are present for the five willow species established in the greenline, and potential shade can be achieved (as constrained by cover of herbaceous species) within the next decade. This objective addresses the need to reduce stream temperature for redband trout habitat and Oregon Department of Environmental Quality (DEQ) 303d list concerns for Home Creek. √ *Objective*: Restore natural and free-flowing characteristics of the Three Springs complex and associated meadow on BLM land, an unnamed spring in T.34S., R.32¾E., Section 19, along Three Springs Road, and an unnamed mesic/wet meadow system in T.34S., R.32½E., Section 36, all in Steens Pasture. Protection and enhancement strategies should allow riparian areas to reach potential extent within one decade after implementation at each site, and achieve presence of at least 75% wetland species in the greenline within two decades (presence of woody riparian species is not expected or required at these sites).

2. Upland Areas: Manage uplands in a mosaic of native plant communities and seral stages. The focus of management will be on plant communities such as mountain big sagebrush, aspen, low sagebrush, and juniper that appear to be changing ecologically to a point of concern over future watershed integrity. √ *Objective*: Determine the rate of ecological change and opportunity (window) to apply management strategies such as prescribed fire. √ *Objective*: Determine ecological change in plant communities that alter desired range of variability in seral stages. √ *Objective*: Maintain/improve upland condition.	**Modified** - Juniper encroachment has been identified as an ecological concern. The majority of the areas with aspen is no longer part of the allotment and is now part of Steens Mountain Wilderness. **Upland Areas**: Goal - Manage uplands in a mosaic of native plant communities and seral stages. Mountain big sagebrush and low sagebrush communities appear to be declining in vigor and reproductive capability due to juniper encroachment. √ *Objective*: Increase the relative frequency of key species such as Idaho fescue, bluebunch wheatgrass, mountain big sagebrush and forbs species that provide food for greater sage-grouse in the Tombstone, Steens, and Home Creek Pastures over the next 10 years. √ *Objective*: Maintain the relative frequency of key species such as Indian rice grass, needleandthread grass, Thurber's needlegrass, bluebunch wheatgrass, Wyoming sagebrush and forbs species that provide food for greater sage-grouse in the Hollywood Pasture over the next 10 years. √ *Objective*: Maintain frequency and distribution of bitterbrush in Steens and Tombstone Pastures over the next 10 years.
3. Wild Horses: Manage forage and water resources to provide quality habitat for wild horses in South Steens HMA. √ *Objective*: Manage wild horse populations at an AML between 159 and 304 animals. Provide adequate quality forage for 3,648 AUMs. Manage in a manner which maintain satisfactory riparian, aquatic, and upland condition and improve riparian and upland conditions where less than satisfactory conditions exist.	**Modified** - Please refer to the Riparian and Upland Areas goals and objectives. **Wild Horses***:* Goal - Manage forage and water resources to provide and maintain a thriving natural ecological balance within the South Steens Allotment portion of the South Steens HMA. √ *Objective*: Manage wild horse populations at an AML of between 159 and 304 animals to provide and maintain a thriving natural ecological balance with all resource uses.
4. T&E and Sensitive Species: Land and resource uses will be managed to provide habitat for viable populations of T&E and sensitive plan and animal species present. √ *Objective:* Provide habitat for viable populations of Steens Mountain paintbrush, redband trout, California bighorn sheep, sage-grouse, bald eagle, American peregrine falcon, and Malheur mottled sculpin.	**Deleted** - Peregrine Falcons and bald eagles are no longer listed on the Threatened or Endangered species list and are no longer present in the allotment due to allotment boundary changes. Bighorn sheep, Malheur mottled sculpin and Steens Mountain paintbrush are no longer on the Sensitive Species List. The Catlow tui chub are no longer in the allotment. Please refer to the Riparian (redband trout) and Upland Areas (sage-grouse) Goals and Objectives for species habitat objectives.

5. Stability of Ranch Operation: Forage and water resources will be managed to provide sufficient qualities and quantities to support a harvest on a sustained basis for livestock, wild horse, and wildlife. This will contribute to the economic stability for the county and the ranch unit. √ *Objective:* Maintain stability/flexibility of the ranching operation. Improve productivity of private land not in the allotment. General season of use is April 1 to October 31 and November 16 to March 15 with 21,197 AUMs attributed to public lands and 14,381 AUMs attributed to private lands within the allotment.	**Deleted -** Please refer to the Upland Areas goal and objectives.
6. Wilderness: Manage land and resource uses within WSAs in a manner that will protect and enhance wilderness values within the scope of the BLM's IMP for land under wilderness review (do not impair the suitability of these areas for wilderness designation). √ *Objective:* Manage the following WSAs in accordance with the IMP: Rincon, Alvord Peak, Basque Hills, South Fork Blitzen River, Home Creek, Blitzen River, High Steens, Little Blitzen Gorge.	**Modified** - Due to the Steens Act and subsequent land exchanges and wilderness designation, Home Creek, Blitzen River, and South Fork of Donner und Blitzen River are the only WSAs within the allotment. The allotment does contain part of Steens Mountain Wilderness (Home Creek). **Wilderness/WSA**: Goal - Maintain wilderness characteristics within Steens Mountain Wilderness (Home Creek portion) and Home Creek, Blitzen River and South Fork Donner und Blitzen River WSAs. √ *Objective*: Maintain wilderness in a manner consistent with the Steens Mountain Wilderness and WSRs Management Plan (August 2005), Steens Act, Wilderness Act and FLPMA. √ *Objective*: Maintain Home Creek, Blitzen River and South Fork Donner und Blitzen River WSAs within South Steens Allotment in a manner consistent with the Steens Act and FLPMA.

7. Wild and Scenic Corridor: Manage land and resource uses within the Donner und Blitzen WSR corridor to protect and improve resource conditions with special emphasis on the ORVs described in the Final WSR Management Plan. √ *Objective:* Manage to protect and enhance the Donner und Blitzen National WSR as outlined in the Final Donner und Blitzen River Management Plan and EA of May 1993. Protection and enhancement of the ORVs is required by the National WSRs Act. The ORVs are scenic quality, geologic, recreation, fish, wildlife, vegetation and cultural (historic). All protection and enhancement activities will be based on ecological function. Also applicable are the riparian, fisheries and aquatic habitat objectives. Improve water quality to meet or exceed quality requirements for all beneficial uses as established by the DEQ Nonpoint Source Assessment and Management Plan.	**Deleted** – The main stem of the Donner und Blitzen WSR is no longer part of this allotment except for the Tabor Cabin water gap. Roaring Springs Ranch reserved a "nonexclusive easement" to use and maintain the water gap in the Tabor Cabin area within Donner und Blitzen River "…for livestock, wild horse and wildlife watering purposes." This easement is recognized as a legal use of this portion of the No Livestock Grazing Area for said purposes. Goals and objectives for the Donner und Blitzen WSR are outlined in the Steens Mountain Wilderness and WSRs Plan (2005, Appendix P, CMPA RMP).
8. Fisheries and Aquatic Habitat: Maintain or improve fisheries and aquatic habitat through changes in riparian vegetation within the allotment to enhance water temperatures, reducing amount of sediments in the substrates of streams. √ *Objective*: Establish baseline data from which target or desired trends for fish and aquatic habitat characteristics would be determined.	**Deleted -** Please refer to the Riparian Goal and Objectives.
9. Wildlife Habitat: Manage vegetation to enhance or maintain a diverse habitat mosaic for a diversity of wildlife species. Attention will be given to seasonal and yearlong habitat requirements for all wildlife species. √ *Objective*: Maintain or improve aspen and riparian vegetation for the benefit of neotropical migrant songbirds and other species. Create and maintain a dynamic mosaic of seral stages that would meet the forage and cover requirements for mule deer, bighorn sheep, elk, sage-grouse and antelope. Acquire additional information on the habitat requirements for amphibians, reptiles, mammals, and birds.	**Deleted -** Please refer to the Riparian and Upland Areas Goals and Objectives.
10. Reintroduction of Fire: Reintroduction of natural and prescribed fire as an ecosystem function. √ *Objective*: Maintain watershed integrity to enhance hydrologic function. √ *Objective*: Achieve a mosaic of forage production and cover needs for wildlife and livestock. √ *Objective*: Enhance the richness of plant and animal species.	**Deleted -** Please refer to the Riparian and Upland Areas Goals and Objectives.

Address the following resource concerns: Steens Mountain CMPA, Steens Mountain Wilderness, riparian, water quality, SSS - greater sage-grouse, noxious weeds, WSAs, South Steens HMA, recreation and juniper encroachment.

Achieve the following standards: Indicators for all five standards for rangeland health are present. They include: Standard 1. Watershed Function-Uplands; Standard 2. Watershed Function-Riparian; Standard 3. Ecological Processes; Standard 4. Water Quality; and Standard 5. Native, T&E, and Locally Important Species.

Grazing System: A grazing system that incorporates rest, deferment and adaptive management strategies would be utilized in achieving resource objectives (Adaptive Rotational Grazing). Considerations would be given to the previous year's monitoring results, as well as preseason monitoring and current climatic conditions such as drought and availability of water. The annual prescription for grazing would be determined during the annual user meeting between the permittee and the BLM, held prior to turnout. This may result in changes to stocking levels, pasture rotations and timing of grazing. These or other modifications would result in changes to the general schedule to attain utilization target levels of 50 percent and to achieve management objectives. Hollywood Pasture would primarily be used as trail-through pasture to get cattle to Tombstone Pasture from private ground or back to private from Tombstone Pasture.

Table 2: Proposed Grazing System

Pasture	Cows	Year 1	Year 2	Year 3	Year 4	AUMs
Hollywood	500	*Early/Defer	Rest	Early/Defer	Early/Defer	500
Tombstone	1,200	Early/Graze	Defer	Early/Graze	Defer	3,900
Steens	1,200	Defer	Early/Graze	Defer	Early/Graze	3,300
Home Creek	1,000	Early	Early	Early	Rest	1,850

*See Glossary for definition

Authorized Flexibility: Adjustments of up to 14 days may be allowed without prior authorization from the Field Manager for each of the grazing treatments to provide flexibility in meeting resource objectives.

Range Improvements: Range improvement projects are addressed and analyzed under individual action alternatives (see below). Juniper management will occur in accordance with North Steens Project ROD (2007). Range improvement projects may be funded under a cost share between the Burns District BLM and the permittee as specified in a cooperative agreement. The permittee has verbally agreed to cost share range improvement projects.

Billing: After-the-fact billing would be authorized and actual use forms would be turned in within 2 weeks of removing livestock from the allotment.

Monitoring needs and schedule: "I" category allotments receive long-term trend monitoring every 5 years. Method used to determine trend would be Pace 180° frequency method. Utilization monitoring is performed yearly after every pasture move with route transect performed by vehicle and horseback. Riparian monitoring would also be completed every 5 years using Greenline method. In addition, use supervision would be performed periodically (1 to 3 times per month) to determine if the management system is being followed. An evaluation of management objectives and actions would be completed within 5 years of implementation of this AMP.

E. Alternatives Including the No Action Alternative

Alternative A - No Action

Under the No Action Alternative no additional water developments would be created in South Steens Allotment and grazing would continue under the current AMP. Existing water developments developed prior to WSA designation and without naturalness in mind would continue to be maintained. Currently there are 17 reliable reservoirs, 29 reservoirs which are not reliable all year, 16 reservoirs which are variable from year-to-year, 2 springs, 3 dugouts (one of which is a spring-fed dugout, Broken Leg Springs along Three Springs Road), 2 troughs, 0.75-mile of pipeline and 52.1 miles of fence. Access to Donner und Blitzen WSR would continue to be limited by fence (except Tabor Cabin area); therefore, reducing reliable, year-round water for wild horses and use by livestock. Grazing would continue under the South Steens AMP and during drier years, livestock may continue to be removed early under the permittee's discretion from South Steens Allotment.

Table 3: Existing Improvements by WSA for Alternative A

Blitzen River WSA		South Fork Donner und Blitzen WSA		Home Creek WSA	
Existing Improvements	**Quantity**	**Existing Improvements**	**Quantity**	**Existing Improvements**	**Quantity**
Reservoirs	12	Reservoirs	17	Reservoirs	5
Ways	34.0 miles	Ways	28.2 miles	Ways	1 mile
Fences	23.5 miles	Fences	9.4		
Corral	1	Old house	1		
Dugouts/Waterholes	5	Dugouts/waterholes	1		
Developed Spring	1				

Alternative B - Maximum Water Distribution

Alternative B proposes to implement the AMP as described above in addition to constructing the maximum numbers of water developments to evenly distribute wild horses and livestock throughout the allotment. No changes to the permitted number of AUMs would occur. The location and number of watering points are important to control movement, distribution and concentration of grazing animals (J. Vallentine 2001).

Recommendations on distance between watering points vary with terrain, type of animal and breed of livestock. The most practical distances (from the standpoint of both livestock and the range) based on topography are 1 to 2 miles in flat to rolling, hilly country. The rule of thumb is no more than 50 cattle per water facility (J. Holechek et al., 2004). This alternative was designed to make water available approximately every 4 square miles (2-mile distance between water developments). Developments are also proposed on private lands.

In order to evenly distribute horses and livestock, Alternative B proposes to construct 17 reservoirs and 4 miles of fence which includes 3 water gaps; drill 10 wells; install 15 miles of pipeline and 17 troughs; convert 2 dugouts (Weaver and Broken Leg) back to their natural spring-like characteristics; and rehabilitate 1 spring (Three Springs). Rehabilitation of Three Springs, drilling of 3 wells and installation of pipeline and 1 trough are proposed on private lands. A Cooperative Management Agreement with the current landowner would be developed.

This alternative also proposes to rehabilitate/modify 14 reservoirs to improve their efficiency to hold water during drier periods and decommission 8 reservoirs once monitoring shows new developments are adequate.

These range improvements would be in addition to existing range improvements described under the No Action Alternative.

Table 4: Type of Action by WSA for Alternative B

Blitzen River WSA		South Fork Donner und Blitzen WSA		Home Creek WSA	
Type of Action	**Quantity**	**Type of Action**	**Quantity**	**Type of Action**	**Quantity**
Wells	1	Wells	3	Reservoir Rehabilitation	2
Tanks	1	Tanks	3	Reservoir Decommissioning	3
Troughs	5	Troughs	7		
New Reservoirs	6	New Reservoirs	11		
Reservoir Rehabilitation	1	Reservoir Rehabilitation	9		
Well Pipeline	4.53 miles	Reservoir Decommissioning	4		
		Spring Developments	2		
		Well Pipeline	4.95 miles		
		Way Realignment	60 feet		

Alternative C – "Along Roads and Ways Developments"

Alternative C would implement the AMP as described above and was designed to construct water developments mostly along roads and ways to limit surface disturbance and for easy access for construction and maintenance. Developments are also proposed on private lands. No changes to the permitted number of AUMs would occur.

Alternative C proposes to drill 11 wells (one within the 30-foot setback from road center line adjacent to Steens Mountain Wilderness), install 20 miles of pipeline along ways within WSAs, install 19 troughs, construct 5 miles of fence, remove 2 miles of Lauserica Fence (south of Lauserica Camp); rehabilitate 1 dugout (Weaver); convert 1 dugout back to its natural spring-like characteristics (Broken Leg); and rehabilitate 1 spring (Three Springs). Rehabilitation of Three Springs and drilling of 3 wells and installation of pipeline and 1 trough are proposed on private land. A Cooperative Management Agreement with the current landowner would be developed.

This alternative does not propose construction of any new reservoirs or decommissioning of any reservoirs.

The above described range improvements would be in addition to existing range improvements described under the No Action Alternative.

Table 5: Type of Action by WSA for Alternative C

Blitzen River WSA		South Fork Donner und Blitzen WSA		Home Creek WSA	
Type of Action	**Quantity**	**Type of Action**	**Quantity**	**Type of Action**	**Quantity**
Wells	1	Wells	3	Well Pipeline	0.91
Tanks	1	Tanks	3		
Troughs	5	Troughs	9		
Well Pipeline	4.53 miles	New Fences (miles)	0.53		
		Fence Removal (miles)	2.1		
		Dugout Rehabilitation	1		
		Spring Developments	1		
		Well Pipeline	8.32 miles		
		Way Realignment	60 feet		

Alternative D – "Edge Developments"

Alternative D focuses developments around the edge of South Steens Allotment in addition to implementing the AMP as described above. Most developments are on private lands and nonwilderness/non-WSA lands with the following exceptions: proposal to convert two dugouts back to their natural spring-like characteristics (Weaver and Broken Leg), construction of approximately 1-mile of fence, removal of 5 fence miles and construction of 3 water gaps. Additional developments consist of drilling 9 wells, installing 5 miles of pipeline and 11 troughs, rehabilitating 1 spring; developing 1 spring; and constructing 9 miles of fence (includes water gap fencing).

These range improvements would be in addition to the existing improvements described under the No Action Alternative. No changes to the permitted number of AUMs would occur.

All improvements/developments on private lands would be under a Cooperative Management Agreement with the current landowner.

Table 6: Type of Action by WSA for Alternative D

South Fork Donner und Blitzen WSA*	
Type of Action	**Quantity**
Troughs	2
New Fences (miles)	0.3
Fence Removal (miles)	4.6
Spring Developments	2
Way Realignment	60 feet

*No proposed water developments on public lands within Home Creek or Blitzen WSAs would occur under this alternative.

Proposed Action

The Proposed Action was developed after analyzing effects of the No Action and all other Action Alternatives. The criteria used in selecting developments that would be part of the Proposed Action and still meet the Purpose and Need were:

- Protecting and enhancing sensitive riparian habitat around natural springs.
- Locating developments away from sensitive wildlife habitat.
- Minimizing nonnatural construction materials and developments to afford a more natural look over time.
- Emphasizing developments in areas with good vegetative and topographic screening.
- Placement of developments in areas where these developments could be constructed and maintained without upgrading ways in WSAs for passage of construction equipment.
- Emphasizing developments (e.g., reservoirs) in areas (e.g., drainages) that could be constructed in a manner to discourage livestock from concentrating and lingering around water sources.
- Emphasizing developments that would require minimal annual maintenance.
- Avoiding new developments in designated wilderness.

The Proposed Action would implement the AMP as described above and construct 12 or 13 new reservoirs, decommission 9 reservoirs, rehabilitate 14 reservoirs, drill 3 wells, install 3 to 5 miles of pipeline and 11 troughs, create 1 exclosure around a riparian meadow complex and rehabilitate 1 spring and 2 dugouts as described above under Design Features. The 13th reservoir would be constructed if Pipeline P8 and Trough T13B are installed (see Proposed Action map). No changes to the permitted number of AUMs would occur.

The riparian condition at the dugout at Weaver Place would be enhanced by fencing the spring, installing 2 metal troughs and installing approximately 0.4-mile of pipeline. Troughs would not have floats rather water would be allowed to drain back into the system. The exclosure around the spring (less than approximately one-quarter acre) would be built using wooden posts and poles requiring less maintenance than steel posts and barbed wire.

The riparian condition at the dugout along Three Springs Road (Broken Leg) would be enhanced by fencing the dugout, installing two metal troughs and installing approximately 0.4-mile of pipeline. Troughs would not have floats, rather water would be allowed to drain back into the system. In order to effectively rehabilitate the dugout, the existing route would be realigned approximately 20 feet west of the dugout (upper end) for a distance of 20 yards. The new portion of this route would be created primarily by passage of a vehicle. However, to provide safe access, large rocks may need to be moved with equipment followed by filling of holes with soil. This would be the only work allowed with equipment. The old route could be barricaded using downed juniper from the immediate area and reseeded using native seed. The exclosure around the dugout would be made of downed juniper.

Three Springs complex located on BLM-administered and private lands would also be rehabilitated. Four metal troughs would be installed along with approximately one-eighth mile of pipeline. Troughs would be tied together with pipeline in a square pattern to facilitate better maintenance. Fencing around Three Springs would be made of downed juniper.

Riparian condition in an unnamed riparian-capable intermittent tributary and associated meadow complex in T. 34 S., R. 32½ E., Section 36 (tributary to Dry Creek) would be enhanced and maintained by construction of an exclosure which would eliminate effects of shear from both horses and cattle. The exclosure would be constructed with downed juniper.

In addition, three wells would be drilled. Wells W3 and W7 would have associated pipelines and troughs installed along existing routes and buried storage tanks or W7 would have a shorter pipeline (P8 versus P7) and a storage tank installed aboveground.

Troughs are supplied with water by gravity flow. The trough associated with Pipeline P8 is higher in elevation than the well location; therefore, the storage tank needs to be aboveground to allow for gravity flow. Portable generators would be utilized. In combination with Pipeline P8 and Trough T13B, Reservoir R18 would be constructed if this option is chosen. No pipelines, troughs or storage tanks would be installed in association with Well W16. This well would be drilled within the footprint (disturbed area) of an existing reservoir (Long Dam). When this particular well is needed for emergency situations in extreme drought years, water would be pumped into the existing reservoir using a portable generator. The pipe necessary would be laid aboveground while pumping and removed when the reservoir is full. Attempts to minimize visual and audio effects would be made by using the dam and existing on-the-ground features as screening.

No water gaps are proposed. Other than spring exclosure fencing necessary to protect the spring source and associated emergent vegetation, no fence would be constructed and no fences would be removed.

Design features as described above would be utilized and other measures to ensure a natural-looking appearance for projects within WSA would be considered on a case-by-case, site-specific basis.

Table 7: Type of Action by WSA for the Proposed Action

Blitzen River WSA		South Fork Donner und Blitzen WSA		Home Creek WSA	
Type of Action	**Quantity**	**Type of Action**	**Quantity**	**Type of Action**	**Quantity**
New Reservoirs	4	Well[a]	1	Reservoir Rehabilitation	2
Reservoir Rehabilitation	1	Concrete Troughs	1	Reservoir Decommissioning	3
		Metal Troughs[b]	8		
		New Reservoirs	8 or 9		
		Reservoir Rehabilitation	9		
		Reservoir Decommissioning	5		
		Spring Rehabilitation	2		
		Well Pipeline (miles)	2.8 or 1.07		
		Way Realignment	60 feet		
		Riparian Fence Exclosure	0.57 miles		

[a]This well would be drilled adjacent to an existing reservoir and only used with a temporary generator and pipe during severe drought to water wild horses.
[b]Metal troughs would be located together in two sets of two and one set of four in three (one on private land) different locations for the rehabilitation of springs.

F. Comparison of the Alternatives

Tool*	Alternative B	Alternative C	Alternative D	Proposed Action
	Number or Miles of Developments/Acres Affected			
Fence Construction	4 miles	5 miles	9 miles	<.25-mile (exclosure)(wooden post and poles)
Fence Removal	0	2 miles	5 miles	0
Water Gaps	3	0	3	0
Reservoir Construction	17	0	0	12 or 13
Decommissioning of Reservoirs	8	0	0	9
Rehabilitation of Reservoirs	14	0	0	14
Wells	10	11	9	3
Pipelines	15 miles	20 miles	5 miles	5 or 3 miles
Troughs	17	19	11	11
Storage Tanks	5	5	6	2
Spring Developments/Rehabilitation	3	2	4	3
Dugout Rehabilitation	0	1	0	0
Route Realignment	20 yards	20 yards	20 yards	20 yards

*Not all tools are shown on the attached maps (e.g., spring exclosure fences and troughs associated with springs).

G. Alternatives Considered but not Fully Analyzed

Six additional alternatives were considered, but not analyzed in detail because they did not meet the Purpose of and Need for Action. These six alternatives were complete removal of livestock, a modified season of use or livestock reduction, change of class of livestock from cattle to sheep and removal of Tombstone Fence, complete removal of wild horses, moving wild horses to Steens Mountain Wilderness, and hauling water.

1. Complete removal of livestock within the Project Area was eliminated for the following reasons: 1) It does not meet the purpose of and need for action as removing livestock would not provide live, reliable, late-season water for livestock, wildlife, or wild horses while promoting viable and sustainable grazing; 2) Three of the four pastures are achieving all Rangeland Health Standards. Only Steens Pasture (consisting of 41,699 acres, CMPA RMP, Appendix J) is not achieving Watershed Function-Riparian Standard 2 (causal factors being livestock, wild horses and juniper encroachment, see Table 1 above) and Water Quality Standard 4 (causal factors being livestock and wild horses); 3) Affected areas consisting of two springs and a wet meadow (approximately 15 to 18 acres or 0.00043 percent of Steens Pasture) are being considered for removal from livestock grazing under other alternatives;

4) Removing livestock would likely not create conditions under which Rangeland Health Standards 2 and 4 could be achieved in Steens Pasture of South Steens Allotment. According to BLM Technical Reference 1737-20, p 21 (Grazing Management Processes and Strategies for Riparian – Wetland Areas): "Reducing stocking rates may reduce the percentage of area in unsatisfactory condition, but the impacts around the foci of highly used areas (e.g., riparian areas or other water) will remain the same until few, if any, animals remain." Since wild horses would remain in the allotment year-round and would continue to have access to springs and associated meadows, this causal factor contributing to the compromised riparian functioning condition would not change; 5) Juniper removal will occur under the North Steens Project ROD); 6) All pastures are conforming to Guidelines; 7) The permittee is currently not using all available AUMs due to a shortage of live, reliable, late-season water; and 8) It is unlikely it would be economically viable as the permit holder would have to provide replacement forage for 9,577 AUMs [Fair Market Value for AUMs is between $17 and $25[1] (compared to BLM AUMs at $1.35/AUM] which would cost approximately $162,809 using the lower AUM rate to replace the existing AUMs on an annual basis. Hay to replace the 9,577 AUMs would require approximately 2,394 tons (1 ton of hay per cow per 4 months). Current cost of hay is averaging $140 to $225/ton. The cost to feed hay to replace the AUMs would be approximately $340,000 to $540,000 plus labor on an annual basis.

The Steens Act promotes viable and sustainable grazing on private and public lands (Section 1) and promotes grazing, recreation, historic, and other uses that are sustainable (Section 102).

The Taylor Grazing Act provides the basic legislative authority for livestock grazing on public lands with provisions for protection of the lands from degradation, for orderly use and improvement of public rangelands, and established standards for rangeland improvements.

The FLPMA and the Public Rangelands Improvement Act mandate the management of public land for multiple-use and sustained yield. Specifically, the regulations implementing these Acts call for rangeland management strategies that provide forage for economic use as well as for maintenance or restoration of watershed function, nutrient cycling, water quality, and habitat quality for SSS and native plants and animals. These management strategies have been supported and implemented by development of national policies and the Standards for Rangeland Health and Guidelines for Livestock Management (S&Gs, 1997).

[1] Fair Market Value for private AUMs includes full care of livestock while on private lands v. the permittee must provide complete care of livestock while grazing on BLM-administered lands including fence maintenance and salting.

2. A modified season of use or livestock reduction alternative was eliminated because under other alternatives removal of livestock from riparian areas to address Standards not being achieved in Steens Pasture (see Table 1 above) is being analyzed and the purpose of and need for the project to provide live, reliable, late-season water would not be met. Additionally, all other Standards in all other pastures are being achieved; all pastures are conforming to Guidelines; winter grazing is not feasible as snow levels and road conditions would inhibit access to the area, livestock mortality rates would be higher if access is limited preventing regular livestock checks, supplemental feeding may need to occur based on snow depth (which is not generally permissible under BLM regulations); spring grazing every year could cause long-term trend on plant communities to deteriorate; therefore, pastures would not achieve Standards or conform to Guidelines. (The BLM's standard practice is to build periodic growing season rest for upland pastures into the grazing management plan). Modifying use could affect the economic viability of the permittee (see above).

3. Change of class of livestock from cattle to sheep and removal of Tombstone Fence were determined to be unfeasible as the pastures are near bighorn sheep habitat; it would not be economically feasible; it would not satisfy need for reliable water; most pastures are currently achieving Standards (except Steens Pasture, Standards 2 and 4, see Table 1 above); all pastures are conforming to Guidelines; and the fence is functioning and allows for some wild horse movement because of gates.

   Because sheep use is controlled by a herder that is with them continually, Tombstone Fence could be removed. This type of use would intensively manage utilization levels and timing of use and provide more uniform utilization patterns. Removal of the fence could benefit the free-roaming nature of wild horses and aid in improved wild horse distribution across the HMA.

   Bighorn sheep inhabit the area which could result in contact with domestic sheep. Interactions between wild and domestic sheep have proven to be detrimental to bighorn sheep populations. In recent years, biologists and veterinarians have shown that even casual contact may lead to respiratory disease and fatal pneumonia in bighorns (Onderka and Wishart 1988, Schommer and Woolever 2006). In the summary of their disease overview, Schommer and Woolever (2006) quote several scientists concluding contact between bighorn and domestic sheep increases the risk of bighorn mortality and complete range of causal agents that lead to these disease events cannot be conclusively proven at this point. Therefore, segregation of these two species on native range is the best management tool until more information is collected.

   The 46-year effort to successfully reestablish native California bighorn sheep on Steens Mountain could be jeopardized by domestic sheep use in this area.

Additionally, Roaring Springs Ranch's facilities are not currently capable of accommodating sheep as they are a large, cattle ranch well known for their Oregon natural beef. Changing from cattle to a sheep business would require a complete change of their facilities including, but not limited to, rebuilding chutes, corrals and fences and building lambing sheds (basically the entire infrastructure of the ranch would need to happen); a change in management would also likely occur with hiring of sheepherders as experience varies between sheepherders and wranglers; and conducting predator control. The ranch would also have to change their grazing rotation as sheep eat forbs, which are not available later in the season in the Project Area, whereas cattle prefer grass. Associated costs are unknown but are expected to be unreasonable.

4. Complete removal of horses within the Project Area was eliminated from detailed analysis for the following reasons: 1) Elimination of wild horses and closure of HMAs can only be conducted during the land use planning process or within an RMP revision or amendment. This action is not a land use plan allocation; therefore, elimination of wild horses is outside the scope of this analysis. Furthermore: 2) Removing horses would not meet the purpose and need for action to provide live, reliable water yearlong; 3) The Wild Horse and Burro Act requires the BLM to protect and manage wild horses in areas they were found at the time the Act was passed and in a manner designed to achieve and maintain a thriving ecological balance in keeping with the public land, multiple-use concept; 4) Current holding facilities for gathered wild horses are full and the likelihood of additional facilities being made available is unlikely; 5) The current market for horses has declined in recent years making adoption of gathered horses less desirable; 6) Moving wild horses to other HMAs would jeopardize herd viability, genetic diversity and the genetic and physical characteristics that distinguish individual herds; 7) Current funding for wild horse gathers is scarce; 8) the CMPA RMP provides for viable wild horse populations in the South Steens HMA; 9) rangeland conditions are currently achieving Standards (except Steens Pasture, Standards 2 and 4, see Table 1 above) and conforming to Guidelines; and 10) South Steens wild horse herd is currently healthy and viable.

5. Moving all wild horses to Steens Mountain Wilderness would not comply with the CMPA RMP which provides for viable wild horse populations in the South Steens HMA; most pastures are currently achieving Standards (except Steens Pasture, Standards 2 and 4, see Table 1 above) and conforming to Guidelines; South Steens wild horse herd is currently healthy and viable, Steens Mountain Wilderness does not provide year-round habitat and removing the horses would not meet the purpose and need for action to provide reliable, late-season water.

6. Other tools considered but eliminated from further consideration was hauling of water to existing reservoirs and installing troughs for water storage. The purpose and need would not be met. When livestock are not in the area, water would not be hauled; therefore, water would not be available for horses. Live, reliable water is the best safety valve for horses. Roaring Springs Ranch, Inc., headquarters is approximately 35 miles to the Donner und Blitzer River. The BLM office is approximately 90 miles. The time and cost associated with hauling water on a daily basis during drought years for the BLM could cost as much as $13,095 per season [180 miles @ 48.5 cents/mile (General Services Administrative rate to cover fuel, maintenance and insurance) x 7 days a week x 5 months] for vehicles. Labor is not included in this total. In addition, routes would need to be maintained or upgraded in order to get equipment to prime locations to dispense water.

CHAPTER III: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The environmental consequences discussion describes all expected effects including direct, indirect and cumulative on resources from enacting the proposed alternatives. A distinction between direct and indirect effects is not made in this chapter and in many cases cumulative effects are only described as effects. All effects are considered direct and cumulative; therefore, use of these words may not appear.

This document is tiered to the AMU/Steens Mountain CMPA Proposed RMP/FEIS (Andrews/Steens PRMP/FEIS) (August 2004). The environmental consequences and cumulative effects sections in the Andrews/Steens PRMP/FEIS describe potential environmental consequences to the greater environment of the South Steens Allotment and are incorporated into this document by reference in accordance with the CEQ regulations § 43 CFR 1502.2. Additional project-specific descriptions of potential environmental consequences are provided in the text below.

Reasonably Foreseeable Future Activities: The North Steens Ecosystem Restoration Project (North Steens Project) is a landscape-level project, the goal of which is to reduce juniper-related fuel loading and improve the ecological health of the area by encouraging a healthy functioning ecosystem through appropriate land treatments. Treatment techniques will include a combination of prescribed fire, juniper treatments, fencing, seeding and planting to reduce fuel loads, restore vegetative communities, improve habitat and increase forage. Project activities will primarily occur above 4,500 feet and below 7,200 feet, concentrating on the "juniper belt." The North Steens Project Area includes the entire South Steens Allotment.

Climate: Weather in the semiarid area is the result of maritime air moving eastward from the Pacific Ocean over the coast and Cascade Mountain range. As air masses rise to cross these mountains, much of the moisture in the air condenses and falls to the ground making the air relatively dry by the time it reaches southeastern Oregon. Average annual precipitation ranges from 12 to 14 inches at the lowest elevations along Catlow Valley to 28 to 32 inches at the highest elevations of the Project Area. The normal runoff pattern on Steens Mountain and the Catlow Rim area is highly variable, but is characterized by high spring flows with low flows during the remainder of the year. Late spring and summer precipitation occurs in the form of sudden storms which may produce local runoff from heavy rain, hail or snow.

The IDT reviewed the elements of the human environment as required by law, regulation, Executive Order and policy, to determine if they would be affected by the Proposed Action or any of the alternatives. The following table summarizes the results of that review. Affected elements are in bold.

Critical Elements of the Human Environment	**Status**		**If Not Affected, why? If Affected, Reference Applicable EA Section**
Air Quality	Not Affected		Dust produced from livestock movement, range improvement construction, and vehicle use would be intermittent and unmeasurable.
American Indian Traditional Practices	Not Present		No concerns have been disclosed.
Areas of Critical Environmental Concern	Not Present		
Cultural Resources	**Affected**		See Chapter III. A. Cultural
Environmental Justice	Not Affected		The proposed action is not expected to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.
Flood Plains	Not Present		The proposed action does not involve occupancy and modification of flood plains, and would not increase the risk of flood loss.
Hazardous or Solid Waste	Not Present		
Noxious Weeds	**Affected**		See Chapter III. C. Noxious Weeds
Paleontological Resources	Not Present		
Prime or Unique Farmlands	Not Present		
Migratory Birds	**Affected**		See Chapter III. B. Migratory Birds
Wildlife/ Threatened or Endangered (T/E) Species or Habitat	Fish	Not Present	
	Wildlife	Not Present	
	Plants	Not Present	

Critical Elements of the Human Environment	Status		If Not Affected, why? If Affected, Reference Applicable EA Section
Wildlife/BLM SSS and Habitat	Fish	Not Affected	Since effects to redband trout would be the result of effects to water quality (temperature or increased sediment), and water quality would not be measurably affected by any of the project alternatives, no effects to redband trout are anticipated for any of the alternatives.
	Wildlife	**Affected**	*greater sage-grouse and fringed myotis and Townsend's big-eared bats* – **Affected**. See Chapter III. D. Special Status Species *pygmy rabbit* – Not present.
	Plants	**Affected**	*Diverse-leaved pondweed* - See Chapter III. D. Special Status Species
Water Quality (Surface and Ground)	**Affected**		See Chapter III. E. Wetlands/Riparian Areas and Water Quality
Wetlands/Riparian Zones	**Affected**		See Chapter III. E. Wetlands/Riparian Areas and Water Quality
WSRs	**Affected**		See Chapter III. F. Wilderness and Wild and Scenic Rivers
Wilderness/WSAs	**Affected**		See Chapter III. F. Wilderness and Wild and Scenic Rivers and Chapter III. G. Wilderness Study Areas
Noncritical elements of the Human Environment present	**Status (Affected/Not Affected)**		**If Not Affected, why? If Affected, Reference Applicable EA Section**
Grazing Management	**Affected**		See Chapter III. A. Grazing Management
Recreation	**Affected**		See Chapter III. C. Recreation
Soils/Biological Crusts	**Affected**		See Chapter III. A. Vegetation, Soils and Biological Soil Crusts
Upland Vegetation	**Affected**		See Chapter III. A. Vegetation, Soils and Biological Soil Crusts
Visual Resources	**Affected**		See Chapter III. E. Visual Resources
Social and Economic Values	**Affected**		See Chapter III. D. Social and Economic Values
Wildlife	**Affected**		See Chapter III. F. Wildlife
Wild Horses	**Affected**		See Chapter III. G. Wild Horses

Critical Elements

A. Cultural

Affected Environment

Current discussion and analysis of potential effects on cultural are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.9 and 4.9.

The South Steens Allotment has not received a high level of cultural resources survey. A research survey in the late 1970s and inventories for reservoirs, spring and rock source development are the primary sources of cultural resource data in the allotment. These surveys found prehistoric archaeological sites associated with a number of topographic and hydrological features such as hilltops, low rims above relic water courses, playa lakes, springs, and modern watercourses. Adjacent Riddle Brothers Ranch National Historic District (Historic District) has been completely inventoried with the discovery of 47 prehistoric sites within the approximately 1,000-acre Historic District. Although the Historic District probably has a high-site density because of access to perennial Little Blitzen River, many sites in the Historic District are not near the river. Similar but slightly lower-site densities are expected in the upland portions of South Steens Allotment and similar site densities are expected near perennial water sources. Several prehistoric sites in the Historic District are considered very important in the region. They are long-term village sites probably used 9 months a year. At least three similar sites are known to occur within the allotment and one of three prehistoric rock art sites on the Steens occurs in the allotment. One of these sites has both very old (7000+) and more recent rock art and may have the oldest buried deposits on the mountain. The probability more National Register eligible sites occur within the allotment is very high.

No paleontological resources or American Indian Traditional Use areas are known to occur within the Project Area.

Actions Common to All

The South Steens Allotment is also the focus of fuels reduction/range improvement efforts under the North Steens Project. This project proposes to remove, through thinning and burning, thousands of acres of juniper within the allotment. Juniper in known cultural resources sites will not generally be cut. Prescribed fire, other than low-intensity surface fires, is not recommended within cultural sites as well. Therefore, the cultural objective under the Proposed Action is to protect sites from juniper removal operations and from moderate to high fire intensities during the North Steens Project implementation.

However, livestock and wild horses are likely to be attracted to the remaining junipers, where cultural sites exist, and could use these areas as resting/shading places during foraging in the allotment. New effects of such rest, shading and wallowing activities are likely to be relatively shallow (less than 12 inches) surface soil disturbance, vertical and horizontal displacement of artifacts, destruction of shallowly buried archaeological features such as prehistoric hearths and habitation surfaces within prehistoric house features and breakage of artifacts. These types of effects are more intense than generalized grazing effects and have similar intensity to other livestock congregation areas such as around spring developments and reservoirs.

Between the North Steens and South Steens Water Improvement Project, sites that have not experienced grazing impacts are likely to sustain impacts as described above.

Alternative A - No Action Alternative

Generalized livestock and horse trampling effects such as churning of archaeological site matrix and artifacts to a depth of 8 inches and horizontal displacement of up to 24 inches of archaeological materials would continue to occur as a result of Alternative A. Areas of historical, ungulate presence (water sources) would continue receiving concentrated use. Trampling effects from livestock and horses would likely remain the same.

Thirteen prehistoric sites are located near existing range developments within the allotment. Eleven of thirteen (85 percent) have been affected by livestock and wild horse grazing. Generalized grazing effects are typically churning of archaeological site matrix and artifacts to a depth of 6 inches and horizontal displacement of up to 12 inches of surface artifacts, removal of vegetation and removal of sediment by water. Grazing impacts have not been measured or monitored at the majority of sites since they were first recorded. Other impacts listed are erosion, dispersed recreation, collection by researchers, weathering of historic period artifacts and structures, vandalism (illegal collecting), road and reservoir construction.

The remaining existing water developments in the allotment have not been inventoried for cultural resources. Continued use, rehabilitation or retirement of these water developments would require cultural resources inventory, site-impact assessments and some type of mitigation of impacts if the sites were deemed eligible for nomination to the National Register of Historic Places.

Alternative B - Maximum Water Distribution Alternative

Generally, proposed range improvement projects would ultimately spread livestock use across the allotment to better utilize available forage. Development of additional water sources would increase geographic spread of livestock and wild horses into locations that may not have received prior grazing pressure and lessen the effects of grazing in other, more intensely used areas in the allotment. It is assumed more widely spreading the same number of animals across the allotment would diminish trampling effects generally allotment-wide. Trampling effects on cultural resources would then be lessened in areas grazed in the past and the impact of grazing in new areas would be at low levels. Generalized grazing effects are described as follows: Churning of archaeological site matrix and artifacts to a depth of 6 inches and horizontal displacement of up to 12 inches of archaeological materials, removal of vegetation and removal of sediment by water erosion. The only exception to this conjecture would be effects of concentration of animals at new water developments. Cultural resources in these new locations could be affected by increased trampling, causing artifact breakage, horizontal and vertical displacement of artifacts and churning of the top 10 inches of sediment. These effects would reduce the data potential of archaeological sites and diminish their potential for nomination to the National Register of Historic Places.

Seven prehistoric sites could be affected by their close proximity to the proposed water developments and new fence construction in this alternative. Sites could sustain new livestock and horse trampling and other effects if they are within congregation areas resulting from construction of these developments.

Proposed Developments: Potential conflicts with already recorded sites.

- One site is near Pipeline P10 and Trough T28
- Four sites are near reservoirs proposed for rehabilitation
- One site is near a proposed spring rehabilitation
- One site is near the proposed southern Water Gap F2

Alternative C - Along Roads and Ways Alternative

Effects to cultural heritage sites under Alternative C would be lessened but similar to those discussed for Alternative B.

Three prehistoric sites could be affected by their close proximity to the proposed water developments and new fence construction in this alternative. Sites could sustain new livestock and horse trampling and other effects if they are within congregation areas resulting from construction of these developments.

Proposed Developments: Potential conflicts with already recorded sites.

- One site is near proposed Pipeline P10
- One site is near the dugout (D1) proposed for rehabilitation
- One site is near proposed fence F6

Alternative D - Edge Developments Alternative

Effects to cultural heritage under Alternative D would be similar to those discussed for Alternative C. Four prehistoric sites could be affected by close proximity to the proposed water developments and new fence construction in this alternative. Sites could sustain new livestock and horse trampling and other effects if they are within congregation areas resulting from construction of these developments.

Proposed Developments: Potential conflicts with already recorded sites.

- One site is near proposed Trough T33
- One site is near the proposed Spring Rehabilitation S2 near T33
- One site is near the proposed southern Water Gap F2
- One site is near proposed Trough T11

Proposed Action

Effects to cultural heritage under the Proposed Action could be slightly greater to those discussed for Alternatives C and D. Five prehistoric sites could be affected by close proximity to the proposed water developments and new fence construction (exclosures) in this alternative. Sites could sustain new livestock and horse trampling and other effects if they are within congregation areas resulting from construction of these developments.

Proposed Developments: Potential conflicts with already recorded sites.

- Three sites are near the proposed reservoir rehabilitation ER3
- One site is near proposed Spring Rehabilitation 2 and Trough T33
- One site is near proposed Reservoir R9

B. Migratory Birds

Affected Environment

Current discussion and analysis of potential effects on migratory birds are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.6 and 4.6.

Approximately 70 species of migratory birds are known to inhabit different parts of the Project Area. Neotropical migratory birds utilize all habitats in the Project Area; some are habitat specific while others use a variety of habitats. Grassland species include vesper sparrow and horned lark. Sagebrush species include Brewer's sparrow, white-crowned sparrow, green-tailed towhee, sage thrasher, and sage sparrow. Woodland species include gray flycatcher, dusky flycatcher, dark-eyed junco, bushtit, Cassin's finch, pine siskin, western wood-peewee, and chipping sparrow. Species that may be found in two or more habitats include American robin, brown-headed cowbird, Lincoln's sparrow, lark sparrow, and western meadowlark. Many of these species use riparian habitat for part of their existence whether foraging for insects or for watering. Riparian dependent species would use habitat along the Donner und Blitzen River system and would not be affected by the scope of this project. Most migratory birds are only present from mid-March through late August each year but some species such as robins may be present during fall and winter months. Breeding activities may begin in April at lower elevations and extend until mid-June at higher elevations. Most of the Project Area would have breeding activity from late April through June 1, with most young fledged by late June or early July. Water distribution does not appear to be a limiting factor for the distribution of migratory bird species.

Environmental Consequences to Migratory Birds

No Action Alternative

In this alternative, migratory birds would have the same resources available as are currently present in the allotment. Some areas of the allotment near current perennial water sources would continue to be impacted by concentrated livestock and wild horse use. Portions of the allotment away from existing waterholes and springs would have some unused areas that may provide more suitable nesting sites for ground nesting birds and foraging resources.

Common to All Action Alternatives

In general, migratory birds use water from troughs but would more likely use reservoirs and spring sources where water is easier to access. New troughs and reservoirs may provide more food sources for those species that prey on bugs such as some flycatcher species. Escape ramps would be placed in all troughs should birds became trapped. Sagebrush dependent species of migratory birds would be affected through loss of habitat near new water troughs and reservoirs. About 2 acres of vegetation would be removed around each new trough mainly through use by livestock and wild horses. Vegetation would be removed in construction of reservoirs as well but use by livestock and wild horses would not remove much more vegetation than removed during construction. Areas within 0.25-mile of water sources would show reduced grasses and forbs so bird species that forage for plant seed would have to search other areas for sufficient food. Spring sources that are fenced and returned to a more natural state would benefit migratory bird species for watering purposes.

Overall, effects of different development alternatives on different species of migratory birds would be minimal and should not affect habitat for different species. There should be no effects on population numbers of different species. There will be cumulative effects to migratory bird habitat from the North Steens Ecosystem Project due to changes in habitat types from the use of fire to reduce expansion juniper. Habitat for grassland species will increase as treatments are applied with reductions in habitat for sagebrush dependent species and woodland species. Some areas of sagebrush will be returning to a canopy cover that will support sagebrush dependent species nesting habitat throughout the duration of the project. Woodland species will have decreased habitat for a longer period of time as this is the thrust of the North Steens Ecosystem Project. There will still be habitat for woodland species available throughout the area as wilderness will not be treated unless other NEPA analysis is completed.

C. Noxious Weeds

Affected Environment

Current discussion and analysis of potential effects on noxious weeds are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.5.5 and 4.5.5.

The Project Area is susceptible to introduction and spread of noxious weeds, in particular, Scotch thistle. Many reservoirs in the area already have infestations of Scotch thistle. Depending on climatic conditions in any given year, weed infestations would vary from a few plants to several acres. Once Scotch thistle establishes in an area, the seed can be viable onsite for 25+ years. Seeds are windborne and can travel miles.

Environmental Consequences

Affects Common to All

Recreational visitors to Steens Mountain travel the road networks and camp in many areas. Hikers spread out across incidentally monitored trails. Each visit creates opportunities for new weed introductions. New introductions can spread quickly in disturbed areas, potentially infesting many new acres.

Alternative A - No Action

Noxious weeds are currently present within the area and require continued monitoring and treatment. By not providing reliable offsite water to compensate for the loss of water due to restricting access to Donner und Blitzen River, we are seeing greater concentrations of livestock, wildlife, and wild horses at existing water developments. Concentrated grazing could negatively impact the health of plant communities, opening up opportunities for new weed introductions and spread. Controlling livestock by removing them early can help moderate the effect but impacts from wildlife and wild horses may still be considerable, causing impacts to vegetation through trampling or overgrazing which open up niches for noxious weed invasion and spread.

Affects Common to All Action Alternatives

Any new ground-disturbing activities have potential to create opportunities for noxious weed establishment and spread. Therefore, risk of new weed introductions is higher for alternatives with greater numbers of ground-disturbing activities. Following standard design features listed in Chapter II would reduce opportunities for introduction of new weeds.

Additional water sources would help reduce concentrations of livestock, wildlife, and wild horses, thereby, reducing impacts to plant communities. Productive, healthy plant communities should reduce opportunities for noxious weed introduction and spread.

Locating water sources where they would be beneficial but also reasonable to monitor and treat for noxious weeds would help sustain proper function of this area, and minimize consequences associated with noxious weed introduction and spread.

Alternative B - Maximum Water Distribution Alternative

This alternative may be best for distribution of livestock, wildlife, and wild horses but it creates the most disturbances and would be spread across a greater area. Monitoring these new developments on a regular basis would be problematic for noxious weed management. Monitoring, particularly in known weed-prone areas, is generally done using ATVs equipped with motorized spray equipment so when weeds are found, they can be treated promptly, appropriately, and efficiently.

Alternative C – Along Roads and Ways Alternative

This alternative keeps new developments within already disturbed sites (e.g., roads and trails). This would be beneficial for annually recurring weed monitoring and treatment.

Alternative D - Edge Developments Alternative

This alternative does not provide well-dispersed water in the allotment. With large unwatered areas livestock, wildlife, and wild horses would continue to concentrate more in watered areas creating areas of higher disturbance than desired. Areas with water are then more susceptible to noxious weed invasion and spread. While there would be less disturbed areas than in Alternatives B and C, impacts at existing and proposed water developments would be much greater, offering less opportunity for those areas to remain functional and weed-free.

Proposed Action

This alternative proposes new reservoirs in the interior portions of the Project Area. These new reservoirs would provide needed additional water sources, which should help spread out impacts from livestock, wildlife, and wild horses. Minimizing disturbance would be beneficial in reducing opportunities for noxious weed introduction and spread. Because the interior reservoirs would be built where there are no roads or trails, monitoring the sites for new weeds by range staff would be important. It would be important they learn the weeds in the area and report them quickly if found.

D. Special Status Species

Affected Environment

Current discussion and analysis of potential effects on SSS are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.7 and 4.7.

One Special Status plant species is known to be in the Project Area. Diverse-leaved pondweed (*Potamogeton diversifolius*), a Bureau Sensitive species, has been found in Tombstone Reservoir in Tombstone Pasture 1. The species may be present in reservoirs elsewhere in the Project Area that hold water for most of the summer. A systematic survey of reservoirs has not been conducted. Pondweed appears to have expanded on the west side of Steens Mountain as a result of livestock grazing and establishment of reservoirs. The species' presence in any given year is determined by the volume of and persistence of runoff that reaches a reservoir, and it probably becomes established in new reservoirs or in new areas by hitching a ride on animals or birds.

Special Status animal species occurring within this Project Area include greater sage-grouse and two species of bats: fringed myotis and Townsend's big-eared bat. Greater sage-grouse use the Project Area yearlong with seven leks being present in the Project Area. Nest sites were located in the Project Area during a radio telemetry study from 1997 to 2000. Nest sites were mostly in big sagebrush/mountain shrub vegetation types with about one-third of nests occurring in low sagebrush sites (Crawford et al., 2000). Since most sage-grouse hens nest during late March to early April, new growth on perennial grasses is minimal and previous years' (residual) grass growth provides cover for nesting. Nest success for sage-grouse is higher when sagebrush canopy cover is high and residual tall grass (> 7 inches) cover is present at the nest site (Gregg et al. 1994, DeLong et al. 1995). Residual grass cover provides horizontal screening at the nest site which blocks the view of predators. Brood rearing also occurs in the allotment, but with few meadow areas, sage-grouse hens with broods may move to higher elevations or south to Home Creek. During the summer months, sage-grouse seek out water usually associated with wet meadows and succulent vegetation (Call and Maser 1985). If the year has been unusually dry, sage-grouse use any water source available including reservoirs but do not use livestock watering troughs as readily since access to the water is more difficult than a reservoir. Partially buried water troughs or those set with the top near ground level may be accessed more easily by sage-grouse (Call and Maser 1985, Hanf et al. 1994). Sage-grouse winter in lower elevations of the Project Area depending on snow depth during winter. The "Greater Sage-Grouse Conservation Assessment and Strategy for Oregon" (Strategy) (Hagen 2005) has the following guidelines for livestock grazing from Pages 75-76:

Action: Promote vegetation that supports nesting and brood-rearing habitats including maintenance or recovery of shrub and herbaceous (native grasses and forbs) cover. Retain residual cover adequate to conceal sage-grouse nests and broods from predation, and plant communities that provide a diversity of plant and insect food sources.	
Issue	**Conservation guidelines**
Appropriate livestock grazing regimes can be compatible with sage-grouse habitat needs.	1) Where livestock grazing management results in a level of forage use (use levels) that is consistent with RMPs, AMPs, Terms and Conditions of Grazing Permits or Leases, other allotment-specific direction, and regulations, no changes to use or management are required if habitat quality meets Rangeland Health Standard and Guidelines. 2) Where livestock grazing management results in a forage use level detrimental to habitat quality, changes in grazing management that will maintain or rehabilitate habitat quality will be made as soon as possible. Adjustments to grazing management will be conducted in accordance with responsible land management agency regulations. a) Adaptive management that should be considered include: i) changes in salting and/or watering locations, ii) change in the season, fencing, duration or intensity of use, iii) reducing grazing use levels, iv) temporary livestock nonuse (rest), or v) extended livestock nonuse until specific local objectives are met as identified by implementation group.
Livestock management facilities can promote balanced grazing distributions and compatibility with sage-grouse habitat needs.	1) Locate new and/or relocate livestock water developments within sage-grouse habitat to maintain or enhance habitat quality. 2) Spring developments both new and old should be constructed and/or modified to maintain their free-flowing natural and wet meadow characteristics. 3) Ensure wildlife accessibility to water and install escape ramps in all new and existing water troughs. 4) Construct new livestock facilities (livestock troughs, fences, corrals, handling facilities, "dusting bags," etc.) at least 1 km (0.6-mile) from leks to avoid concentration of livestock, collision hazards to flying birds, or avian predator perches.

These excerpts are not inclusive of all guidelines in the Strategy but are the most pertinent to the project.

The Strategy also contains guidelines for wild horse management as it relates to sagebrush habitat management.

***Wild Horses**--The management goals for wild horses are to manage them as components of the public lands in a manner that preserves and maintains a thriving natural ecological balance in a multiple-use relationship. Wild horses are managed in 20 HMAs that involve 2.8 million acres of public land, primarily in southeastern Oregon.*	1) The cumulative AML for horse numbers should be kept within current AML (**1,351** to **2,650)** in HMAs. a) Management agencies are strongly encouraged to prioritize funding for wild horse round-ups in sage-grouse areas that are over AML, b) Evaluate the AMLs for impacts on sagebrush habitat, c) Further measures may be warranted to conserve sage-grouse habitat even if horses are at, above, or below the appropriate AML for an HMA.

West Nile Virus (WNV) was documented in sage-grouse in Wyoming near coal bed methane wells (Naugle et al. 2004). Water in new ponds constructed at the well sites provided habitat for mosquitoes that carry WNV to live in areas that previously had little late season water. Sage-grouse mortality was 25 percent higher in these areas than control areas without late season water (Naugle et al. 2004). In 2006, approximately 60 sage-grouse carcasses/feather piles were discovered in a meadow area near Burns Junction, Oregon. Only three carcasses had enough body tissue left to be tested for WNV, which was found in all three (R. Garner pers. comm.). While no instances of WNV have been documented in sage-grouse populations since 2006 in Harney County, Malheur County has had several cases of humans infected with WNV this summer.

Bats are a migratory species with arrival in the Project Area during May to June. Most species may migrate south in the fall but a few winter hibernacula are known to exist in the area. Bats roost in small caves or rock crevices and in loose bark of cottonwood or older juniper trees. Bats forage for insects anywhere they can find sufficient concentrations and use still water pools in streams, springs, waterholes/reservoirs and water troughs for watering. Bats may travel several miles from day roost sites for foraging and watering. Usually they roost during the night for a period of time, then foraging before returning to their day roost.

Redband trout, a Bureau Sensitive species, inhabits Donner und Blitzen River and Home Creek within the Project Area. The species presents a unique natural history reflecting the Pleistocene connection between lake basins of eastern Oregon and Snake and Columbia Rivers. Redband trout are able to survive warmer water than most other salmonids and thus are better adapted to a desert environment.

The Steens Act designated Donner und Blitzen River as a redband trout reserve upstream of the confluence with Fish Creek. The purpose of the reserve is to conserve, protect, and enhance the Donner und Blitzen River population of redband trout and the unique ecosystem of plants, fish, and wildlife of a river ecosystem; and to provide opportunities for scientific research, environmental education, and fish and wildlife-oriented recreation and access (Steens Act 2000).

Environmental Consequences to Special Status Species

Common to All Alternatives

The persistence of diverse-leaved pondweed in any individual reservoir is not responsive to management control, since water availability from runoff is not predictable. Maintenance of any reservoir containing diverse-leaved pondweed could have temporary effects as a result of excavation that might remove some plants. As long as some plants remain in the pond, and it does not completely dry-out, the population would persist and possibly provide a source for distribution elsewhere in the Project Area. Construction of new reservoirs could have a beneficial effect for the species by providing more habitat and allowing the plants to spread naturally to new areas. New populations could be established in reservoirs that hold water for at least most of the year.

Since effects to redband trout would be the result of effects to water quality (temperature or increased sediment), and water quality would not be measurably affected by any of the project alternatives (Chapter III. E.), no effects to redband trout are anticipated for any of the alternatives.

No Action Alternative

In this alternative, Special Status wildlife species would have the same resources available as are currently present in the allotment. Some areas of the allotment near perennial water sources would continue to be affected by concentrated livestock and wild horse use. Portions of the allotment away from existing waterholes and springs would have ungrazed areas that may provide more suitable nesting sites for sage-grouse due to more residual grass cover. This provides horizontal screening at nest sites which could reduce predation. During drought years, sage-grouse would have only those perennial water sources present now which have little vegetation for cover or have juniper nearby. Bats would rely on the few reservoirs with late-season water or use other slow moving waters such as pools in Little Blitzen River.

Effects Common to All Action Alternatives

Disturbance from construction of the different projects would have minor temporary effects on SSS. Effects would be only during the actual construction and should have minimal impact on SSS use of the habitat. Since not all projects would likely be constructed or completed at the same time, effects would be spread out over several years and disturbance would be localized. Most project construction work would occur after sage-grouse nesting season due to limited access to the area (muddy roads) during nesting season (April 1 to June 15). Once individual projects are completed, SSS would likely use the areas again. About 2 acres of vegetation would be removed around each new trough mainly through use by livestock and wild horses. Vegetation would be removed in construction of reservoirs as well but use by livestock and wild horses would not remove much more vegetation than removed during construction. Although vegetation would remain outside this area, grasses and forbs would be more heavily used in an area

about 0.25-mile from these water sources. Based on location of these new sites, greater sage-grouse could be affected through the loss of nesting habitat. Exclusion of livestock and wild horses from existing spring sources would improve these areas for sage-grouse use by providing water and restoring riparian/wetland vegetation which sage-grouse depend on during the late summer months. Spreading out water sources would reduce impacts to spring areas, but it would also allow for later season use in areas around new water sources. This late-season use would reduce the amount of residual grass near these sites and reduce horizontal cover for nesting sage-grouse the following spring. Reduction in horizontal cover could affect nest success for sage-grouse through increased predation. Livestock would use areas early, during the growing season or after seed ripe (deferred) on a rotational basis (Table 2: Proposed Grazing System) so effects of livestock use on grasses for residual horizontal cover would occur only on years when use occurred in a pasture during these timeframes. Only grazing during the early graze period with no other grazing occurring afterward would allow for grasses to reach full height depending on the timing of precipitation each year. Wild horses would have access to these water sources yearlong and could have more effects on residual nesting cover from late-season use. Reduction and maintenance of wild horse populations within the AML range would lessen late-season effects of grazing by wild horses on residual grass cover for sage-grouse nesting habitat.

Increased late-season water could provide sources for mosquitoes that carry WNV which has reduced sage-grouse populations in certain areas (Naugle et al. 2004).

Increased late-season water could benefit bat species by providing more watering areas. This may lead to some increased population numbers but this would be dependent on available roost/maternity sites as well as available insect populations. Bats may use new water sources such as troughs and reservoirs for watering spots during evening foraging. Whether this would affect bat populations is not known since roosting sites (day roosts, maternity colonies) may already be fully occupied. Bats would probably forage on mosquitoes that carry WNV but would probably not reduce the population enough to eliminate the threat to sage-grouse.

Cumulative effects would be some increased late-season livestock and wild horse use in sage-grouse habitat. Late-season use in other areas would still have some effect on residual cover the following spring, but it is not known if these areas are used by sage-grouse for nesting. Fencing of several spring sources for protection and spreading of livestock use to other areas would provide more late-season, brood-rearing areas for sage-grouse. While the number of yearlong water sources is increased from the No Action Alternative, several water sources already present in and near this allotment have provided possible breeding sites for WNV carrying mosquitoes. There have been no known outbreaks of WNV in this part of Steens Mountain so the probability of an outbreak is small. Other actions, mainly implementation of the North Steens Project will have a positive effect on sage-grouse habitat by removing encroaching juniper from what was probably suitable nesting and brood-rearing habitat. Removal of juniper may also increase the amount of forage available for livestock, wild horses and certain wildlife species. This would leave more residual nesting cover in the long term for sage-grouse.

Removing juniper may also increase the amount of water available in seasonally wet areas that would improve sage-grouse brood-rearing habitat.

Cumulative effects for bats would be the increased water sources available for watering and foraging in the long term.

Alternative B - Maximum Water Distribution Alternative

This alternative would spread the most water around the Project Area with 17 new troughs associated with wells and springs and 17 new reservoirs constructed. Although late-season grazing effects would be spread out, this could affect residual grass cover for nesting sage-grouse the following spring. Wild horses may have a greater effect on residual grass cover than livestock since they are in the Project Area yearlong. The more late-season water sources available, the greater chance of mosquitoes carrying WNV being found throughout the Project Area and affecting sage-grouse populations.

Bats would be provided the most opportunities from late-season watering sources as they may have more areas to forage for insects near these water sources. Late-season water availability would depend on the reliability of new reservoirs to capture and retain water season-long as well as the distribution of new troughs.

Alternative C - Along Roads and Ways Alternative

This alternative is similar to Alternative B in its effects but calls for installation of 19 troughs associated with wells and springs with no new reservoirs constructed. Troughs would be supplied with water mainly from wells but also springs, which is more reliable than reservoirs, so water could remain in more areas later in summer than with Alternative B. This could reduce the amount of residual horizontal grass cover the following spring for sage-grouse nesting and would also allow for more reliable late-season water sources for WNV infected mosquitoes to spread into the Project Area. Exclusion of livestock and wild horses from existing spring sources would improve these areas for sage-grouse use by providing water and restoring riparian/wetland vegetation which sage-grouse depend on during the late summer months. Although existing reservoirs would still be available for sage-grouse use, their reliability during dry years is variable. Sage-grouse would have access to troughs for water which is less than ideal due to the trough edges being aboveground. Sage-grouse would also move to other areas with water outside the allotment for late brood-rearing habitat.

With more water troughs associated with wells than Alternative B, bats would have more reliable, late-season water sources available.

Alternative D - Edge Developments Alternative

Of the action alternatives, this alternative would have the fewest effects on sage-grouse nesting habitat since fewer water developments would be installed or constructed. There would still be some effects as described above around new water troughs and reservoirs where livestock and mainly wild horses would gather during late summer when other water sources have dried. There would still be the possibility of WNV spread even though fewer late-season water sources would be present.

Bats would have fewer late-season water sources but would have more than under the No Action Alternative.

Proposed Action

This alternative would have effects that are between the effects of Alternatives B and C on the one end and Alternatives A and D on the other end. The proposed action provides less yearlong water than Alternatives B and C which means grazing by livestock and wild horses would occur in fewer areas. This translates to more residual grass cover for sage-grouse nesting the following spring. This alternative still provides more late-season water than Alternatives A and D which means residual grass cover would still be affected in some areas. This also means late-season water and the possibility of WNV mosquitoes being present would increase.

E. Wetlands/Riparian Areas and Water Quality

Affected Environment

Current discussion and analysis of potential effects to wetlands and riparian zones are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated by reference: Sections 3.5.1, p. 3-11 and 4.5.2, p. 4-31.

The Project Area includes approximately 94,565 acres in portions of ten, 6^{th} field subwatersheds. Within the Project Area, only five of these subwatersheds include streams with perennial flows (3.05 miles) or intermittent streams (less than .5-mile) capable of supporting riparian vegetation. The remainder of the subwatersheds are composed of 227 miles of zero and first order stream channels that do not have riparian soils or support riparian vegetation communities.

Five springs are displayed by U.S. Geological Survey (USGS) topographic maps on BLM-administered land within the allotment, only two of which still emerge with surface flow. One of these springs was developed for livestock use by construction of a dugout.

The other has never been developed. Two springs located within the allotment have never appeared on USGS maps, one of which was developed as a dugout when it was privately-owned. No surface flow is evident now. The second spring does not maintain perennial flow. None of these springs contributes to perennial stream flows that reach Donner und Blitzen River or Catlow Basin water bodies.

Numerous small (generally less than 1-acre) unmapped mesic/wet meadows with riparian vegetation are present, two of which originate at the undeveloped springs. Others are the result of subsurface flow from the surrounding areas. Most of these meadows do not maintain saturated soils through late spring and summer.

Although waterholes may support aquatic and wetland vegetation, for the purposes of analysis, they do contribute to riparian functioning condition. This is because waterholes respond to surface runoff, lack contact with the water table, are intended to store water rather than transport water through watersheds, and cannot be assessed using PFC factors as described in interagency protocols (TR 1737-15, 1998 or TR 1737-16 1999).

Riparian Proper Functioning Condition Assessment

Analysis of riparian condition is based on an assessment of PFC, a methodology developed by BLM and U.S. Forest Service (USFS) resource specialists to provide a consistent approach for considering hydrology, vegetation, and soil erosion/deposition attributes and processes to assess conditions of riparian and wetland areas. Assessments are conducted by IDTs of BLM resource specialists who may include livestock operators and specialists from cooperating agencies. Seventeen factors of *hydrology*, *vegetation*, and *erosion/deposition* are evaluated for lotic (flowing stream) assessments (USDI BLM Tech Ref. 1737-15, 1998), and 20 factors are evaluated for lentic (wetland) assessments (TR 1737-16 1999).

Approximately four stream miles (representing six stream reaches) within South Steens Allotment were assessed in 1998 and 1999. These assessment-miles are composed primarily of three reaches of Home Creek in Home Creek Pasture 3 and two unnamed perennial tributaries to Donner und Blitzen River in Steens Pasture 2. This number includes less than .02-mile of South Fork Donner und Blitzen River where water gap facilitate livestock access. All assessed stream reaches were determined to be in PFC or functioning at-risk with an upward trend.

Informal assessments of two springs and one unmapped intermittent riparian-capable stream were conducted in 2008 utilizing all factors considered in IDT field assessments.

Although the full IDT did not participate in the field assessment, each written assessment, including numerous photos, was reviewed by the full IDT for concurrence. These informal assessments are summarized in the section, *Summary of Riparian Condition by Hydrologic Subbasin* below. The current condition of these springs with perennial flow is largely or entirely influenced by the infrequent distribution of water for cattle and horses within pastures, resulting in concentrated hoof chiseling on saturated soils and grazing on wetland vegetation. Short riparian-capable stream sections, small wetlands and springs within large pastures are generally difficult to manage effectively without the use of exclosures (BLM TR 1737-20, p. 22).

Surface Water Quality Assessment

The U.S. Environmental Protection Agency (EPA) delegated authority to Oregon DEQ to implement the Clean Water Act (CWA). The objective of the CWA is to restore and maintain the physical, chemical, and biological integrity of the nation's waters. To implement the CWA, the State of Oregon develops and adopts water quality standards, which include beneficial uses, narrative and numeric criteria, and antidegradation policies. Oregon's water quality standards are contained in Oregon Administrative Rules 340 Division 41. Section 303(d) of the CWA requires the State to identify those waters not meeting the water quality standards, referred to as "water quality limited" or "impaired" and to develop Total Maximum Daily Loads (TMDLs). The TMDLs describe the amount of each pollutant a water body can receive without violating water quality standards.

Through a Memorandum of Agreement (MOA, USDI 2003), the DEQ recognizes BLM as the Designated Management Agency responsible for implementing and enforcing natural resource management programs for the protection of water quality on public lands under its jurisdiction. This MOA recognizes nonpoint source water quality issues are best controlled through development, adoption, and implementation of sound resource management practices, referred to as Best Management Practices. The primary cause of water quality degradation on public land is nonpoint source pollution. To further the purposes of this MOA and the CWA, the USFS and BLM are implementing a protocol for addressing CWA Section 303(d) Listed Waters (USDA/USDI 1999). In coordination with the EPA, DEQ and other agencies, the BLM is implementing the protocol recognized as the vehicle for achieving water quality compliance.

South Fork Donner und Blitzen River (*Donner und Blitzen Subbasin*) and Home Creek (*Guano Subbasin*) are included on DEQ's 303(d) list (2004-2006 report) because both streams exceed the water temperature standard for salmonid fish (spawning, rearing, or presence). Since less than .02-mile of South Fork Donner und Blitzen River is in the Project Area (the main stem and major tributaries of Donner und Blitzen River on the eastern border of the allotment are either fenced out of the allotment, or are not accessible due to steep rocky terrain), and these areas are part of the No Livestock Grazing Area of Steens Mountain Wilderness, BLM's capacity to influence the 303(d) listing as a result of this project's affects is nonmeasurable. A Water Quality Restoration Plan (WQRP) was completed and was implemented for the Guano Subbasin in 2007. The WQRP (p. 20) states:

> *The existing grazing management described under the Problem Description and Condition Assessment section* (for Home Creek) *has demonstrated maintenance and/or restoration of riparian vegetation communities and stream channel stability over historic management and condition.*

The DEQ is scheduled to complete TMDLs for temperature for the Donner und Blitzen and Guano Subbasins in 2010.

For pastures in which no perennial streams, and consequently no fish occur and no known or likely water contact recreation occurs, water for livestock, wildlife and hunting, and aesthetic quality and are the primary designated beneficial uses of surface water. Since reliable water sources are not well-distributed within the pasture, springs receive unrestricted use from both livestock when present and year-round from wild horses, which results in poor-quality (muddy) drinking water for horses, livestock, and wildlife, especially in the Fall.

Where invasive western juniper has become well-established in the Project Area, the hydrologic cycle has been altered, and precipitation available for infiltration or runoff is generally reduced (Pierson et al. 2007). Juniper intercepts moisture that would otherwise reach low vegetation or the ground, after which it is lost to the atmosphere through evaporation from the canopy, or channeled to the root systems of trees through stem flow (water travels down the trunks of trees). The expansive root system of juniper trees also facilitates very efficient use of soil moisture, such that vigor of forbs, shrubs, and bunchgrasses may be reduced (including riparian-associated species), depending on soil characteristics and other site-specific conditions. When and where this layer of vegetation is lost and no other surface feature (such as rocks, plant litter or soil crusts) is available to protect the soil surface, excessive soil erosion may occur. In addition, invasive juniper may diminish the capacity of the watershed to augment late-season base flow with captured groundwater, which can contribute cool water to moderate stream temperatures.

Summary of Riparian Condition by Hydrologic Subbasin

The Project Area includes portions of the Guano/Harney and Donner und Blitzen subbasins (Andrews/Steens RMP Map S-1, Hydrographic Subbasins, and Map S-2, PFC Assessment). Current conditions are summarized by 6th level subwatersheds within the Project Area.

Donner und Blitzen Subbasin

Dry Creek 6th Field Hydrologic Unit Code (HUC) (5,774 acres): Approximately 1.4 miles of two unnamed perennial tributaries to Donner und Blitzen River were assessed for PFC in 1999. These streams have rocky, very stable channels with diverse vegetative communities that include at least three woody riparian species. They were determined to be in PFC, and were at or very near potential.

Catlow Rim 6th Field HUC (16,719 acres): The entire subwatershed is within the Project Area. One riparian-capable perennial stream flows from a spring complex on BLM land in the Three Springs area in T. 34 S., R. 32½ E., Section 25. Perennial flows likely extend no more than 0.1-mile during the wettest years. Intermittent flows support at least some riparian vegetation for another .25-mile below this, after which an ephemeral stream channel alternates with infrequent patches of mesic/wet meadow vegetation. Although this spring and associated stream channel have not been formally assessed for PFC, hoof-chiseling from cattle and wild horses has altered soil topography, effectively shrinking the extent of saturated soils and the total area capable of supporting riparian vegetation. The amount of shrinkage has not been measured, but may be as much as 10 percent of the total riparian-capable area.

Therefore, this spring is functional at-risk because: the riparian area has shrunk; upland watershed is contributing to riparian degradation (loss of base flow potential); and none of the applicable vegetative factors (specifically age class distribution, species composition, and vigor) indicate maintenance of riparian function. Since flows from this spring are consistent and tributary areas are small (tens of acres), erosion/deposition factors are of lesser or no concern with respect to functioning condition.

Three other springs emerge on adjacent private land (Three Springs) and are in worse condition, based on casual observation. The BLM spring has the greatest potential for recovery within a decade, based on current condition. A second spring, not displayed on USGS topographic maps has been located in T. 34 S., R. 32½ E., Section 9 (Weaver Place). This spring was developed as a dugout prior to public ownership, and no longer maintains surface flow.

Deep Creek 6th Field HUC (837 acres): No riparian-capable perennial or intermittent streams flow within the Project-Area portion of this subwatershed.

Fivemile Lake 6th Field HUC (248 acres): No riparian-capable perennial or intermittent streams flow within the Project-Area portion of this subwatershed.

Mud Creek 6th Field HUC (837 acres): The subwatershed within the Project Area includes the existing water gap (Tabor Cabin) on Donner und Blitzen River. Since access to the river is limited and forage is abundant around the water gap or the canyon used to access it, livestock do not appear to linger there. The banks of the water gap are well-vegetated and stable. No other perennial or riparian-capable intermittent streams are within the Project Area.

Surface water emerges at Broken Leg Spring in T. 34 S., R. 32¾ E., Section 19, along Three Springs Road. A dugout was created over the spring prior to records-keeping for such developments. The dugout has silted-in, and is now capable of supporting only approximately 300 sq. ft. of wetland vegetation. Although the old dugout is wallowed-in while cattle are present in summer and year-round use by wild horses, extensive root masses of sedges and rushes produce new growth every year. The road passes directly below the spring, and a gully has developed (probably decades ago) at the crossing altering the outflow path from the spring, and likely shrank the extent of saturated soils capable of supporting riparian vegetation in the small (0.3-acre) mesic/wet meadow below. Soils remain saturated throughout the dry portion of the year in less than .1-acre of this meadow. An informal PFC assessment indicates hoof-chiseling from cattle and wild horses has likely further reduced the seasonally saturated portion of the meadow.

Therefore, this spring is functional at-risk because the riparian area has shrunk, at least in the portion that remains saturated year-round; upland watershed is contributing to riparian degradation (loss of base flow potential); and none of the applicable vegetative factors (specifically age class distribution, species composition, and vigor) indicate maintenance of riparian function within the portion saturated year-round. Since flows from this spring are consistent and tributary areas are small (tens of acres), erosion/deposition factors are of lesser or no concern with respect to functioning condition.

Guano/Harney Subbasin

Dry Creek 6th Field HUC (20,392 acres): The entire subwatershed is within the Project Area. One riparian-capable unnamed intermittent tributary to Dry Creek in T. 34 S., R. 32½ E., Section 36 supports facultative[2] wetland vegetation in the green line for approximately 2,000 feet. A mesic/wet meadow system is supported by subsurface flow from the adjunct uplands along at least some of this stream channel. The stream and meadow complex have not been formally assessed for PFC, but an informal assessment conducted in 2008 indicates it is functioning at-risk, with a static or slow upward trend.

[2] *Obligate wetland* species are plants that almost always occur under natural conditions in wetlands (estimated probability greater than 99%).

Facultative wetland species are plants that occur in wetlands (estimated probability greater than 67% - 99%), but are occasionally found in non-wetlands.

Facultative species are plants that are equally likely to occur in wetlands or non-wetlands (estimated probability greater than 34% - 669%).

Hoof-shear on streambanks from grazing animals is the main reason for the determination, but it is not certain whether this is due primarily to wild horses or cattle. Expansion juniper may also be reducing the subwatershed's capacity to capture and store precipitation, reducing subsurface flow to support meadow vegetation.

Three mapped springs are identified on USGS maps in the subbasin. These springs could not be located on the ground in 2008, and likely no longer emerge due to reduction in base flow and watershed yield from expansion juniper.

Kueny Canyon 6th Field HUC (17,167 acres): No riparian-capable perennial or intermittent streams flow within the Project-Area portion of this subwatershed. One intermittent spring has been located in T. 34 S., R. 32 E., Section 2. This spring does not appear on USGS topographic maps.

Solomon Canyon 6th Field HUC (17,703 acres): No riparian-capable perennial or intermittent streams flow within the Project-Area portion of this subwatershed.

Threemile Creek 6th Field HUC (1,621 acres): No riparian-capable perennial or intermittent streams flow within the Project-Area portion of this subwatershed.

Home Creek 6th Field HUC (3,509 acres): Approximately 2.6 perennial miles of Home Creek is within the Project Area, all of which is in designated wilderness. Home Creek was assessed for PFC in 1998, and the stream was determined to be functioning at-risk with an upward trend. A riparian inventory study of streams in the Guano Subbasin was conducted in 2003. Based on an informal reassessment of factors used to determine riparian functioning condition described in this study, this reach of Home Creek within Home Creek Pasture is now likely in PFC. Expansion western juniper has become well-established in riparian areas along Home Creek.

Environmental Consequences

Effects Common to All Alternatives, Including No Action

Availability of water from precipitation, either as rainfall or snowmelt within South Steens Allotment is determined by the amount of precipitation received annually and over consecutive years, and by the capability of subwatersheds to capture, store, and release water as base flow. Capture and storage capability are determined by soils and by plant community composition and distribution relative to infiltration and runoff. Presence of expansion western juniper continues to have the greatest influence on capture and storage of precipitation within allotment subwatersheds, and by consequence, likely controls ecological processes. Greater cover by juniper shifts the disposition of precipitation away from infiltration in favor of interception, evapotranspiration and surface runoff (Pierson et al. 2007). This influences the degree to which precipitation can recharge springs and streams as infiltrated base flow regardless of the arrangement of water developments within the allotment.

For the Project Area as a whole, the long-term cumulative effect (over decades) to the potential for excessive erosion and effects to water quality and riparian vegetation from expansion western juniper is greater than what is likely to occur from the grazing system currently in place and water sources available to facilitate grazing and wild horses. After planned juniper management activities occur, a greater proportion of precipitation is likely to reach the soil surface to become available for forbs, shrubs, and bunchgrasses within affected treatment units. Soil infiltration potential is also likely to increase, which may facilitate slower inflow to existing reservoirs and any new reservoirs, as well as springs and streams.

Effects Common to All Action Alternatives

Since new or rehabilitated reservoirs are or would be located on ephemeral stream channels, mostly surface runoff would be captured that might otherwise flow further downstream. Some infiltrated subsurface water may also be captured, but ephemeral streams by nature remain in contact with the water table briefly (usually a few weeks), if at all. Since all reservoirs are designed to facilitate downstream passage of overflow and since flow from these streams generally does not reach perennial streams lower in the watershed except during pulse (storm) events or years with abnormally high snowpack, effects from reservoirs on water quality and flow volume in affected subbasins as a whole would be negligible to nonmeasurable. In general, any additional sediment generated by livestock presence around new or rehabilitated reservoirs would likely be contained within the tributary area of the reservoir, where it would settle and be retained. Therefore, effects to downstream beneficial uses, primarily resident fish and aquatic life, would likely be uncommon, episodic, occurring no more frequently than with the No Action Alternative, and not measurable after any specific storm event.

There would be no affect to riparian areas, wetlands or water quality as a result of construction of new wells, pipelines, troughs, fence construction or fence removal. The route realignment around Broken Leg Spring in T. 34 S., R. 32¾ E., Section 19 along Three Springs Road would facilitate recovery of riparian function below the spring and restoration of PFC to the spring and downstream meadow.

Alternative A

Riparian Functioning Condition

Since no changes in authorized number of livestock or season of use would occur, the grazing system in place with the current configuration of water availability would likely maintain PFC or an upward trend on portions of Home Creek functioning at-risk, and would maintain PFC in 1.4 miles of unnamed intermittent streams in Dry Creek 6th Field HUC in Donner und Blitzen subbasin.

For nonfunctional springs or springs functioning at-risk, factors contributing to current condition would not change. Therefore, trend in functioning condition of these springs would not change, and may degrade further. Hoof chiseling would continue to channel flows such that the extent of wetland soils capable of supporting wetland vegetation would diminish. Although wetland vegetation would continue to be present at the springs, it would likely never achieve adequate age class distribution, species diversity, and vigor so that affected springs would be in PFC.

The cumulative effect on watershed processes from nonfunctional or poorly functioning springs would not be measurable, since flows from springs are not tributary to any perennial streams that reach Donner und Blitzen River or Guano/Harney subbasin. Even if riparian vegetation was fully expressed and reached potential at all springs (under BLM administration), cover by wetland species within the allotment would likely increase by less than 1-acre, or about .01 percent of the total allotment area. Since stream channels below these springs are ephemeral and are not capable of supporting wetland vegetation and the tributary area around springs is very small (tens of acres at most), potential decrease in sediment yield from increased vegetation at springs is also likely not measurable.

Surface Water Quality

The current condition and trend of surface water quality within the Project Area, described as effects to designated beneficial uses, would not change. Springs would continue to receive unrestricted use from both livestock when present, and year-round from wild horses, perpetuating poor-quality (muddy) drinking water for horses, livestock, and wildlife, especially in the fall.

Since no change would occur in grazing management, the trend to water quality (temperature) in Home Creek as described in the WQRP would continue, and cover of woody vegetation would expand and continue to provide additional shade to the stream.

Alternative B - Maximum Water Distribution Alternative

Rehabilitation of unreliable reservoirs would tend to pull livestock and horses away from Home Creek. This redistribution of grazing animals may accelerate the current upward trend in riparian functioning condition, which would be visible as expanded cover of woody species such as willows, alder, and dogwood.

One of the proposed reservoirs in Tombstone Pasture 1 (R1) would be constructed on a riparian-capable stream (unnamed tributary to Donner und Blitzen River) now in PFC. It is possible PFC would be maintained with a reservoir in the middle of the reach, since it is essentially at potential now. However, it is more likely functioning condition would diminish to some extent due to presence of grazing animals and disruption of persistent flows.

Based on riparian condition of the existing water gap (Tabor Cabin) on Donner und Blitzen River, it is unlikely addition of three more well-constructed water gaps would have any measurable influence on overall riparian condition or water quality. As with the existing water gap, access would be limited, terrain on the approach would be relatively steep, and forage would not be abundant near the water source. Therefore, grazing animals would be no more likely to linger at any of the three proposed water gaps than they do now at Tabor Cabin.

The rehabilitation of an existing dugout at Weaver Place to natural spring characteristics may result in a very small riparian area (less than 1/10 acre). Results of rehabilitation would not be obvious or immediate, since flow from the spring appears to be very low. Rehabilitation of springs would reduce or eliminate grazing animal access to riparian soils saturated year-round, forcing them to congregate on firmer upland soils. Without annual disturbance from hoof chiseling by horses and cattle, the extent and function of riparian soils would expand within topographic limits at the sites and support riparian vegetation over a larger area (estimated at 12 to 15 acres for the entire allotment). Since troughs fed by springs would include float valves to assure flows in excess of animal needs would be diverted back to riparian areas, response of wetland vegetation would be immediate, and would likely reach potential extent within the following decade.

Alternative C - Along Roads and Ways Alternative

Since the alternative focuses on new wells rather than constructing or rehabilitating reservoirs, effects to riparian resources would be limited to rehabilitated springs (refer to Environmental Consequences for Alternative B). The dugout at Weaver Place would continue to function as a dugout, to be used strictly as a water source for livestock and horses, and would be unlikely to support riparian vegetation.

Alternative D - Edge Developments Alternative

Effects to riparian resources would be limited to rehabilitated springs (refer to Environmental Consequences for Alternative B) and the new spring development in Steens Pasture 2. Effects at the new development would be the same as with the rehabilitated sites, since an exclosure would be constructed there as well.

Proposed Action

Since the same number of spring development/rehabilitation projects in the same locations would occur as with Alternative B, effects to riparian functioning condition of springs would be the same.

F. Wilderness and Wild and Scenic Rivers

Current discussion and analysis of potential effects on wilderness and WSRs are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.22, 3.24, 4.22 and 4.24.

Affected Environment

Steens Mountain Wilderness includes approximately 172,911 acres of BLM-administered lands. The only affected portion of Steens Mountain Wilderness within the Project Area is along the edge of the wilderness where water gaps are being proposed (portions of Donner und Blitzen WSR and South Fork of Donner und Blitzen WSR). This portion of wilderness and the WSRs falls within the No Livestock Grazing Area established by the Steens Act.

Both river segments have a wild classification and the ORVs identified include scenery, geological, recreational, fish, wildlife, and vegetation. The portion of the Project Area within wilderness and WSRs is relatively remote and does not have established trails along the river, but likely receives some recreational use primarily associated with hiking/backpacking, fishing, and camping.

Environmental Consequences

No Action Alternative

No changes to wilderness values or WSR ORVs would be expected under this alternative.

Alternative B - Maximum Water Distribution Alternative

Under this alternative three water gaps would be installed. During construction there would be temporary and short-term (days) disturbance to solitude and recreational use. This disturbance would include noise and presence of motorized equipment if vehicles, helicopters or other motorized equipment are used to deliver materials or construct the water gaps.

Following construction water gaps would be observable as unnatural features in the wilderness and WSRs and encounters would likely last several minutes for each encounter as visitors approach and pass the structures. Water gaps would block visitor access right along the river, requiring visitors to either climb over structures or hike around the structures. Generally these encounters are expected to be low, limited to a few a year, given the remoteness of the area and lack of trails. The area likely to affect recreational use the most is water gap F5 because a dispersed campsite is located near this area. In addition, presence of cattle would be observable at times when using the water gaps. Evidence of livestock use may also displace some visitors from these campsites.

The structures are not expected to restrict water movement, so the free-flowing character of the river segments would be maintained. Geological values would not be affected and other values would be affected as described above.

Motorized access for general monitoring and minor maintenance of the structures (e.g., replacing individual components or clearing debris) would not be allowed, so impacts to wilderness values associated with these activities would be low to none. However, if major reconstruction of the structures is needed, impacts similar to those associated with construction would be expected.

The only benefit to wilderness values would be to wild horses, a special feature. The water gaps would allow better access to live water while cattle are present in the allotment adjacent to the No Livestock Grazing Area.

Alternative C - Along Roads and Ways Alternative

Same as the No Action Alternative.

Alternative D - Edge Developments Alternative

Same as Alternative B.

Proposed Action

Same as the No Action Alternative.

G. Wilderness Study Areas

Current discussion and analysis of potential effects on WSAs are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.23 and 4.23.

Affected Environment

Blitzen River, South Fork of Donner und Blitzen River, and Home Creek are the three WSAs within the Project Area.

Wilderness characteristics within WSAs include naturalness, outstanding opportunities for solitude or primitive and unconfined recreation, and the presence of special features. The following definitions are from BLM Manual Handbook H-8550-1 – Interim Management Policy for Lands under Wilderness Review.

Naturalness refers to an area which "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable."

Solitude is defined as "the state of being alone or remote from habitations; isolation. A lonely, unfrequented, or secluded place." *Primitive and Unconfined Recreation* is defined as nonmotorized and undeveloped types of outdoor recreation activities. *Supplemental Values* are listed in the Wilderness Act as "ecological, geological, or other features of scientific, educational, scenic, or historical value." *Ways* refer to motorized routes in WSAs, "maintained solely by the passage of vehicles which has not been improved and/or maintained by mechanical means to ensure relatively regular and continuous use."

Wilderness characteristics of the three WSAs are summarized below from Volume I of the Oregon BLM Wilderness Study Report, 1991. The designation of Steens Mountain Wilderness modified all three WSAs by designating portions of them as Steens Mountain Wilderness and these changes are reflected in the descriptions below.

Blitzen River WSA

Blitzen River WSA (Alternative Map A) is approximately 31,901 acres and is in a generally natural condition. The WSA contains a variety of wildlife habitats with a diversity of animals. Unnatural features consist of 17 reservoirs, a developed spring, 14 fences totaling 23.5 miles, a corral and 34 miles of ways. It is estimated approximately 3,115 acres (9.8 percent) of the WSA is currently influenced by these unnatural features. Outside influences include several small reservoirs along the west boundary, Page Springs Campground, and a power line along the northwest boundary.

Blitzen River WSA has outstanding opportunities for solitude. The area contains both topographic and vegetative screening. There are small portions of the WSA, mostly near the western border, where finding seclusion would be difficult because of the area's lack of topographic or vegetative screening.

Blitzen River WSA provides outstanding opportunities for primitive recreation. Recreation activities include day hiking, backpacking, camping, horseback riding, hunting, wildlife viewing, sightseeing, and photography. Game species include mule deer, pronghorn antelope, elk, and chukars.

Special features of Blitzen River WSA are scenic quality and wildlife. Topography of the WSA offers spectacular scenery of ridges covered by juniper and sagebrush, intermixed with outcroppings of dark basalt rock. Most of this spectacular scenery was in the portion of the WSA that is now part of Steens Mountain Wilderness. Special wildlife features include two greater sage-grouse strutting grounds and mule deer winter range. Though not specifically mentioned as a special feature in the 1991 Wilderness Study Report, wild horses are present in this WSA and are generally considered a special feature that enhances the wilderness experience of some visitors. The WSA also provides important winter range habitat for elk.

South Fork Donner und Blitzen River WSA

South Fork Donner und Blitzen River WSA (Alternative Map A) is approximately 27,968 acres and is in a generally natural condition. Juniper and low sagebrush are the dominant vegetation. The WSA provides habitat for a variety of big game, upland game birds, and other wildlife species. Unnatural features currently consist of 17 reservoirs, one dugout, 28.2 miles of ways, four fences totaling 9.4 miles, and an old abandoned house. It is estimated approximately 2,636 acres (9.4 percent) of the WSA is currently influenced by these unnatural features. Influences to naturalness from developments outside of the WSA are minor consisting primarily of boundary roads and a few water developments.

Opportunities for solitude in South Fork Donner und Blitzen River WSA are outstanding. The WSA's size, numerous shallow drainages and juniper trees enhance the opportunities for a visitor to find seclusion.

South Fork Donner und Blitzen River WSA has outstanding opportunities for primitive recreation. Day hiking, backpacking, camping, and horseback riding opportunities are available. Water and camping spots are available throughout the WSA. Game species in the WSA include mule deer, pronghorn antelope, elk, and upland game birds.

A greater sage-grouse strutting area is located in South Fork Donner und Blitzen River WSA. Though not specifically mentioned as a special feature in the 1991 Wilderness Study Report, wild horses are present in this WSA and are generally considered a special feature that enhances the wilderness experience of some visitors. The WSA also provides important winter range habitat for elk.

Home Creek WSA

Home Creek WSA (Alternative Map A) is approximately 1,165 acres and is in a generally natural condition. The WSA does provide habitat for pronghorn antelope, chukar, and a variety of nongame species. There are five reservoirs and a one mile-long way in the WSA. It is estimated approximately 162 acres (13.9 percent) of the WSA is currently influenced by these unnatural features. Influences to naturalness from developments outside the WSA are minor consisting primarily of boundary roads and a few water developments.

While small in size, Home Creek WSA is located adjacent to Steens Mountain Wilderness and is not separated by a boundary road, but rather a motorized route identified as a way. Its proximity to Steens Mountain Wilderness makes it possible for this WSA to offer outstanding opportunities for solitude and primitive and unconfined recreation. Recreational opportunities include hunting, wildlife viewing, camping, and horseback riding. Game species include mule deer, pronghorn antelope, and chukars.

The identified special features of wildlife, geology, and scenery for Home Creek WSA are now in Steens Mountain Wilderness. Though not specifically mentioned as a special feature in the 1991 Wilderness Study Report, wild horses are present in this WSA and are generally considered a special feature that enhances the wilderness experience of some visitors.

Environmental Effects

Effects Common to All Action Alternatives

The general effects to naturalness from each type of development are described below. Following the description of effects for each individual type of development, additional effects to wilderness values associated with the type and combination of developments are also described for each WSA by alternative.

Wells and Tanks: The only permanent development component observable aboveground after installation of the well and tank would be a short portion of pipe (12 to 36 inches in aboveground height). The rest of the well pipe and tank would be below ground. There would be less than .25-acre of soil and vegetation disturbance and after construction these areas would be seeded and have rocks returned in a manner that would help promote a more natural appearance within 3 to 5 years.

If a portable generator is used to run the well pump, it would only be present during the 5 months the well is in operation each year. No additional soil or vegetation disturbance is expected as the generator would be parked within 30 feet of an existing road or way on an area already disturbed by either the tank or well construction. The generator and trailer are relatively small in size (similar to the bed of a standard-sized pickup) and covered with a canopy to help buffer the sound of the motor. Depending on water use, the generator is expected to run 8 to 16 hours a day. Topography, vegetation, and wind would also help muffle the sound of the generator. It is likely the generator would not be heard or seen for a distance of greater than .25-mile from the generator.

If solar power or a windmill is used, there would likely be no more than .25-acre of soil or vegetation disturbance associated with construction. These facilities would be observable year-round. Due to topographic screening and buffering, solar panels are not likely to be seen for a distance of greater than .25-mile from the panel. While the area affected by noise disturbance from generators would be similar to visual impacts of windmills or solar panels, the use of generators would have less overall effects. Generators would be a temporary facility present less than half the year and smaller in overall size. The motion associated with windmills may draw additional attention over the stationary generator or solar panels.

Well Pipelines: Impacts to soils, vegetation, and naturalness are expected to be minimal given that most of these pipelines are all located along existing roads, ways or closed roads. Some ways are currently not open to the public for use and are not shown on maps, but are available for administrative uses. The area disturbed by pipeline installation would be seeded and native rocks would be placed in a manner that appears more natural to break up the linear pattern of disturbance. Following this rehabilitation, the disturbed area would be expected to appear more natural within 3 to 5 years.

Troughs: Soil and vegetation disturbance associated with construction and use of each trough by livestock would be 2 to 3 acres for each trough. There would also be a secondary area where livestock use would be evident and more concentrated (approximately 31 acres per trough), but shrubs and some grasses would still be present. To the extent possible, the trough would be located in a manner utilizing vegetative and topographic screening. Even with limited topographic screening, generally troughs would not be expected to be observable from a distance greater than $1/6^{th}$ of a mile (approximately 56 acres per trough for naturalness influenced).

Reservoir Construction: Soil and vegetation disturbance associated with construction and use of each reservoir by livestock would be 2 to 3 acres for each reservoir. The secondary area affected by livestock use would be similar to troughs (approximately 31 acres per reservoir); however, reservoirs would be expected to be less visible as they are located in drainages with good topographic and vegetative screening, so reservoirs would likely not be observable until a visitor came into direct contact with them, reducing the area of naturalness influenced. New reservoirs would be located in drainages and could be constructed in a manner that discourages livestock from lingering around the water source for extended periods of time. Establishment of unauthorized motorized routes is not expected because any cross-country travel by motorized equipment for reservoir construction would be conducted to minimize soil and vegetation disturbance and any tracks observable near existing roads and ways would be raked. Use by ATVs to monitor the reservoirs is not expected to create new routes as only one trip per year would be needed. Travel would be conducted to minimize soil and vegetation disturbance.

Reservoir Rehabilitation/Dugout: Rehabilitated reservoirs would primarily be made deeper, rather than larger in size. This may require using soil and rock from nearby the reservoir. If materials are removed outside the core livestock use areas, the area would be seeded with native vegetation. The additional area disturbed is not expected to be larger than 0.5-acre and is likely to be less. Disturbance is not expected to influence an area greater than that of the original reservoir. Most existing reservoirs are adjacent or close to existing roads or ways, so cross-country travel by equipment is expected to be minimal and establishment of new routes is not expected.

Reservoir Decommissioning: Those reservoirs needing work on the contouring or berm repair work are not expected to disturb an area larger than 0.5-acre. Any area disturbed by contouring or berm repair would be seeded and would be expected to appear more natural within 3 to 5 years. Most of these reservoirs are adjacent or close to existing roads or ways, so cross-country travel by equipment would be minimal and establishment of new routes is not expected.

Spring Rehabilitation/Developments: Each spring exclosure would be approximately 2 to 6 acres; however, disturbance to soil and vegetation would only occur where the spring box, pipeline, and trough(s) are installed likely affecting less than 1-acre. Most of the pipeline would be buried below ground and would not be observable after installation. If metal troughs are used they would be painted to blend in with the surrounding area making it unlikely they would be observable except when directly encountered. Spot removal of vegetation or rocks would occur when necessary in fencing the exclosure and fence length would be 0.4-mile or less. Any pipeline extending out of the spring development is addressed separately. Vegetative and topographic features should help screen the fence from view except when a direct encounter occurs. The use of cut junipers would be expected to have a more natural appearance than barbed wire fences, especially from a distance. There may be some short-term disturbance to vegetation if equipment is used to move juniper into place. The work would be done to minimize disturbance and creation of new routes.

Fence Construction/Removal: Minimal soil and vegetation disturbance would be expected from construction or removal of fences as blading or scalping a route along the fence is not allowed in a WSA. Any area needing spot removal of rock or vegetation would be expected to return to a natural appearance within 3 to 5 years. Cross-country travel by motorized vehicles and visual impacts of the proposed fences would be minimal given most fences proposed are located along WSA boundaries, adjacent to an existing road. These visual impacts would be offset by removal of fence within WSA. Only ATVs would be used in the removal of any fencing in the WSAs, so disturbance to soil and vegetation would also be limited.

Cumulative Impacts Common to All Alternatives

New developments proposed as part of this project occurring on BLM-administered or private lands outside but near the WSA would also be expected to have some influence on naturalness. These effects would be limited as most developments would occur along the outer edges of the WSAs. Other projects affecting these WSAs include potential removal of juniper trees as described in the North Steens Project ROD. To the extent possible, nearby juniper trees that help screen the proposed developments or dispersed campsites would be left intact. Depending on the type of treatments implemented within the WSAs, there may be some short-term (years) disturbance to the appearance of naturalness in areas treated.

However, these treatments are expected to help restore the natural fire regime and protect ecological integrity in the WSAs and the CMPA as a whole over the long-term (decades) as provided for under the Steens Act. There are no other known reasonably foreseeable future actions that would contribute to effects to wilderness values in the WSAs.

Blitzen River WSA

No Action Alternative

No changes to naturalness associated with the imprints of humans, solitude, primitive and unconfined recreation in this WSA are expected. Ecological benefits associated with the proposed water developments would not occur. Effects to wildlife related special features are addressed in their respective sections of this chapter.

Alternative B - Maximum Water Distribution Alternative

There would be some ecological benefits associated with better distribution of water and livestock (cattle and horses) throughout the allotment. Health and vigor of key forage species and other upland grasses would be maintained or in some areas improved by moderate grazing in previously ungrazed areas after additional water is available. Additional information about these benefits is described in other Resource Sections of this chapter for this alternative.

Types of effects described as common to all alternatives associated with development of wells, tanks, troughs, new reservoirs, reservoir rehabilitation, and pipelines would occur in Blitzen River WSA under this alternative. Below is a table summarizing the estimated area that naturalness would be influenced by developments proposed under this alternative.

Table 8: Estimate of Acres in Blitzen River WSA affected by Alternative B

Type of Action	Quantity	Acres Affected per Development	Total Acres Affected	Percent of WSA
Wells	1	126	126	0.39
Tanks	1	.01	0.01	0.00
Troughs	5	56	280	0.88
New Reservoirs	6	31	186	0.58
Reservoir Rehabilitation	1	0.5	0.5	0.00
Well Pipeline	4.53 miles	1	4.53	0.01
		TOTALS	597	1.9

Proposed developments within Blitzen River WSA would affect naturalness in approximately 597 acres (1.9 percent) of the WSA. These acre-affected estimates include those areas affected not only by soil and vegetation disturbance, but also by the visual and noise effects as already described above for the developments. Following rehabilitation, most acres estimated to be affected by developments would still have a generally natural appearance with shrubs and some grasses present, but might have some visual or noise disturbance associated with the presence of the facility itself.

No changes to the types (e.g., hiking, horseback riding, hunting, etc.) of recreation opportunities available in Blitzen River WSA are expected. If encounters with visitors occur during installation of the proposed developments, there would be some temporary and short-term (days) loss of solitude and disturbance to recreational activities in the immediate area.

Most developments are located away from known areas of prolonged visitor use (e.g., campsites). As a result, visual or noise disturbance associated with the presence of proposed developments to visitor solitude or their recreational experience is expected to be short term (minutes) and be limited to a visitor's direct encounter with a development as they pass by foot, horseback or vehicle.

There are only three proposed developments (Well W3, Trough T9, and Reservoir R2) located near known dispersed campsites. Disturbance associated with the presence of the developments and their use by livestock may displace some visitors. These effects are expected to be low for the WSA as a whole, given the limited number of campsites, as described above that would potentially be affected.

Some visitor's perception of solitude and recreation experience would be affected by the presence of livestock. For some visitors increased presence of livestock around the new water developments would be undesirable. However, it is expected livestock would be better distributed in smaller numbers over the entire WSA rather than concentrated in larger numbers around a few water sources. Even with the presence of livestock, some visitors may find the areas around water developments more desirable due to the increased chance of observing wildlife and wild horses.

Effects to scenery as a special feature are expected to be similar to those already described for naturalness above; however, the most scenic areas of the WSA have already been designated as wilderness and would not be affected by this proposal. Wildlife and wild horses are addressed in their respective sections of this chapter.

With the exception of portable generators needed to operate well pumps, all proposed developments would be considered to be permanent facilities. Motorized vehicle use associated with monitoring and annual maintenance for most of the proposed developments would be limited to existing roads and ways or to areas adjacent to existing roads and ways.

There would be one trip per year to each reservoir with an ATV for monitoring and potential treatment of weeds, so disturbance to vegetation, soils, and wilderness values would be minimal. Motorized equipment would be used in maintenance of reservoirs on a very infrequent (10 to 20 years) basis. Effects associated with replacement of any developments would be infrequent (10 to 20 years) and would be the same as that described for construction of the development.

The total area influenced by existing and proposed unnatural developments in Blitzen River WSA would be approximately 11.6 percent (3,712 acres) for this alternative.

Alternative C - Along Roads and Ways Alternative

There would be some ecological benefits associated with better distribution of water and livestock (cattle and horses) throughout the allotment. Health and vigor of key forage species and other upland grasses would be maintained or in some areas improved by moderate grazing in previously ungrazed areas after additional water is available. Additional information about these benefits is described in other Resource Sections of this chapter for this alternative.

Types of effects described as common to all alternatives associated with development of wells, tanks, troughs, and pipelines would occur in Blitzen River WSA under this alternative. Below is a table summarizing the estimated area that naturalness would be influenced by developments proposed under this alternative.

Table 9: Estimate of Acres in Blitzen River WSA affected by Alternative C

Type of Action	Quantity	Acres Affected per Development	Total Acres Affected	Percent of WSA
Wells	1	126	126	0.39
Tanks	1	0.01	0.01	0.00
Troughs	5	56	280	0.88
Well Pipeline	4.53 miles	1	4.53	0.01
		TOTALS	410	1.3

Types of effects to naturalness, solitude, and recreation would be the same as those described for Alternative B with the following differences. The proposed developments within Blitzen River WSA would affect naturalness in approximately 410 acres (1.3 percent) of the WSA. There are two proposed developments (Well W3 and Trough T9) located near a known dispersed campsite. Well W3 is located outside the WSA; however, there is a dispersed campsite within the WSA nearby. Except for the proposed fence removal, all work would occur within 30 feet of existing roads, ways or closed roads, so minimal cross-country travel would be needed for installation and maintenance of the developments. Total area influenced by existing and proposed unnatural developments in Blitzen River WSA would be approximately 11.1 percent (3,525 acres) for this alternative.

Alternative D - Edge Developments Alternative

Same as the No Action Alternative.

Proposed Action

There would be some ecological benefits associated with better distribution of water and livestock (cattle and horses) throughout the allotment. Health and vigor of key forage species and other upland grasses would be maintained or in some areas improved by moderate grazing in previously ungrazed areas after additional water is available. Additional information about these benefits is described in other Resource Sections of this chapter for this alternative.

Types of effects described as common to all alternatives for development of new reservoirs and reservoir rehabilitation would occur in Blitzen River WSA under this alternative. Below is a table summarizing the area that naturalness would be influenced by the actions proposed under this alternative.

Table 10: Estimate of Acres in Blitzen River WSA affected by Proposed Action

Type of Action	Quantity	Acres Affected per Development	Total Acres Affected	Percent of WSA
New Reservoirs	4	31	124.0	0.39
Reservoir Rehabilitation	1	0.5	0.5	0.00
	TOTALS		124.5	0.39

Effects associated with the Proposed Action would be similar to types of effects described for new reservoirs and reservoir rehabilitation in Alternative B. Only one campsite in the WSA would be close to a proposed development (Well W3) which is located outside the WSA. The proposed developments under this alternative would only influence naturalness on approximately 125 acres (0.39 percent). Overall, 10.2 percent (3,239 acres) would be influenced by existing and proposed unnatural features. Most of these acres would still be dominated with shrubs and some grasses and have a generally natural appearance. The proposed developments are not expected to be substantially noticeable given that they are dispersed within the WSA, the limited acres affected and the fact that most of these acres will still have a generally natural appearance. Overall effects to naturalness and solitude are expected to be negligible and no reduction in the availability or quality of recreation in the WSA as a whole is expected.

South Fork Donner und Blitzen WSA

No Action Alternative

No changes to naturalness associated with the imprints of humans, solitude, primitive and unconfined recreation in this WSA are expected. The ecological benefits associated with the proposed water developments would not occur. Effects to wildlife and wild horse related special features are addressed in their respective sections of this chapter.

Alternative B - Maximum Water Distribution Alternative

There would be some ecological benefits associated with better distribution of water and livestock (cattle and horses) throughout the allotment. Health and vigor of key forage species and other upland grasses would be maintained or in some areas improved by moderate grazing in previously ungrazed areas after additional water is available. The spring developments would help protect riparian areas by eliminating hoof-shear so riparian vegetation can reach potential, PFC can be achieved and habitat can be improved for riparian-associated wildlife species. Additional information about these benefits is described in other Resource Sections of this chapter for this alternative.

Types of effects described as common to all alternatives associated with development of wells, tanks, troughs, new reservoirs, reservoir rehabilitation, spring developments, reservoir decommissioning and pipelines would occur in South Fork Donner und Blitzen River WSA under this alternative. Below is a table summarizing the estimated area that naturalness would be influenced by developments proposed under this alternative.

Table 11: Estimate of Acres in South Fork Donner und Blitzen River WSA affected by Alternative B

Type of Action	Quantity	Acres Affected per Development	Total Acres Affected	Percent of WSA
Wells	3	126	378	1.35
Tanks	3	.01	0.03	0.00
Troughs	7	56	392	1.40
New Reservoirs	11	31	341	1.22
Reservoir Rehabilitation	9	0.5	4.5	0.02
Reservoir Decommissioning	4	0.5	2	0.01
Spring Developments	2	60	120	0.43
Well Pipeline	4.95 miles	1	4.95	0.02
Way Realignment	60 feet	.03	1.8	0.01
		TOTALS	1,244	4.5

Proposed developments within South Fork Donner und Blitzen WSA would affect naturalness in approximately 1,244 acres (4.5 percent) of the WSA. These acre-affected estimates include those areas affected not only by soil and vegetation disturbance, but also by visual and noise effects as already described above for the developments. Following rehabilitation, most acres estimated to be affected by developments would still have a generally natural appearance with shrubs and some grasses present, but might have some visual or noise disturbance associated with the presence of the facility itself.

Realignment of the way would result in some soil and vegetation disturbance related to clearing of rocks by equipment and manual clearing of vegetation. The segment to be realigned is short, would not be bladed, and would remain naturally surfaced. As a result, overall appearance of the way as a whole would not be expected to change or become more noticeable, it would be expected to blend into the surrounding area, and would not be as observable as an unnatural feature until a direct encounter occurred. Overall this realignment would enhance wilderness values by moving the route a short distance to avoid a sensitive spring area. While the spring developments would add unnatural features to the WSA, overall wilderness values would be enhanced by protection of these riparian areas as described above.

While there would be some disturbance to soil and vegetation associated with reservoir decommissioning, overall wilderness values would be enhanced after vegetation has returned. Because these reservoirs are located along or near an existing road or way, cross-country travel with equipment is expected to be minimal.

No changes to the types (i.e., hiking, horseback riding, hunting, etc.) of recreation opportunities available in South Fork Donner und Blitzen WSA are expected. If encounters with visitors occur during installation of the proposed developments, there would be some temporary and short-term (days) loss of solitude and disturbance to recreational activities in the immediate area.

Most developments are located away from known areas of prolonged visitor use (i.e., campsites). As a result, visual or noise disturbance associated with the proposed developments to visitor solitude or their recreational experience is expected to be short term (minutes) and be limited to a visitor's direct encounter with a development as they pass by foot, horseback or vehicle.

There are only three proposed developments (Well W8, Spring Developments S1, Trough T28) located near known dispersed campsites. Disturbance associated with presence of developments and their use by livestock may displace some visitors from using the campsites. These effects are expected to be negligible for the WSA as a whole, given the limited number of campsites, as described above that would potentially be affected.

Some visitor's perception of solitude and recreation experience would be affected by the presence of livestock. For some visitors increased presence of livestock around new water developments would be undesirable. However, it is expected livestock would be better distributed in smaller numbers over the entire WSA rather than concentrated in larger numbers around a few water sources. Even with the presence of livestock, some visitors may find the areas around water developments more desirable due to the increased chance of viewing wildlife and wild horses. Effects to special features such as wildlife and wild horses are addressed in their respective sections of this chapter.

With the exception of portable generators needed to operate well pumps, proposed developments would be considered permanent facilities. Motorized vehicle use associated with monitoring and annual maintenance for most proposed developments would be limited to existing roads and ways or to areas adjacent to existing roads and ways. There would be one trip per year to each reservoir with an ATV for monitoring and potential treatment of weeds, so disturbance to vegetation, soils, and wilderness values would be minimal. Motorized equipment would be used in the maintenance of reservoirs on a very infrequent (10 to 20 years) basis. Effects associated with replacement of any developments would be infrequent (10 to 20 years) and would be the same as described for construction of the development.

The total area influenced by existing and proposed unnatural developments in South Fork Donner und Blitzen WSA would be approximately 13.9 percent (3,880 acres) for this alternative. If removal of existing reservoirs occurs, wilderness values would be enhanced on approximately 60 acres and reduce overall acres affected by unnatural features to 13.7 percent.

Alternative C - Along Roads and Ways Alternative

There would be some ecological benefits associated with better distribution of water and livestock (cattle and horses) throughout the allotment. Health and vigor of key forage species and other upland grasses would be maintained or in some areas improved by moderate grazing in previously ungrazed areas after additional water is available. The spring development would help protect riparian areas by eliminating hoof-shear so riparian vegetation can reach potential, PFC can be achieved and habitat can be improved for riparian-associated wildlife species. Additional information about these benefits is described in other Resource Sections of this chapter for this alternative.

Types of effects described as common to all alternatives associated with development of wells, tanks, troughs, new reservoirs, reservoir rehabilitation, dugout rehabilitation, reservoir decommissioning, spring developments, fences, and pipelines would occur in South Fork Donner und Blitzen River WSA under this alternative. Below is a table summarizing the estimated area that naturalness would be influenced by developments proposed under this alternative.

Table 12: Estimate of Acres in South Fork Donner und Blitzen River WSA affected by Alternative C

Type of Action	Quantity	Acres Affected per Development	Total Acres Affected	Percent of WSA
Wells	3	126	378	1.35
Tanks	3	0.01	0.03	0.00
Troughs	9	56	504	1.80
New Fences (miles)	0.53	97	51	0.18
Dugout Rehabilitation	1	0.5	.05	0.01
Spring Developments	1	60	60	0.43
Well Pipeline	8.32 miles	1	8.32	0.03
Way Realignment	60 feet	.03	1.8	0.01
		TOTALS	1,004	3.6

Types of effects to naturalness, solitude, and recreation would be the same as those described for Alternative B, with the following differences. The proposed developments within South Fork Donner und Blitzen WSA would affect naturalness in approximately 1,004 acres (3.6 percent) of the WSA. There are only three proposed developments (Trough T18, Spring Developments S1 and S3 plus troughs) located near known dispersed campsites. Except for the proposed fence removal, all work would occur within 30 feet of existing roads, ways or closed roads, so minimal cross-country travel would be needed for installation and maintenance of the developments. The total area influenced by existing and proposed unnatural developments in South Fork Donner und Blitzen WSA would be approximately 13.0 percent (3,640 acres) for this alternative. Removal of existing fences would enhance wilderness values on approximately 204 acres and reduce overall acres affected by unnatural features in the WSA to 12.3 percent.

Alternative D - Edge Developments Alternative

There would be some ecological benefits associated with better distribution of water and livestock (cattle and horses) throughout the allotment. Health and vigor of key forage species and other upland grasses would be maintained or in some areas improved by moderate grazing in previously ungrazed areas after additional water is available. The spring development would help protect riparian areas by eliminating hoof-shear so that riparian vegetation can reach potential, PFC can be achieved and habitat can be improved for riparian-associated wildlife species. Additional information about these benefits is described in other Resource Sections of this chapter for this alternative.

Types of effects described as common to all alternatives associated with spring developments, troughs and fences would occur in South Fork Donner und Blitzen River WSA under this alternative. Below is a table summarizing the estimated area that naturalness would be influenced by developments proposed under this alternative.

Table 13: Estimate of Acres in South Fork Donner und Blitzen River WSA affected by Alternative D

Type of Action	Quantity	Acres Affected per Development	Total Acres Affected	Percent of WSA
Troughs	2	56	112	0.40
New Fences (miles)	0.3	97	29.1	0.10
Spring Developments	2	60	120	0.43
Way Realignment	60 feet	.03	1.8	0.01
		TOTALS	263	0.9

Types of effects to naturalness, solitude, and recreation would be the same as those described for Alternative B with the following differences. Proposed developments within South Fork Donner und Blitzen WSA would affect naturalness in approximately 270 acres (one percent) of the WSA. There are only two proposed developments (Spring Developments S1 and S3 with troughs) located near dispersed campsites. Except for the proposed fence removal, all work would occur within 30 feet of existing roads, ways or closed roads, so minimal cross-country travel would be needed for installation and maintenance of the developments. The total area influenced by existing and proposed unnatural developments in South Fork Donner und Blitzen WSA would be approximately 10.4 percent (2,899 acres) for this alternative. Removal of existing fences would enhance wilderness values on approximately 446 acres and reduce overall acres affected by unnatural features in the WSA to 8.8 percent.

Proposed Action

There would be some ecological benefits associated with better distribution of water and livestock (cattle and horses) throughout the allotment. Health and vigor of key forage species and other upland grasses would be maintained or in some areas improved by moderate grazing in previously ungrazed areas after additional water is available. The proposed spring developments and the riparian exclosure would help protect riparian areas by eliminating hoof-shear so riparian vegetation can reach potential, PFC can be achieved and habitat can be improved for riparian-associated wildlife species. Additional information about these benefits is described in other Resource Sections of this chapter for this alternative.

Types of effects described as common to all alternatives associated with development of wells, new reservoirs, reservoir and spring developments, troughs, pipelines, fences, and realignment of a way would occur in South Fork Donner und Blitzen River WSA under this alternative. Below is a table summarizing the estimated area that naturalness would be influenced by developments proposed under this alternative.

Table 14: Estimate of Acres in South Fork Donner und Blitzen River WSA affected by Proposed Action

Type of Action	Quantity	Acres Affected per Development	Total Acres Affected	Percent of WSA
Well[a]	1	0.001	0.001	0.00
Concrete Troughs	1	56	56	0.20
Metal Troughs[b]	8	3*56	168	0.60
New Reservoirs	8 or 9	31	248 or 279	0.89 or 1
Reservoir Rehabilitation	9	0.5	4.5	0.02
Reservoir Decommissioning	5	0.5	2.5	0.01
Spring Developments	2	60	120	0.43
Well Pipeline (miles)	2.8 or 1.07	1	2.8 or 1.07	0.01 or less
Riparian Fence Exclosure (miles)	0.57	97	55	0.20
Way Realignment	60 feet	.03	1.8	0.01
		TOTALS	689 or 718	2.5 or 2.6

[a]This well would be drilled adjacent to an existing reservoir and only used with a temporary generator and pipe during severe drought to provide emergency water to wild horses.
[b]Metal troughs would be located together in two sets of two and one set of four in three (one on private land) different locations for the rehabilitation of springs.

Effects associated with the Proposed Action would be similar to those described for Alternative B, except no tanks would be installed and fewer wells and pipeline would be installed. In addition, there would be only two developments (Spring Developments S1 and S3 plus the troughs) near known dispersed campsites. Under the Proposed Action with the option of the longer pipeline, developments would influence naturalness on approximately 689 acres (2.5 percent). Overall, 11.9 percent (3,325 acres) of the WSA would be influenced by existing and proposed unnatural features. Under the Proposed Action with the option of the shorter pipeline and the additional reservoir, developments would influence naturalness on approximately 718 acres (2.6 percent).

Overall, 12 percent (3,354 acres) of the WSA would be influenced by existing and proposed unnatural features. Most of these acres would still be dominated with shrubs and some grasses and have a generally natural appearance. If removal of existing reservoirs occurs, wilderness values would be enhanced once vegetation occurs on approximately 75 acres and reduce overall acres affected by unnatural features by 0.27 percent. Most of these acres would still be dominated with shrubs and some grasses and have a generally natural appearance. The proposed developments are not expected to be substantially noticeable given that they are dispersed within the WSA, the limited acres affected and the fact that most of these acres will still have a generally natural appearance. Overall effects to naturalness and solitude are expected to be negligible and no reduction in the availability or quality of recreation in the WSA as a whole is expected.

Home Creek WSA

No Action Alternative

No changes to naturalness associated with the imprints of humans, solitude, primitive and unconfined recreation in this WSA are expected. Ecological benefits associated with proposed water developments would not occur. Effects to wildlife and wild horses as a special feature are addressed in their respective sections of this chapter.

Alternative B - Maximum Water Distribution Alternative

There would be some ecological benefits associated with better distribution of water and livestock (cattle and horses) throughout the allotment. Those benefits are described in other resource sections of this chapter for this alternative.

Types of effects described for reservoir rehabilitation and decommissioning of reservoirs would occur in Home Creek WSA under this alternative. Below is a table summarizing the area that naturalness would be influenced by the actions proposed under this alternative.

Table 15: Estimate of Acres in Home Creek WSA affected by Alternative B

Type of Action	Quantity	Acres Affected per Development	Total Acres Affected	Percent of WSA
Reservoir Rehabilitation	2	0.5	1.0	0.09
Reservoir Decommissioning	3	0.5	1.5	0.13
		TOTALS	2.5	0.21

Proposed reservoir rehabilitation and decommissioning within Home Creek WSA would affect naturalness in approximately 2.5 acres (0.21 percent) of the WSA. While there would be some disturbance to soil and vegetation associated with reservoir decommissioning, overall wilderness values would be enhanced. After decommissioning has occurred only two reservoirs would be present and maintained rather than five. Because these reservoirs are located along an existing road, cross-country travel with equipment is expected to be minimal. If decommissioning of reservoirs occurs, the area influenced by unnatural features in this WSA would be reduced following revegetation approximately 120 acres to 10.3 percent.

No changes to the types (i.e., hiking, horseback riding, hunting, etc.) of recreation opportunities available in Home Creek WSA are expected. If encounters with visitors occur during the rehabilitation or decommissioning of reservoirs, there would be some temporary and short-term (days) loss of solitude and disturbance to recreational activities in the immediate area. None of the reservoirs are located near known dispersed campsites.

Alternative C - Along Roads and Ways Alternative

Types of effects described as common to all alternatives for pipelines would occur in Home Creek WSA under this alternative. (The well would be drilled in Donner und Blitzen WSA and effects are described above.) Below is a table summarizing the area that naturalness would be influenced by the actions proposed under this alternative.

Table 16: Estimate of Acres in Home Creek WSA affected by Alternative C

Type of Action	Quantity	Acres Affected per Development	Total Acres Affected	Percent of WSA
Well Pipeline	0.91	1	0.91	0.08
		TOTALS	0.91	0.08

The proposed pipeline within Home Creek WSA would affect naturalness in approximately 1-acre (0.08 percent) of the WSA. Following rehabilitation, most of this area would still have shrubs and some grasses present. Given the pipeline would not be observable once rehabilitation has occurred and it would utilize an existing reservoir rather than a new trough, little visual changes to naturalness are expected and the WSA would continue to appear natural as a whole. Overall the area influenced by the existing and proposed unnatural developments in Home Creek WSA would remain at 14 percent.

No changes to the types (i.e., hiking, horseback riding, hunting, etc.) of recreation opportunities available in Home Creek WSA are expected. If encounters with visitors occur during the installation of the proposed developments, there would be some temporary and short-term (days) loss of solitude and disturbance to recreational activities in the immediate area. The work would not occur near any areas of prolonged visitor use such as campsites. An existing reservoir would be used, so no changes to the presence of livestock would be expected.

Effects to wilderness values associated with monitoring and maintenance of the water developments are not expected because motorized vehicles would only be used on the existing way adjacent to the pipeline. Effects associated with replacement of any developments would be infrequent (10 to 20 years) and would be the same as described for construction of the development.

Alternative D - Edge Developments Alternative

Same as No Action Alternative.

Proposed Action

Same as Alternative B.

Noncritical Elements

A. Vegetation, Soils, and Biological Soil Crusts

Affected Environment

Current discussion and analysis of potential effects to soils, vegetation, and biological crusts are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated by reference: Sections 3.4, Page 3-7, 4.4, Page 4-21, 3.5.4, Page 3-14, and 4.5.5, Page 4-52.

These resources are described and analyzed together because of the influence they have on one another, and the manner in which they act together to support ecological and hydrologic site processes. Five general soil types have been identified within the Project Area. Table 17 contains a description of each type by acre within the Project Area.

Soils

Table 17. Soil Types in the Project Area
(Burns District Geographic Information System Database)

Soil Types	Description	Acres
Spangenburg-Enko-Catlow	Very deep, somewhat poorly-drained, hydric soils of basins and playa. Low potential for water erosion, moderate potential for wind erosion.	423
Reallis-Vergas-Lawen	Well-drained, very deep soils formed on high lake terraces and fan terraces. Generally low potential for erosion from wind or water.	2,249
Raz-Brace-Anawalt	Well-drained, shallow or moderately deep soils formed in residuum and colluvium on tablelands. Generally low potential for erosion from wind or water.	11,446
Ninemile-Westbutte-Carryback	Well-drained, shallow and moderately deep soils formed in residuum and colluvium on tablelands. Generally low potential for erosion from water, moderate potential from wind erosion.	76,767
TOTAL ACRES		**90,885**

Approximately 88,213 acres (97 percent) of the Project Area is composed of claypan soils in the Ninemile-Westbutte-Carryback and Raz-Brace-Anawalt general soil series. The primary characteristic of these soils is a dense, compact, slowly permeable layer in the subsoil having much higher clay content than the overlying material, from which it is separated by a sharply defined boundary. Claypans are usually hard when dry, and plastic and sticky when wet. These soils limit or slow the downward movement of water. Within the Project Area, mountain big sagebrush and low sagebrush are dominant shrubs on claypan soils, usually with Sandberg's bluegrass, bluebunch wheatgrass and Idaho fescue, and forb diversity and density can be quite high. Western juniper has expanded into much of this plant community.

Approximately 3,317 acres (4 percent) of the Project Area in the Ninemile-Westbutte-Carryback soil series is composed of rock outcrops on mountainsides, hillsides, and escarpments with slopes steeper than 30 percent. These areas support communities primarily composed of mountain big sagebrush, bluebunch wheatgrass, Thurber's needlegrass, and Idaho fescue. Local stands of bitterbrush are also present. These areas are often less accessible (or inaccessible) to livestock.

Loamy soils in the Reallis-Vergas-Lawen and Raz-Brace-Anawalt series comprise 2,249 acres (2 percent) of the allotment. These soils on slopes generally less than 25 percent support vegetation communities including Wyoming big sagebrush, low sagebrush, needlegrass species, and bluebunch wheatgrass.

Three, small areas encompassing 423 acres (< 1 percent) consist of seasonal flood plains and dry basins and playas in the Spangenburg-Enko-Catlow soil series. These areas typically support communities consisting of silver sagebrush, basin wildrye, and Nevada bluegrass.

Expansion Western Juniper

Western juniper occurs in a band between 4,500 and 7,000 feet on Steens Mountain, over 90 percent of which is comprised of trees established after the 1860s (Miller et al. 2008, p. 13). Over half of the area of the present juniper forest in eastern Oregon became established between 1850 and 1900. Once established, juniper forest increased in density with the greatest increase occurring between 1879 and 1918 (Gedney et al. 1999). This rapid increase in juniper stand establishment occurred during a period of favorable climatic conditions and reduced fire frequency and intensity. Larger trees are sometimes killed by fire, but most survive. The crowns of larger juniper trees often limit grass and other vegetative growth beneath them, thereby, reducing the fuel necessary to carry fire into the tree, fireproofing the crown and stem (Agee 1993).

In the absence of pre-settlement fire return intervals, western juniper has functioned as an invasive species over much of the Project Area, generally increasing in frequency to the greatest degree on north slopes and at higher elevations (Johnson and Miller 2006), encroaching into more productive mountain big sagebrush and low sagebrush plant communities. Expansion juniper intercepts precipitation and utilizes soil moisture well beyond its own crown area that would otherwise be available to competing native vegetation (Bates et al. 2000). Juniper has assumed control of ecological site processes (soil hydrologic cycle and nutrient transfer through the soil profile) within the Project Area. Loss of shrubs, grasses, and forbs has occurred in some areas, and likely to lead to loss of soil surface stability in some areas over the next few decades, although this has not been observed at this time.

Up to 10 percent of juniper stands is comprised of older trees (over 100 years) inhabiting rocky ridgetops or shallow soil areas where fires did not burn very often. Tree age may exceed 1,000 years in these stands, and at these sites the rocky surface controls soil infiltration and maintains soil surface stability.

Fire History

Approximately 5,595 acres within Steens 2 and Home Creek 3 Pastures have burned as a result of wildfires since 1981, 4,112 acres of which burned since 1997. An additional 7,581 acres were treated as part of prescribed burn projects between 1997 and 2001. Approximately 790 acres have been subject to both wildfire and prescribed fire since 1981. Effects to vegetation resulting from fire, either prescribed or natural are obvious, and can be compared easily at the edges of these disturbance areas. In addition to the obvious dead juniper trees, these burned areas typically support taller more vigorous bunchgrass plants and few, if any, obvious young juniper trees, and vigorous shrubs that have little or no visible decadence.

Key Forage Species Utilization and Vegetation Trend

The following table describes actual utilization levels by pasture for South Steens Allotment. The CMPA management direction for target utilization of native forage plants (RMP Grazing Management, p. 53) by all ungulates is 50 percent (moderate) at the end of the growing season. Utilization data are generally collected along roads for easy access and away from water sources in order to assess conditions not biased toward extreme conditions within pastures. Utilization immediately around water sources may be much higher than the pasture average, and much lower (or no use may occur) in rough or steep terrain or areas more than 2 miles from water sources. Utilization data in most years indicate forage (below 50 percent utilization) is generally available in all pastures during most years, reflecting the early livestock removal that has occurred.

Table 18: Actual Utilization* of Key Forage Species for South Steens Allotment (2003-2008)

Pasture Name				
Hollywood	**Tombstone**	**Steens**	**Home Creek**	
Utilization %	**Utilization %**	**Utilization %**	**Utilization %**	**Year**
63	29	40	12	2003
65	33	23	23	**2004
15	36	36	Rest	2005
No Data	No Data	16	No Data	***2006
47	44	26	51	2007
40	35	28	17	2008

* No Use = 0-5%, Slight = 6-20%, Light = 21-40%, Moderate = 41-60%, Heavy = 61-80%, Severe = 81-100%.

** Horses were gathered in fall of 2004 from South Steens HMA.

*** Grandad Fire occurred in 2006 and no utilization data was collected due to staff shortage except in Steens Pasture.

Since watering sites are not well-distributed, especially in Steens Pasture 2, visual effects to vegetation from grazing are more obvious in these areas and not easily observed in portions of the Project Area away from water, especially after grazing has occurred in any particular season. Bunchgrass vigor is declining or likely to decline in locally heavily-grazed areas due to utilization in excess of 50 percent over successive grazing seasons. Conversely, bunchgrass vigor may also decline in lightly-grazed or ungrazed areas due to plant decadence (growth may be limited by accumulation of old and dead tissue, Oesterheld and McNaughton 1991), especially where no fire or other event has occurred which would remove accumulations of dead material. Both conditions have been observed in the Project Area.

Vigor of bunchgrass plants may be maintained, or even improved by some disturbance that removes buildup of previous years' growth, either infrequently through large sudden events as wildfire, which may kill the plant, or more frequently with less intensity as with livestock grazing. The effect of defoliation to bunchgrasses before and after prescribed and wildfire can be directly observed and is obvious within the allotment. The effect on plant vigor from livestock grazing is more subtle, and involves interplay between a plant's ability to reestablish photosynthetic activity and its ability to retain a competitive position in the plant community (Oesterheld and McNaughton 1991). Although assessments have found the allotment meets rangeland health standards for upland watershed health, local areas of declining bunchgrass health have been observed, generally in areas affected by juniper expansion and further from water sources.

Long-term trend data were collected at six sites in 2004. Ground cover averaged 50 percent or better (vegetative cover) in all but one site and that was due to excessive horse use 2 months prior to gathering. Long-term trend was stable to upward in all sites in all pastures. Soil Surface Factors (stability) was stable in all sites in all pastures except one in Steens Pasture, which was due to juniper encroachment into the site.

The BSCs are specialized organisms that occupy nutrient-poor zones between vegetation clumps in many types of upland, arid vegetation communities and function as living mulch by retaining soil moisture, discouraging annual weed growth, reducing wind and water erosion, fixing atmospheric nitrogen, and contributing organic material to soil fertility (U.S.D.I. TR 1730-2, 2001, p. 2). The BSCs include such organisms as mosses, lichens, green algae, microfungi, cyanobacteria, and other bacteria. Presence and general health of BSCs are reflected in a site's soil surface stability and (U.S.D.I. TR 1730-2, 2001, p. 67) biological productivity, which in turn is a reflection of BSC contribution to ecological processes supporting these elements.

Potential types, cover area, and species composition of BSCs are influenced by a number of physical and biotic site-specific factors. Species composition is sensitive to subtle changes in soil chemistry (Ponzetti and McCune 2001), especially with respect to lichen species. Cover area by BSCs is generally greater at drier sites at lower elevations, especially salt desert shrub communities not subjected to periodic seasonal flooding and Wyoming big sagebrush sites (3 percent of the Project Area). Potential cover by BSCs is generally inhibited by wetter conditions that support vigorous cover by vascular plants in higher elevation. Habitat factors limiting potential cover by BSCs include juniper tree density, presence of a gravelly surface, and cover by vascular plants (grasses and forbs).

Within the Project Area, dense vascular vegetation (especially mountain big sagebrush), accumulating plant litter, and high herbaceous plant density are the primary limitations to potential BSC cover (ICBEMP Supplemental Draft EIS, Vol. 2, p. 13a-1). The BSC cover is likely to be highest on soils with fine-textured silt, silt loam and clay surface layers where low sagebrush grows. Rangeland health assessments found short mosses to be the most common BSC type within the allotment. Foliose lichens are present on north slopes with deeper soils, usually in association with mountain big sagebrush communities. Presence of cyanobacteria would naturally be rare, due to allotment soil and vegetation types, and may or may not be present only in playa habitat (< 1 percent of the total allotment area).

Grazing (livestock and horse) has occurred in the Project Area for at least 100 years. Effects to soil compaction and BSCs from livestock grazing within the Project Area are generally greatest around water and mineral supplement sites and along frequent travel corridors, and lowest on slopes steeper than 30 percent, areas with low forage quality or quantity, very rocky sites, and areas farthest from water and supplements. Well over 90 percent of the Project Area are in slopes 0 to 12 percent and, therefore, easily accessible to livestock.

Environmental Consequences

Effects Common to All Alternatives

None of the Action Alternatives increase authorized number of AUMs for livestock grazing, nor does any of the alternatives change the authorized season of use as prescribed in the Proposed AMP. Since the alternatives change only distribution of soil disturbance from hoof impact and pattern of vegetative utilization from grazing, the net effect to soil surface stability, health and vigor of vegetative communities and extent and vigor of BSCs within the Project Area as a whole would likely be the same for any alternative, including No Action. The sum of differences in environmental consequences between alternatives is characterized by the extent, degree and distribution of *localized* impacts. The alternatives represent a range of impacts from greater extent and degree distributed within a smaller portion of the Project Area, to lesser extent and degree of impacts distributed over a larger portion.

Other environmental effects to soil and vegetation differ in the extent of soil and vegetative disturbance required to access and construct proposed developments and maintenance of developments. To the extent these actions would occur once with infrequent return for maintenance over decades, effects are expected to be temporary, disappearing within a few years to a decade at most.

Since virtually all of the Project Area is within an elevation band that is subject to expansion juniper, soil surface stability, health and vigor of vegetative communities and extent and vigor of BSCs is likely to decline over time (excluding areas that maintain old-growth juniper stands). A separate analysis (North Steens Project FEIS) was prepared and management of juniper is planned for the Project Area regardless of the alternative chosen for this project. Since affects to these three interrelated resources (soil stability, BSCs, and vegetation) would be essentially neutral from this project, their disposition would be influenced to a much greater degree by management of expansion juniper than by any alternative considered for this project, including No Action.

Alternative A - No Action

The existing condition and trend of vegetation and BSCs and their contribution to soil surface stability would be maintained. Livestock distribution would continue to be driven by availability of water as currently described, which would maintain the current uneven utilization of bunchgrasses and the pattern of effects to soil surface stability and BSCs within the Project Area. Animals would continue to have access to 24 reliable and 45 unreliable or variably reliable reservoirs in addition to existing springs, troughs and dugouts. Effects to BSCs in any given year would generally be greatest around available water sources used earliest, when clay soils are wet. Once clay soils have dried, the timing of which is highly variable from year-to-year, hoof shear from summer and fall livestock grazing would have less influence on BSCs (U.S.D.I. TR 1730-2, 2001, p. 1). Growth and expansion of juniper would continue to be the primary influence on vegetation and BSCs and their contribution to soil surface stability until planned treatments are implemented. Temporary effects (lasting less than one decade, but generally 1 to 3 years) to soils and BSCs would continue to occur infrequently as part of livestock grazing facilities maintenance.

Effects Common to All Action Alternatives

All action alternatives propose to select from a list of management actions (or "tools") to achieve project objectives. Alternatives differ only in the number, location, and arrangement of tools used in combination. Potential environmental effects from individual management actions are local in nature, but the cumulative effect of each alternative would be a change in distribution of livestock (including horses) within the Project Area. Therefore, an analysis of potential effects begins with a general discussion of anticipated effects of employing tools individually. This supports a summary of effects of using these tools in concert to achieve project objectives.

Since implementation of any selected alternative would depend upon funding, it is likely the full cumulative effect (on distribution of animals) of implementing the entire slate of proposed actions in the alternative may take one or more decades to be fully realized, with incremental changes as each action is completed.

Table 19: Number of Water Sources Available to Grazing Animals under each Alternative †

Water Sources	Alt A.	Alt. B.	Alt. C.	Alt. D.
Existing reservoir (reliable)	17	17	17	17
New reservoir	0	17	0	0
Rehabilitated (existing) reservoir	0	15	0	0
Trough	2	17	19	10
Water gap	1	4	1	4
Dugout	2	1	2	1
Spring	3	2	3	3
Total # reliable water sources	**25**	**73**	**42**	**35**
Existing reservoir (not reliable)	29	11	29	29
Existing reservoir (variable reliability)	16	11	16	16
Total # unreliable/variable water sources	**45**	**22**	**45**	**45**

† *Livestock would have access to Home Creek in Home Creek Pasture 3 under all alternatives.*

Fencing – Since blading, grading, and brushing would not occur to facilitate construction of new fence in WSA and Wilderness, visual effects to vegetation would be slight and temporary, and would likely be unnoticeable 1 to 2 years after construction. Some soil surface disturbance and compaction would occur adjacent to fencelines during construction, but frost action would likely return soils to previous conditions after one winter. Vegetation would be crushed or damaged to a greater extent (6-foot width of a vehicle, or .73-acre/linear mile), where vehicles are used to deliver fence material, or to a lesser extent if pack animals are used. These effects would have little or no effect on vigor of vegetation, and would be undetectable after one or two growing seasons.

Effects to soils and BSCs from one-time annual passage along fencelines to check maintenance needs would not be measurable.

New and Rehabilitated Existing Reservoirs – Established upland soil profiles would be removed or turned-over, and upland vegetation would be removed and prevented from becoming reestablished (by saturated soils) during construction at new reservoir sites. Compaction and disturbance to soils, BSCs, and vegetation would occur along access routes for equipment, during both construction and infrequent maintenance, but these effects would be temporary in nature, visible for 1 to 3 years. Annual frost action would restore soil bulk density on access routes within one to two winters.

At each reservoir, zones of locally heavier annual soil disturbance and compaction would become established by livestock and horse use, diminishing with distance (depending on terrain and available forage nearby). Where reservoirs are constructed at confined sites with steep banks, soil disturbance is likely to be limited to the inflow periphery and the berm/dam. At more open sites, soil impacts are likely to be more evenly distributed, or may be locally heavier where shade is available nearby. Degree and extent of disturbance at any particular site would vary by alternative, and would be determined primarily by the number and distribution of water locations available to grazing animals within the Project Area.

Due to focused soil compaction resulting from annual hoof impacts, BSCs may be completely eliminated from a band of soil surface surrounding reservoirs. Width and configuration of this band depends on topography and proximity to shade during warmer months. However, effects to soil surface stability are offset by rocks, vegetative litter, animal manure, and soil physical properties, which generally have low to moderate potential for erosion within the Project Area. Any surface erosion that does occur is mostly, if not entirely, captured by the reservoir itself, since the impact area is primarily sloped toward the catchment.

Decommissioned Reservoirs – At sites where upland vegetation is already well-established and soil surface is stable, natural vegetation and soil-building processes would be allowed to continue with minimal intervention. These sites would likely restore presence of BSCs in years to decades, depending on the length of time during which they have been unsaturated. Depending on slope, aspect and type of vegetation present, some sites may already have established some BSC species (likely short mosses).

At sites where a greater degree of earth moving occurs to recontour the site, seeding of grass species would provide initial protection of bare soil surfaces, augmented by naturally-seeded shrubs as the sites mature. It is likely rehabilitated sites would take a decade or more to become indistinguishable from surroundings.

Wells – Soil would be compacted and vegetation crushed or damaged in an area approximately 100 feet in diameter (.02-acre). Soil compaction from presence of drilling equipment and materials would be temporary, requiring 1 to 2 years of frost action to recover, and damage to vegetation from drilling would be temporary, lasting 1 to 3 years.

Pipelines – Pipeline installation would turn-over soil profiles in an area that would equate to approximately .25-acre per linear mile, and damage vegetation in an overlapping area equating to approximately 1-acre per linear mile. Direct seeding and rocks would provide initial protection of soil surfaces, augmented by establishment of shrubs and other native vegetation naturally over the following decade.

Troughs – Bottomless troughs would replace roughly 710 sq. ft. of soil surface with concrete, upon which the trough would be placed and sealed. At each trough, zones of locally heavier annual soil disturbance and compaction would become established by livestock and horse use, diminishing with distance (depending on terrain and available forage nearby). Since bottomless troughs are usually placed on relatively flat terrain, it is likely this area would be somewhat uniform. Installation of metal troughs would disturb vegetation and compact soil over an area approximately 10 feet by 20 feet and completely cover an area 4 feet by 12 feet under the trough.

As with reservoirs, focused soil compaction resulting from annual hoof impacts may completely prevent recovery or reestablishment of BSCs on a band of soil surface surrounding troughs, with the same dependent characteristics.

Storage Tanks – The process and equipment required to bury a 10,000-gallon water storage tank would turn over soil profiles over an area approximately 12 feet wide by 36 feet long, or .01-acre per site. Direct seeding and rocks would provide initial protection of soil surfaces, augmented by establishment of shrubs and other native vegetation naturally over the following decade. Should the tank need to be replaced, the process would occur again in 20 or more years.

Dugout Rehabilitation – Disturbance to soil and vegetation at the one proposed site would be within the footprint of the existing development.

Spring Development/Rehabilitation – Effects to upland soils and vegetation are addressed previously as those resulting from pipeline burial, trough placement, and fencing. Effects to riparian and aquatic resources are discussed in the Wetlands, Riparian Areas and Water Quality Section of this EA.

Route Realignment – Soil compaction resulting from vehicle passage to create the alternate route would be offset as soils on the original route recover through frost action and other site processes. Over the following decade, as the old route becomes rehabilitated through nonuse, effects become a one-for-one exchange, with no net gain of heavily compacted vehicle tracks.

Water Gaps – Effects are discussed in the Wetlands, Riparian Areas and Water Quality Section of this EA.

Table 20: Changes to Soils and Vegetation over the Long and Short Term

Numbers in parentheses are developments on private land in addition to those on public land.	***Alt. B.***		***Alt C.***		***Alt. D***		**Proposed**	
	#	*Acres*[†]	*#*	*Acres*	*#*	*Acres*	*#*	*Acres*
Long-term (1 or more decades) changes to soils and vegetation								
Upland soil cover converted to reservoirs	17	*8.5*	0	*0*	0	*0*	12 or 13	*6.5*
Decommissioned reservoirs to upland soil cover	8	*-4*	0	*0*	0	*0*	9	*-4.5*
Old reservoirs rehabilitated to new reservoirs	14	*7*	0	*0*	0	*0*	14	*7*
Surface covered by new metal troughs			5	*.005*	3	*.003*	4 (4)	*.004 (.004)*
Surface covered by new bottomless troughs	17	*.28*	13 (1)	*0.21 (0.02)*	5 (3)	*0.08 (0.05)*	3	*.005*
Total (net increase)		***11.78***		***.215 (.02)***		***.083 (.05)***		***9.00 (.004)***
% of BLM land in Project Area with Long-Term change to soil and vegetation = .023								
Short-term (less than 1 decade) changes to soils and vegetation								
Buried pipeline (max. miles)	14.4	*14.4*	19.3	*19.3*	3.9 (1.3)	*3.9 (1.3)*	5	*5*
Buried storage tanks	5 (2)	*.05 (.02)*	6 (3)	*.06 (.03)*	2 (5)	*.2 (.5)*	2	*.2*
New wells	8 (2)	*.16 (.04)*	9 (2)	*.18 (.04)*	3 (6)	*.06 (.12)*	2 (1)	*.02* (.01)*
Total (net increase)		***14.61 (.06)***		***19.54 (.07)***		***3.98 (1.47)***		***5.22***
Total long and short-term change by alternative		***26.39 (.06)***		***19.76 (.07)***		***4.06 (1.52)***		***14.22 (.014)***
% of BLM land within the allotment changed		***.029***		***.022***		***.005***		***.016***

**One well on BLM is within an existing reservoir, so no change to existing vegetation would occur.*

Alternative B - Maximum Water Distribution Alternative

Direct long-term (one or more decades) and short-term (less than one decade) impacts to vegetation, soils and BSCs from all ground-disturbing activities associated with implementing this alternative would affect approximately 0.029 percent of the Project Area (Table 20). The cumulative effect of the alternative, when all proposed projects have been completed, would be to distribute annual disturbance to BSCs, soils and vegetation from livestock and horse grazing over the largest portion of the Project Area.

Animals would have access to 68 reliable and 22 unreliable or variably reliable water locations. Over the next decade, as livestock access portions of the Project Area where bunchgrasses have become decadent, trampling and light to moderate (Table 18 for a definition of utilization) grazing may begin to improve vigor of plants.

Alternative C - Along Roads and Ways Alternative

Direct short-term impacts to vegetation, soils, and BSCs from reservoir construction and trough placement affect approximately .022 percent of the Project Area. Since no new reservoirs would be constructed, direct long-term effects would be even less (Table 20). The cumulative effect of the alternative, when all proposed projects have been completed, would be to increase distribution of annual disturbance to BSCs, soils, and vegetation from livestock and horse grazing along existing roads and ways. Animals would have access to 40 reliable and 45 unreliable or variably reliable water locations. Since water sources would be fairly evenly split between reliable sources and unreliable sources from year-to-year, distribution of grazing animals and associated impacts to soil and vegetation are less likely to be consistent between years. Localized impacts to soils and BSCs from grazing animal use and livestock trails at and around any single water source may be relatively light in wet years when unreliable sources are available and relatively heavier in drier years when only reliable sources are available. Over the next decade, as livestock access portions of the Project Area where bunchgrasses have become decadent, trampling and light to moderate grazing may begin to improve vigor of plants. However, a larger proportion of the Project Area (greater than 1 to 2 miles away from a water source) would still be lightly used or unused, especially in dry years.

Alternative D - Edge Developments Alternative

Direct short-term impacts to vegetation, soils and BSCs from reservoir construction and trough placement would affect approximately .0005 percent of the Project Area. The cumulative effect of the alternative, when all proposed projects have been completed, would be to increase distribution of annual disturbance from livestock and horse grazing toward the edges of pastures and private land inholdings. Animals would have access to 32 reliable and 45 unreliable or variably reliable water locations. Since new water sources would be mostly at or near pasture boundaries, grazing in pasture interiors, especially in Steens Pasture 2 and Home Creek Pasture 3, would probably not change much, if at all.

Grazing in the Project Area and associated impacts to soil and vegetation are less likely to be consistent between years. Localized impacts to soils and BSCs from grazing and livestock trails at and around any single water source may be light in wet years when unreliable sources are available and heavier in drier years when only reliable sources are available. Over the next decade, as livestock access portions of the Project Area where bunchgrasses have become decadent, trampling and light to moderate grazing may begin to improve vigor of plants. However, in comparison to other action alternatives, a larger proportion of the Project Area (greater than 1 to 2 miles away from a water source) may still be lightly used or unused, especially in dry years.

Proposed Action

Grazing in the Project Area and associated impacts to soil and vegetation are likely to be consistent between years. Direct short-term impacts to vegetation, soils, and BSCs from reservoir construction and trough placement would affect approximately .016 percent of the Project Area. The cumulative effect of the alternative, when all proposed projects have been completed, would be to increase distribution of annual disturbance from livestock and horse grazing in the interior of Tombstone 1, Steens 2, and Home Creek 3 Pastures in comparison to current conditions. No measurable change would occur to livestock and wild horse distribution in Hollywood Pasture 4. Animals would have access to 41 reliable and 36 unreliable or variably reliable water locations.

Over the next decade, as livestock access portions of the Project Area where water was unavailable or not reliable prior to implementation, vigor of key forage (bunchgrass) species subject to light to moderate grazing within utilization guidelines may be maintain or improved.

B. Grazing Management

Affected Environment

Current discussion and analysis of potential effects on grazing management are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.15 and 4.15.

In 1995 the South Steens Allotment (#6002) consisted of 10 pastures totaling 332,400 private and public acres. Livestock use was permitted for 21,197 AUMs on public land and followed an adaptive rotational grazing system. In 2000, following the Roaring Springs Ranch, Inc., legislated land exchange outlined in the Steens Act, AUMs were reduced to 19,133. During the Steens Act 3-year implementation period (2000-2002) AUMs were further reduced to the current grazing permit for 9,577 AUMs within four pastures (Hollywood, Steens, Tombstone, and Home Creek) totaling 94,565 private and public acres. The permittee has not used the allotted 9,577 AUMs since the legislated land exchange was completed. See Table 21 for a history of actual (AUMs) use.

Table 21: Actual Use for South Steens Allotment (2002-2007)

Year	AUMs Used
2000-2002	Transition Phase
2003	4,946
2004	4,824
2005	3,107
2006	2,989
2007	5,930

An adaptive rotational grazing system designed for the allotment in its previous configuration is still in effect. Under this system, in two consecutive years livestock grazing starts at the north end of the allotment in May, after which cattle move south through Tombstone Pasture, and are removed from Steens Pasture on or before October 1. For the following 2 years, cattle start on the south end of the allotment in Home Creek Pasture, then move north through Steens and Tombstone Pastures, and are finally removed from Hollywood Pasture in October. This grazing system was designed to provide rest during the growing season for key forage species for two consecutive growing seasons on a 2-year cycle. Since livestock no longer have access to Donner und Blitzen River as before and the Fish Creek/Big Indian Allotment is now within the No Livestock Grazing Area, this grazing system has not been consistently implemented as planned due to lack of reliable, late-season water. Only 17 of 62 waterholes within the allotment are considered reliable for late-season water in their current condition. Cattle and horses also have access to three dugouts (constructed over springs) of variable year-to-year reliability, two troughs and two undeveloped spring complexes which typically become muddy (water quality becomes poor) due to horse and cattle use.

Under the previous allotment configuration, cattle were trailed from lower elevations (where they wintered) in spring through what is now South Steens Allotment and summered in the higher elevations of Steens Mountain. In this high-elevation area, livestock had access to reliable, late-season water in the form of perennial streams, springs, wells, waterholes, reservoirs and dugouts as well as Donner und Blitzen River. Pastures that now compose South Steens Allotment only needed to provide enough water to sustain livestock grazing in spring and during trailing in the fall (a couple of days to a couple of weeks). Even on dry years, water was available for livestock, wild horses, and wildlife at Donner und Blitzen River and at some of the more reliable springs and reservoirs.

However, since implementation of the No Livestock Grazing Area, which fenced-off the Donner und Blitzen River corridor and reduced available forage, livestock have had to summer in pastures previously spring-grazed. This has effectively increased demand on existing water sources such that in dry years, many unreliable or variable water sources dry-up, forcing stock to congregate on fewer reliable, late-season water sources. This concentration of livestock has increased utilization of upland and riparian vegetation around water sources by cattle and horses, often to the point of heavy or severe utilization (61 to 100 percent) as is the case with Three Springs, Long Dam, Tombstone, and Kundert Reservoir (Section E. Wetlands/Riparian Areas and Water Quality and Section A. Vegetation, Soils and Biological Soil Crusts).

Environmental Consequences

Alternative A - No Action Alternative

The No Action Alternative is a continuation of the AMP under a new Term Grazing Permit without availability of new reliable, late-season water sources for use by authorized livestock and wild horses. The permittee would continue to be authorized for 9,577 AUMs from May to October using the current rotation. However, full use of authorized AUMs would continue to be unreliable, and would require the ranch to bring livestock home early on dry years.

Since Rangeland Health Standards 2 (Watershed Function - Riparian/Wetland Areas) and Rangeland Health Standard 4 (Water Quality) are not being achieved, riparian protection measures would need to be proposed and implemented so that "significant progress toward" properly functioning riparian areas can be made, and authorized grazing could continue.

Affects Common to All Action Alternatives

Water developments are an effective way to encourage uniform distribution of livestock; cattle with off-stream water will range further from water in search of forage than those cattle without off-stream water (T. Delcurto et al. 2005, D. Ganskopp 2001). Furthermore, C.T. Parsons, et al. (2003) states off-stream water development achieves more uniform cattle distribution. Recommendations on distance between watering points vary with terrain, type of animal, and breed of livestock. The most practical distances (from the standpoint of both livestock and the range) based on topography are 1 to 2 miles in flat to rolling, hilly country. The rule of thumb is no more than 50 cattle per water facility (J. Holechek et al. 2004).

Other research, summarized in Chamberlain and Doverspike (2001) indicates cattle prefer to drink from troughs rather than from stock ponds or streams. His preference is thought to be due to problems with depth perception and behavioral adaptation for predator avoidance (BLM TR 1737-20, p. 25). Off-stream water development improves cattle performance (weight gains) and distribution (M.L. Porath et al. 2002). T. Delcurto et al. (2005) agrees livestock gained more weight with off-stream water than those that did not have off-stream water available. Alternatives that increase availability of clean drinking water would most likely lead to higher weaning weights for calves, higher breed-back percentages for cows and an overall increase in livestock health.

Alternative B - Maximum Water Distribution Alternative

After all new developments and reservoir rehabilitation is completed, livestock would have access to the 17 currently reliable reservoirs, as well as 14 rehabilitated reservoirs and 17 new reservoirs. With the addition of 17 troughs from new wells and pipelines and spring developments (converting muddy poor-quality drinking water to clean drinking water) nearly four times the number of reliable, late-season watering sites would be available for authorized livestock and horses. Availability of reliable water is approximately one-quarter from groundwater sources (wells and springs) and three-quarters from surface runoff sources (reservoirs). The increase in distribution and arrangement of reliable clean watering sites would ensure that water would likely no longer limit full utilization of authorized AUMs, even during years when precipitation is well below average.

Although some portions of the allotment would still be greater than 2 miles from drinking water, the alternative would disperse both cattle and horses more evenly throughout the allotment, decrease demand on any individual water source, and distribute grazing effects to vegetation and soils (especially riparian soils) more evenly within the allotment. This change would be most obvious in Steens Pasture 2, where essentially no water has been available in the interior portion of the pasture, and only two waterholes are considered to be reliable for late-season water. Development of springs would improve water quality at these sites, which would likely improve livestock health and performance factors as described in the Affected Environment.

Under this alternative, it is unlikely that utilization of key species would reach target levels around more numerous watering sites before the authorized season of use has ended. Therefore, Alternative B would achieve the RMP (p. 53) objective to "Manage for a sustained level of livestock grazing while maintaining healthy public land resources."

Alternative C - Along Roads and Ways Alternative

After all new developments and reservoir rehabilitation is completed, livestock would have access to the 17 currently reliable reservoirs, as well as 19 new troughs from new wells and pipelines and spring developments (converting muddy poor-quality drinking water to clean drinking water) and two existing troughs. Approximately twice the number of reliable late-season watering sites would be available for authorized livestock and horses. Since unreliable reservoirs would remain intact (and unmodified), water would be available during some years in these locations as well. Availability of reliable water is slightly more than one-half from groundwater sources (wells and springs) and slightly less than one-half from surface runoff sources (reservoirs).

However, distribution and arrangement of reliable clean watering sites would still restrict distribution of livestock and leave interior portions of Steens Pasture 2 lightly used or completely unused. This alternative may still limit full use of authorized AUMs during years if utilization of key species reaches target levels around watering sites before the authorized season of use has ended.

Therefore, Alternative C may achieve the RMP (p. 53) objective to "Manage for a sustained level of livestock grazing while maintaining healthy public land resources," but some degree of uncertainty would remain with respect to full use of authorized AUMs from year-to-year.

Alternative D - Edge Developments Alternative

After all new developments are completed, livestock would have access to the 17 currently reliable reservoirs, as well as 11 new troughs from new wells and pipelines and spring developments (converting muddy poor-quality drinking water to clean drinking water) and two existing troughs. Less than twice the number of reliable late-season watering sites would be available for authorized livestock and horses, but distribution of clean drinking water would still leave the interior of Steens Pasture 2 mostly unused by livestock. Since unreliable reservoirs would remain intact (and unmodified), water would be available during some years in these locations as well. Availability of reliable water is slightly less than one-half from groundwater sources (wells and springs) and slightly more than one-half from surface runoff sources (reservoirs).

This alternative may still limit full use of authorized AUMs during dry years or if utilization of key species reaches target levels around watering sites before the authorized season of use has ended.

This alternative would concentrate livestock use on regular BLM-administered and private lands. Eight water developments are proposed on regular BLM-administered land. This alternative would have localized effects around the perimeter of the allotment rather than distributing livestock and wild horse utilization throughout the allotment. This alternative also does not provide reliable, late-season water throughout the Project Area, only on the perimeter.

Therefore, Alternative D is unlikely to achieve the RMP (p. 53) objective to "Manage for a sustained level of livestock grazing while maintaining healthy public land resources," due to the degree of uncertainty that would remain with respect to full use of authorized AUMs from year-to-year.

Proposed Action

The effect of implementing the Proposed Action is similar to Alternative B. After all new developments and reservoir rehabilitation are completed, livestock would have access to the 17 currently reliable reservoirs, as well as 14 rehabilitated reservoirs and 12 or 13 new reservoirs. With the addition of 11 troughs from new wells and pipelines and spring developments (converting muddy poor-quality drinking water to clean drinking water) nearly four times the number of reliable late-season watering sites would be available for authorized livestock and horses. Availability of reliable water is approximately one-quarter from groundwater sources (wells and springs) and three-quarters from surface runoff sources (reservoirs). The increase in distribution and arrangement of reliable clean watering sites would ensure that water would likely no longer limit full use of authorized AUMs, even during years when precipitation is well below average.

Although some portions of the allotment would still be greater than 2 miles from drinking water, the alternative would disperse both cattle and horses more evenly throughout the allotment, decrease demand on any individual water source, and distribute grazing effects to vegetation soils (especially riparian soils) more evenly within the allotment. This change would be most obvious in Steens Pasture 2, where essentially no water has been available in the interior portion of the pasture, and only two waterholes are considered to be reliable for late-season water. Development of springs would improve water quality at these sites, which would likely improve livestock health and performance factors as described in the Affected Environment.

C. Recreation

Affected Environment

Current discussion and analysis of potential effects on recreation are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.20 and 4.20.

The primary recreation activities within the Project Area include driving for pleasure, sightseeing, camping, hiking, backpacking, wildlife viewing, hunting, fishing, and photography. Other recreational opportunities include picnicking, biking, rock hounding, snowmobiling, cross-country skiing, and Off-Highway Vehicle use. The main season of use is generally July through November, with highest use occurring during the fall from late September through mid-October during rifle season for deer hunting.

The Steens Loop Road is the main access route into the Project Area and is suitable for passenger-car traffic. Other motorized and mechanized vehicle use is limited to designated roads. Most designated routes leading off the Loop Road in the Project Area are not suitable for passenger cars. As a result, recreational use in areas accessed by these routes is low except during hunting season. Motorized access to the Project Area is generally closed with the Loop Road gated from late November through late May due to snow or wet road conditions.

Environmental Effects

No Action Alternative

No changes to recreation opportunities or activities are expected.

Alternative B - Maximum Water Distribution Alternative

If any encounters with visitors occur during installation of the proposed developments, there would be some temporary and short-term (days) disturbance to recreational activities in the immediate area.

No changes to the types (i.e., hiking, horseback riding, hunting, etc.) of recreation opportunities available in the project are expected. Locating most developments away from any known areas of prolonged visitor use (i.e., campsites) would minimize effects on the quality of the recreational experience. Any visual or noise disturbance associated with developments would be expected to be short term, lasting minutes as visitors pass by foot, horseback or vehicle.

Such disturbance could last longer if developments are located near dispersed campsites. Within the entire Project Area, only eight proposed developments are located near dispersed campsites. Some visitors may be displaced from these campsites either by noise or visual disturbance associated with developments or increased presence of cattle. However, it is expected livestock would be better distributed in smaller numbers over the entire Project Area, rather than concentrated in larger numbers around a few water sources. Overall, evidence of livestock may be reduced at each water source.

Other projects affecting recreation include potential removal of juniper trees as described in the North Steens Project ROD. These treatments are not expected to affect the types of recreation opportunities. Restrictions on recreational use in areas treated would be short term (weeks). To the extent possible, nearby juniper trees that help screen the proposed developments or dispersed campsites would be left intact. There are no other known reasonably foreseeable future actions that would contribute to effects to recreational resources.

Alternative C - Along Roads and Ways Alternative

Types of effects would be the same as Alternative B except six of the proposed developments would be located near dispersed campsites. In addition, there would be 2.98 miles of new fence under this alternative not including that needed for spring exclosures. New fences could potentially restrict travel of visitors in the area immediately surrounding the fence. However, no destinations or unique features were identified that would be affected by the fence. This effect would also be offset by removal of 2.1 miles of fence that currently exists in the same general area.

Alternative D - Edge Developments Alternative

Types of effects would be the same as Alternative B except four of the proposed developments would be located near dispersed campsites. In addition, there would be 5.19 miles of new fence under this alternative not including that needed for spring exclosures. Approximately 2.65 miles of this fence would be located on private land. This fence would restrict the travel of visitors in the area immediately surrounding the fence. However, access to destinations or unique features is not affected. This effect would also be offset by the removal of 4.6 miles of fence that currently exists to the north of the same general area.

Proposed Action

Types of effects would be the same as Alternative B except four of the proposed developments would be located near dispersed campsites and overall there would be fewer developments implemented.

D. Social and Economic Values

Affected Environment

Current discussion and analysis of potential effects on social and economic values are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.12 and 4.12.

Livestock raising and associated feed production industries are major contributors to the economy of Harney County. The highest individual agricultural sales revenue in the county is derived from cattle production, which is inextricably linked to the commodity value of public rangelands. The cattle industry provided $48,782,000 in sales in Harney County in 2007 [Oregon State University (OSU), Extension Service 2007]. Nearly half the county taxes are derived from the ranching community (www.harneycounty.com 2003).

Those engaged in ranching and forage production are an important part of the history, culture and economy of Harney County and make up a strong component of the fabric of the local societies. Livestock grazing operations on public and private lands can have a stabilizing influence on local employment and quality of life (social, health, economic and environmental conditions).

"Quality of life" is very individual when determining what is valued in a lifestyle and what features make up that lifestyle. Lifestyle features can be determined by historical activities of the area, career opportunities and the general cultural features of the geographical area. Quality of life issues are subjective and can be modified over time with exposure to other ways of living.

Recreation is a component of most lifestyles in the area and includes driving for pleasure, camping, backpacking, fishing, hunting, hiking, horseback riding, photography, wildlife viewing and sightseeing for the overall quality of life for residents. In addition to local recreation use, the undeveloped, open spaces in the county are themselves a tourist attraction and contribute a "sense of place" for many. The attachment people feel to a setting, typically through a repeated experience, provides them with this sense of place. Attachments can be spiritual, cultural, aesthetic, economic, social or recreational.

Tourism also contributes revenue to local businesses. The Steens Mountain Area is central to Harney County tourism. A 2007 study found local economic effects associated with recreation visits to Malheur National Wildlife Refuge totaled approximately 4.4 million dollars during 2006 (E. Carver and J Caudill 2007). Hunting and other types of dispersed outdoor recreational experiences also contribute strongly to the local economy on a seasonal basis. Fee hunting and recreation contributed $100,000 alone to Harney County in 2007 (OSU 2007).

Currently the allotment is licensed for 9,577 AUMs at $1.35/AUM. During drought years, the permittee has elected to remove livestock early from the allotment using an average of 4,359 AUMs per year. Approximate revenue generated over the last 5 years is $31,805.

Environmental Consequences to Social and Economic Values

Actions Common to All Alternatives

The North Steens Project is a reasonably foreseeable future project having potential to improve rangeland health and increase forage production for wildlife, wild horses, and livestock, thereby, maintaining or possibly increasing economic opportunities and fostering more desirable recreation opportunities with associated economic benefits to the local economy. Rangeland improvement could also bring about increased sustainability for livestock operations, further improving the local economy and supporting a well-established, local, rural-oriented social fabric.

No Action Alternative

Under the No Action Alternative, the permittee would likely continue to remove cattle early due to drought as no new water developments would be constructed.

Costs associated with development of water features vary from $4,500 to develop a spring to $35,000 to drill a well. No contracts for construction or supplies would be purchased from local vendors under this alternative; therefore, no new revenue would be generated.

The value of livestock in the allotment is expected to remain at current levels as rangeland conditions remain stable. However, potential exists for rangelands to move toward a downward trend if uneven distribution of livestock continues or the permittee grazes all allotted AUMs during drought years in a small portion of the allotment. Poorer range conditions could lead to lower weaning weights or a reduction in overall cattle numbers affecting the economics of the ranch.

The Federal government would continue to collect grazing permit fees from the permittee and this commodity use on public lands would continue to generate revenues for the Federal government and private sector. However, under this alternative the government would not collect fees for all 9,577 AUMs allotted during drought years as the permittee has historically removed cattle early as shown in Table 21 under Grazing Management above.

At the same time, public lands in and around the Project Area would also continue to contribute social amenities such as open space, scenic quality, and recreational opportunities (including hunting, hiking, sightseeing, and camping). These amenities enhance local communities and tourism, though the specific contribution of the Project Area is not known.

No effects to a visitor's experience or opportunities are expected by implementing the No Action Alternative.

Alternative B - Maximum Water Distribution Alternative

Alternative B would allow the permittee to graze all 9,577 allotted AUMs even during drought years and increase the revenue generated to the Federal government. Payment to the Federal government would be $12,928.95/year at the current AUM rate of $1.35/AUM.

This alternative could utilize contracts to construct the proposed water developments. To develop all water sources under this alternative the cost is estimated to be over $900,000 but does not include costs associated with decommissioning or rehabilitating existing reservoirs as BLM would likely do this work under an adaptive management approach.

Implementing the project could provide economic opportunities for local contractors and suppliers. Range improvement projects may be funded under a cost share between the Burns District BLM and the permittee as specified in a cooperative agreement. The permittee has verbally agreed to cost share range improvement projects.

The proposed water developments are designed to better distribute livestock and wild horses which in turn should continue to improve rangeland conditions over time. Improved rangeland conditions could increase forage production for livestock, wild horses, and wildlife. Providing for sustainable grazing management that improves habitat conditions for wildlife would in turn increase economic opportunities and foster more desirable social opportunities such as hunting and wildlife viewing.

However, some visitors may feel additional range improvements would detract from their recreational experience. Four miles of additional fence would add linear features to the landscape and may pose as impediments to hikers along the river. However, no destinations or unique features were identified that would be affected by the fence. There would be some temporary and short-term (days) disturbance to recreational activities in the immediate area during construction; however, no changes to the types of recreation opportunities are expected. Reservoirs would have the most excavation, but they would be located in drainages and would not be expected to be large enough to modify the overall form of those drainages.

Some visitor's perception of solitude and experience may also be affected by presence of livestock; however, it is expected livestock would be better distributed in smaller numbers over the entire area. Overall the area would still offer outstanding opportunities for solitude.

By maintaining a viable ranching operation and improving rangeland conditions in South Steens Allotment, the traditions associated with the ranching communities of Harney County would be maintained and possibly improve.

Alternative C - Along Roads and Ways Alternative

Effects from implementing Alternative C would be similar to Alternative B. Differences include costs associated with contracts would be approximately $888,000 not including rehabilitation of the dugout as BLM would perform the work; additional fencing could potentially restrict the travel of visitors but would be offset by removal of 2.1 miles of existing fence; and distribution of livestock and wild horses would not be realized as well as under Alternative B.

Alternative D - Edge Developments Alternative

Costs associated with implementing Alternative D are estimated to be $661,500. Livestock, wild horse, and wildlife distribution would not be realized as well as under Alternative B. This alternative could mean lower weaning weights for calves, lower breed-back percentages and overall lower livestock health. Approximately 5.19 miles of new fence are proposed under this alternative and would restrict the travel of visitors in the area immediately surrounding the fence. However, no destinations or unique features were identified that would be affected by the fence. This effect would also be offset by the removal of 4.6 miles of existing fence. All other effects would be the same as Alternative B.

Proposed Action

Affects would be similar to Alternative B; however, costs associated with implementing the Proposed Action are estimated to be $562,850. The riparian vegetation around the rehabilitated springs and a wet meadow would be enhanced by fencing. No other fencing is proposed which would impede hikers/hunters mobility.

E. Visual Resources

Affected Environment

Current discussion and analysis of potential effects on visual resources are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.11 and 4.11.

Most of the Project Area (69,251 acres) falls within a Visual Resource Management (VRM) Class I category. Class I management objectives provide for preservation of the existing character of the landscape. This class provides for natural ecological changes but does not preclude very limited management activity. Class I lands in this Project Area correspond to BLM lands designated as wilderness or a WSA.

Most of the remaining Project Area (15,978 acres) falls within a VRM Class II category. Class II objectives provide for retention of the existing landscape character. Level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements found in the predominant natural features of the characteristic landscape.

There are portions of the Project Area (4,281 acres) that fall within a VRM Class III category. Class III objectives provide for partial retention of the existing character of the landscape. Level of change to the characteristic landscape can be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. Most Class III lands are south of Steens Loop Road adjacent to the Home Creek portion of Steens Mountain Wilderness.

Environmental Effects

No Action Alternative

No changes to the landscape character would be expected under this alternative.

Alternative B - Maximum Water Distribution Alternative

Below is a table summarizing the number and types of developments proposed under each VRM Class for this alternative.

Description	VRM Class I	VRM Class II	VRM Class III
Wells (each)	5	2	1
Tanks (each)	4	2	0
Troughs (each)	12	4	0
New Reservoirs (each)	17	0	0
Reservoir Rehabilitation (each)	13	2	0
Reservoir Decommission (each)	7	1	0
Spring Dev/Rehab (each)	2	0	0
Pipeline (miles)	9.48	4.88	0
Way Realignment (feet)	60	0	0
Water Gaps (miles)	1.52	0	0

Very little change to the land/water component of the landscape character would occur given none of the developments require major excavation that would modify landscape features. Reservoirs would have the most excavation, but they would be located in drainages and would not be expected to be large enough to modify the overall form of those drainages. Decommissioning of reservoirs would help restore a more natural looking appearance after rehabilitation has occurred. Overall, the land/water component of the landscape character would be preserved.

Disturbance to the vegetation feature of the landscape would be the same as described in the WSA section for each type of development. With the exception of vegetation effects associated with livestock use of reservoirs and troughs (86 acres total), disturbed areas would be seeded and expected to have vegetation return within 3 to 5 years. Given the limited area affected by developments as a whole, the vegetation component of the landscape character would be preserved.

These developments would add structures to the landscape character that would introduce vertical lines associated with windmills, solar panels and fenceposts and horizontal lines associated with fences and water gaps. To the extent possible, structures would be painted to blend in with the surrounding area. Length of time the development would be in view would be expected to be minutes as most visitors pass by in motorized vehicles but also by foot or horseback. Given topographic and vegetative screening, visitor encounters with most other developments not located near an area of prolonged visitor use (i.e., dispersed campsites) would also be expected to last only minutes as visitors pass. Exposure would be longer for those developments near dispersed campsites and these effects are addressed in the Recreation Section.

Other projects affecting visual resources in the Project Area include potential removal of juniper trees as described in the North Steens Project ROD. To the extent possible, nearby juniper trees that help screen the proposed developments would be left intact. Depending on the type of treatments implemented, there may be some short-term (years) disturbance to visual resources in areas treated. However, these treatments are expected to help restore the natural fire regime and protect ecological integrity in the CMPA as a whole over the long term (decades) as provided for under the Steens Act. There are no other known reasonably foreseeable future actions that would contribute to effects to visual resources. Overall the character of the landscape would be preserved.

Alternative C - Along Roads and Ways Alternative

Below is a table summarizing the number and types of developments proposed under each VRM Class for this alternative.

Description	VRM Class I	VRM Class II	VRM Class III
Wells (each)	5	2	1
Tanks (each)	4	2	0
Troughs (each)	14	4	0
Spring Dev/Rehab (each)	1	0	0
Dugout Rehabilitation (each)	1	0	0
Pipeline (miles)	14.32	4.88	0
Fence (miles)	2.98	0	0
Fence Removal (miles)	2.1	0	0
Way Realignment (feet)	60	0	0

Effects of this alternative would be similar to Alternative B, except fewer developments would be implemented, especially on BLM-administered lands that fall within a VRM Class I category and no new reservoirs would be constructed. In addition there would be visual impacts associated with the proposed new fencing that would be the same as those effects described under WSAs. The landscape character would be preserved.

Alternative D - Edge Developments Alternative

Below is a table summarizing the number and types of developments proposed under each VRM Class for this alternative.

Description	VRM Class I	VRM Class II	VRM Class III
Wells (each)	0	2	1
Tanks (each)	0	2	0
Troughs (each)	2	4	0
Spring Dev/Rehab (each)	2	1	0
Pipeline (miles)	0.56	3.32	0
Fence (miles)	2.54	0	0
Fence Removal (miles)	4.6	0	0
Way Realignment (feet)	0	0	0
Water Gaps (miles)	1.52	0	0

Effects of this alternative would be similar to Alternative C, except even fewer developments would occur overall, especially on BLM-administered lands that fall within a Class I category. Overall, less fence would be constructed on BLM-administered lands in a Class I category. The landscape character would be preserved.

Proposed Action

Below is a table summarizing the number and types of developments proposed under each VRM Class for this alternative.

Description	VRM Class I	VRM Class II	VRM Class III
Wells (each)	1	2	0
Tanks (each)	0	2	0
Troughs (each)	9	2	0
New Reservoirs (each)	12 or 13	0	0
Reservoir Rehabilitation (each)	12	2	0
Reservoir Decommission (each)	7	1	0
Spring Dev/Rehab (each)	3	0	0
Pipeline (miles)	2.8 or 1.07	2.13	0
Way Realignment (feet)	60	0	0
Riparian Exclosure (0.57 miles)	1	0	0

Effects of this alternative would be similar to Alternative B, except fewer developments would be implemented, especially on BLM-administered lands that fall within a VRM Class I category and fewer wells would be constructed so less affects related to presence of generators, solar panels or windmills would occur. The landscape character would be preserved.

F. Wild Horses

Affected Environment

Current discussion and analysis of potential effects on wild horses are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.14 and 4.14.

Table 22. South Steens Herd Area Acres

	Public	Private	Malheur NWR	State	Total
HMA before RMP*	127,840	34,923	12	658	163,433
HMA after RMP	126,732	7,716	12	0	134,460
Inactive HA before RMP*	58,948	58,336	0	0	117,284
Inactive HA after RMP	60,055	85,543	0	658	146,256

*Acre figures after legislated Steens Act land exchanges.

South Steens HMA encompasses the Project Area. Although legislated Steens Act land exchanges adjusted ownership patterns within the entire South Steens HA, the boundaries were not adjusted since establishment of the HMA and inactive HA in the 1970s. Current boundaries for the HMA and inactive HA were finalized in the AMU and CMPA RODs. Currently, the HMA contains 134,460 acres total which is a decrease of 28,973 acres, most of which are private lands (Table 22). The inactive HA consists of 146,256 acres which increased by the same amount. Although boundary adjustments were made due to loss of private lands, the AML was not adjusted due to lack of monitoring data to support a change. The RMP states that "Permanent increases or decreases in AML and forage allocations will be considered if analysis of monitoring data indicates changes in long-term forage availability" (CMPA ROD p. 50). Currently wild horse management in South Steens HMA is being maintained within its limits of AML (159 to 304 animals). The last gather occurred in October 2004. Horses were in good health and quality, reflective of past management actions that returned the best animals to the range, thereby, improving and maintaining characteristics of good conformation, size, color, and temperament. Wild horses are allocated 3,648 AUMs compared to 9,577 AUMs for domestic livestock. Forage is allocated to ensure enough feed exists within the HMA to sustain AML of 304 head throughout the year.

Direct competition for forage within South Steens Allotment exists as livestock and wild horses (the primary species of large herbivores) have a dietary overlap of 90 to 100 percent. Site observations and utilization studies indicate wild horse utilization patterns are similar to livestock. Wild horse utilization is typically concentrated within 1 to 2 miles of reliable water. Although wild horse distribution cannot be controlled within the HMA, livestock grazing is controlled through prescribed rotations and fencing.

To maintain a thriving ecological balance, wild horse gathers are to be done as the herd reaches the maximum established AML number within the HMA and when monitoring data (census, utilization, use supervision, etc.) indicate ecological balance would be exceeded. Depending on reproductive rates, results of rangeland monitoring data, funding, and management considerations, horses within HMAs are typically gathered and removed on a 4 to 5-year cycle.

Since 1998, there have been numerous census counts, gathers, and releases within the HMA. See Table 23 below for a brief history.

Table 23. South Steens HMA - Census and Gather History since 1998

Year	Activity	Number of Horses
1998	Census	271
	Gather	259
	Release	91
2001	Census	321
2002	Census	387
2004	Gather	376
	Release	101

The census conducted in 2001 documented 321 horses and 72 foals within South Steens Allotment. These data indicate wild horse populations were over the AML for South Steens Allotment 3 years following the 1998 gather. Additionally, these data indicate wild horse numbers may exceed the high end of the AML before another gather is completed.

Utilization of forage species within the HMA is not uniform due to a lack of reliable, live water (wells and rivers). In part, this is due to a loss of approximately 28,973 acres of the existing HA due to legislated land exchanges and placement in inactive HA status concentrating horse use on the remaining viable water sources. Actions dating back to the establishment of South Steens HA, HMA and inactive HA have resulted in long-term adverse affects to wild horses through a loss of a majority (approximately 75 percent) of their summer range containing the most live water in the HMA and most of the winter range (Wild Horse Impacts Map). Enhancement of reliable water within the HMA is crucial to partial mitigation. Loss of these lands and associated reliable water sources adversely impacted wild horse management because these waters were not replaced with reliable water sources. Reliable water sources would sustain wild horses in drought conditions and ensure more even distribution.

Fencing of the Donner und Blitzen WSR corridor by court decree as well as numerous miles of private land fences constructed before the land exchanges on the east side of the Donner und Blitzen River, has resulted in additional live water being excluded from wild horse use. While some of the private land fences have been removed in the No Livestock Grazing Area , the openings (gates and water gap at Tabor Cabin) to Donner und Blitzen River are not suitable for wild horse use due to juniper encroachment. This may increase the probability of predation by mountain lions, resulting in the horses not using them. Actions to reduce juniper in these areas would likely increase horse use of the approaches to the crossings. An isolated population of approximately 20 head of wild horses that uses the east side of the river does not access the remaining portion of their HMA. In winter months these horses have a harder existence due to lack of access to suitable winter range which may affect the reproductive health of these horses and lower recruitment.

In an HMA, external perimeter fences exist to contain wild horses within the active horse use area while internal fences are used to manage timing of livestock grazing or provide periodic rest from livestock grazing. While necessary for livestock grazing management, these internal fences create seasonal barriers to the free movement of wild horses within the HMA. To mitigate effects of fencing, once livestock have been removed from an HMA, internal fence gates are required to be opened by the permittee as a term and condition of their permit. In addition, during the livestock grazing season, pasture gates should be left open whenever possible (when not allowing livestock drift). Approximately 100 miles of fence still exists in the interior of the HMA boundary within South Steens Allotment. Existing fences were constructed to manage timing of livestock grazing, and exclude livestock from Donner und Blitzen WSR and No Livestock Grazing Area.

There has been no documented evidence of WNV in the South Steens wild horse herd. The disease affects a horse's immune system and is spread by mosquitoes and biting flies. Mosquitoes are present, but late season water sources are not reliable so the mosquitoes that carry WNV are probably not present in the HMA. A BLM equestrian campground is located close to the HMA along the south section of the Steens Mountain Loop Road. WNV infected flies could be transported in horse trailers or infected carrier horses could be transported to the HMA by the public or commercial concessionaires.

In Nevada during 2007, drought conditions affected water availability in an HMA. By the time wild horses were able to be gathered, many died and a large number (approximately 150) of animals gathered subsequently died from salmonella poisoning. As a result of drought, the habitat around drying water sources suffered from overgrazing. The vegetation will take years to recover from concentrated use. Proactive management of supplying adequate water could have prevented this situation as well as saved the lives of many wild horses. Emergency gather measures are always contingent on funding and space to hold animals resulting in potential compromise of forage conditions. Proper management facilities (water developments) would disperse grazing use and reduce the chance of this happening.

Environmental Consequences

Effects Common to All Action Alternatives

Development of reliable, live water is essential to sustain wild horses in drought conditions and ensure proper animal distribution. Typically live water (wells, springs) should be no more than 2 miles apart to ensure uniform use of the HMA. Without live water available horses are at risk of dieing from thirst if drought conditions exist because most available water is runoff to reservoirs. Adding wells would allow the BLM to turn water on when needed during drought and supply water year-round to disperse use by livestock and wild horses. Also existing fences restricting access to Donner und Blitzen River have reduced the amount of remaining live water in the HMA. Fencing, both management and river protection fences, has also restricted the free movement of wild horses within the HMA. Fence construction was mitigated by opening gates when livestock were not present on the allotment. This leaves wild horses in a precarious position genetically by not facilitating the movement of horses within the HMA and by not facilitating their movement across Donner und Blitzen River to reach winter range in their Federally protected HMA.

Development of numerous reliable late-season water sources within the HMA would reduce concentrations of wild horses at individual water sources and reduce the chance of disease spread if transmitted by public or commercial horse use. Late season water may increase the possibility of WNV since mosquitoes that carry this disease are more prevalent later in the summer when habitat for breeding is available.

Alternative A - No Action

Wild horse movement would continue to be restricted by the management fence for Donner und Blitzen River as well as other internal livestock management fences. Animal distribution would continue to be problematic as some areas would be overutilized while other areas would be underutilized by grazing animals (wild horses, livestock) due to a lack of reliable, live water. In severe drought years, horses could die due to lack of water similar to the circumstances surrounding the Nevada horse die-off as described under the Affected Environment. Although gates to Donner und Blitzen River could be opened for access to the river during drought, horses may not use these openings as is currently the case. Portions of the HMA would continue to be isolated resulting in genetic isolation (inbreeding) of some wild horses.

Wild horse access to cross the river to live water through existing gates when livestock are not in the allotment would continue to be unsuitable for wild horse use. Juniper encroachment at these crossings and their approaches increases the likelihood of predation by mountain lions. Until these crossings are improved they would not be used by horses because it goes against their sense of survival.

Alternative B - Maximum Water Distribution Alternative

Providing reliable water throughout the HMA would result in animals being evenly distributed throughout the HMA. Seventeen new troughs would be installed and seventeen new reservoirs would be constructed to provide reliable water sources throughout the HMA. Troughs which are associated with wells and springs would provide yearlong water sources. Wild horses would discover and use new water sources as they are developed. This would result in having forage utilization being evenly distributed and reducing or eliminating areas of overuse. During hard winters wild horses may be stressed due to loss of their winter range through land exchanges. Existing management and gap fences would continue to restrict wild horse movement within their HMA. Portions of the HMA would continue to be isolated resulting in genetic isolation of some wild horses.

Alternative C - Along Roads and Ways Alternative

Since only troughs associated with wells and springs (19) would be installed in this alternative, the lack of new reservoirs would leave larger distances between reliable water sources. Wild horses would move to these sources as existing reservoirs dried up which would leave portions of the HMA without reliable water resulting in concentrations of livestock and wild horses in areas with water. Distribution of grazing animals would not occur as well as under Alternative B as this alternative leaves portions of the area overused and portions underused, but would still provide nineteen new water sources during drought to sustain wild horses. Wild horse movements and available live water would continue to be restricted by the management fence for protection of Donner und Blitzen River.

Alternative D - Edge Developments Alternative

This alternative would not have any well development inside the WSA resulting in the center of the HMA being underwatered. Fewer troughs (11) would be installed than in Alternatives B and C and no new reservoirs would be constructed. This would leave larger portions of the HMA without reliable water sources. Wild horses would still have 11 more yearlong water sources than currently. During drought conditions, wild horses and livestock would concentrate at these sources and forage use around these areas would be overutilized while other areas were unused.

Proposed Action

Eleven new troughs would be installed and 12 or 13 new reservoirs would be constructed throughout the allotment which would spread wild horse use in the allotment.

Wild horses would discover and use new water sources as they are developed. Although not as many water sources would be available as in Alternative B, effects would be similar to Alternative B in that water sources are distributed throughout the allotment which provides more sources for wild horses during drought conditions. Eleven yearlong water sources would remain if drought conditions persist which would be the same as in Alternative D. Wild horses and livestock would concentrate at these sources and forage use around these areas would be overutilized while other areas were unused.

G. Wildlife

Affected Environment

Current discussion and analysis of potential effects on wildlife are tiered to the AMU/CMPA PRMP/FEIS (August 2004), and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3.6 and 4.6.

Wildlife other than migratory birds and SSS include mule deer, elk, pronghorn antelope, badger, black-tailed jackrabbit, cottontails, magpies, ground squirrels, pocket gophers, deer mouse, cougar, bobcat, coyote, ducks, geese, swans, chukar, California quail, mountain quail, yellow-bellied marmot, wood rats, voles, bats, reptiles, and amphibians.

Mule deer, elk, pronghorn, and predators use the area most of the year. Deep snows may force big game animals, upland birds, and some small animals to lower elevations of the Project Area. Other small mammals are not as mobile and may remain underground or stay active near the ground's surface throughout winter. Wild horses may exclude other wildlife use from water sources.

Mule deer use bitterbrush as a fall and winter browse. There are several areas throughout the Project Area with extensive stands of bitterbrush. Currently there are only about six reliable late-season water sources near most of the bitterbrush areas. Although bitterbrush stands appear healthy for the most part in the allotment, juniper encroachment into these stands could affect the continued health of these plants.

Environmental Consequences to Wildlife

No Action Alternative

Wildlife would have the same resources available as are currently present in the allotment. Some areas of the allotment near perennial water sources such as springs would continue to be affected by concentrated livestock and wild horse use. Wildlife would still have access to Donner und Blitzen River for watering purposes. Areas with bitterbrush would not be affected by late-season grazing and mule deer would have more bitterbrush available later in the fall and winter.

Common to All Action Alternatives

Wildlife in general would be affected by noise and human presence during construction of the different projects. This disturbance would be localized and temporary in nature and wildlife would return to these areas after the disturbance ceased. Certain species of wildlife such as pronghorn antelope could benefit from increased water sources but there would probably not be any increase in population numbers. This would apply to most species of wildlife. Small mammals, which are not as mobile, could experience some loss of habitat near new water sources since there would be a loss of vegetation around water troughs.

With the protection of spring sources and spreading of water in the Project Area, there would be some benefit to wildlife from increased vegetation at these springs. Effects to bats are discussed in the SSS section. Although predators such as coyotes and cougars probably have plenty of water available, new water sources would attract predators to new watering sites (Prasad 1986). This could affect other species of wildlife by exposing them to predation at these new water sources although the effect would be minimal.

Bitterbrush stands could be affected by the increase of water sources near these stands. As the growing season progresses and grasses mature, livestock diets include bitterbrush usually starting in June with use of bitterbrush increasing in the diet through September (Ganskopp et al. 1999). The closer bitterbrush is to the water source, the more use will occur. Livestock use of bitterbrush during the Graze and Defer parts of the grazing cycle (Table 2: Proposed Grazing System) would increase. This would affect availability of current year's growth of bitterbrush for mule deer during fall and winter at a time when nutrition from other sources is low.

Alternative B - Maximum Water Distribution Alternative

At least 19 new water sources would be constructed near bitterbrush stands under this alternative. There would be more water troughs (11) associated with wells and more reservoirs (8) constructed to maintain late-season water near bitterbrush stands so late-season use would affect bitterbrush resources the most. If the reservoirs dry up during the late season, then livestock use of bitterbrush would decrease in these areas but increase where troughs still have water available.

Alternative C - Along Roads and Ways Alternative

Eleven troughs associated with wells would be installed so effects of this alternative would be similar to those of Alternative B but there would be more reliable water sources for late-season livestock use near stands of bitterbrush. Since no new reservoirs would be constructed, livestock use would be concentrated more at the troughs and use of bitterbrush in those areas would probably increase above that in Alternative B.

Alternative D - Edge Developments Alternative

This alternative would develop the least amount of new water sources (3) near bitterbrush stands, so late-season use by livestock would not affect availability of bitterbrush for mule deer fall and winter use as much as other alternatives although bitterbrush use by livestock would increase in the areas around the troughs.

Proposed Action

This alternative would have eight new reservoirs and three troughs associated with wells near bitterbrush stands. The affects to bitterbrush would increase during the late season in the areas around these water sources which would decrease availability of bitterbrush for mule deer during the fall and winter months.

The cumulative effects of any of the action alternatives would increase livestock use in areas near bitterbrush stands where new late-season water sources are developed. The amount of new water sources will affect the availability of current year's growth of bitterbrush for mule deer during the fall and winter months. This combined with the effects of the North Steens Ecosystem Management Plan to treat juniper could affect the availability of bitterbrush to a greater extent. Bitterbrush in much of the Steens Mountain Area does not resprout after fire unless the intensity of the fire is low and does not kill the root crown. Some seedling establishment has been observed in recent fires on the Steens from rodent caches of bitterbrush seed. Sprouting depends on the viability of the seed and moisture conditions the year following the fire. The combination of these two long-term projects (15+ years) could reduce the amount of bitterbrush available for mule deer use unless reestablishment of bitterbrush occurs after the prescribed fire treatments.

H. Cumulative Effects

As the Council on Environmental Quality (CEQ), in guidance issued on June 24, 2005, points out, the "environmental analysis required under NEPA is forward-looking," and review of past actions is required only "to the extent that this review informs agency decision-making regarding the Proposed Action." Use of information on the effects on past action may be useful in two ways according to the CEQ guidance. One is for consideration of the Proposed Action's cumulative effects, and secondly as a basis for identifying the Proposed Action's effects.

The CEQ stated in this guidance that "[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions."

This is because a description of the current state of the environment inherently includes the effects of past actions. The CEQ guidance specifies that the "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions." Our information on the current environmental condition is more comprehensive and more accurate for establishing a useful starting point for a cumulative effects analysis, than attempting to establish such a starting point by adding up the described effects of individual past actions to some environmental baseline condition in the past that, unlike current conditions, can no longer be verified by direct examination.

The second area in which the CEQ guidance states that information on past actions may be useful is in "illuminating or predicting the direct and indirect effects of a Proposed Action." The usefulness of such information is limited by the fact that it is anecdotal only, and extrapolation of data from such singular experiences is not generally accepted as a reliable predictor of effects.

In this analysis, cumulative effects are incorporated into the effects analysis for each relevant resource.

CHAPTER IV: CONSULTATION AND COORDINATION

A. Participating Staff

*Daryl Bingham, SCEP (Riparian and Water Quality)
Darren Brumback, District Fisheries Biologist (Water Rights)
Laura Dowlan, Outdoor Recreation Planner (Wilderness/WSAs, Recreation, WSR, VRM)
*Steve Dowlan, Natural Resource Specialist (Riparian, Vegetation, Soils, SSS-Plants, Water Quality)
*Joe Glascock, Rangeland Management Specialist (Grazing)
Kelly Hazen, Geographic Information Systems
Rhonda Karges, NEPA Lead – Planning and Environmental Coordinator
Gary McFadden, Wild Horse Specialist
*Matt Obradovich, Wildlife Biologist (SSS-Animals, Migratory Birds, Wildlife)
Lesley Richman, District Weed Specialist
Scott Thomas, Archaeologist

*IDT conducting S&Gs.

B. Persons, Groups, and Agencies Consulted

Oregon Department of Fish and Wildlife, Hines, Oregon
Roaring Springs Ranch, Inc.
Steens Mountain Advisory Council
Steens Mountain Landowner Group

In December 2006, a scoping document was mailed to approximately 241 individuals, groups, and agency representatives and made available for review on the BLM website. The BLM received 49 comment letters.

A 30-day public comment period was offered on the EA in September 2008. Five comment letters were received (see Proposed Decision for BLM's response to individual comments) and resulted in minor changes to the EA.

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Glossary - Grazing Treatment Descriptions

Early – (approximately March 1 to April 30) – This treatment provides the plants an opportunity to recover after utilization of early plant growth. By removing livestock before all spring and summer precipitation occurs, the plants will be able to store carbohydrates, set seed, and maintain their vigor. This "Early" treatment can be used every year with little effect on the plant.

The dates of April 1 to April 30 are a guideline for the "Early" treatment. Early use must take place before grass plants are in the boot stage. There must also be enough soil moisture in the ground to provide for regrowth after grazing. Therefore, flexibility in the early treatment will allow for use prior to April 1, but generally not after April 30 and will depend on climate.

Graze – (approximately May 1 to July 1-15) – This treatment allows for grazing during the critical growth period of most plants. Carbohydrate reserves are utilized when the plant grows or regrows because the green parts of the plants are removed by a grazing animal. The pastures currently under the "Graze" treatment will generally experience some other treatment the following year so as not to repeat graze treatments.

Defer – (approximately July 1 to October 15) – Grazing during this treatment will not begin until after most plants have reached seed ripe and have stored adequate carbohydrate reserves. This treatment will assist in meeting the objectives by providing all plants an opportunity to complete their life cycles and produce the maximum amount of cover and forage.

Winter – Grazing during this treatment will occur when most plant species are dormant. Most plants will have completed their life cycles and stored maximum carbohydrates for the next growing season.

Rest – This treatment provides the plants a full year of growth in the absence of grazing. They are allowed to store maximum carbohydrate reserves, set seed, and provide carryover herbage for the following year's turnout.

These dates are approximation based on general plant phenology. Year-to-year variation in phenology will occur based on climatological phenology.

South Steens AMP/EA
Cooperative Management and Protection Area

Project Area and South Steens Allotment

Pasture Boundary

Steens Mountain Cooperative Management and Protection Area

No Livestock Grazing Area

Paved Road

Non-Paved Improved Road

Major Streams

BLM

Wilderness Study Area

Wilderness

State

U.S. Fish and Wildlife

Private

2.5 1.25 0 2.5 Miles

N

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US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Burns District, Oregon
Andrews Resource Area

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Davison Butte
Saddle Butte
Rattlesnake Butte
Round Barn Visitor Center
Little Riddle Mountain
Anderson Mountain
Riddle Mountain
Indian Creek Butte
Baker Pass
Folly Farm
Buena Vista Butte
Jackass Butte
Diamond
Jackass Mountain
Krumbo Butte
Kiger Wildhorse Viewing Area
Frenchglen
Coffin Butte
Page Springs Campground
Mann Lake Rec Site
Fish Lake Campground
Jackman Park Campground
Butler Hill
Mickey Butte
Riddle Bros Ranch
Mickey Hot Springs
Roaring Springs Ranch
South Steens Campground
Devine Rock
Steens Mountain
Alvord Ranch
Home Creek Butte
Alvord Hot Springs
Andrews
Skull Creek Butte
Howluk Butte
Alvord Peak
Red Lookout Butte
Borax Works
Red Mountain
Square Mountain
Black Point
Fields
Willow Creek Hot Spring
Whitehorse Butte
Willow Butte
Flagstaff Butte

South Steens AMP/EA
ALTERNATIVE A EXISTING CONDITON

Project Area
and South Steens Allotment

South Steens Pastures

Existing Fence 52.1 miles

Existing Pipeline .75 miles

Existing Reservoir Reliability

- Reliable 17
- Not Reliable 29
- Variable 16
- Cattle Grd 1
- Corral 1
- Dugout 3
- Gate 14
- Spring 2
- Trough 2

Paved Road
Closed Road
Non-Paved Improved Road
Primitive Road
Way

BLM
Wilderness Study Area
Wilderness
State
U.S. Fish and Wildlife
Private

Frenchglen
Blitzen River WSA
Page Springs Campground
Steens Mountain Loop Rd
Donner Und Blitzen River
Fish Cr
Drift Fence
Hollywood Rd
Butler Hill
Burnt Car Rd
Burnt Car
Blitzen River WSA
TOMBSTONE #1
Tombstone Canyon Rd
Riddle Bros Ranch
Roaring Springs Ranch
Blitzen River WSA
South Steens Campground
Indian Creek
South Fork Donner Und Blitzen WSA
STEENS #2
Taber Cabin Easement
South Fork Donner Und Blitzen WSA
HOME CREEK #3
Home Creek Butte
Home Creek
Home Creek WSA
Threemile Creek

1 0.5 0 1 Miles

N

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South Steens AMP/EA
ALTERNATIVE B MAXIMUM

Project Area
and South Steens Allotment

South Steens Pastures

Existing Development

Cattle Guard
Spring
Corral
Gate
Dugout
Trough
Reservoir
Pipeline
Drift Fence
Fence

Proposed Existing Development / Rehabilitation

Reservoir Rehab 14
Spring Rehab 3
Reservoir Remove 8

Proposed New Development

Fence 4 miles
Pipeline 15 miles
Trough 17
Well 10
Reservoir 17

Paved Road
Closed Road
Non-Paved Improved Road
Primitive Road

BLM
Wilderness Study Area
Wilderness
State
U.S. Fish and Wildlife
Private

Frenchglen
Page Springs Campground
205
Butler Hill
Roaring Springs Ranch
Burnt Car
Riddle Bros Ranch
OR
South Steens Campground
Indian Creek
Taber Cabin Easement
Home Creek Butte
TOMBSTONE #1
STEENS #2
HOME CREEK #3
Drift Fence
T1 T2 T3 T4 T5 T6 T8 T9 T10 T13 T14 T15 T21 T24 T28 T29 T33
W1 W2 W3 W4 W5 W6 W7 W8 W15 W16
ER1 ER2 ER3 ER4 ER5 ER6 ER7 ER8 ER9 ER10 ER11 ER12 ER13 ER14 ER15 ER16 ER17 ER18 ER19 ER20 ER21 ER22
R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R12 R13 R14 R15 R16A R16B R17
S1 S2 S3

1 0.5 0 1 Miles

N

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Burns District, Oregon
Andrews Resource Area

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South Steens AMP/EA
ALTERNATIVE C Along Road Developments

Project Area
and South Steens Allotment

South Steens Pastures

Existing Development

Cattle Guard
Corral
Dugout
Reservoir
Fence
Spring
Trough
Gate
Pipeline
Drift Fence

Proposed Existing Development / Rehabilitation

Spring Rehab 2
Dugout Rehab 1

Proposed Development

Fence 5 miles
Pipeline 20 miles
Remove Fence 2 miles
Trough 19
Well 11

Paved Road
Closed Road
Non-Paved Improved Road
Primitive Road

BLM
Wilderness Study Area
Wilderness
State
U.S. Fish and Wildlife
Private

Frenchglen
Page Springs Campground
Burnt Car
Butler Hill
Riddle Bros Ranch
South Steens Campground
Roaring Springs Ranch
Taber Cabin Easement
Home Creek Butte
TOMBSTONE #1
STEENS #2
HOME CREEK #3
T1 T2 T3 T4 T5 T6 T8 T9 T10 T13 T15 T16 T17 T18 T19 T21 T24 T29 T31
W1 W2 W3 W4 W5 W6 W7 W8 W12 W13
D1
S1 S3
F6

1 0.5 0 1 Miles

N

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South Steens AMP/EA
ALTERNATIVE D Edge of WSA Developments

Project Area
and South Steens Allotment

South Steens Pastures

Existing Development

- Cattle Guard
- Corral
- Dugout
- Reservoir
- Fence
- Spring
- Trough
- Gate
- Pipeline
- Drift Fence

Proposed Existing Development / Rehabilitation

- Spring Rehab 3

Proposed Development

- Fence 9 miles
- Pipeline 5 miles
- Remove Fence 5 miles
- Trough 11
- Well 9
- Spring 1

- Paved Road
- Closed Road
- Non-Paved Improved Road
- Primitive Road

- BLM
- Wilderness Study Area
- Wilderness
- State
- U.S. Fish and Wildlife
- Private

Frenchglen
Page Springs Campground
Butler Hill
Burnt Car
Riddle Bros Ranch
South Steens Campground
Taber Cabin Easement
Roaring Springs Ranch
Home Creek Butte
OR

TOMBSTONE #1
STEENS #2
HOME CREEK #3

T2 W4 W6 T3 W2 W3 T6 T7 W5 W7 T11 T29 T33 S2 W10 T34 W12 W14 P21 T27 F7 S3 T24 T32 S1

1 0.5 0 1 Miles

N

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Burns District, Oregon
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South Steens AMP/EA
PROPOSED ACTION

Planning Area and South Steens Allotment

South Steens Pastures

Existing Development

- Cattle Guard
- Spring
- Corral
- Gate
- Dugout
- Trough
- Reservoir
- Pipeline
- Drift Fence
- Fence

Proposed Existing Development / Rehabilitation

- Reservoir Rehab 14
- Spring Rehab 3
- Reservoir Remove 9

Proposed New Development

- Pipeline 5 miles or 3 miles
- Trough 11
- Exclosure
- Reservoir 12 or 13
- Well 3
- Paved Road
- Closed Road
- Non-Paved Improved Road
- Primitive Road

- BLM
- Wilderness Study Area
- Wilderness
- State
- U.S. Fish and Wildlife
- Private

Frenchglen
Bridge Creek WSA
Page Springs Campground
Blitzen River WSA
Butler Hill
ER1
ER2
ER15
W3
T6
R1
Burnt Car
TOMBSTONE #1
Roaring Springs Ranch
T8
W7
T13B
R4
R5
R18
T13
OR
T33
S2
ER4
ER3
R6
R7
ER5
STEENS #2
W16
R12
R9
S3
T24
Riddle Bros Ranch
South Steens Campground
Taber Cabin Easement
South Fork Donner Und Blitzen WSA
R13
ER16
ER6
ER23
ER17
T21
S1
ER8
R14
R15
OR
R16B
R16A
ER7
EXCLOSURE
R17
ER18
ER9
ER10
HOME CREEK #3
Home Creek Butte
ER11
ER12
ER13
ER19
ER20
ER21
ER14
Home Creek WSA
ER22

1 0.5 0 1 Miles

N

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South Steens AMP/ EA *Wild Horse Impacts*

Project Area
and South Steens Allotment

South Steens Pastures

Existing Fence

Existing Pipeline

Wild Horse

Crossings 4

Prime Summer Range

Prime Winter Range

South Steens Herd Area (Inactive)

South Steens Herd Management Area

Existing Reservoir Reliability Within Project Area

Reliable 17

Cattle Grd 1

Corral 1

Dugout 3

Gate 14

Spring 2

Trough 2

Paved Road

Non-Paved Improved Road

Primitive Road

BLM

Wilderness Study Area

Wilderness

State

U.S. Fish and Wildlife

Private

Frenchglen

Page Springs Campground

Riddle Bros Ranch

Steens Campground

Indian Creek

Roaring Springs Ranch

Home Creek Butte

Butler Hill

205

1 0.5 0 1 Miles

N

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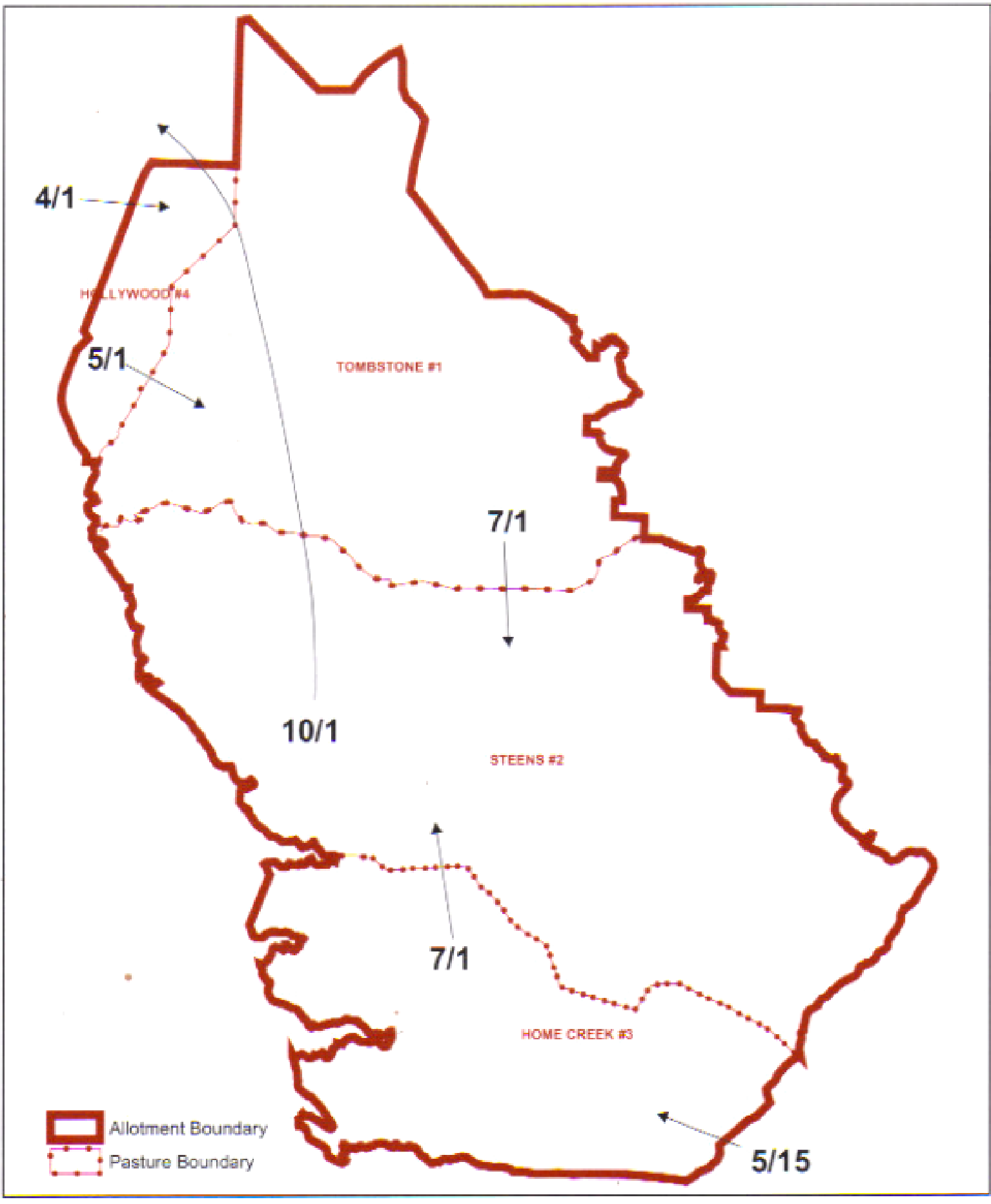
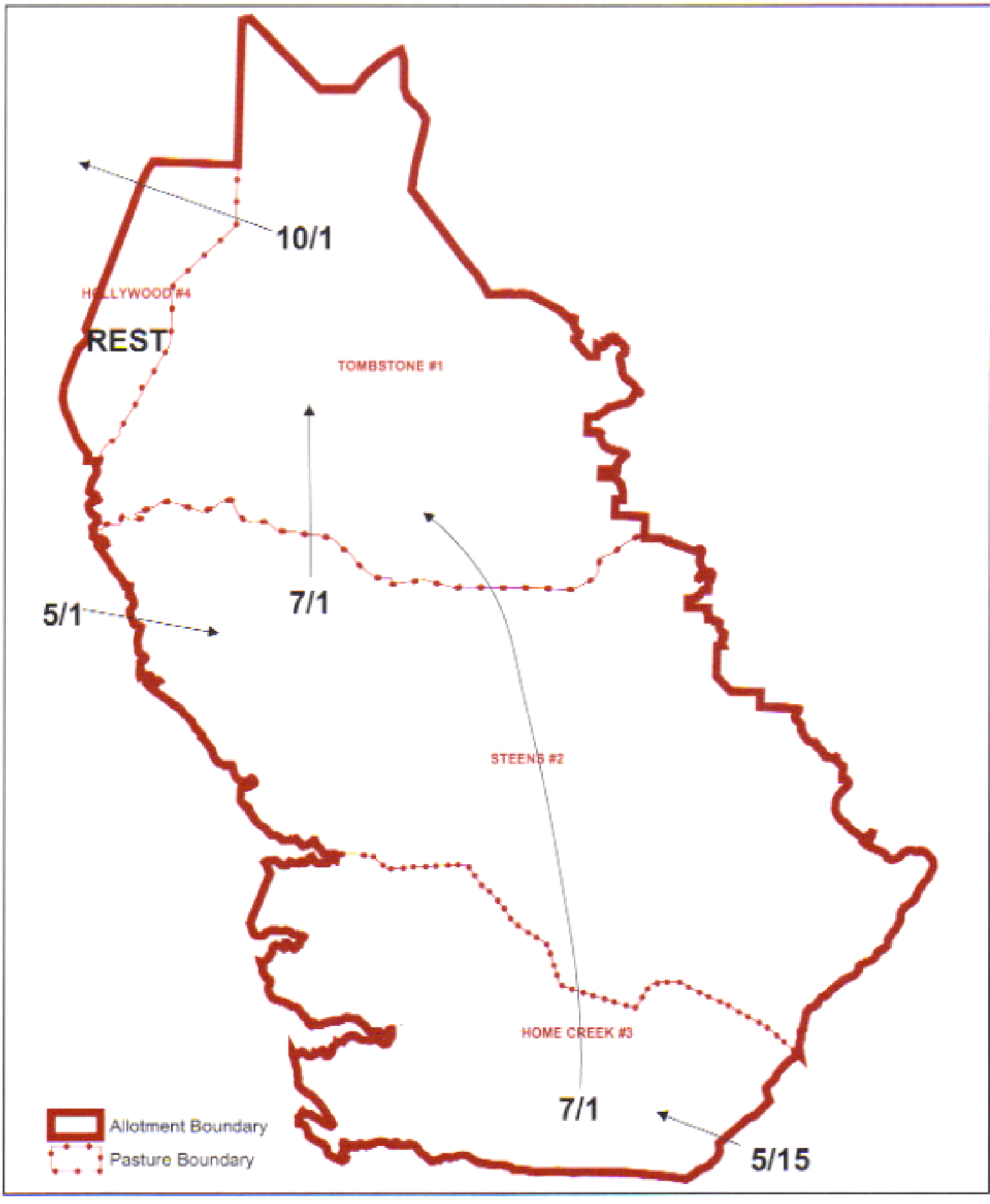
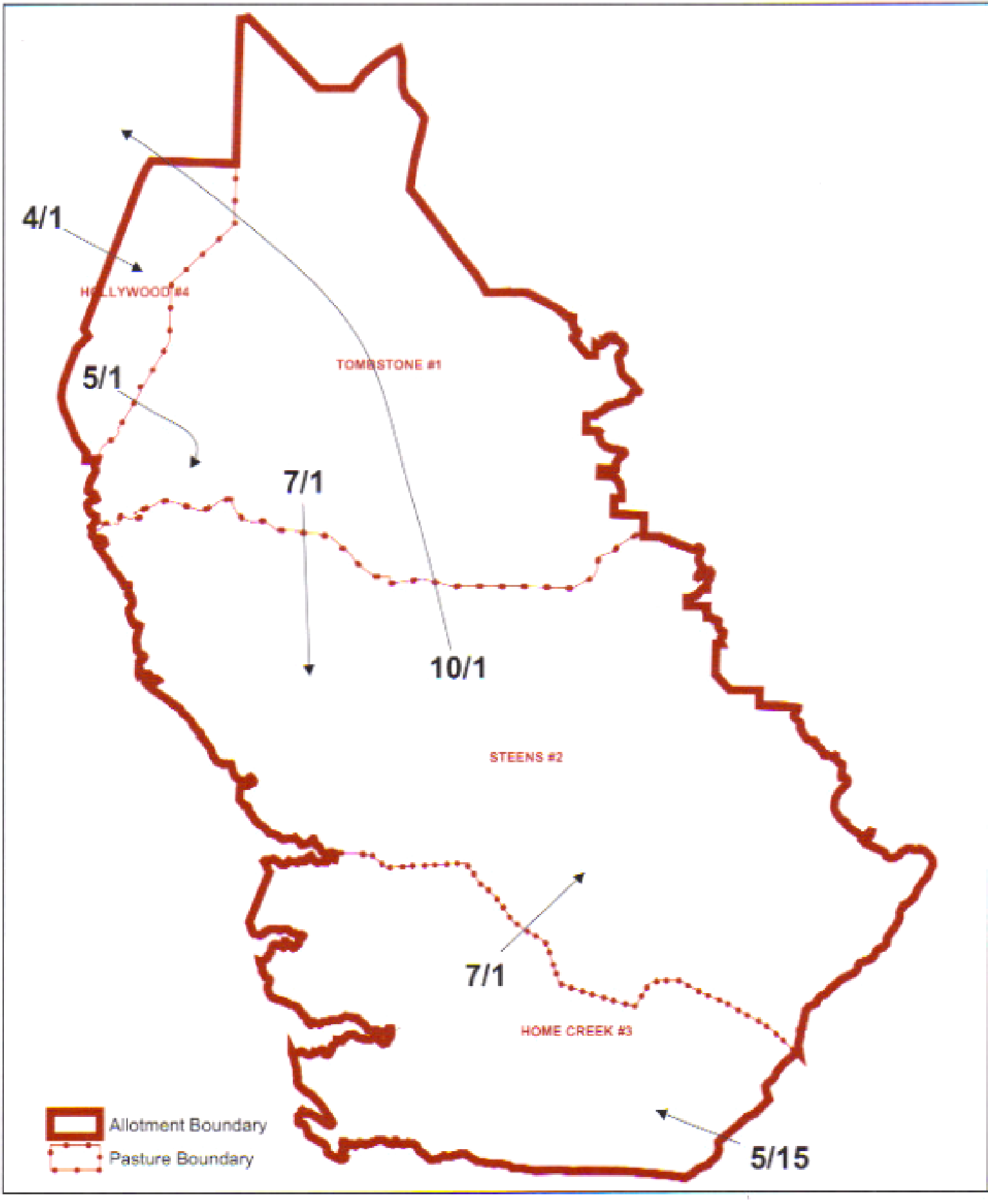
Appendix A1
South Steens Allotment
YEAR 1 GRAZING SCHEMATIC



Appendix A2
South Steens Allotment
YEAR 2 GRAZING SCHEMATIC



Appendix A3
South Steens Allotment
YEAR 3 GRAZING SCHEMATIC



Appendix A4
South Steens Allotment
YEAR 4 GRAZING SCHEMATIC