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Final Environmental Impact Statement

Summit Logan Valley Grazing Authorization Project

and Forest Plan Amendment # MAL - 75

Prairie City Ranger District, Malheur National Forest
Grant County, Oregon

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Summit Logan Valley Grazing Authorization Project and Forest Plan Amendment # MAL - 75 Final Environmental Impact Statement Grant County, Oregon

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The FEIS can be viewed and downloaded from the internet at http://www.fs.fed.us/nepa/fs-usda-pop.php/?project=24301. In addition, an electronic copy on CD-ROM is available upon request, by contacting Randy Gould using the contact information noted above.

Abstract: The purpose of this analysis document is to disclose the proposed actions and environmental effects of authorizing livestock grazing in the Summit Logan Valley Grazing Authorization Project area. The Summit Logan Valley Grazing Authorization (Summit Logan) project area includes all of the Lake Creek, Logan Valley, McCoy Creek and Summit Prairie Allotments. The project area is located south and west of Prairie City, Oregon and includes approximately 40,279 acres of National Forest System lands administered by the Prairie City Ranger District of the Malheur National Forest. Embedded within the project area is approximately 5,000 acres of private land. The Forest Service developed four alternatives: the No Action, the Proposed Action, and two additional action alternatives generated in response to public comment (scoping) and grazing permittee issues.

FEIS Errata Sheet

Page	Currently Reads	Should Read
Page 378 – Row 2, column 7 of the table	See below for Riparian Pasture Adaptive Strategy.	Construct exclosures around West Fork Summit.
Page 379 – Row 2, columns 3, 5 and 7	Additional rest within the West Summit Recovery Unit.	Additional rest within the Lake Creek Riparian Pasture

Summary

Introduction

The Forest Service has prepared this Final Environmental Impact Statement (FEIS) on the potential effects of authorizing livestock grazing in the Summit Logan Valley Grazing Authorization (Summit Logan) Project in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. The Summit Logan project area includes all of the Lake Creek, Logan Valley, McCoy Creek and Summit Prairie Range Allotments.

The project area is predominately within the Upper Malheur River watershed. Numerous streams flow within the watershed including Summit Creek, Big Creek, McCoy Creek and Lake Creek. A minor portion of the Summit Prairie Allotment (371 acres or less than 0.6 percent of the analysis area) occurs in the Upper North Fork Malheur River watershed (Crane Creek subwatershed). There are no streams within these 371 acres.

The project area is located south and west of Prairie City, Oregon and includes approximately 40,279 acres of National Forest System lands administered by the Prairie City Ranger District of the Malheur National Forest. Embedded within the project area is approximately 5,000 acres of private land. Detailed maps are in FEIS appendix B.

Purpose and Need for Action

The purposes of the proposed action are two-fold:

- To review and evaluate continuation or modification of grazing authorizations on Lake Creek, Logan Valley, McCoy Creek and Summit Prairie allotments (within the Summit Logan project area) to ensure their effectiveness in meeting or moving toward desired conditions outlined in the amended Forest Plan, and to be consistent with agency policy, and other applicable laws and regulations and;
- Improve resource conditions for aquatic habitat to recover important attributes of aquatic habitat including riparian vegetation and hardwoods, stream shade, and streambank stability.

The need for the action is described below:

- **Allotment Management Plans -** The Rescission Act (PL 104-19, Section 504) requires that each National Forest "establish and adhere to a schedule for the completion of National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) analysis and decisions on all allotments for which NEPA analysis is needed." In addition the Forest Plan directs updates or revisions to allotment management plans to address emerging resource management issues and concerns. Since direction exists to update allotment management plans and conditions have changes (i.e. listing of bull trout as a threatened species) there is a need to review and evaluate existing allotment management plans to reflect current management direction, policies, other applicable laws and regulations, and to address resource concerns in allotments.
- **Management Direction Regarding Livestock -** There is a need to meet the Malheur Forest Plan goals by providing a sustained production of palatable forage for grazing by livestock and dependent wildlife species while meeting the needs of other resources and uses at a level which is responsive to site-specific objectives (USDA Forest Service 1990 Forest Plan, page IV-2) as well as to contribute to the social and economic health of communities which are significantly affected by National Forest management (USDA Forest Service 1990 Forest Plan, page IV-3, # 42).

The Forest Plan also provides direction for continued range improvements as outlined in standards #87 and 88 below:

- Employ all available methods to achieve the desired levels of utilization by permitted livestock and big game. Design the methods selected for controlled livestock use to fit the site-specific requirements for improving the riparian area to satisfactory condition. Any one combination of methods may be used to treat unsatisfactory riparian areas such as corridor fencing, herding, additional water developments, salting, nonuse for resource protection, early add/or late season use, shorter grazing seasons, reduced livestock numbers, reduced livestock numbers, control of degree of use, and/or creating additional pastures through fencing (USDA Forest Service 1990 Forest Plan, pg.IV-35).
- Design and implement structural and nonstructural range improvements to maintain productivity and range condition in addition to benefiting both wildlife and livestock.

- Resource Condition for Aquatic Habitat in Range Allotments: There is a need to improve aquatic habitat in the range allotments within the project area to support all life stages of threatened bull trout populations and other aquatic species. This includes improvements in riparian vegetation and hardwoods to enhance stream shade, temperature, riparian vegetation composition and vigor and streambank stability. Water temperature and streambank stability are important aquatic habitat features (riparian management objectives) identified in the Forest Plan as amended by INFISH.

  The Inland Native Fish Strategy directs that grazing practices be modified (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of riparian management objectives or are likely to adversely affect inland native fish. Suspend grazing if adjusting practices is not effective in meeting riparian management objectives (USDA Forest Service 1995 INFISH GM 1).

  There is also a need to develop an upward trend in riparian areas currently assessed as functioning-at risk with a downward or slowed trend, while continuing to improve or maintain riparian areas with upward recovery trends or properly functioning conditions toward desired conditions identified in appendix A (Table 102).

Proposed Action in Brief

Figure 1 illustrates the arrangement of range allotments for the proposed action. Table 1 summarizes the basic proposals for each grazing allotment.

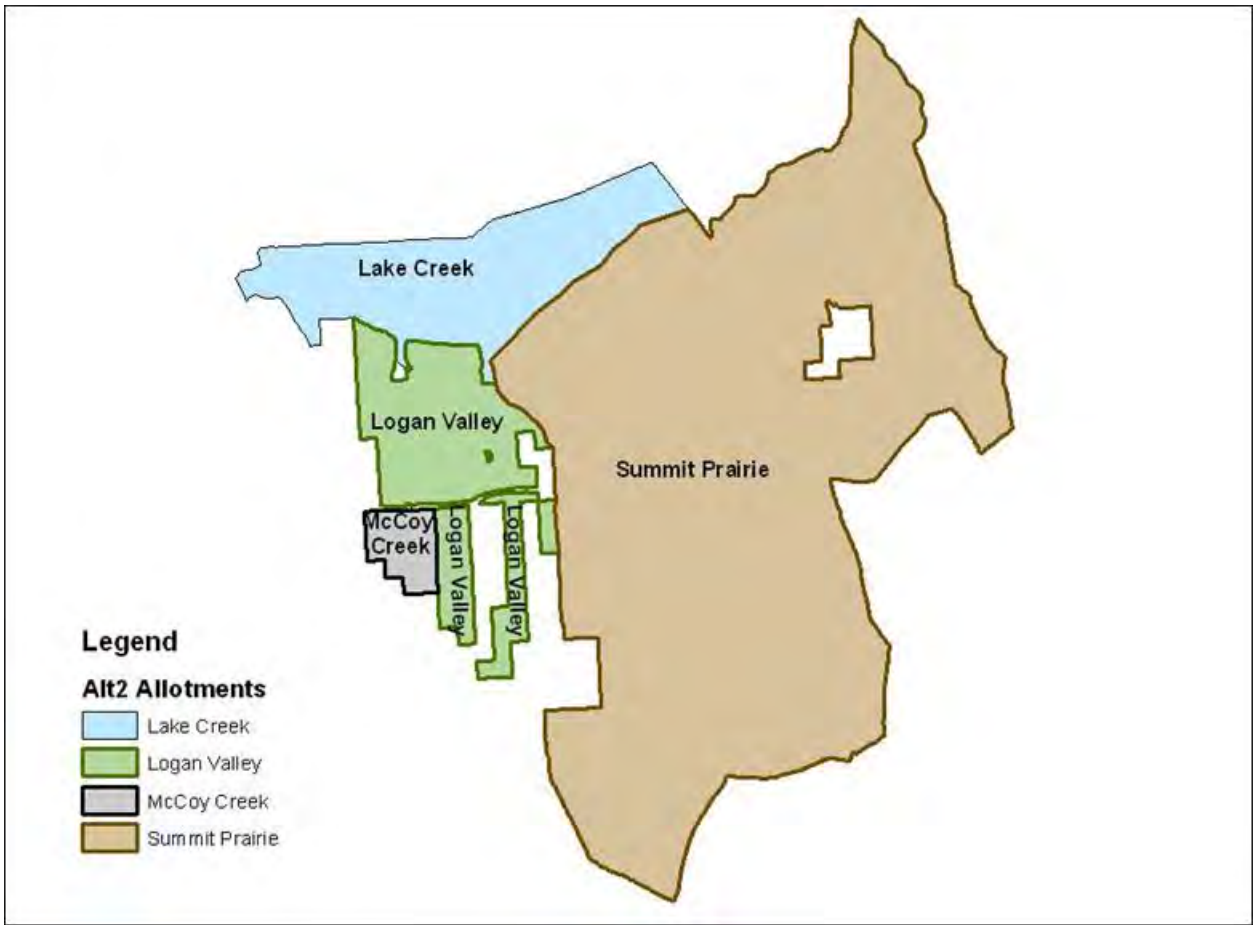

Figure 1. Range allotment configuration for proposed action

Table 1. Summary of the proposed action

Element	Lake Creek Allotment	Logan Valley Allotment	McCoy Creek Allotment	Summit Prairie Allotment
Grazing System	**About half of the allotment (5,069 acres) would remain vacant** in the McCoy Creek and newly designated Corral Basin units.	**Periods of rest or deferment during the season of use based on resource needs**. Would not be a systematic or scheduled rotation.	**Deferred rotation grazing system**. Systematic rotation of deferment among units. Provide flexibility to change the time of year when units would be used.	**Periods of rest or deferment during the season of use based on resource needs**. Would not be a systematic or scheduled rotation.
Boundary Changes	**Remove 388 acres** from Lake Ck. Allotment (298 acres from McCoy Ck. Unit and 90 acres from Horse Pasture Unit)	**Add 388 acres** from Lake Ck. Allotment to Logan Valley Allotment – (becomes Deardorff Unit)	**Remove 267 acres** of Lake Creek Unit (218 ac.) and N. Fork Unit (49 ac.) from McCoy Allotment.	**Add 4,449 acres** from Lake Ck. Allotment to Summit Prairie Allotment - This new unit called Bosenberg Unit, which is now part of Summit Prairie Allotment.
	Remove 4,449 acres from Lake Creek Allotment (Bosenberg Unit). Rename 2,430 ac. the Corral Basin Unit. Add 91ac. of Bosenberg Unit to McCoy Ck. Unit. Eliminate Bosenberg Unit from Lake Ck. Allotment.	**Add 267 acres** from McCoy Creek Allotment to Logan Valley Allotment – Keep Lake Ck. Unit name (218 ac.) and add the 49 acres from North Fork Unit to Flat Field Unit.		**Add 52 acres** from Front Field Unit in Logan Valley Allotment to Little Logan unit in Summit Prairie Allotment
	Remove 349 acres from SW corner of McCoy Creek Unit of Lake Creek Allotment (possibly be added to Dollar Basin Allotment in future NEPA analysis)	**Remove 52 acre** Front Field Unit from Logan Valley Allotment and add to Summit Prairie Allotment.	**Remove 53 acre** Starvation Unit from McCoy Creek Allotment (possibly be added to Dollar Basin Allotment in future NEPA analysis)	
		Combine Big Ck. portion of E. Lake Ck. with North and South Big Creek Units to create 623 acre Big Creek Riparian Pasture.	**Combine** Dry Unit (28 ac.) and Ridge unit (264 ac.) into one unit called Ridge Unit (292 ac.)	
	The present allotment consisting of 10,196 ac. would decrease in size to 5,069 ac.	The present allotment consisting of 3,756 ac. would increase in size to 4,359 ac. The increase in size would allow additional rest for the Logan Valley allotment.	The present allotment consisting of 980 acres would decrease in size to 660 acres.	The present allotment consisting of 25,331 acres would increase in size to 29,832 acres.

Element	Lake Creek Allotment	Logan Valley Allotment	McCoy Creek Allotment	Summit Prairie Allotment
Livestock numbers	0	357 cow/calf pairs[a]	63 cow/calf pairs[a]	260 cow/calf pairs[a]
Forage allocations	N/A	1,983 AUMs[b]	416 AUMs [b]	1,546 AUMs [b]
Grazing Season	None	6/10 – 10/15	6/1 – 10/30	6/10 – 10/24
	same as currently permitted			
Changes	About half of allotment, which had previously been vacant would be added to Summit Prairie and Logan Valley Allotments where it would be grazed.	Livestock would be distributed over a larger landscape by adding areas from the Lake Creek and McCoy Creek allotments. Big Creek Riparian Pasture unit would require livestock removal by August 15th to protect bull trout spawning habitat in Big Creek. Forage allowable use, move triggers, and endpoint indicators are listed in appendix E.	Forage allowable use, move triggers, and endpoint indicators are listed in appendix E.	Livestock would be distributed over a larger landscape (4,501 more acres) by adding areas from Lake Creek and Logan valley Allotments Forage allowable use, move triggers, and endpoint indicators are listed in appendix E.
Adaptive Management	None proposed	Adaptive management strategies shown in appendix A (Table 104) are summarized in Table 23 in chapter 2.	None proposed	Adaptive management strategies shown in appendix A (Table 104) are summarized in Table 29 in chapter 2.

Element	Lake Creek Allotment	Logan Valley Allotment	McCoy Creek Allotment	Summit Prairie Allotment
Improvements and Structures	**Construct 2.5 miles of fence** to separate SW corner of McCoy Ck. Unit from Lake Ck. Allotment	**Remove 0.3 miles of existing fence** to combine N. Fork unit of McCoy Allotment into Flat Field Unit of Logan Valley Allotment.	**Remove 1 mile of fence** to create larger Ridge Unit by combining Dry (28 ac.) and existing Ridge units (264 ac.) of McCoy Allotment.	**Remove 0.7 miles of fence** to combine Front Field Unit of Logan Valley Allotment with the Little Logan Unit of Summit Prairie Allotment.
				Construct 7 miles of fence to add Bosenberg unit from Lake Ck. Allotment to Summit Prairie Allotment.
				Construct two water gaps where National Forest System road 1648 crosses Bosenberg Creek and an unnamed tributary of Big Creek.
		Convert 0.3 miles of electric fence in the North Fork unit along Big Creek **to a permanent let-down fence.**		**Develop three ponds in the uplands** to provide alternative water away from perennial streams.
		Construct 2.5 miles of fence to define Deardorff Unit which absorbs 298 ac. of the McCoy Creek unit and 90 ac. of the Horse Pasture from the Lake Creek allotment into the Logan Valley allotment.		**Develop a** headwater spring of Bosenberg Creek. Fence and pipe water to a trough located about 300 ft. from the spring.
		Remove 1.2 miles of fence to create Big Creek Riparian Unit through combining Big Creek portion of the East Lake Creek, North Big Creek and South Big Creek into one unit.		**Pipe water from Bosenberg Creek to a trough** located approximately 100 ft. from the stream.

a – Cow/calf pairs - a mature cow and her suckling calf.

b – AUMs – Animal Unit Month - The amount of forage required by one animal unit (AU) for one month is called an Animal Unit Month (AUM). One animal unit is defined as a 1,000 lb. beef cow with or without a nursing calf with a daily requirement of 26 lb. of dry matter forage. Therefore, one AUM is equal to 780 lbs of dry matter forage (30 days X daily forage requirement).

Proposed Forest Plan Amendments

Alternatives 2, 3, and 4 propose amendments to the Malheur Forest Plan as amended by amendment 29. Specifically, the numeric value for shade in hardwood/meadow complexes from Forest Plan amendment 29 would be modified for site specific stream reaches. The numeric values in amendment 29 were based upon the best information available at the time the Decision Notice was signed by the Malheur National Forest Supervisor in August of 1994. The DN stated that "if new information becomes available in the future which indicates changes in the numeric values to achieve the stated desired condition, these values may be inserted as a clarification/correction to the individual standard". New available information and data collected for the Summit Logan project would be used to amend the numberic values for hardwood meadow complexes on several stream reaches on Summit Creek, West Fork Summit Creek, Lake Creek, Big Creek, and Bosenberg Creek.The proposed amended percent shade values developed for hardwood/meadow complexes within the Summit Logan allotments are based on work by the Carex Working Group (2012) and the Malheur River Basin Total Maximum Daily Load (TMDL) and Water Quality Management Plan completed by State of Oregon Department of Environmental Quality (2010). Work carried out by the Carex Working Group involved estimating the expected (and perhaps maximum) level of streamside shade (height and density) that could be attained from willows, sedges, and other hardwoods under near-natural rates of recovery at two time scales: (a) five years, and (b) twenty years from all stream reaches on Summit Creek. To determine the historic range of variability of the various reaches of Summit Creek the Carex Working Group considered the habitat characteristics of each reach, the habitats occupied by mature willow thickets, alder thickets, and sedge meadows on the reference sites, and similar plant communities we have observed elsewhere in Grant and Harney Counties (Carex Working Group 2010, 2011a, and 2011b).

The stream reaches where modifications are proposed to Amendment 29 Numeric Values are shown in Table 2. Potential values for shade in the TMDL were derived using Ecoregion Based Effective Shade Curves if reference data was not available. These effective shade curves are general heat load allocations that are identified by region and channel width for various riparian plant communities. The given values represent the maximum possible effective shade if the potential height and density are present. The curves account for latitude, critical summertime period and stream aspect. The Carex Working Group only collected reference data for alder and/or willow riparian plant communities. As a result, the Native Floodplain Grasses effective shade curve was used from the TMDL.

Table 2. Proposed modifications to the Malheur Forest Plan

Stream/Reach	Amendment 29 Numeric Value to be Modified			Proposed Modification
	Amendment 29 Element	Location	Specific Value	
Summit Creek Reach 1	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade 65% or greater[a]
Summit Creek Reach 2	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade ≥60% in areas with hardwoods[b] or ≥25% in areas with native floodplain grasses[a]
Summit Creek Reach 4	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade ≥60% in areas with hardwoods[b] or ≥25% in areas with native floodplain grasses[a]
Summit Creek Reach 5	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Increase hardwood shade component; shade ≥ 60%[b]
Summit Creek Reach 6	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	≥ 25% for native floodplain grasses[a]
Summit Creek Reach 7	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	Increase hardwood shade component; shade ≥ 80% for alder-dominated areas (Amendment 29), ≥ 60% for mixed shrub areas[b], or ≥ 25% in areas with native floodplain grasses[a]
West Fork Summit Creek Reach 1	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	≥ 25% for native floodplain grasses[a]
West Fork Summit Creek Reach 2	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	Increase hardwood shade component; shade ≥ 80% for alder-dominated areas (Amendment 29), ≥ 60% for mixed shrub areas[b], or ≥ 25% for native floodplain grasses[a]
Lake Creek Reach 1	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	Increase hardwood shade component; shade ≥ 60% in hardwood areas[b] or ≥ 25% in areas with native floodplain grasses[a]

Stream/Reach	Amendment 29 Numeric Value to be Modified			Proposed Modification
	Amendment 29 Element	Location	Specific Value	
Lake Creek Reach 2	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	Increased hardwood shade component: shade ≥ 60%[b] or ≥ 25% for native floodplain grasses[a]
Lake Creek Reach 3	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	Shade 60-80% in mixed shrub and conifer[b] or ≥ 25% for native floodplain grasses[a]
Lake Creek (no proper functioning condition (PFC)[c] assessment)	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	Shade 60-80% in mixed shrub[b] or ≥ 25% for native floodplain grasses[a]
Big Creek (no PFC assessment, south side of FS rd 16 for 0.15 miles)	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	Shade 60-80% in mixed shrub[b] or ≥ 25% for native floodplain grasses[a]
Big Creek Reach 1	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded 50-65% canopy closure	Shade 60-80% in mixed shrub and conifer[b] or ≥ 25% for native floodplain grasses[a]
Big Creek Reach 2	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	Shade 60-80% in mixed shrub and conifer[b] or ≥ 25% for native floodplain grasses[a]
Big Creek Reach 3	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species d) Hardwood/ Meadow Complex	Hardwood/meadow complex 80% shaded	Shade 60-80% in mixed shrub and conifer[b]
Bosenberg Creek	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species	Hardwood/meadow complex 80% shaded	Shade 60-80% in mixed shrub[b] or ≥ 25% for native floodplain grasses[a]

a – State of Oregon Department of Environmental Quality 2012

b – Carex Working Group 2012

c- PFC - proper functioning condition - A methodology for assessing the physical functioning of riparian and wetland areas.

Public Involvement

Public comments were previously requested in October, 2008 for this project. Since that time, the Summit Logan Grazing Authorization Project has transitioned from an Environmental Assessment (EA) to an Environmental Impact Statement (EIS). On February 1, 2012, a scoping letter providing information and seeking public comment was mailed to approximately 230 entities, including agencies, groups, individuals and other parties that had requested information on general forest or specific range projects. Four comments letters were received: Oregon Natural Desert Association in conjunction with Oregon Wild, Grant County Conservationists, Blue Mountain Biodiversity and an anonymous commenter. Original letters, emails and other scoping comments are contained in the project files. Additionally, on February 8, 2012, a Notice of Intent was published in the Federal Register.

Interaction with the Summit Logan allotment grazing permittees has been ongoing since the fall of 2007 and has included several field trips and meetings. Field trips to the project area were facilitated by the National Riparian Service Team and attended by representatives from U.S. Fish and Wildlife Service and the permittees.

Tribal consultation on a government-to-government basis is ongoing with the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of Warm Springs Reservation. This government-to-government consultation is being conducted under the terms of specific agreements with individual tribes and includes regular contact and meetings as appropriate. Scoping letters were mailed to the tribal governments. In the spring and fall of 2008 the District Ranger, Rangeland Management Specialist and various Interdisciplinary Team members met with the Burns Paiute Tribe to discuss their proposals for the Logan Valley area. Several partnership projects are ongoing in the project area involving the Burns Paiute Tribe and the Logan Valley allotment permittees. The Burns Paiute Tribe is involved in constructing several riparian pasture and exclosure fences on Big Creek and Lake Creek to assist in grazing management and aquatic habitat recovery. On April 3, 2013 the Prairie City Ranger District met with representatives from the Burns Paiute Tribe to discuss ongoing and future projects, which included the Summit Logan Grazing Authorization Project.

Draft EIS Comments and Responses

The Summit Logan Grazing Authorization Project DEIS was completed in October 2012, and was made available to the public the week of November 5, 2012. The 45 day review period began on November 2, 2012, the day that the Notice of Availability was printed in the Federal Register. The review period ran through December 17, 2012. Letters informing that the DEIS was available was mailed to over 100 potentially interested publics. Copies of the DEIS were mailed to those individuals that responded during scoping. Additional copies were given to other individuals, agencies and groups following the initial mailing. Eight written and verbal comments were received from the public. These comments, with agency responses, are located in appendix F.

Issues

Scoping identified the following issues. The issues were separated into three groups for the purpose of this analysis:

- Significant issues are defined as those directly or indirectly caused by implementing the proposed action; however, the effects cannot be reduced by normal best management practices (BMPs) or project design criteria (PDCs). Alternatives were developed to address these issues.
- Analysis issues are defined as those directly or indirectly caused by implementing the proposed action; however, the effects could be reduced with normal best management practices and project

design criteria. An alternative was usually not developed to address these analysis issues. However, these analysis issues will be tracked in the relevant resource area effects analyses in chapter 3 and in the Comparison of Alternatives in chapter 2. Several of the issues for this project fall into this category.

- Issues eliminated from detailed study are identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality NEPA regulations require identification and elimination from detailed study the issues which are not significant or which have been covered by prior environmental review (Title 40 Code of Federal Regulations section 1506.3).

Table 3. Significant issues

Significant Issue	Significant Issue Indicator(s)

Bull trout critical habitat	Measure or element for evaluation:
	• Miles of occupied bull trout habitat grazing during spawning season by stream
	• Miles of critical bull trout habitat[a]
	  ○ Not grazed
	  ○ Grazed annually
	  ○ Grazed with periods of rest
	  ○ Riparian pastures with rest
	  ○ Riparian exclosures not grazed
	• Rate of Recovery
	  ○ Miles of critical habitat expected to achieve proper functioning condition in 5 years
	  ○ Miles of critical habitat expected to achieve proper functioning condition in 10 years
	  ○ Miles of critical habitat expected to achieve desired vegetation conditions and channel characteristics in 10 years

Economic impacts to permittees and the local community	Measure or element for evaluation:
	  ○ Available forage and Animal Unit Months
	  ○ Costs of improvements
	  ○ Acres rested or not grazed
	  ○ Acres available for grazing
	  ○ Miles of added fence maintenance

a - Miles of 303d listed streams are included in the critical bull trout habitat miles

The significant issues and the analysis issues were carried through the analysis in order to fully develop and allow further comparison of the proposed action and alternatives. The environmental consequences of the proposal are disclosed in chapter 3 of the FEIS. Issues are discussed in detail in chapter 1. The significant issues are noted below:

- **Bull Trout Critical Habitat** – Grazing may degrade critical habitat for threatened bull trout. There may be direct, indirect, and cumulative effects of livestock use of streams and riparian areas that could negatively affect spawning and reproductive success. Livestock grazing may trample eggs,

impact stream banks increasing sediment and widening stream channels, decrease shade-providing plants on the banks and increase water temperatures. Continued grazing on streams that are "functional at risk" may impact recovery of resource values including critical bull trout and beaver habitat. In areas that are functioning at risk, channels may not be interacting with the floodplain, substrate is often highly embedded and pool quality low, banks are incised with little vegetation, willows are under-represented in density and age classes, and water temperatures are high.

- **Economic Impacts to Permittees and Community** – Changes in how allotments are managed can affect operational and implementation costs. Riparian exclosures and riparian pastures can exclude productive forage areas and impact livestock movement. The addition of fences can increase annual fence maintenance costs. Permittees, managers and employees of allotments reside in the local communities and contribute to the local economy.

Alternatives Considered in Detail

The Forest Service developed four alternatives: the no action, the proposed action, and two other action alternatives generated in response to issues raised during scoping. The four alternatives considered in detail for this analysis are listed in the table below. Project alternatives are discussed in detail in FEIS chapter 2. Project design criteria, best management practices and monitoring are also listed in detail in FEIS chapter 2.

Alternative 1 - No-Action

For this FEIS, the no action alternative is interpreted to be no grazing. All term grazing permits would be cancelled upon implementation of the decision and resolution of the appeal process. Permittees would be given two years written advance notice of cancellation of their permits as provided for under 36 CFR 222.4 (a)(1). Upon cancellation of the existing permit, there would be no livestock grazing under this alternative.

Alternative 2 – Proposed Action

Alternative 2 was developed to establish a grazing system that provides opportunities for rest and deferment (flexibility in season of grazing) in the Logan Valley and Summit Prairie allotments to recover important attributes of aquatic habitat including riparian vegetation and hardwoods, stream shade, and streambank stability.

Portions of the vacant Lake Creek allotment would be added to the Logan Valley and Summit Prairie allotments and a small geographically-isolated portion of Logan Valley would be added to Summit Prairie. These changes would create a larger landscape for grazing in those allotments with no proposed increase in livestock numbers (animal unit months or AUMs[1]). Adding additional acres to these allotments, combined with other grazing unit adjustments within the allotments, provide the flexibility to periodically rest entire grazing units or defer the season of grazing to restore riparian area conditions, while maintaining enough acres to be grazed annually to support a viable grazing operation.

The southwest corner of the McCoy Creek unit of the Lake Creek Allotment would be removed from the allotment. It may be added to an adjacent allotment in the future. This would be analyzed in a future NEPA analysis. The remainder of the Lake Creek Allotment would remain vacant, as is has been for many

[1] The AUM is the amount of forage needed by an "animal unit" (AU) grazing for one month. The quantity of forage needed is based on the cow's metabolic weight, and the animal unit is defined as one mature 1,000 pound cow and her suckling calf. It is assumed that such a cow nursing her calf will consume 26 pounds of dry matter (DM) of forage per day (20 lbs for the cow and 6 lbs for the calf).

years, to protect important habitat for the bull trout, which is listed as a threatened species under the Endangered Species Act.

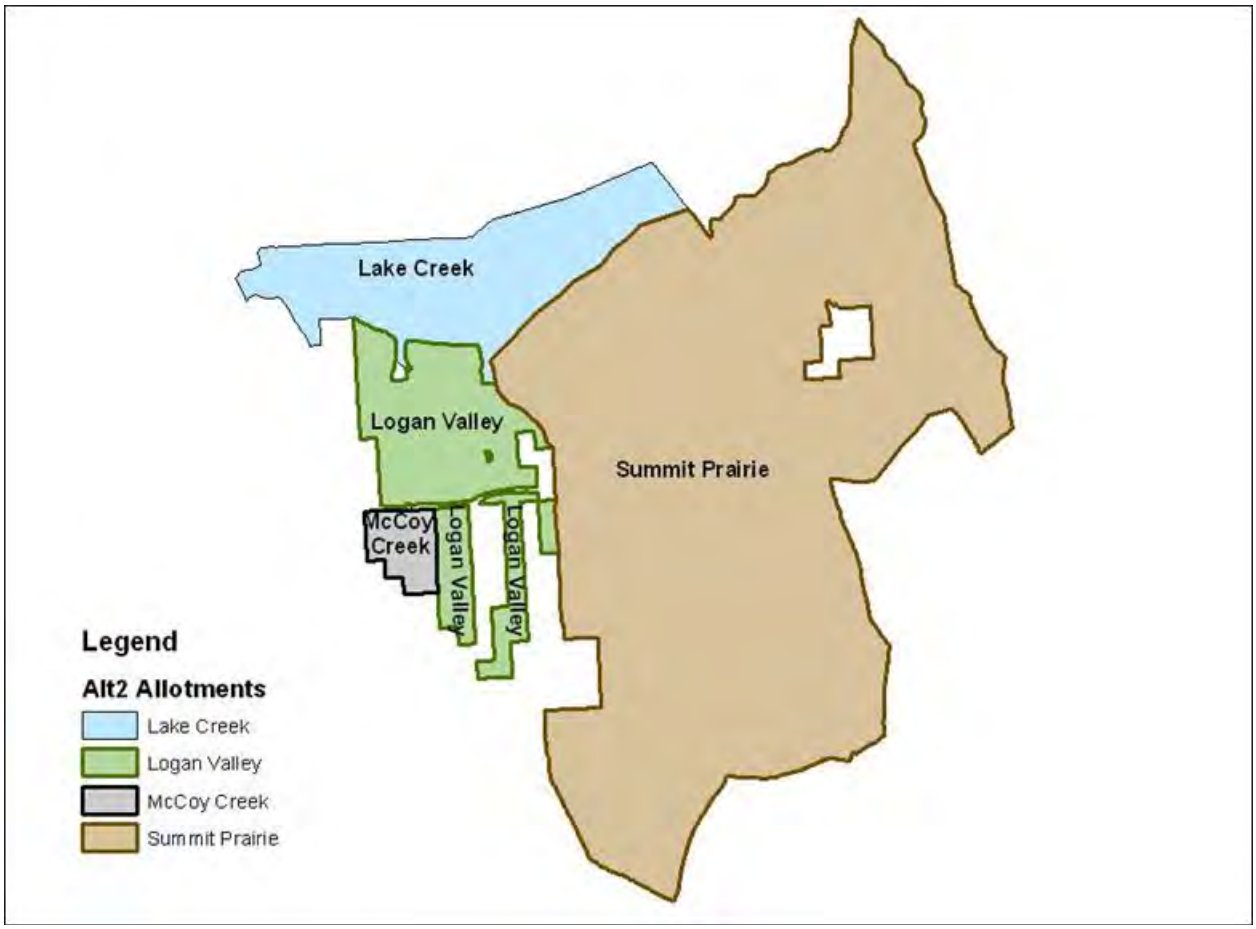

Figure 2. Alternative 2 - range allotment configurations

Proposed allotment boundary and pasture adjustments in the McCoy Creek allotment establish a deferred rotation grazing system allowing flexibility to change the time of year when units would be used. Combining two small units into one larger unit would help to improve livestock distribution for more uniform forage utilization. Small, geographically-isolated grazing units within this allotment would be added to adjacent allotments thus improving logistics of moving animals between units. Ongoing activities described in FEIS chapter 1 (Current Management) include fence construction that excludes grazing from most of the Lake Creek riparian area to recover hardwoods,stream shade, and critical habitat for bull trout.

In the Logan Valley, McCoy Creek, and Summit Prairie allotments, proposed move triggers and allowable use levels for herbaceous forage and shrub use, and bank alteration vary by pasture. See FEIS appendix E for specific details.

Figure 2 displays the allotment configuration for alternative 2.

Alternative 3

Alternative 3 was developed in response to the public's concern over bull trout critical habitat. All of the Lake Creek allotment would remain vacant in this alternative. The Lake Creek allotment contains all or portions of Lake Creek, Big Creek, Corral Basin Creek, and Bosenberg Creek which are designated critical habitat for bull trout.

In the Logan Valley, McCoy Creek, and Summit Prairie allotments, proposed move triggers and allowable use levels for herbaceous forage and shrub use, and bank alteration vary by pasture based on the existing condition of the specific riparian area, its resiliency to grazing effects and other disturbances, and the presence of critical bull trout habitat. See FEIS appendix E for specific details.

Ongoing water developments in the Logan Valley allotment would provide opportunities to defer the season of grazing and a change to a deferred grazing system.

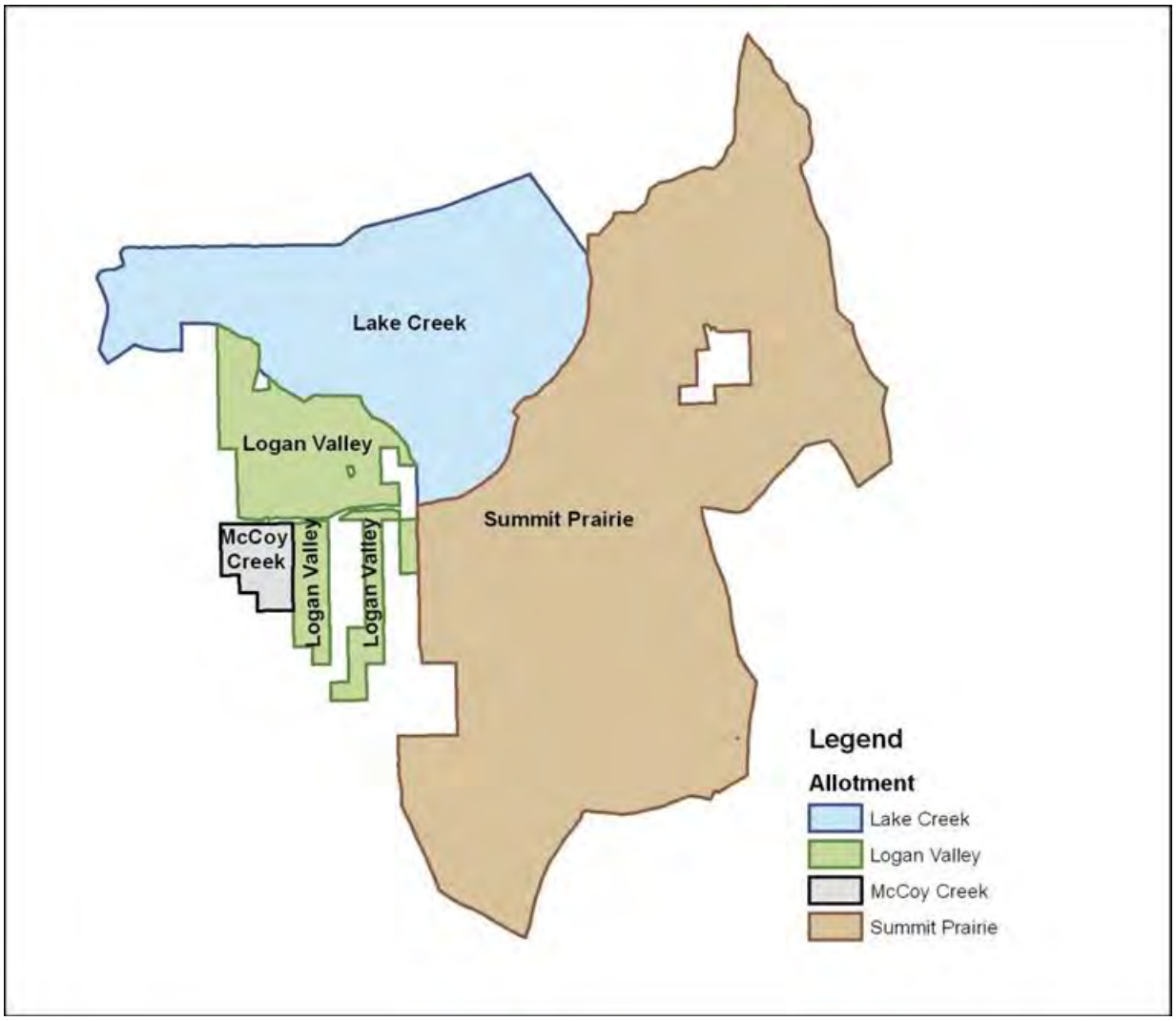

Figure 3. Alternative 3 range allotment configurations

Proposed allotment boundary and pasture adjustments in the McCoy Creek allotment establish a deferred rotation grazing system allowing flexibility to change the time of year when units would be used.

Combining two small units into one larger unit would help to improve livestock distribution for more uniform forage utilization. Small, geographically-isolated grazing units within this allotment would be added to adjacent allotments thus improving logistics of moving animals between units. Ongoing activities described in chapter 1 (Current Management) would construct fences that exclude grazing from most of the Lake Creek grazing unit riparian area (McCoy Allotment) to recover hardwoods , stream shade, and critical habitat for bull trout. Riparian pastures and exclosures would be constructed on Summit Creek in the Little Logan and Sagehen pastures. Riparian pastures would be rested for several years to expedite recovery of riparian vegetation to enhance stream shade, riparian vegetation composition and vigor, and streambank stability. Figure 3 displays range allotment configurations for alternative 3.

Alternative 4

Alternative 4 was developed using public scoping comments and recommendations from Summit Prairie allotment grazing permittee. Part of the vacant Lake Creek allotment would be added to the Logan Valley allotment. The portions of the Lake Creek allotment containing Lake Creek, Big Creek, Corral Basin Creek, and Bosenberg Creek (critical bull trout streams) would remain vacant. Adding acres from the Lake Creek allotment to the Logan Valley allotment establishes a larger grazing landscape providing the flexibility to rest and defer (flexibility in season of grazing) grazing to recover important attributes of aquatic habitat, while maintaining enough acres to be grazed annually to support a viable grazing operation.

Proposed allotment boundary and pasture adjustments in the McCoy Creek allotment establish a deferred rotation grazing system allowing flexibility to change the time of year when units would be used. Combining two small units into one larger unit would help to improve livestock distribution for more uniform forage utilization. Small, geographically-isolated grazing units within this allotment would be added to adjacent allotments thus improving logistics of moving animals between units. Ongoing projects would construct fences that exclude grazing from most of the Lake Creek riparian area to recover hardwoods, stream shade and critical habitat for bull trout. Management changes are proposed in the Summit Prairie allotment to encourage recovery of riparian vegetation to enhance stream shade, riparian vegetation composition and vigor, and streambank stability. Daily riding by the permittee would be required when livestock are within the Sagehen and Little Logan units to move and distribute animals into the uplands away from Summit Creek. Small exclosures would be constructed and cages placed in the Sagehen and Little Logan units. A riparian pasture would be constructed from a portion of the Summit Rock and North Summit units containing portions of Summit Creek and West Fork Summit Creek.

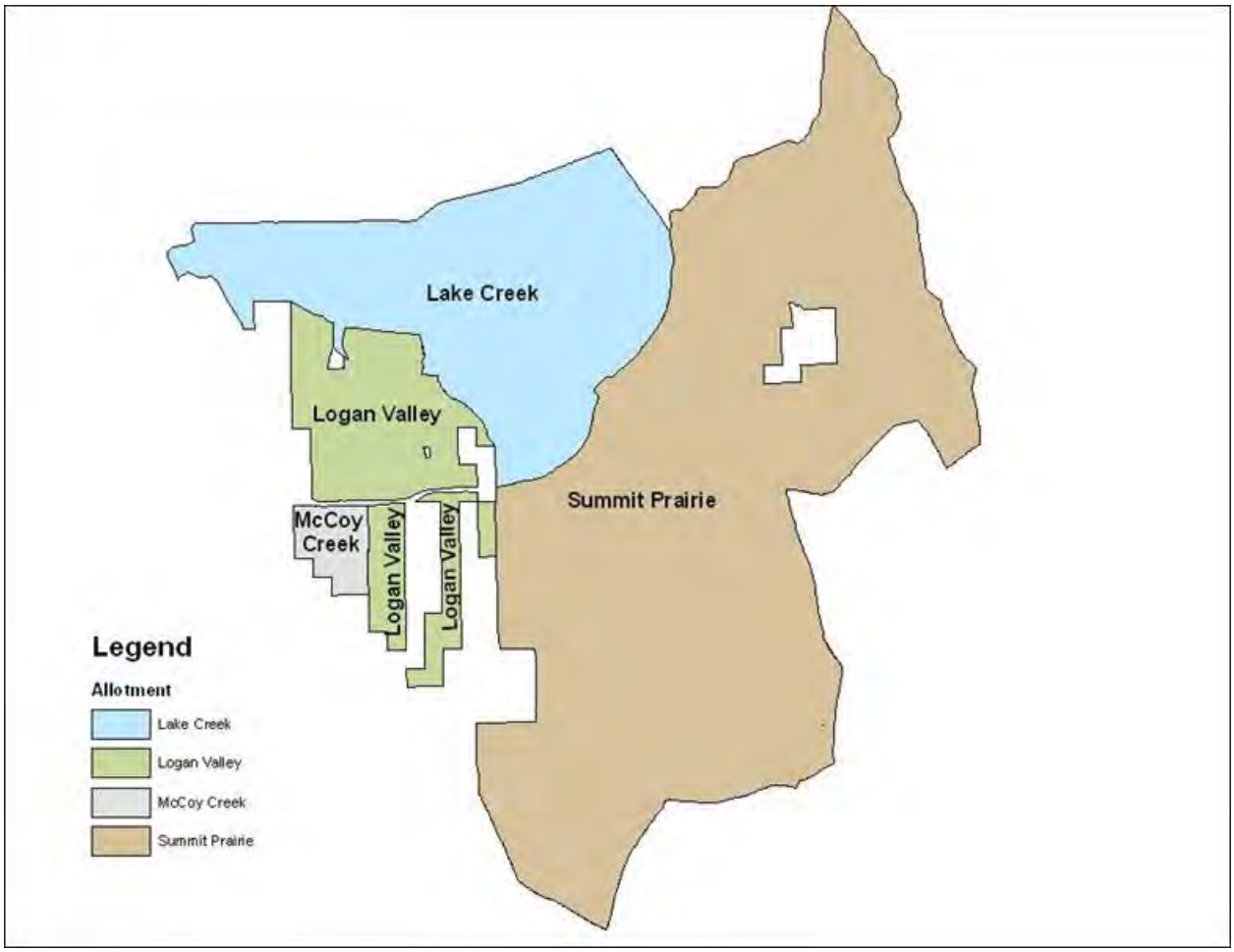

Figure 4. Alternative 4 range allotment configurations

In the Logan Valley, McCoy Creek, and Summit Prairie allotments, proposed move triggers and allowable use levels for herbaceous forage and shrub use, and bank alteration vary by pasture based on the existing condition of the specific riparian area, its resiliency to grazing effects and other disturbances, and the presence of critical bull trout habitat. See FEIS appendix E for specific details.

Figure 4 displays range allotment configurations for alternative 4.

Table 4 summarizes the various elements of the alternatives by range allotment in a comparative format.

Table 4. Summary of alternative actions

Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Lake Creek Allotment				
Allotment Acres	Not Applicable	5,069	10, 196	9,459
Grazing System	No Grazing	Vacant	Vacant	Vacant
Boundary Changes	Not Applicable	Approximately 4,778 acres of the Lake Creek allotment would be absorbed into the adjacent Logan Valley and Summit Prairie allotments. An additional 349 would be removed from the Lake Creek allotment. This area may be added to the Dollar Basin allotment in the future.	No boundary changes. Entire allotment would remain vacant.	Approximately 388 acres of the Lake Creek allotment would be absorbed into the adjacent Logan Valley allotment. An additional 349 would be removed from the Lake Creek allotment. This area may be added to the Dollar Basin allotment in the future.
Livestock Numbers (AUMs)	0	0	0	0
Grazing Season	No Grazing Season	No Grazing Season	No Grazing Season	No Grazing Season
Improvements and Structures	0	0	0	0
Minimum Rest Requirements	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Forage Allowable Use, Move Triggers, and Endpoint Indicators	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Special Requirements	None	None	None	None
Adaptive Management	None	None	None	None

Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Logan Valley Allotment				
Allotment Acres	Not Applicable	4,359	3,971	4,359
Grazing System	No Grazing	Periods non-scheduled rest and deferment	Deferred Rotation	Periods non-scheduled rest and deferment
Boundary Changes	Not Applicable	Approximately 655 acres from the Lake Creek and McCoy Creek allotments would be added to the Logan Valley allotment. The Big Creek portion of the East Lake Creek, North Big Creek, and South Big Creek would be combined into a single large unit known as Big Creek Riparian pasture. Approximately 52 acres would be removed from the Logan Valley allotment and absorbed into the Summit Prairie allotment.	Approximately 267 acres of the McCoy Creek allotment would be absorbed into the Logan Valley allotment. The Big Creek portion of the East Lake Creek, North Big Creek, and South Big Creek would be combined into a single large unit known as Big Creek Riparian pasture. Approximately 52 acres would be removed from the Logan Valley allotment and absorbed into the Summit Prairie allotment.	Approximately 655 acres from the Lake Creek and McCoy Creek allotments would be added to the Logan Valley allotment. The Big Creek portion of the East Lake Creek, North Big Creek, and South Big Creek would be combined into a single large unit known as Big Creek Riparian pasture. Approximately 52 acres would be removed from the Logan Valley allotment and absorbed into the Summit Prairie allotment.
Livestock Numbers (AUMs)	0	1,983	1,983	1,983
Grazing Season	No Grazing Season	06/10-10/15	06/10-10/15	06/10-10/15
Improvements and Structures	0	Approximately 2.8 miles of additional fences would be constructed and 2.3 miles removed.	Approximately 0.3 miles of additional fences would be constructed and 1.5 miles removed.	Approximately 2.8 miles of additional fences would be constructed and 2.3 miles removed.
Minimum Rest Requirements	Not Applicable	See FEIS chapter 2, Table 21	See FEIS chapter 2, Table 33	See FEIS chapter 2, Table 43
Forage Allowable Use, Move Triggers, and Endpoint Indicators	Not Applicable	See FEIS appendix E	See FEIS appendix E	See FEIS appendix E
Special Requirements	None	Livestock would be removed by August 15th to protect bull trout spawning habitat in the Big Creek Riparian Pasture.	Livestock would be removed by August 15th to protect bull trout spawning habitat in the Big Creek Riparian Pasture.	Livestock would be removed by August 15th to protect bull trout spawning habitat in the Big Creek Riparian Pasture.
Adaptive Management	None	None – Lake Creek will be fenced (riparian exclosures) with no grazing as part of ongoing projects (see appendix C).	None – Lake Creek will be fenced (riparian exclosures) with no grazing as part of ongoing projects (see appendix C).	None – Lake Creek will be fenced (riparian exclosures) with no grazing as part of ongoing projects (see appendix C).

Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
McCoy Creek Allotment				
Allotment Acres	Not Applicable	660	660	660
Grazing System	No Grazing	Deferred Rotation	Deferred Rotation	Deferred Rotation
Boundary Changes	Not Applicable	The Lake Creek and North Fork units (267 acres) of the McCoy Creek allotment would be removed from the McCoy Creek allotment and absorbed into the Logan Valley allotment. The Starvation unit would be removed from the McCoy Creek allotment and possibly added to the Dollar Basin allotment in the future. A separate environmental analysis would be required.	Same as alternative 2	Same as alternative 2
Livestock Numbers (AUMs)	0	416	416	416
Grazing Season	No Grazing Season	06/01-10/30	06/01-10/30	06/01-10/30
Improvements and Structures	0	Approximately 1 mile of fence removed	Same as alternative 2	Same as alternative 2
Minimum Rest Requirements	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Forage Allowable Use, Move Triggers, and Endpoint Indicators	Not Applicable	See FEIS appendix E	See FEIS appendix E	See FEIS appendix E
Special Requirements	None	None	None	None
Adaptive Management	None	None - Lake Creek fenced in riparian exclosures with no grazing.	None - Lake Creek fenced in riparian exclosures with no grazing.	None - Lake Creek fenced in riparian exclosures with no grazing.

Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Summit Creek Allotment				
Allotment Acres	Not Applicable	29,832	25,383	25,383
Grazing System	No Grazing	Periods non-scheduled rest and deferment	Deferred Rotation	Deferred Rotation
Boundary Changes	Not Applicable	Approximately 52 acres would be removed from the Logan Valley allotment and absorbed into the Summit Prairie allotment. The Bosenberg unit (4,449 acres) from the vacant Lake Creek allotment would be added to the Summit Prairie Allotment.	Approximately 52 acres would be removed from the Logan Valley allotment and absorbed into the Summit Prairie allotment. Riparian pastures and grazing exclosure would be constructed in the Sagehen, Little Logan and North Summit units allowing portions of Summit Creek to be rested.	Approximately 52 acres would be removed from the Logan Valley allotment and absorbed into the Summit Prairie allotment. A riparian pasture would be constructed containing portions of Summit Creek and West Fork Summit Creek in portions of the Summit Rock and North Summit units.
Livestock Numbers (AUMs)	0	1,546	1,546	1.546
Grazing Season	No Grazing Season	06/10-10/24	06/10-10/24	06/10-10/24
Improvements and Structures	0	Approximately 7.0 miles of new fence would be constructed and 0.7 miles removed.	Approximately 12.2 miles of additional fences would be constructed and 0.7 miles removed.	Approximately 6.1 miles of additional fences would be constructed and 0.7 miles removed.
Minimum Rest Requirements	Not Applicable	See FEIS chapter 2, Table 27	See FEIS chapter 2, Table 37	See FEIS chapter 2, Table 47
Forage Allowable Use, Move Triggers, and Endpoint Indicators	Not Applicable	See FEIS appendix E[a]	See FEIS appendix E	See FEIS appendix E
Special Requirements	None	To ensure adequate protection of all streams in the unit, riding in the Bosenberg unit would be required to maintain livestock concentrations in the uplands. Part of the Bosenberg Unit was burned in early 1990 wildfires. To allow continued recovery of Bosenberg Creek, specific monitoring criteria and stream bank alteration standards would be applied. (Chapter 2 (Monitoring) and appendix E).		Daily riding by the permittee would ensure livestock stay in the uplands, reducing grazing use along Summit Creek in the Sagehen and Little Logan units during the season of use.

Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Adaptive Management	None	Adaptive management strategies shown in FEIS appendix A (Table 104) are summarized in chapter 2, Table 29	Adaptive management strategies shown in FEIS appendix A (Table 104) are summarized in chapter 2, Table 39	Adaptive management strategies shown in FEIS appendix A (Table 104) are summarized in chapter 2, Table 49.

a - Move triggers and allowable use levels on herbaceous hydrophytic riparian species (riparian greenline), riparian woody shrubs, and bank alteration vary by grazing unit and alternative.

Affected Environment and Environmental Consequences

The environmental consequences of implementing this project, by alternative, are described in detail in chapter 3 of the FEIS. A concise summary of the effects is displayed in the tables below.

Table 5. Comparison of alternatives: significant and analysis issues

Measure		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Issue: Bull Trout Critical Habitat					
Miles of occupied bull trout habitat grazed during spawning season by stream		0	0	0	0
Miles of critical bull trout habitat for occupied and unoccupied:	Not grazed	35	9.9	14.3	14.3
	Grazed annually	0.0	7.3	12.1	15.4
	Grazed with periods of rest	0.0	14.5	0.0	0.0
	Riparian pasture with rest	0.0	2.7	7.4	4.8
	Riparian exclosures not grazed[a]	0.0	0.0	0.8	0.0
Rate of Recovery:	Miles of Critical Habitat expected to achieve proper functioning condition in 5 years	31.1	29.6	33.3	31.7
	Miles of Critical Habitat expected to achieve proper functioning condition in 10years	35	30.9	34.4	34.5
	Miles of Critical Habitat expected to achieve desired vegetation and channel conditions in 10 years	31	17.2	32.1	25.5
Issue: Economic Impacts to Permittees and the Local Community					
Animal Unit Months (AUMs)		0	Upper limit AUMs are the same for every alternative: Lake Creek: 0 Logan Valley: 1,983 McCoy Creek: 416 Summit Prairie: 1,546		
Total Available Forage (lbs. acre)/ Animal Unit Months Supported by Available Forage (AUMs) Note: Total Available forage was calculated using a 45% forage use level by livestock. Wildlife use was not included in the estimate.	Lake Creek	No Forage or AUMS for Livestock	2,275,922/ 2,918 No Livestock Use of Forage	4,382,366/ 5,618 No Livestock Use of Forage	4,055,049/ 5,199 No Livestock Use of Forage
	Logan Valley		4,329,288/ 5,550	4,164,989/ 5,340	4,329,288/ 5,550
	McCoy Creek		775,585/ 994	775,585/ 994	775,585 994
	Summit Prairie		8,030,701/ 10,296	7,109,413/ 9,115	7,111,601/ 9,117

Measure			Alternative 1	Alternative 2	Alternative 3	Alternative 4
Costs of Improvements:	Lake Creek		$0	$67,500	$0	$67,550
	Logan Valley			$74,400	$12,600	$80,100
	McCoy Creek			$3,000	$3,000	$3,000
	Summit Prairie			$224,100	$333,800	$155,600
Acres Rested or Not Grazed (average minimum on an annual basis over the next 10 years):	Lake Creek		10,196	5,056	10,196	9,459
	Logan Valley		3,756	246	60	246
	McCoy Creek		980	0	0	0
	Summit Prairie		25,331	3,453	94	20
Acres available for Grazing (average on an annual basis over the next 10 years)[b]:	Lake Creek		0	0	0	0
	Logan Valley			4,113	3,911	4,113
	McCoy Creek			660	660	660
	Summit Prairie			26,379	25,289	25,363
Miles of Added Fence Maintenance[c]:	Lake Creek		0	0	0	0
	Logan Valley			4.8	2.3	2.3
	McCoy Creek			1.4	1.4	1.4
	Summit Prairie			7.3	12.5	4.6
Analysis Issues						
Fences are movement barriers to wildlife	Miles of Fence Removed	Lake Creek	0	0	0	0
		Logan Valley		2.3	1.5	1.5
		McCoy Creek		1.0	1.0	1.0
		Summit Logan		0.7	0.7	0.7
	Miles of Fence Constructed		See Significant Issue “Miles of Added Fence Maintenance” for miles of fence constructed.			
	Design Elements to Reduce Impacts		Not Applicable	To reduce the impact of fences to big game, Design Elements are in place requiring a smooth bottom wire at least 16 inches above the ground to facilitate fawn movement, with a maximum top wire height of 42 inches, and spacing of 10 inches between the top and next lower wire to reduce the potential of back legs being caught when animals jump the fence.		
Proposed Move Triggers, End-Point Indicators not capable of allowing for riparian recovery	Move Triggers and End-Point Indicators		See FEIS appendix E			

Measure		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Limited hardwoods have resulted in a loss of beaver habitat and reduction of animals within the project area	Short – and Long – Term Effects on Shrub Development	Not Applicable	Adding the Bosenberg unit and requiring yearlong rest (3 out of 10 years) would improve the height and vigor of existing shrubs.	The creation of riparian pastures and exclosures with immediate rest (5 years) along with reduced woody browse would improve height, vigor and potential expansion of willow densities.	Site specific willow exclosures and a range rider along with reduced woody browse would improve height, vigor and potential expansion of willow densities.
Shifting parts of vacant allotments into active livestock use	Acres of Currently Vacant Allotment Grazed	0	4,478	0	388
	Miles of Critical Bull Trout Habitat Grazed in Currently Vacant Allotment	0	4.4	0	0
Livestock stocking levels should be reduced	Capability, Suitability and Forage Production	No Grazing	The AUMs proposed are maximum limits and may be adjusted to allow flexibility for annual adjustment of both numbers and/or season. The analysis of available forage and stocking rates shows that adequate forage is available to support AUMs levels currently permitted including any proposed allotment boundary and management changes.		

a - Miles do not include 0.5 miles of Lake Creek to be excluded from grazing (riparian exclosures) in ongoing/foreseeable projects.

a - Acres do not include existing exclosures that would not be grazed.

b - Miles are cumulative, including acres from ongoing projects (see current management in chapter 1 for further detail).

Table 6. Comparison of alternatives: resource areas

Resource Areas	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 4
Rangeland Vegetation				
Range Vegetation and Health Vigor	No direct or indirect effects	Proposed forage use levels are adequate to maintain or improve plant vigor (health) and allow continued improvement in forage condition trends.		
Invasive Species	No direct or indirect effects	The ground disturbance for the new structural improvements could create an opportunity for invasive weed species to be introduced. Livestock grazing or associated permittee actions have not been identified as a major factor in the establishment and spread of noxious wees in the project area. Currently noxious weeds occupy less than .0001 percent (11 acres) of the analysis area and environmental effects are minimal. Implementing proposed grazing management practices and design criteria described in Chapter 2 would minimize noxious weed spread. Assuming noxious weed control continues, anticipate short term (<10 years) effects from infestation and spread of noxious weeds is expected to be relatively low.		

Resource Areas	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 4
Botany (Sensitive Plants)	See Table 7			
Soils	No direct or indirect effects	Consistent with Forest Plan soil protection standards		
Hydrology and Aquatics				
Bull Trout Habitat Recovery	See Table 8			
Threatened, Endangered and Sensitive Aquatic Species	See Table 8			
Forest Plan Consistency	Consistent with Management Area 3A standards and INFISH. Amendments proposed to modify the numeric value for shade in hardwood/meadow complexes from Forest Plan amendment 29.			
Clean Water Act	Consistent with the Clean Water Act; providing for the recovery of the wetland obligate vegetation attributes and channel morphology, resulting in water temperatures that would provide for bull trout beneficial uses.			
Recreation and Visual Quality				
Recreation	Meets recreation opportunity spectrum standard			
Visual Quality	Meets Forest Plan visual quality objectives			
Malheur Wild and Scenic River Corridor	No direct or indirect effects	No improvements and/or structures within the corridor. Meets Forest Plan standards. There would be no effect to the outstanding remarkable values or free flowing conditions of the river.		
Heritage	No direct or indirect effects	No additional impacts to heritage sites within the project area are expected from grazing.		
Social Economics				
Animal Unit Months	See Table 5			
Structural Improvement Costs	See Table 5			
Wildlife	See Table 9			

Table 7. Effects to sensitive plant species

Concern / Impacts	Sensitive Species	Alternative(s)		Rationale
		1	2, 3, 4	
Species where impacts from herbivory / grazing is a concern.	*Carex cordillerana* *Muhlenbergia minutissima* *Trifolium douglasii*	BI	MDI	These three species are palatable and have the potential to be negatively impacted by intensive grazing (Bakker et al. 2010, NatureServe 2012, Wilson et al. 2008).

Concern / Impacts	Sensitive Species	Alternative(s)		Rationale
		1	2, 3, 4	
Species where impacts from trampling and defecation is a concern.	*Botrychium ascendens* *Botrychium hesperium* *Botrychium lunaria* ***Botrychium montanum*** *Botrychium paradoxum* *Botrychium pedunculosum* *Bryum calobryoides* *Eleocharis bolanderi* *Listera borealis* *Mimulus evanescens* *Phacelia minutissima* *Schistidium cinclidodonteum* *Tortula mucronifolia*	BI	MDI	These species are very small, delicate, and exists in areas with high soil moisture. Livestock are often concentrated in these areas. For these species, a single hoof print or cow pie can destroy an individual plant, and even a relatively small amount of hoof action and/or defecation can eliminate a small population.
Species where impacts from trampling, trailing, herbivory, and defecation in peatlands is a concern.	*Anthelia julacea* ***Botrychium crenulatum*** *Harpanthus flotovianus* ***Helodium blandowii*** ***Meesia uliginosa*** *Ophioglossum pusillum* *Pseudocalliergon trifarium* *Splachnum ampullaceum* ***Tomentypnum nitens*** *Utricularia minor*	BI	MDI/BI	Adaptive management strategies that benefit these species would be implemented if detrimental effects are occurring and management objectives are not met within a 5 year period (appendix A, Table 103 and Table 104).

BI=Beneficial Impact, NI=No Impact, MID=May Detrimentally Impact but would not lead to a tread toward federal listing [40 CFR §1508.8, FSM 2672.42(5)]. Species identified in bold font are documented within the project area.

Table 8. Effects to threatened, endangered and sensitive (TES) and management indicator aquatic species

Aquatic Species	Status[a]	Effects Determination[b, c]			
		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Columbia River Bull Trout	T (MIS)	NLAA/BE	LAA	NLAA/BE	NLAA/BE
Columbia River Bull Trout Designated Critical Habitat	D	NLAA/BE	LAA	NLAA/BE	NLAA/BE
Columbia spotted frog	S	NI	MIIH	MIIH/BI	MIIH/BI
Columbia River Bull Trout	MIS	Continued viability is expected	Likely to impact viability of the Malheur population	Continued viability is expected	Continued viability is expected
Interior Redband Trout	MIS	Continued viability is expected	Continued viability is expected	Continued viability is expected	Continued viability is expected

Table 9. Threatened, endangered and sensitive wildlife species summary

Terrestrial Species	Status	Effects Determination			
		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Canada Lynx	Threatened	NE	NE	NE	NE
Gray Wolf	Sensitive	NI	NI	NI	NI
Bald Eagle	Sensitive	NI	NI	NI	NI
American Peregrine Falcon	Sensitive	NI	NI	NI	NI
California Wolverine	Sensitive, Candidate	NI	NI	NI	NI
Pygmy Rabbit	Sensitive	NI	NI	NI	NI
Greater Sage-Grouse	Sensitive, Candidate	NI	MIIH	MIIH	MIIH
Silver-bordered Fritillary	Sensitive	NI	MIIH	MIIH	MIIH
Wallowa Rosy Finch	Sensitive	NI	NI	NI	NI
Bobolink	Sensitive	NI	MIIH	MIIH	MIIH
Grasshopper Sparrow	Sensitive	NI	MIIH	MIIH	MIIH
Upland Sandpiper	Sensitive	NI	NI	NI	NI
Tricolored Blackbird	Sensitive	NI	NI	NI	NI
Bufflehead	Sensitive	NI	NI	NI	NI
Lewis's Woodpecker	Sensitive	NI	MIIH	MIIH	MIIH
White-headed Woodpecker	Sensitive	NI	MIIH	MIIH	MIIH
Townsend's Big-Eared Bat	Sensitive	NI	MIIH	MIIH	MIIH
Pallid Bat	Sensitive	NI	MIIH	MIIH	MIIH
Fringed Myotis	Sensitive	NI	MIIH	MIIH	MIIH
Johnson's Hairstreak	Sensitive	NI	NI	NI	NI
Columbia Clubtail	Sensitive	NI	MIIH	MIIH	MIIH
Columbia Spotted Frog	Sensitive	See Aquatic Section	See Aquatic Section	See Aquatic Section	See Aquatic Section
Big Game Habitat (Elk)	MIS	NI	Not expected to affect elk population numbers or viability.		

Terrestrial Species	Status	Effects Determination			
		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Old Growth Habitat	MIS	No direct or indirect effects to old growth habitat and the MIS species associated with this habitat.	Cattle grazing would have little to no impact to Old Growth Habitat and associated MIS pileated woodpecker, American marten, and three-toed woodpecker.		
Primary Cavity Excavators	MIS	No direct, indirect or cumulative effects to the primary cavity excavators or their habitat.	No impact to snag and down wood habitat in ponderosa pine, lodgepole pine, or mixed conifer stands. Little or no impact to woodpeckers utilizing these habitats. Unprotected aspen stands may continue decline impacting nesting and foraging habitat.		
Goshawk, Osprey, Blue Grouse, Antelope	Features Species	No direct, indirect or cumulative effects to featured species or their habitat.	There would be no impacts to goshawk nesting habitat, osprey nesting habitat (snags), or blue grouse winter roosts. Improvements in riparian shrub density and age classes, as well as herbaceous cover, would improve habitat for small mammals, birds (northern goshawk prey), fisheries (osprey prey), or blue grouse foraging areas. Cattle grazing may displace female pronghorns. Because turn-out dates would be in mid- June or later, this would not impact newly born fawns. Most antelope have had their young by June.		
Beaver	Species of Concern During Scoping	No direct or indirect, or cumulative effects.	Recovery of herbaceous vegetation and riparian hardwoods could increase the expansion of beaver within the project area.		
Landbirds Including Neotropical Migratory Birds	Migratory Birds	No direct or indirect, or cumulative effects.	Overall disturbance from activities would be limited in time and place, and therefore, would not be expected to impact populations of species at the landscape level.		

a - Status
- T Federally Threatened
- S Sensitive species for Regional Forester's list
- D Designated Critical Habitat
- MIS Management Indicator Species

b - Effects Determination
- NLAA May Effect, Not Likely to Adversely Affect
- LAA May Effect, Likely to Adversely Affect
- BE Beneficial Effect

c - Sensitive Species
- NI No Impact
- MIIH May Impact Individuals or Habitat but Will Not Likely Contribute to a Trent Toward Federally Listing or Cause a Loss of Viability to the Population or Species
- BI Beneficial Impact

Identification of the Selected Alternative

Alternative 4 with modifications is the deciding officials selected alternative. The modifications would be that Summit Prairie Allotment would be managed as outlined in alternative 3. In addition, the range rider described in alternative 4 would be used until the proposed riparian fencing is installed in the Summit Prairie Allotment. The remaining allotments: Lake Creek, Logan Valley, and McCoy Creek would be managed as described in alternative 4.

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Chapter 1. Purpose of and Need for Action

Document Structure

The US Department of Agriculture Forest Service (USDA Forest Service) has prepared this Final Environmental Impact Statement (FEIS) in compliance with the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR parts 1500-1508), agency regulations and all applicable federal and state laws. This document is organized into the following sections:

- *Chapter 1. Purpose and Need for the Action*: This chapter includes background information on the project proposal, the purpose and need for the project and the proposal for achieving that purpose and need. This section describes how the Forest Service informed the public of the proposal and identified the significant issues that drive the analysis.
- *Chapter 2. Alternatives, including the Proposed Action*: This chapter provides a more detailed description of the Proposed Action as well as alternative methods for achieving the stated purpose and need. These alternatives were developed based on significant issues raised by the public, the interdisciplinary team (IDT) and other agencies.
- *Chapter 3. Existing Condition and Environmental consequences*: This chapter describes the physical, biological and human environments potentially affected by the Proposed Action and alternatives, and describes the potential effects of the Proposed Action and alternatives, including the No Action Alternative.
- *Chapter 4. Consultation and Coordination*: This chapter provides a list of preparers and those who responded during the scoping period.
- *Chapter 5*. This chapter includes a list of references and an index.
- *Appendices*. This section includes supplemental analysis information and colored maps.

Additional documentation may be found in the project record files. Permanent project record files are located at the Prairie City Ranger District Office, 327 Front Street, P.O. Box 337, Prairie City, OR 97869. For information regarding project record files please contact Randy Gould, Prairie City District Ranger at (541) 820.3800.

Introduction

The Forest Service prepared this Final Environmental Impact Statement (FEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant laws and regulations. It discloses the environmental consequences of authorizing livestock grazing in the Summit Logan Valley Grazing Authorization (Summit Logan) project. The Summit Logan project area includes Lake Creek, Logan Valley, McCoy Creek and Summit Prairie Allotments. These four allotments were combined into this analysis because they have similar geographic, vegetative and ecological attributes. They are all located in the Upper Malheur River Watershed and are tributaries to the Malheur River. All four allotments contain critical habitat for threatened bull trout and have similar aquatic habitat needs. The map below shows the arrangement of these range allotments in the project area.

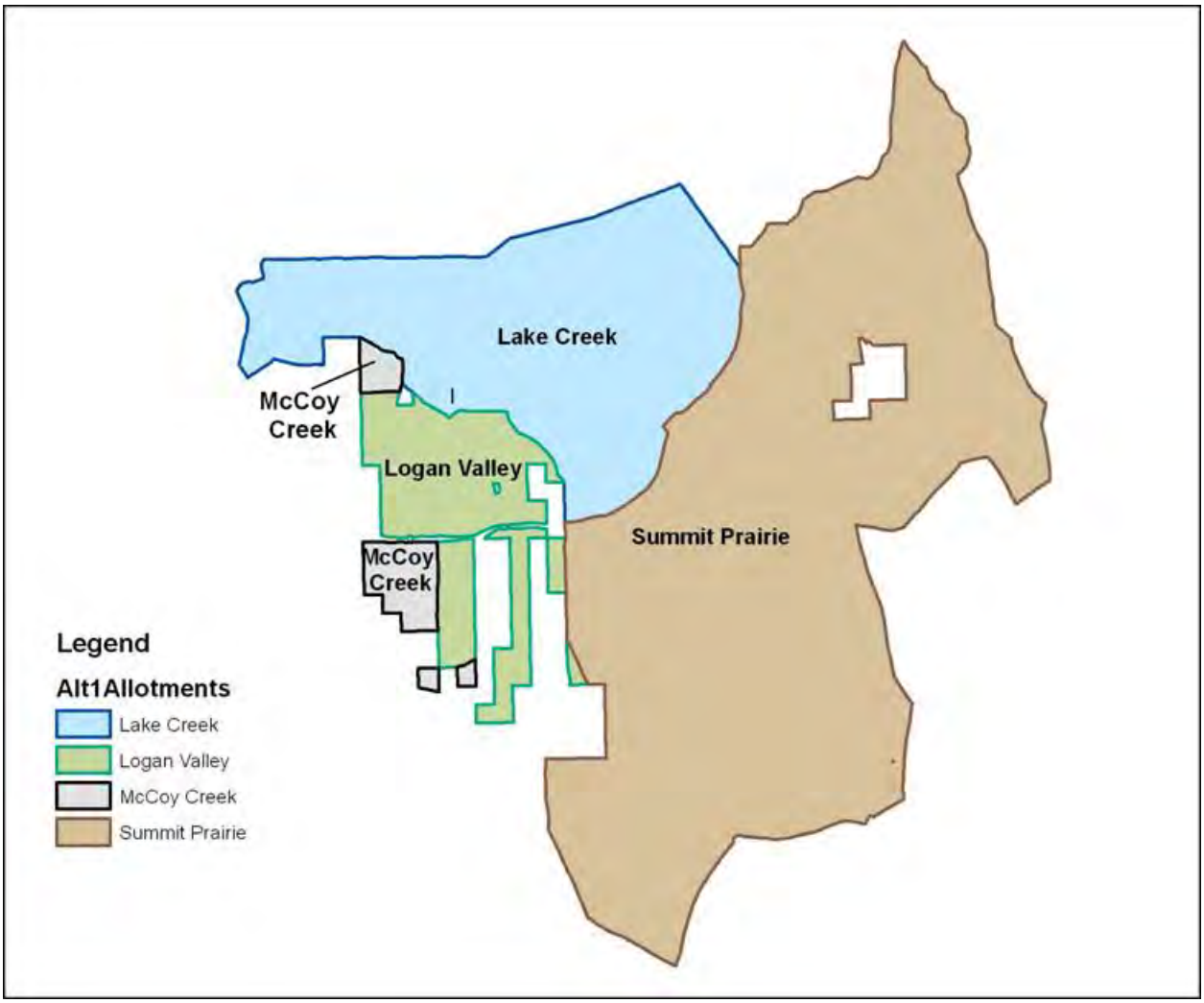

Figure 5. Current configuration of range allotments in project area

Figure 6 shows the grazing units within each range allotment as well as the location of major streams. Shades of blue represent grazing units with the Lake Creek Allotment. Shades of green represent grazing units with the Logan Valley Allotment. Shades of grey represent grazing units within the McCoy Creek Allotment and shades of brown represent grazing units within the Summit Prairie Allotment. To avoid confusion in discussions that follow, note that two allotments and two grazing units have similar names (see Figure 5 and Figure 6). The Lake Creek grazing unit is in the McCoy Creek Allotment and the McCoy Creek grazing unit is in the Lake Creek Allotment.

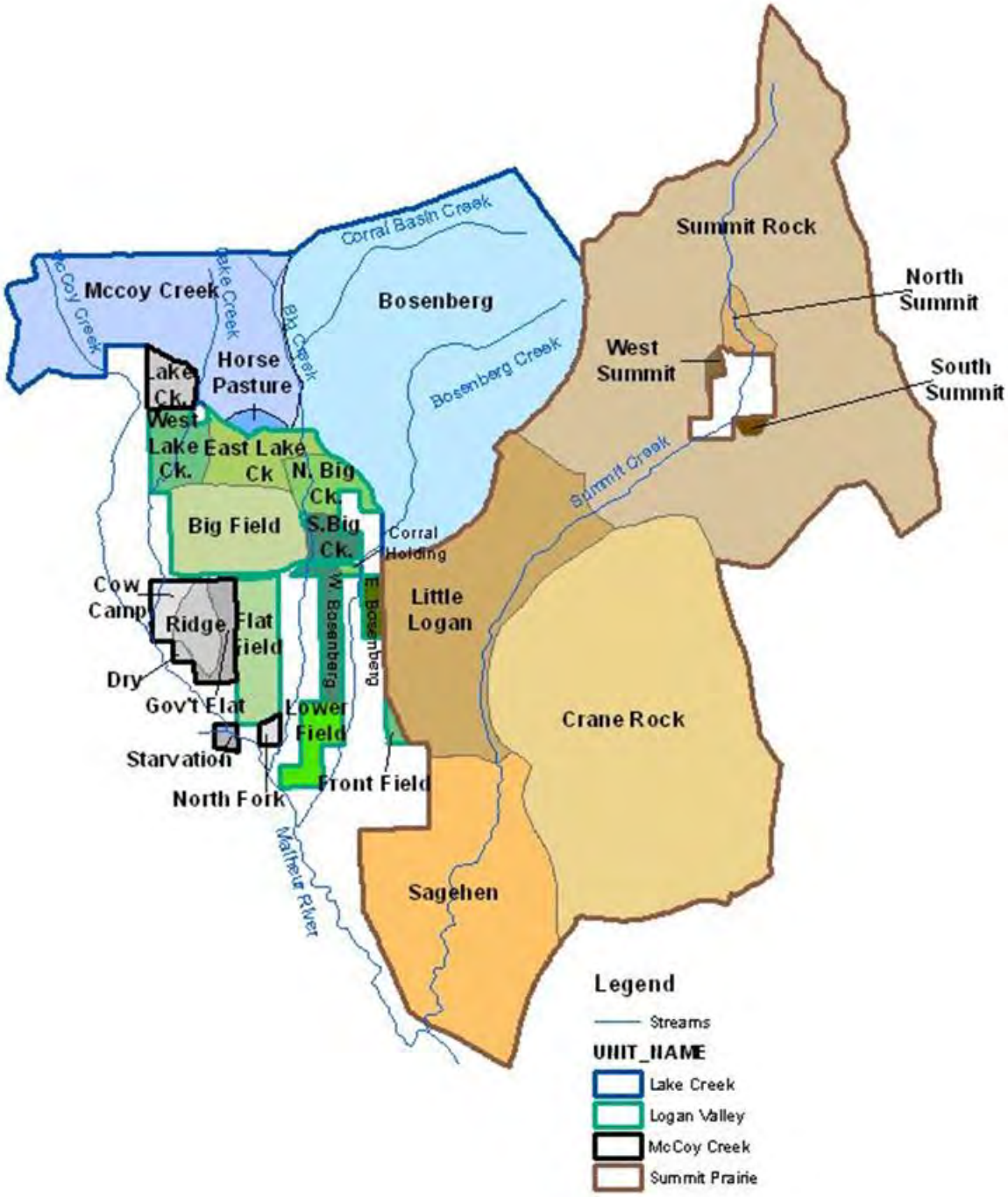

Figure 6. Current configuration of grazing units with the four range allotments

The project area (shown in cross-hatching on Figure 7) is predominately within the Upper Malheur River watershed. Numerous streams flow within the project area including Lake Creek, Big Creek, Bosenberg Creek, and Summit Creek. A minor portion of the Summit Prairie Allotment (371 acres shown on map below, <0.6 percent of the analysis area) occurs in the Upper North Fork Malheur River watershed (Crane Creek subwatershed). There are no streams within these 371 acres.

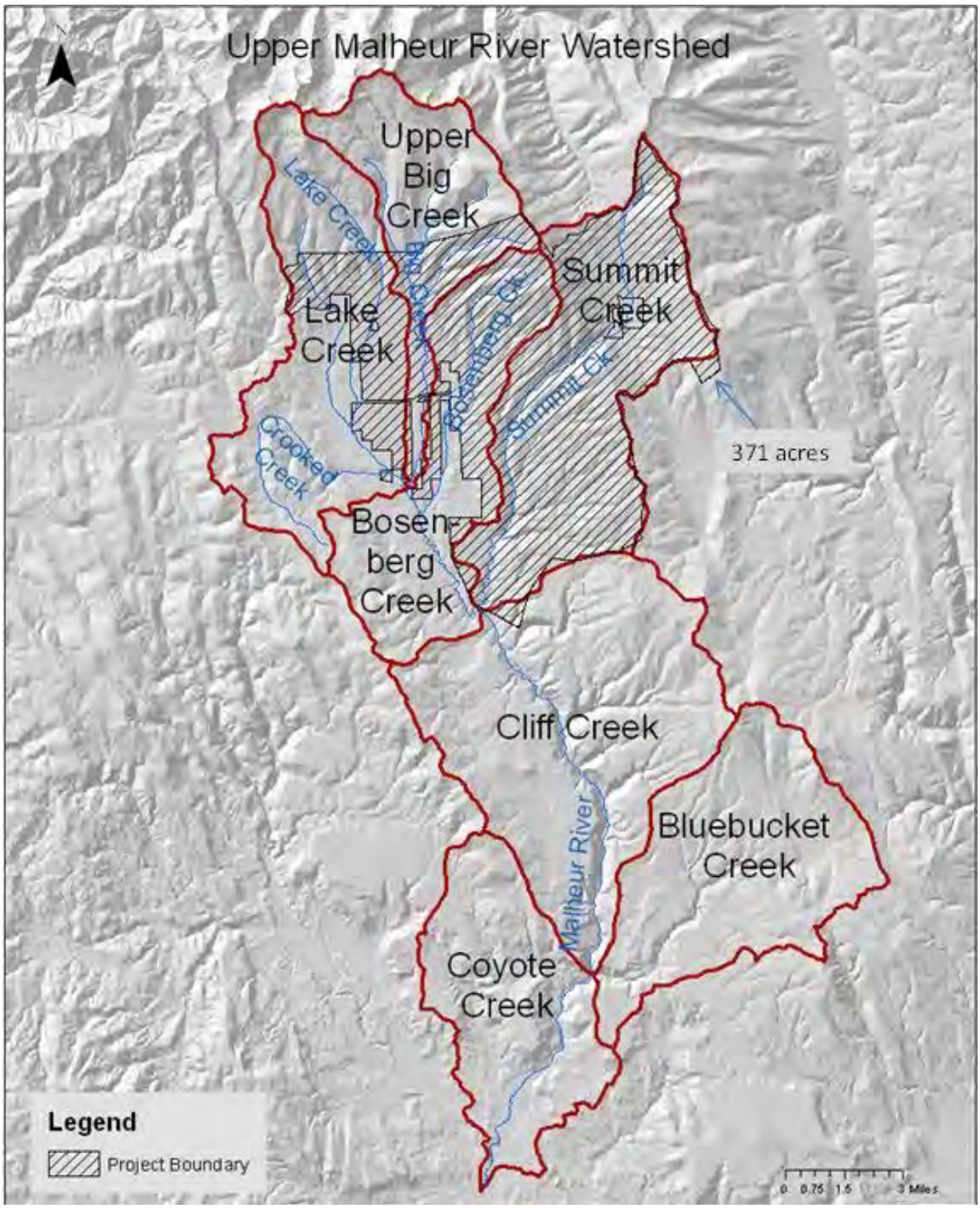

Figure 7. Project area location within Upper Malheur watershed

The project area is located south and west of Prairie City, Oregon and includes approximately 40,279 acres of National Forest System lands administered by the Prairie City Ranger District of the Malheur National Forest. Embedded within the project area is approximately 5,000 acres of private land.

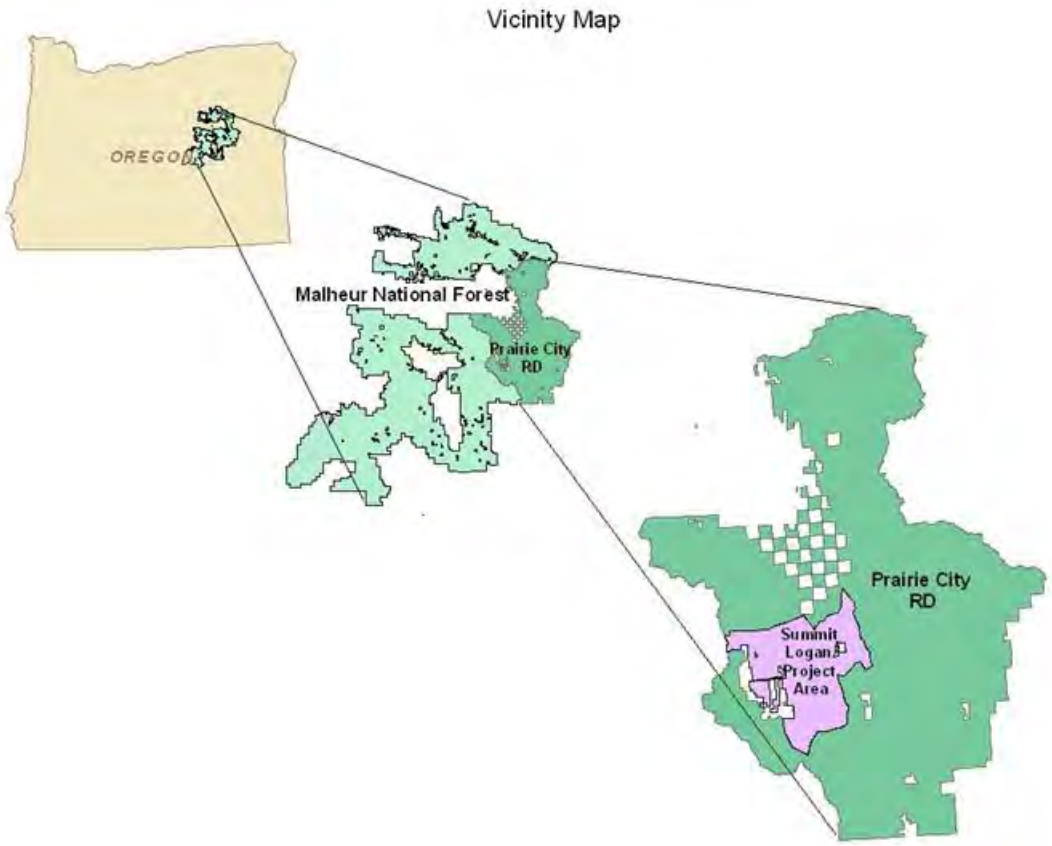

Figure 8. Vicinity map

Changes from Draft to Final Environmental Impact Statement

The following changes were made between the Draft and Final EIS. The listing does not include minor correction, explanations, or edits to grammar and spelling. Some of the changes resulted from public comments on the Draft Environmental Impact Statement (DEIS).

- New Clean Water Act information has been supplemented in the FEIS. All streams listed for stream temperature were de-listed from the 303(d) list when the Environmental Protection Agency (EPA) accepted the 2010 Department of Environmental Quality (DEQ) Integrated Report Decision Framework. References to Lake Creek, Big Creek and Summit Creek as streams 303(d) listed for water temperature have been removed from the Purpose and Need section.
- A summary of the comment period on the DEIS and comments received has been added to the Scoping section.
- Issues eliminated from detailed study have been added to the Issues section.

- The purpose and need for the project was modified.

Decision Framework

The Forest Supervisor of the Malheur National Forest is the responsible official who will decide whether domestic livestock grazing should be authorized on all, part, or none of the project area. If the decision is to authorize some level of livestock grazing, then a decision will be made about which management prescriptions would be applied to ensure that the Forest Plan goals and the purpose and need for the project are met.

Forest Plan

This FEIS tiers to the Malheur National Forest Land and Resource Management Plan (Forest Plan) Final Environmental Impact Statement and Record of Decision (1990) and incorporates by reference the accompanying land and resource management plan (Forest Plan (1990)), as amended. Additional management direction is provided by Forest Plan amendments approved since 1990, some of which include:

- "Columbia River Anadromous Fish Management Policy and Implementation Guide" (USDA Forest Service 1994; herein referred to as Amendment 29). The amendment included changes to both Management Areas 3A (inland fish habitat) and 3B (anadromous fish habitat).
- "Interim Strategies for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and Portions of Nevada" (USDA Forest Service 1995; also known as INFISH). This amendment provides riparian goals, management objectives, and standards and guidelines that reduce the risk of loss of populations of inland fish and potential negative impacts to aquatic habitat.
- The Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, herby referred to as the R6 2005 Invasive Plant FEIS. The R6 2005 Invasive Plant FEIS culminated in a Record of Decision (USDA Forest Service 2005 R6 ROD) that amended the Malheur Forest Plan by adding management direction relative to invasive plants and released all National Forests from direction established by the 1988 ROD and Mediated Agreement for invasive plant management. Parts of the 1988 ROD and 1989 Mediated Agreement for unwanted native plants were not affected by the R6 2005 ROD.
- "Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales" (USDA Forest Service 1995; also known as Regional Forester's Eastside Forest Plan Amendment 2 or Eastside Screens). Amendment 2 is not applicable to this analysis.

Forest plan amendments are those analyses documented in the R6 2005 Invasive Plant FEIS and Record of Decision; and Decision Notices for INFISH (USDA Forest Service 1995) and Amendment 29 (USDA Forest Service 1994).

Management Area Standards

The Forest Plan divided the analysis area into eight management areas (MA), each with different management goals and standards. In addition, INFISH created riparian habitat conservation areas (RHCAs) that overlap management areas and supersede Forest Plan direction with specific standards, except if the existing direction provided more protection for inland native fish habitat. Management areas 1, 2, 3a, 12, 13, 14, 19 and 22b are located within the project area (see Table 10).

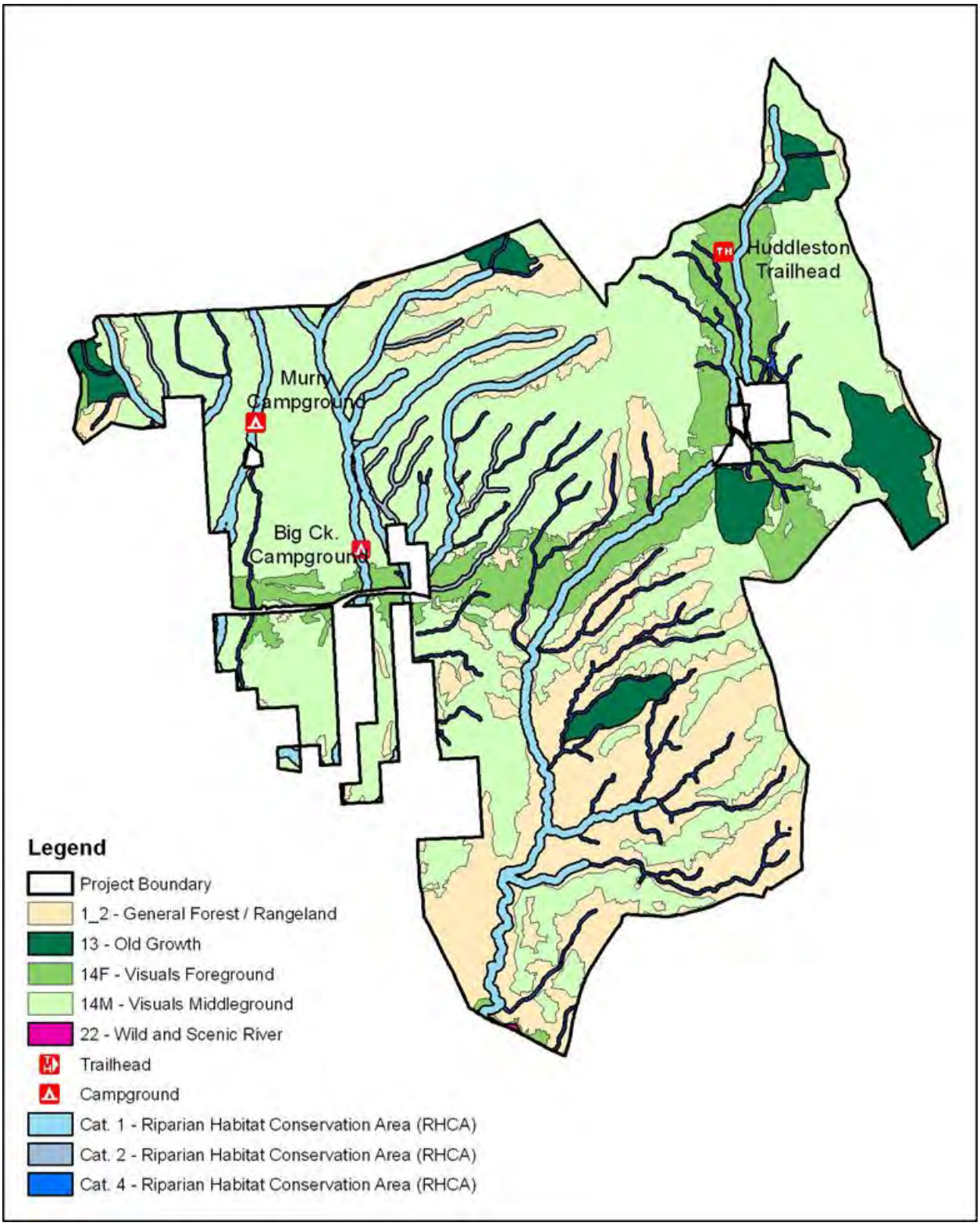

Figure 9. Management areas

Table 10. Management areas

Management Areas	Acres	% of Area
1-2: General Forest and Rangeland	9,117	23
3A: Non-Anadromous Riparian Areas (including RHCAs)	4,719	12
12: Developed Recreation	8	<1
13: Old Growth	2,115	5
14: Visual Corridors	24,278	60
19: Administrative Sites	27	<1
22B: Wild and Scenic River	15	<1
TOTAL	40,279	100%

Management Area 1 - General Forest

This management area primarily consists of forested lands and is designed to emphasize timber production on a sustained yield basis while providing for other resource values.

Generally, acres for management area (MA) 1 and MA 2 (see below) are combined.

Management Area 2 – General Rangeland

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

Management Area 3A – Non-Anadromous Riparian Areas

Management Area 3A consists of lakes, perennial streams and seasonally flowing streams. These areas are to be managed to protest and enhance their value for wildlife, resident fish habitat and water quality. Fore Plan Amendment 29 incorporated the Columbia River Anadromous Fish Habitat Management Policy Plan (USDA Forest Service 1994) establishing specific desired condition numeric values. The Inland Native Fish Strategy (INFISH) (USDA 1995) provided riparian goals, riparian management objectives and standards and guidelines that amended the Forest Plan. The Inland Native Fish Strategy (INFISH) also directed that riparian habitat conservation areas be delineated to include portions of watersheds where riparian dependent resources of would receive primary emphasis. Riparian habitat conservation areas are subject to specific standards. See aquatic section in chapter 3 for further detail.

Management Area 12 – Developed Recreation Sites

Manage for developed recreation opportunities, providing interpretation and enhancement of cultural and natural resources. This management area includes Murray and Big Creek Campgrounds.

Management Area 13 – Dedicated Old Growth and Replacement Old Growth

The primary goal is for wildlife and plant habitat, ecosystem diversity and aesthetic quality.

Management Area 14 – Visual Corridors

This management area consists of visible and potentially visible landscape along major travel routes and the wild and scenic rivers where traveling public has a high-to-medium sensitivity to the scenery.

Management Area 19 – Administrative Sites

This management area includes the Lake Creek Organization camp. The goal is to provide and maintain sites for facilities necessary for the administration of Malheur National Forest lands.

Management Area 22b – Wild and Scenic River

The Malheur River has both wild and scenic segments designated. A portion of the scenic segment is located in the project area. The goal is within the corridor is to protect and enhance the scenic, geologic, wildlife habitat, and historic values of the river corridor. Preserve the free-flowing conditions of the river for the use and enjoyment of present and future generations. A Decision Notice was signed on August 7, 1992 authorizing a management strategy for the Malheur Wild and Scenic River. This decision amended the Forest Plan and established a new Forest Plan management area (MA 22b) replacing management area 22. The management strategy from the decision was incorporated into the Malheur Wild and Scenic River Plan (USDA Forest Service 1992).

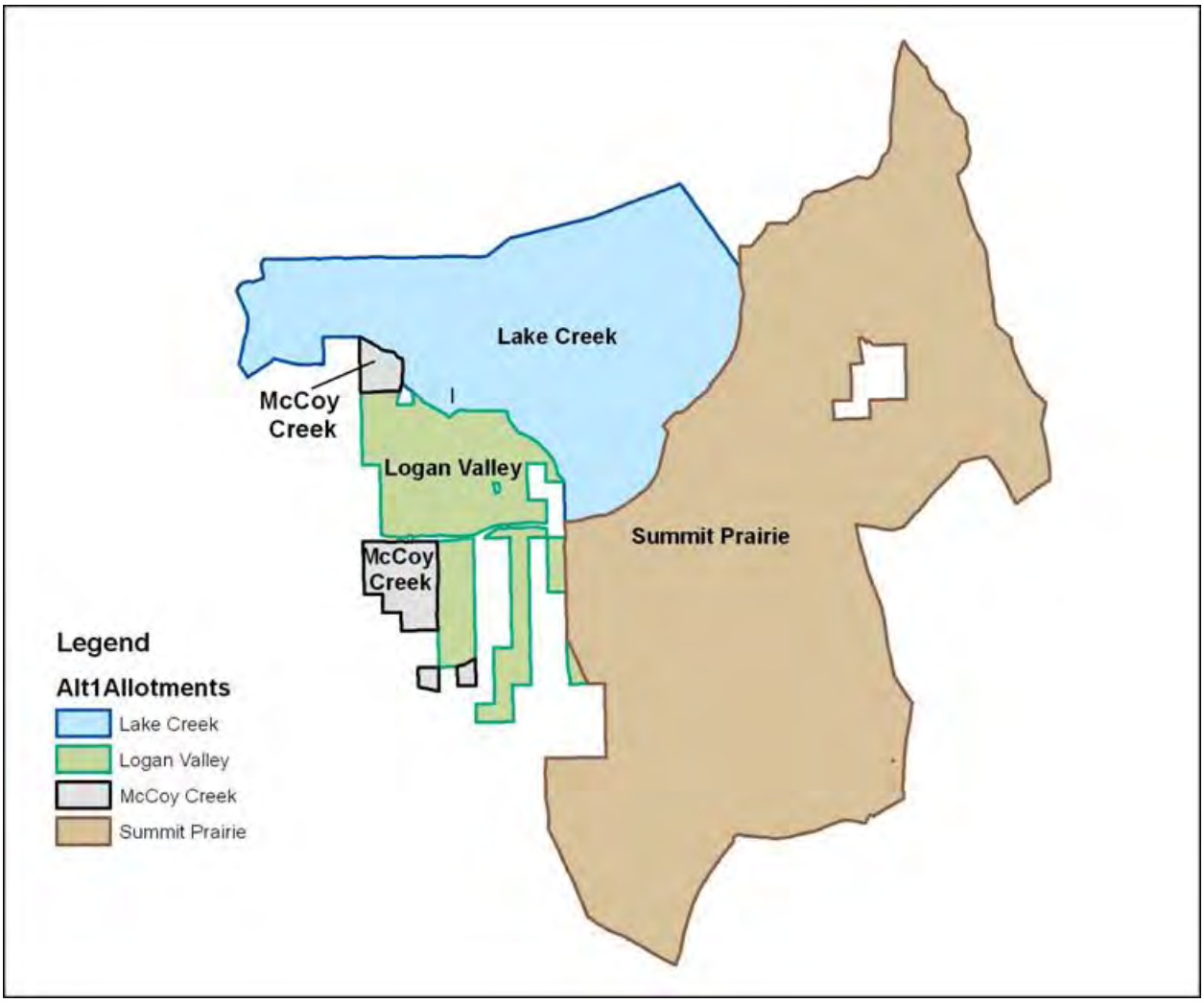

Figure 10. Current range allotment configuration

Listed Species Consultation

On June 18, 2012, the Malheur National Forest submitted a Biological Assessment (BA) and subsequent information to the U.S. Fish and Wildlife Service La Grande Field Office for concurrence on the effects of grazing from 14 allotments on Columbia Basin bull trout designated critical habitat. The Logan Valley, McCoy Creek and Summit Prairie allotments were included in the biological assessment. Lake Creek was not included because no action was proposed. On September 6, 2012, the Malheur National Forest received a Biological Opinion/Concurrence Letter from the Fish and Wildlife Service. The Fish and Wildlife Service concurred that the proposed livestock management for the Logan Valley allotment is not likely to adversely affect bull trout and bull trout critical habitat. The Fish and Wildlife Service also concurred and wrote a letter of opinion that the proposed livestock management in the Summit Prairie and McCoy Creek allotments is likely to adversely affect bull trout critical habitat.

Current Management

This project area contains four grazing allotments: Lake Creek, Logan Valley, McCoy Creek and Summit Prairie (Figure 10).

Lake Creek Allotment

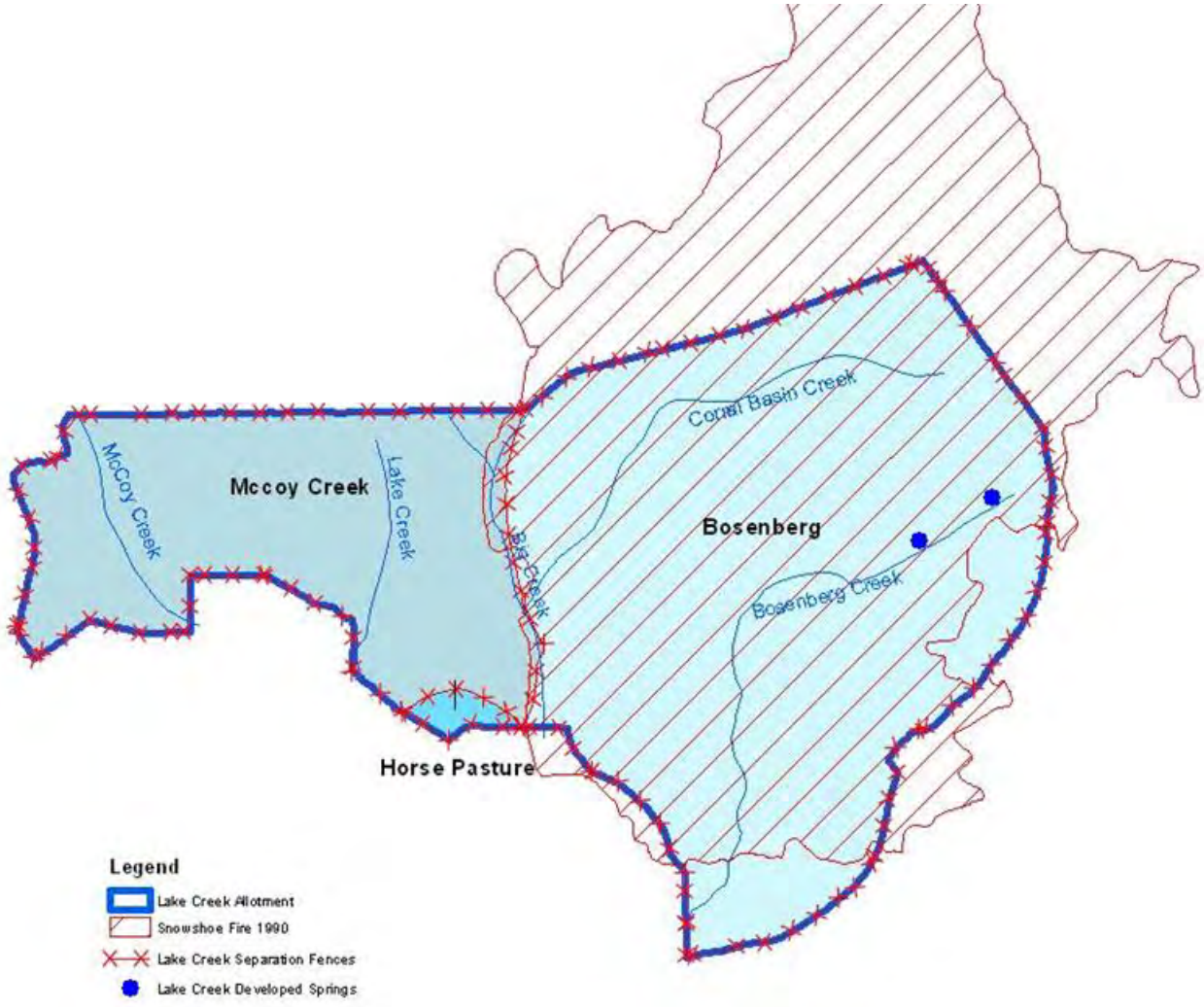

Figure 11. Current grazing unit configuration within the Lake Creek Allotment

The Lake Creek Allotment totals 10,196 acres and contains three units with separation fences: McCoy Creek, Horse Pasture and Bosenberg. Portions of the fence were burned during the 1990 Snowshoe fire. There are two developed springs on the allotment in the Bosenberg unit.

Prior to the 1990 Snowshoe Fire, this allotment was unmanageable due to dense overstory canopy and reduced forage base; so the permittee waived the allotment back to the Forest Service. Since then it has been vacant and not been grazed for over 20 years. Currently, range conditions are capable and suitable for grazing on this allotment.

Logan Valley Allotment

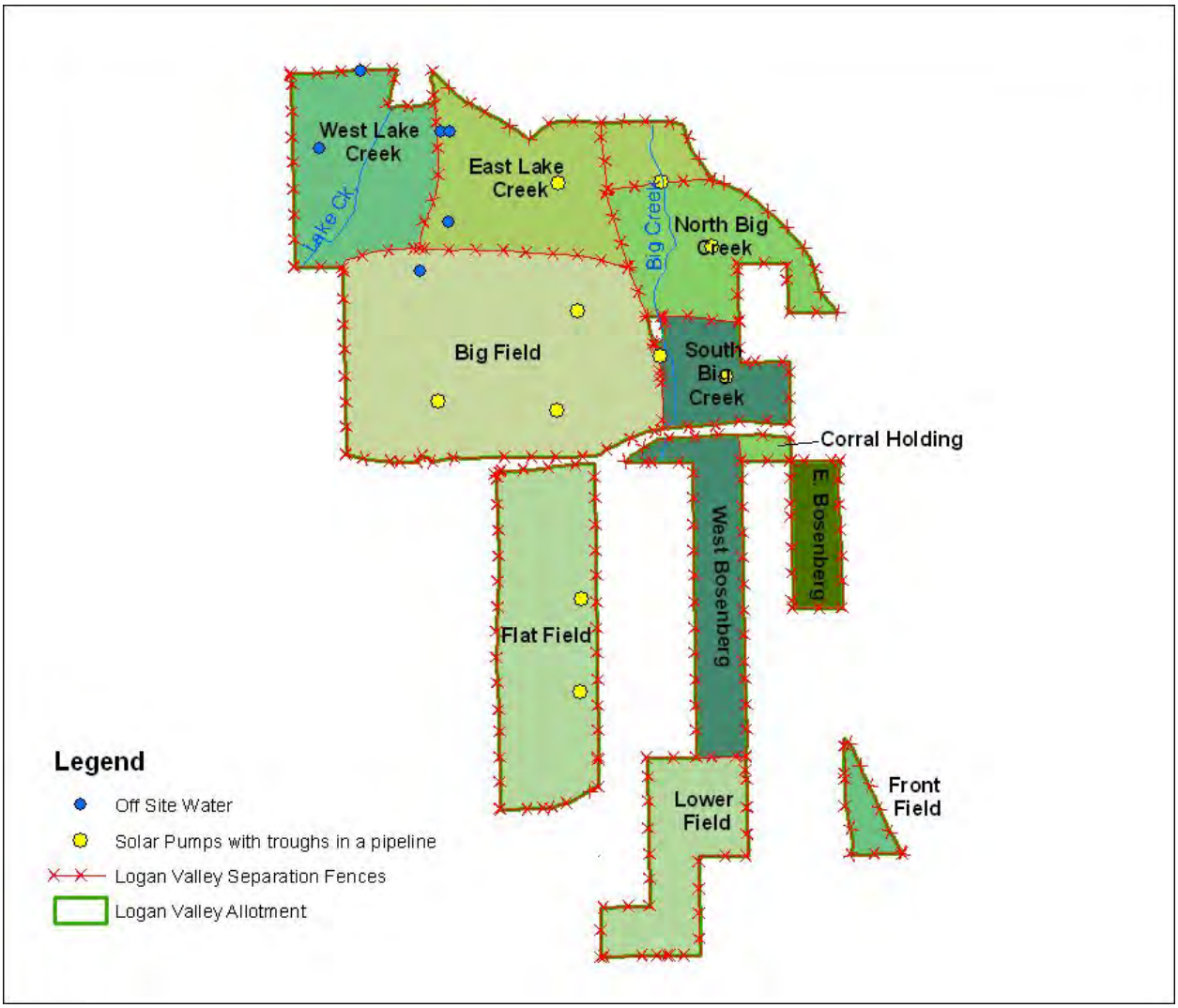

Figure 12. Current grazing unit configuration in Logan Valley Allotment

The Logan Valley Allotment totals 3,756 acres with 11 grazing units in which fences separate the West Lake Creek, East Lake Creek, North Big Creek, South Big Creek, West Bosenberg, East Bosenberg, Corral Holding, Front Field, Lower Field, Big Field and Flat Field units.

The current grazing system is continuous/seasonal with a maximum authorized use of 357 head of cattle (1,983 AUMs) from June 10 to October 15.

Livestock normally enter the allotment on the south side of the 1600 road in East Bosenberg, West Bosenberg, Front Field, Lower Field, and Flat Field units when the range is ready and stock water is available. They are moved to the units on the north side of the 1600 road (North and South Big Creek, East and West Lake Creek, and Big Field) when the range is ready later in the season. Livestock grazing is not permitted after August 15th in the North and South Big Creek and Big Creek portion of the East Lake Creek units to protect bull trout spawning habitat.

Table 11. Logan Valley allotment enhancements

Project Name	Project Description	Objective	Allotment/Unit	Estimated Implementation
Big Creek & Lake Creek Range Aquatics Project (signed: 08-02-2011)				
Big Creek Fence and Water-Gap	Construct about 0.2 mile of riparian pasture fence along Big Creek. Construct hardened water-gap (not exceeding 20 ft.) within fence line to provide water to the remainder of the West Bosenberg unit.	Restoration of critical bull trout habitat on Big Creek while maintaining livestock access to water	Logan Valley allotment/West Bosenberg unit Creates West Bosenberg Riparian pasture	2012-2013
Big Creek & Lake Creek Off-Site Water Sources and West Lake Creek Riparian Fence Range Aquatic Projects (signed: 10-05-2011)				
Big Creek & Lake Creek Off-Site Water Source	Develop solar system to pump water from Big and Lake Creeks to troughs located in the uplands of the units.	Reduce impacts of livestock along Big and Lake Creeks by providing water sources in the uplands of the allotment.	Logan Valley allotment/Big Field, Flat Field, East Lake Creek and West Lake Creek units.	2013-2014
West Lake Creek Riparian Fence	Construct about 1 mile of riparian pasture fence along Lake Creek	Reduce impacts of livestock along Lake Creek, allowing the herbaceous plant community to recover and stabilize the streambank.	Logan Valley allotment/West Lake Creek unit Creates West Lake Creek Riparian pasture	2013-2014
Big Creek & Lake Creek Riparian Hardwood Planting Restoration Project (signed: 12-09-2011)				
Big Creek and Lake Creek Riparian Hardwood Planting	Plant hardwoods within the newly created West Bosenberg and West Lake Creek Riparian pastures.	Restore shade and cover (undercut banks) along Big and Lake Creeks	Logan Valley allotment/West Bosenberg and West Lake Creek Riparian pastures	2013-2014

There is a lack of off-stream water in this allotment. One existing developed water source aids in the distribution of livestock through the Flat Field unit. Other livestock water is provided by Lake Creek and Deardorff Ditch. Some units can only be grazed in the early season because water sources are not available later in the year.

Since completing Proper Functioning Condition (PFC) assessments in 2007 changes in management have occurred on the West Lake Creek unit which was determined to be functioning at risk (FAR) with a

downward trend condition. Adaptations to grazing management in the West Lake Creek unit were made during the 2008-2012 grazing seasons to improve streambank stability and the composition of stream bank stabilizing species. Adaptations include moving to early season grazing and reductions in authorized duration of grazing (head months[2]), as well as the development of a portable solar panel pump with troughs placed in the uplands away from Lake Creek. In 2011, three Decision Memos were signed by the Prairie City District Ranger authorizing projects within the Logan Valley allotment to enhance livestock management and improve shade and hardwood communities associated with bull trout habitat on Big Creek and Lake Creek (Table 11).

McCoy Creek Allotment

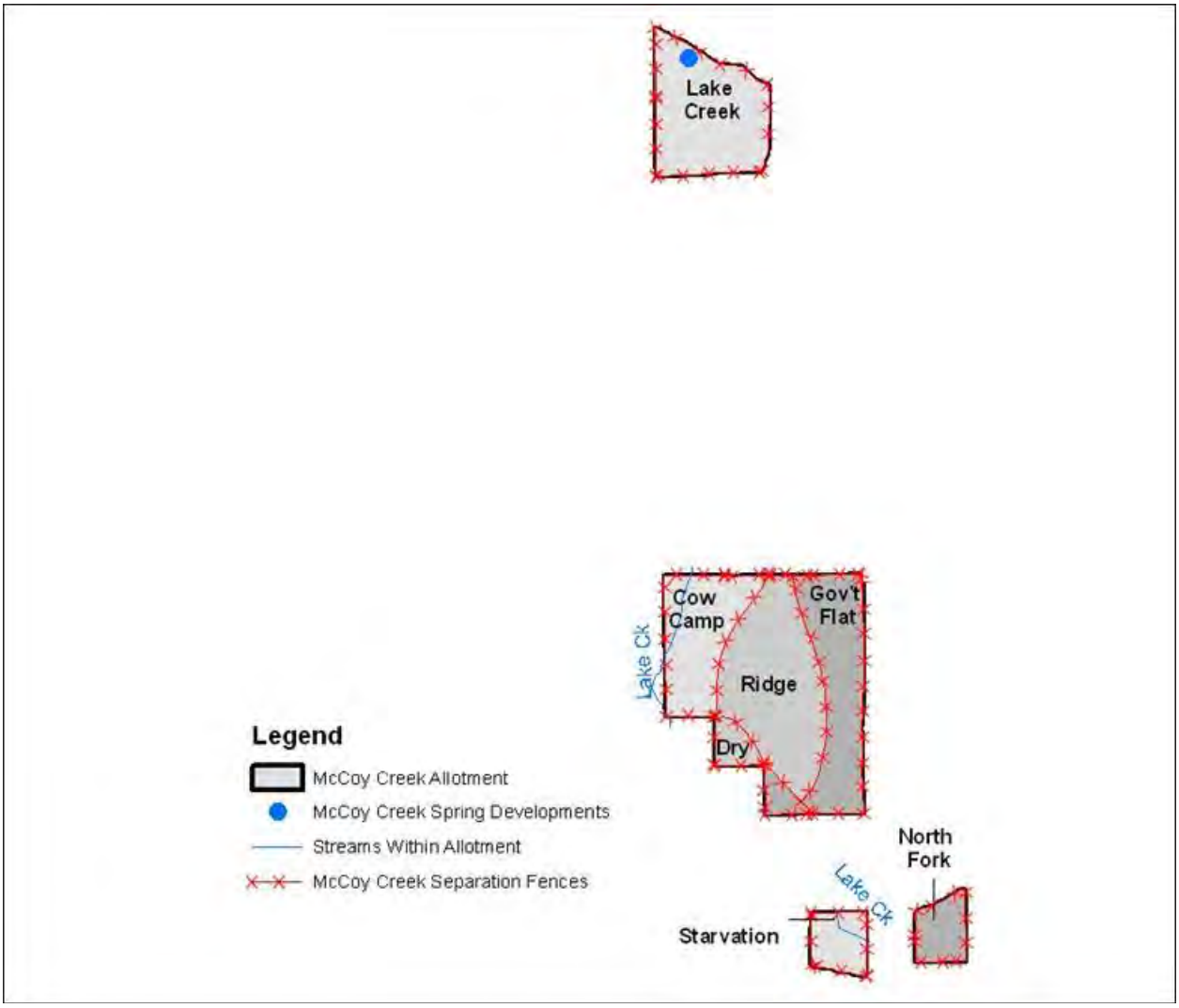

Figure 13. Current configuration of grazing units within McCoy Creek Allotment

The McCoy Creek Allotment utilizes a continuous/seasonal grazing system that authorizes 63 head of cattle (416 AMUs) from about June 1 to October 30.

[2] Head month is one month's use and occupancy of the range by one animal

The 980 acres allotment contains seven fenced grazing units: Lake Creek, Cow Camp, Dry, Ridge, Government Flat, Starvation, and North Fork units.

Three units (Lake Creek, Starvation and North Fork) are detached from the main body of the McCoy Creek allotment and are not consistently grazed because of the logistics of moving livestock. Each of these units has a single source of water provided by ponds or streams. The pond in the Lake Creek unit only provides early season water. Irregular use has allowed the palatability and vigor of upland vegetation to decline.

In the four units that are grazed on a yearly basis (Cow Camp, Dry, Ridge and Government Flat) a stream, accessed through the Cow Camp unit, is the only consistent source of water. In the remaining three units, water is limited to ditches that do not provide a consistent source of livestock water, requiring the four units to be managed as a single unit. Limited water and decreased forage palatability and vigor in uplands have decreased livestock distribution and use in uplands.

In 2011, three Decision Memos were signed by the Prairie City District Ranger authorizing projects within the McCoy Creek allotment to enhance livestock management and improve shade and hardwood communities associated with bull trout habitat on Big Creek and Lake Creek (Table 12).

Table 12. McCoy Creek allotment enhancements

Project Name	Project Description	Objective	Allotment/Unit	Estimated Implementation
Big Creek & Lake Creek Range Aquatics Project (08-02-2011)				
Lake Creek Unit Division Fence Reconstruction	Reconstruct about 1.0 mile of fence	Restore fence to an acceptable condition to control livestock movement and protect critical bull trout habitat on Lake Creek.	McCoy Creek allotment/Lake Creek unit	2013-2014
Lake Creek Fence and Water-Gap	Construct about 0.2 miles of fence along Lake Creek. Construct a hardened water gap within the fence line to provide water for livestock.	Vegetation and stream channel to recovery while maintaining a functional water source for livestock	McCoy Creek/ Cow Camp unit Create temporary exclosure identified in this analysis as the Lake Creek Exclosure	Completed in 2012
Lake Creek Willow Gallery Fence	Construct about 0.5 mile of fence along Lake Creek	Provide protection of willow gallery along Lake Creek that is utilized by beaver and is critical habitat for bull trout.	McCoy Creek/Cow Camp unit Create temporary exclosure identified in this analysis as the Lake Creek Willow Exclosure	Completed in 2012
Big & Lake Creek Off-Site Water Sources and West Lake Creek Riparian Fence Range Aquatic Projects (10-05-2011)				
Big Creek & Lake Creek Off-Site Water Source	Develop solar system to pump water from Big and Lake Creeks to troughs located in the uplands of the units.	Reduce impacts of livestock along Big and Lake Creeks by providing water sources in the uplands of the allotment.	McCoy Creek allotment/Cow Camp unit	2013-2014
Big Creek & Lake Creek Riparian Hardwood Planting Restoration Project (12-09-2011)				
Lake Creek Riparian Hardwood Planting	Plant hardwoods within Lake Creek and Lake Creek Willow gallery fences.	Restore shade and cover (undercut banks) along Lake Creek	McCoy Creek allotment/Cow Camp Grazing unit	2013-2014

Summit Prairie Allotment

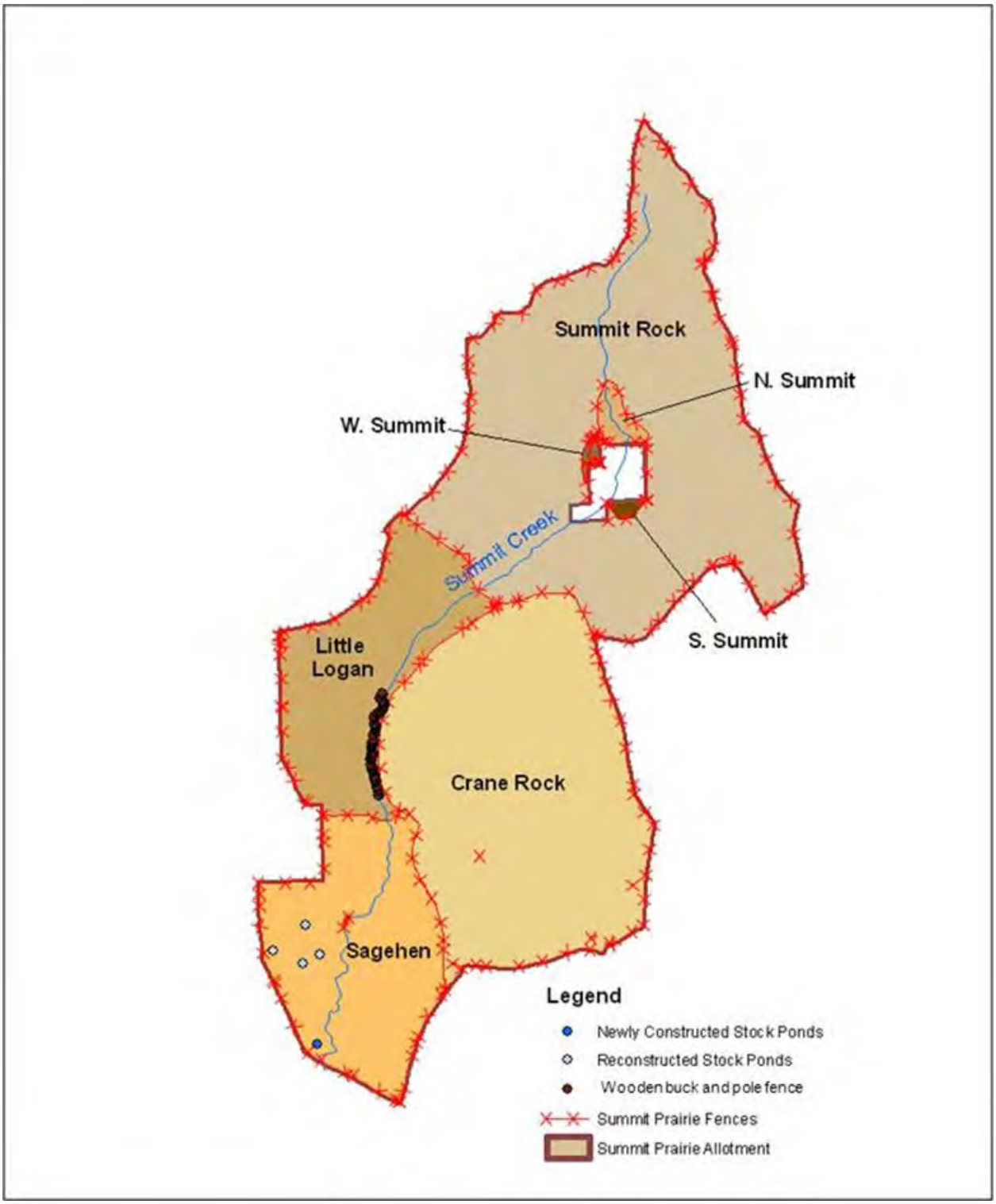

Figure 14. Current configuration of grazing units within Summit Prairie Allotment

The Summit Prairie Allotment encompasses 25,331 acres with seven fenced units: Summit Rock, North Summit, South Summit, West Summit, Little Logan, Crane Rock and Sagehen.

The continuous/seasonal grazing system used on this allotment has a maximum authorized use of 260 head of cattle (1,546 AUMs) from about June 10th and October 24th. Livestock generally enter the Sagehen and Crane Rock units when the range is ready for grazing. They move up Summit Creek to the Little Logan, Summit Rock, North Summit, West Summit and South Summit units as the range is ready.

Within the allotment, 31 ponds and springs have been developed for livestock water to help distribute livestock use in the uplands and away from Summit Creek. Use levels are generally reached in the Summit Creek riparian area before forage can be fully utilized in the uplands.

Adaptations to grazing management were made in the Sagehen, West Summit and Summit Rock units during the 2008-2011 grazing seasons to improve stream bank stability and bank cover of stabilizing plants. Adaptations include reductions in authorized Head Months in the Sagehen unit in 2008-2011; installation of electric fencing along West Fork Summit Creek in 2009-2011; and the removal of all livestock that congregate along the West Fork of Summit Creek in the Summit Rock unit when approaching allowable use standards.

In 2011, a Decision Memo was signed by the Prairie City District Ranger authorizing projects within the Summit Prairie allotment to provide aquatic restoration and improve livestock distribution throughout grazing units.

Table 13. Summit Prairie allotment enhancements

Project Name	Project Description	Objective	Allotment/Unit	Estimated Implementation
Summit Creek Range Aquatics Project (09-09-2011)				
West Fork Summit Creek Fence and Water Gap	Construct about 0.3 miles of fence along the West Fork of Summit Creek. Construct a hardened water gap within the fence line to provide water for livestock.	Reduce impacts of livestock on West Fork of Summit Creek while maintaining a water source for livestock	Summit Prairie allotment/ West Summit unit Creates West Summit Creek Riparian pasture	Completed in 2011
West Fork Summit Creek Parallel Tree Felling	Fell green lodgepole pine parallel to West Fork of Summit Creek to restrict/ deflect livestock and/or wild ungulates from the streambanks	Reduce streambank impacts of livestock and wild ungulates, protecting establishing hardwoods and other riparian plant communities	Summit Prairie allotment/Summit Rock unit	Completed in 2012
Little Logan Willow Restoration	Enlarge or replace existing cages around willows. Remove cages that have significantly grown above browse height. Construct a buck-n-pole exclosure approximately ¼ mile in length along Summit Creek	Continue monitoring willow recovery and browsing that occurs along Summit Creek	Summit Prairie allotment/Little Logan unit	2013-2014
Sagehen Stock Ponds	Construct three uplands stock ponds	Provide functional water source in the uplands, reducing livestock impacts along Summit Creek	Summit Prairie allotment/Sagehen unit	Completed in 2012

Purpose and Need for Action

The purpose for the proposal is outlined below:

1. **To review and evaluate continuation or modification of grazing authorizations on Lake Creek, Logan Valley, McCoy Creek and Summit Prairie allotments (within the Summit Logan project area) to ensure their effectiveness in meeting or moving toward desired conditions outlined in the amended Forest Plan, and to be consistent with agency policy, and other applicable laws and regulations.**

Range Allotment Management Plans

- ***Desired condition –*** The Forest Plan has an objective that **"**All allotment management plans will be prepared or updated based on the goals, objectives, and standards in this Forest Plan (USDA FS 1990. pg. IV-18). In addition, Forest Plan standard and guideline #79 directs preparation, updates, or revisions to "allotment management plans (AMPs) … to address emerging resource management issues and concerns." (USDA Forest Service 1990. Pg. IV-34).
- ***Existing condition -*** Although allotment management plans (AMPs) are in place for the grazing allotments within the Summit Logan planning area, they pre-date the 1990 Forest Plan. Lake Creek allotment management plan was completed in 1966, Logan Valley and McCoy Creek allotment management plans were completed in 1971 and Summit Prairie allotment management plan was completed in 1965. Over the years both allotment and grazing unit boundaries have changed numerous times. In addition, many adjustments have been made to improve both upland and riparian conditions, provide aquatic restoration and improve livestock distribution including fencing, water and pond development, herding, strategic salt placement, exclosure fencing, hardwood planting, and improved grazing systems and pasture design to name a few.
- ***Why consider taking action?*** The Rescission Act (PL 104-19, Section 504) requires that each National Forest "establish and adhere to a schedule for the completion of National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) analysis and decisions on all allotments for which NEPA analysis is needed." In addition, the Forest Plan directs updates or revisions to allotment management plans to address emerging resource management issues and concerns. Since direction exists to update allotment management plans and conditions have changed since the allotment management plans were completed (such as development of the Malheur Forest Plan and the listing of bull trout as a threatened species) there is a need to review and evaluate existing allotment management plans in the planning area to reflect current management direction, policies, other applicable laws and regulations, and to address resources concerns on the allotments.

Management Direction Regarding Livestock Grazing

- ***Desired Condition:*** Where consistent with other multiple-use goals and objectives there is congressional intent to allow grazing on suitable lands (Multiple Use-Sustained Yield Act of 1960, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, and National Forest Management Act of 1976).

  It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with forest plans (FSM 2203.1). It is also Forest Service policy to continue contributions to the economic and social well-being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood (FSM 2202.1).

  By regulation, forage-producing lands are to be managed for livestock grazing where consistent with forest plans (36 CFR 222.2 (c)).

- ***Existing Condition:*** The Summit Logan allotments contain lands identified as suitable for domestic livestock grazing in the Malheur Forest Plan. Domestic livestock grazing is consistent with the goals, objectives, standards, and guidelines of the Forest Plan.

  Current range conditions do not always allow for periodically resting of entire grazing units to allow for recovery of vegetation, etc. In addition current grazing unit configurations and existing water sources do not always encourage well-distributed livestock use for more uniform grazing of the allotment. For instance, in Summit Prairie Allotment, use levels are often reached in riparian areas before forage can be fully utilized in the uplands. Current range management is addressing some of these issues through on-going range improvement projects, but not all of the issues have been addressed in current allotment management plans.

- ***Why Consider Taking Action?*** There is a need to meet the Malheur Forest Plan goals by providing a sustained production of palatable forage for grazing by livestock and dependent wildlife species while meeting the needs of other resources and uses at a level which is responsive to site-specific objectives (USDA Forest Service 1990 Forest Plan, page IV-2) as well as to contribute to the social and economic health of communities which are significantly affected by National Forest management (USDA Forest Service 1990 Forest Plan, page IV-3, # 42).

  The Forest Plan also provides direction for continued range improvements as outlined in standards #87 and 88 below:

  - Employ all available methods to achieve the desired levels of utilization by permitted livestock and big game. Design the methods selected for controlled livestock use to fit the site-specific requirements for improving the riparian area to satisfactory condition. Any one combination of methods may be used to treat unsatisfactory riparian areas such as corridor fencing, herding, additional water developments, salting, nonuse for resource protection, early add/or late season use, shorter grazing seasons, reduced livestock numbers, reduced livestock numbers, control of degree of use, and/or creating additional pastures through fencing (USDA Forest Service 1990 Forest Plan, pg.IV-35).
  - Design and implement structural and nonstructural range improvements to maintain productivity and range condition in addition to benefiting both wildlife and livestock.

2. **To improve resource conditions for aquatic habitat, including threatened bull trout habitat, within range allotments in the project area.**

Resource Conditions for Aquatic Habitat within Range Allotments

- ***Desired Conditions*** include diverse, native plant communities (species composition, structural and age class diversity) that perpetuates the distribution of woody debris, nutrients, soil cover, streambank stability and thermal controls characteristic of resilient riparian ecosystems. In addition, ground cover including shrubs, down wood, grasses and forbs is sufficient to provide sediment buffering from soil movement from upslope areas. Additional desired conditions include: hiding cover (undercut banks), pool habitat and other essential stream components that provide food, protection and habitat is aquatic species.
- ***Existing Condition -*** The existing condition shows many stream reaches lack diverse age classes of willows, other hardwoods, and stabilizing herbaceous vegetation. Impaired shrub height and density and herbaceous vegetation is limiting stream shade, bank stability, hiding cover (undercut banks), and pool habitat. These essential stream components provide protection, food, and habitat (rearing, migratory, and reproductive) for bull trout and other aquatic species. Quantity and diversity of riparian vegetation is also limiting habitat for various wildlife species including beaver. For further information see Table in appendix A.

Segments of Lake Creek, Summit Creek and West Fork of Summit Creek are functioning-at-risk with either an upward (5.1 miles) or downward (4.6 miles) trend. Functioning-at-risk riparian areas have an existing soil, water, or vegetation attribute that makes them more susceptible to degradation during moderately high flow events. Most frequently, vegetation is the primary determining factor for trend on low-gradient streams common to those in the Summit Logan project area (appendix A, Table 102 shows proper functioning condition).

- ***Why consider taking action?*** There is a need to improve aquatic habitat in the range allotments within the project area to support all life stages of threatened bull trout populations and other aquatic species. This includes improvements in riparian vegetation and hardwoods to enhance stream shade, temperature, riparian vegetation composition and vigor and streambank stability. Water temperature and streambank stability are important aquatic habitat features (riparian management objectives) identified in the Forest Plan as amended by INFISH.

  The Inland Native Fish Strategy directs that grazing practices be modified (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of riparian management objectives or are likely to adversely affect inland native fish. Suspend grazing if adjusting practices is not effective in meeting riparian management objectives (USDA Forest Service 1995 INFISH GM 1).

  There is also a need to develop an upward trend in riparian areas currently assessed as functioning-at risk with a downward or slowed trend, while continuing to improve or maintain riparian areas with upward recovery trends or properly functioning conditions toward desired conditions identified in appendix A (Table 102).

Proposed Action

Overview

A “proposed action” is defined early in the project-level planning process. It serves as a starting point for the Interdisciplinary Team and gives the public and other agencies specific information on which to focus comments. Using those comments (see the discussion of significant issues later in chapter 1) and information from preliminary analysis, the Interdisciplinary Team developed alternatives to the proposed action.

The Malheur National Forest, Prairie City Ranger District, proposes to authorize livestock grazing on the Lake Creek, Logan Valley, McCoy Creek and Summit Prairie allotments and update grazing management direction by revising four allotment management plans to address the purpose and need and meet Forest Plan goals, objectives, standards and guidelines and the desired conditions for the analysis area. The specific elements of the proposed action are discussed in brief below. A more detailed description of the proposed action can be found in chapter 2.

Table 14. Summary of the proposed action

Element	Lake Creek Allotment	Logan Valley Allotment	McCoy Creek Allotment	Summit Prairie Allotment
Grazing System	**About half of the allotment (5,069 acres) would remain vacan**t in the McCoy Creek and newly designated Corral Basin units.	**Periods of rest or deferment during the season of use based on resource needs**. Would not be a systematic or scheduled rotation.	**Deferred rotation grazing system.** Systematic rotation of deferment among units. Provide flexibility to change the time of year when units would be used.	**Periods of rest or deferment during the season of use based on resource needs**. Would not be a systematic or scheduled rotation.
Boundary Changes	**Remove 388 acres** from Lake Ck. Allotment (298 acres from McCoy Ck. Unit and 90 acres from Horse Pasture Unit)	**Add 388 acres** from Lake Ck. Allotment to Logan Valley Allotment – (becomes Deardorff Unit)	**Remove 267 acres** of Lake Creek Unit (218 ac.) and N. Fork Unit (49 ac.) from McCoy Allotment.	**Add 4,449 acres** from Lake Ck. Allotment to Summit Prairie Allotment - This new unit called Bosenberg Unit, which is now part of Summit Prairie Allotment.
	Remove 4,449 acres from Lake Creek Allotment (Bosenberg Unit). Rename 2,430 ac. the Corral Basin Unit and combine remaining 91ac. with McCoy Ck. Unit. Eliminating Bosenberg Unit from Lake Ck. Allotment.	**Add 267 acres** from McCoy Creek Allotment to Logan Valley Allotment – Keep Lake Ck. Unit name (218 ac.) and add the 49 acres from North Fork Unit to Flat Field Unit.		
	Remove 349 acres from SW corner of McCoy Creek Unit of Lake Creek Allotment (possibly be added to Dollar Basin Allotment in future NEPA analysis)	**Remove 52 acre** Front Field Unit from Logan Valley Allotment and add to Summit Prairie Allotment.	**Remove 53 acre** Starvation Unit from McCoy Creek Allotment (possibly be added to Dollar Basin Allotment in future NEPA analysis)	**Add 52 acres** to from Front Field Unit in Logan Valley Allotment to Little Logan unit in Summit Prairie Allotment
		Combine Big Ck. portion of E. Lake Ck. with North and South Big Creek Units to create 623 acre Big Creek Riparian Pasture.	**Combine** Dry Unit (28 ac.) and Ridge unit (264 ac.) into one unit called Ridge Unit (292 ac.)	
	The present allotment consisting of 10,196 ac. would decrease in size to 5,069 ac.	The present allotment consisting of 3,756 ac. would increase in size to 4,359 ac. The increase in size would allow additional rest for the Logan Valley allotment.	The present allotment consisting of 980 acres would decrease in size to 660 acres.	The present allotment consisting of 25,331 acres would increase in size to 29,832
Livestock numbers	0	357 cow/calf pairs[a]	63 cow/calf pairs[a]	260 cow/calf pairs[a]
Forage allocations	N/A	1,983 AUMs[b]	416 AUMs[b]	1,546 AUMs[b]

Element	Lake Creek Allotment	Logan Valley Allotment	McCoy Creek Allotment	Summit Prairie Allotment
Grazing Season	None	6/10 – 10/15	6/1 – 10/30	6/10 – 10/24
	same as currently permitted			
Changes	About half of allotment, which had previously been vacant would be added to Summit Prairie and Logan Valley Allotments where it would be grazed.	Livestock would be distributed over a larger landscape by adding areas from the Lake Creek and McCoy Creek allotments. Big Creek Riparian Pasture unit would require livestock removal by August 15th to protect bull trout spawning habitat in Big Creek.	Forage allowable use, move triggers, and endpoint indicators are listed in appendix E.	Livestock would be distributed over a larger landscape (4,501 more acres) by adding areas from Lake Creek and Logan valley Allotments
Adaptive Management	None proposed	Adaptive management strategies shown in appendix A (Table 104) are summarized in Table 23 in chapter 2.	None proposed	Adaptive management strategies shown in appendix A (Table 104) are summarized in Table 29 in chapter 2.
Improvements and Structures	**Construct 2.5 miles of fence** to isolate SW corner of McCoy Ck. Unit from Lake Ck. Allotment	**Remove 0.3 miles of existing fence** to combine N. Fork unit of McCoy Allotment into Flat Field Unit of Logan Valley Allotment. **Convert 0.3 miles** of electric fence in the North Fork unit along Big Creek **to a permanent let-down fence.** **Construct 2.5 miles of fence** to define Deardorff Unit which absorbs 298 ac. of the McCoy Creek unit and 90 ac. of the Horse Pasture from the Lake Creek allotment into the Logan Valley allotment. **Remove 1.2 miles of fence** to create Big Creek Riparian Unit through combining Big Creek portion of the East Lake Creek, North Big Creek and South Big Creek into one unit.	**Remove 1 mile of fence** to create larger Ridge Unit by combining Dry (28 ac.) and existing Ridge units (264 ac.) of McCoy Allotment.	**Remove 0.7 miles of fence** to combine Front Field Unit of Logan Valley Allotment with the Little Logan Unit of Summit Prairie Allotment. **Construct 7 miles of fence** to add Bosenberg unit from Lake Ck. Allotment to Summit Prairie Allotment. **Construct two water gaps** where National Forest System road 1648 crosses Bosenberg Creek and an unnamed tributary of Big Creek. **Develop three ponds in the uplands** to provide alternative water away from perennial streams. **Develop a spring** on a headwater spring of Bosenberg Creek. Fence and pipe water to a trough located about 300 ft. from the spring. **Pipe water from Bosenberg Creek to a trough** located approximately 100 ft. from the stream.

a – Cow/calf pairs - a mature cow and her suckling calf.
b – AUMs – Animal Unit Month - The amount of forage required by one animal unit (AU) for one month is called an Animal Unit Month (AUM). One animal unit is defined as a 1,000 lb. beef cow with or without a nursing calf with a daily requirement of 26 lb. of dry matter forage. Therefore, one AUM is equal to 780 lbs. of dry matter forage (30 days X daily forage requirement).

Allotment Management Plans (AMP)

Authorization of grazing would be implemented with grazing permits and allotment management plans. An allotment management plan as defined in the Federal Land and Policy Management Act (FLPMA) is a document prepared in consultation with lessees or permittees that applies to livestock operations on the public lands and prescribes:

3. The manner and extent to which livestock operations will be conducted in order to meet multiple use, sustained yield, economic and other needs and objectives.
4. Range improvements to be installed and maintained.
5. Range fences constructed to a standard that is compatible with wildlife and human uses, i.e. gates would be placed at a minimum of every one mile and bottom fence wire would be 16 inches off the ground.
6. Such other provisions relating to livestock grazing and other objectives found by the Secretary to be consistent with provisions of FLPMA.

The allotment management plans also include upland and riparian vegetation community objectives (long-term goals), upland and riparian forage use standards and guidelines (short-term goals), required management practices (e.g. salting and riding/herding for proper distribution), maintenance standards for structural improvements and monitoring plans.

Scoping

The Center for Environmental Quality (CEQ) defines scoping as "…an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). Among other things, the scoping process is used to invite public participation, to help identify public issues and to obtain public comment at various stages of the NEPA process. Although scoping is to begin early, it is really an iterative process that continues until a decision is made. To date, the public has been invited to participate in the project in the following ways:

Schedule of Proposed Actions

The Summit Logan Valley Grazing Authorization Project has been listed on the Malheur National Forest Schedule of Proposed Actions since April 2008.

Public Mailing and Field Trips

Public comments were previously requested in October 2008 for this project. Since that time, the Summit Logan Grazing Authorization Project has transitioned from an Environmental Assessment (EA) to an Environmental Impact Statement (EIS). On February 1, 2012, a letter providing information and seeking public comment was mailed to approximately 230 entities, such as, agencies, groups, individuals and other parties who had requested information on general forest or specific range projects. Four comments letters were received: Oregon Natural Desert Association in conjunction with Oregon Wild, Grant County Conservationists, Blue Mountain Biodiversity and an anonymous commenter. Additionally, on February 8, 2012, a Notice of Intent was published in the Federal Register.

Interaction with the Summit Logan allotment grazing permittees has been ongoing since the fall of 2007 and has included several field trips and meetings. Field trips to the project area were facilitated by the National Riparian Service Team and attended by representatives from U.S. Fish and Wildlife Service and the permittees.

Tribal Government Consultation

Tribal consultation on a government-to-government basis is ongoing with the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of Warm Springs Reservation. This government-to-government consultation is being conducted under the terms of specific agreements with individual tribes and includes regular contact and meetings as appropriate. Scoping letters were mailed to the tribal governments. In the spring and fall of 2008 the District Ranger, Rangeland Management Specialist and various Interdisciplinary Team members met with the Burns Paiute Tribe to discuss their proposals for the Logan Valley area. Several partnership projects are ongoing in the project area involving the Burns Paiute Tribe and the Logan Valley allotment permittees. The Burns Paiute Tribe is constructing several riparian pasture and exclosure fences on Big Creek and Lake Creek to assist in grazing management and aquatic habitat recovery. On April 3, 2013 the Prairie City Ranger District met with representatives from the Burns Paiute Tribe to discuss ongoing and future projects, which included the Summit Logan Grazing Authorization Project.

Draft EIS Comments and Responses

The Summit Logan Grazing Authorization Project DEIS was completed in October 2012, and was made available to the public the week of November 5, 2012. The 45 day review period began on November 2, 2012, the day that the Notice of Availability was printed in the Federal Register. The review period ran through December 17, 2012. Letters informing that the DEIS was available was mailed to over 100 potentially interested publics. Copies of the DEIS were mailed to those individuals that responded during scoping. Additional copies were given to other individuals, agencies and groups following the initial mailing. Eight written and verbal comments were received from the public. These comments, with agency responses, are located in appendix F.

Issues

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

The issues were separated into three groups for the purpose of this analysis:

Significant issues, analysis issues and issues eliminated from detailed study. The CEQ NEPA regulations give guidance (40 CFR Sec. 1501.7) to "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)."

- **Significant issues** are defined as those directly or indirectly caused by implementing the proposed action; however, the effects cannot be reduced by normal best management practices (BMPs) or project design criteria (PDCs). Alternatives were developed to address these issues.
- **Analysis issues** are defined as those directly or indirectly caused by implementing the proposed action; however, the effects could be reduced with normal best management practices and project design criteria. An alternative was usually not developed to address these analysis issues. However, these analysis issues will be tracked in the relevant resource area effects analyses in chapter 3 and in

the Comparison of Alternatives in chapter 2. Several of the issues for this project fall into this category.

- **Issues eliminated from detailed study** are identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The CEQ NEPA regulations require identification and elimination from detailed study the issues which are not significant or which have been covered by prior environmental review (40 CFR Sec. 1506.3).

The Interdisciplinary Team identified and carried through the analysis the significant issues and the analysis issues in order to fully develop and allow further comparison of the proposed action and alternatives. The environmental consequences of the proposal are disclosed in chapter 3 for each resource affected by these issues. Each issue has indicators to allow members of the public and the Responsible Official (Forest Supervisor) to determine how well issues are addressed by the alternatives (see Table 5 Comparison of Alternatives in chapter 2 for effects of the alternatives on issues). A complete issue identification summary is in the project record files. A discussion of all issue groups and indicators are presented below:

Significant Issues

After reviewing the public comments received during scoping, two significant issues were identified by the Responsible Official:

Table 15. Significant issues and indicators

Significant Issue	Significant Issue Indicator(s)
Bull Trout Critical Habitat	Measure or element for evaluation: • Miles of occupied bull trout habitat grazing during spawning season by stream • Miles of critical bull trout habitat[a] ○ Not grazed ○ Grazed annually ○ Grazed with periods of rest ○ Riparian pastures with rest ○ Riparian exclosures not grazed • Rate of recovery ○ Miles of critical habitat expected to achieve proper functioning condition in 5 years ○ Miles of critical habitat expected to achieve proper functioning condition in 10 years ○ Miles of critical habitat expected to achieve desired vegetation conditions and channel characteristics in 10 years
Economic Impacts to Permittees and the Community	Measure or element for evaluation: ○ Available Forage and Animal Unit Months ○ Costs of improvements ○ Acres rested or not grazed ○ Acres available for grazing ○ Miles of added fence maintenance

a - Miles of 303d listed streams are included in the critical bull trout habitat miles

- **Bull Trout Critical Habitat** – Grazing may degrade critical habitat for threatened bull trout. There may be direct, indirect, and cumulative effects of livestock use of streams and riparian areas that could negatively affect spawning and reproductive success. Livestock grazing may trample eggs, impact stream banks increasing sediment and widening stream channels, decrease shade-providing plants on the banks and increase water temperatures. Continued grazing on streams that are "functional at risk" may impact recovery of resource values including critical bull trout and beaver habitat. In areas that are functioning at risk, channels may not be interacting with the floodplain,

substrate is often highly embedded and pool quality low, banks are incised with little vegetation, willows are under-represented in density and age classes, and water temperatures are high.

- **Economic Impacts to Permittees and Community** – Changes in how allotments are managed can affect operational and implementation costs. Riparian exclosures and riparian pastures can exclude productive forage areas and impact livestock movement. The addition of fences can increase annual fence maintenance costs. Permittees, managers and employees of allotments reside in the local communities and contribute to the local economy.

Analysis Issues

Table 16 lists the analysis issues considered for this analysis generated from public comments and/or the project Interdisciplinary Team.

Table 16. Analysis issues

Analysis Issue	Analysis Issue Indicator(s)
Fences are Movement Barriers to Wildlife	Measure or element for evaluation: • Miles of Fence Removed • Miles of Fence Constructed • Design Elements to Reduce Impacts
Proposed Move Triggers, End-Point Indicators not capable of allowing for riparian recovery	Measure or element for evaluation: • Move Triggers and End-Point Indictors
Limited hardwoods have resulted in a loss of beaver habitat and reduction of animals within the project area	Measure or element for evaluation: • Short- and Long-Term Effects on Shrub Development
Shifting parts of vacant allotments into active livestock use	Measure or element for evaluation: • Acres of Currently Vacant Allotment Grazed • Miles of Critical Bull Trout Habitat Grazed in Currently Vacant Allotment
Livestock Stocking Levels Should be Reduced	Measure or element for evaluation: • Capability, Suitability and Forage Production

Table 17. Issues eliminated from detailed study

Issues Eliminated	Rationale
Trying to attract or divert livestock away from riparian area will afford adequate protection to bull trout and riparian ecosystems.	Comment not supported by available science. Techniques to attract or herd livestock away from riparian areas have proven to be successful strategies.
Areas like Sagehen should include measures to address impacts from elk.	Comment is addressed by direction in the Malheur Forest Plan. The Malheur Forest plan directs that methods be employed to achieve the desire levels of utilization by permitted livestock and big game. See Forest Plan standard #87, on page IV-35.
The management decision must be coordinated with the water quality restoration plan that is being developed this spring to respond to a number of TMDL violations on the Malheur River.	A water quality management plan is being developed and due to the Department of Environmental Quality in April, 2012. Development of this plan is outside the scope of this analysis.
There should be no livestock allowed in riparian pastures given the extreme loss of riparian biodiversity and historic degradation. As soon as livestock are allowed back in, these gains will be largely lost.	Scientific literature indicates that riparian pastures can recover with managed grazing.

Issues Eliminated	Rationale
Troughs attract concentrated livestock use a lot of compaction, denuding of plants, etc. Piping from a creek to a trough 100 feet from the stream is to close-still well within the sediment contribution zone of at least 200 feet.	Troughs would be located outside of riparian areas greater than 200 feet from streams.
Fence off springs with a trough outside the exclosure still attracts destruction by livestock to an area within the broader spring zone of influence, compacting soils, and potentially reducing water recharge rates.	One spring is proposed for development. The spring source will be fenced with the trough located approximately 400 feet from the spring. The entire spring zone of influence (wet area) will be fenced and protected from grazing.
Propose closures of roads that threaten trout or are redundant in nature.	Comment is outside the scope of the analysis. No road closures are proposed.

Project Record Availability

This FEIS hereby incorporates, by reference, the project record. The project record contains all project-specific information including resource reports, the watershed analysis and other results of field investigations. The record also contains information resulting from public involvement efforts. The project record is available for review during regular business hours at Prairie City Ranger District in Prairie City, Grant County, Oregon.

Chapter 2. Alternatives, Including the Proposed Action

Introduction

Chapter 2 describes and compares the no action (no grazing), the proposed action and alternatives considered by the Forest Service for the Summit Logan Valley Grazing Authorization Project. This chapter is intended to present the alternatives in comparative form, sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14).

Changes from Draft to Final Environmental Impact Statement

The following changes were made between the Draft and Final EIS. The listing does not include minor correction, explanations, or edits to grammar and spelling. Some of the changes resulted from public comments on the Draft Environmental Impact Statement.

- Keeping all livestock out of riparian zones has been added as an alternative considered but eliminated from detailed study.
- Design criteria addressing Greater Sage-Grouse was added for all action alternatives.
- Aspen monitoring has been added to evaluate impacts of browsing on sucker and sapling recruitment.
- The estimated implementation and management schedule was updated.

Development of Alternatives

The Interdisciplinary Team used information from public scoping comments, the significant issues identified for the project (see chapter 1) and direction given by the District Ranger including Forest Plan direction and amendments, existing State and Federal laws, and field-related resource information to formulate a reasonable range of alternatives. A reasonable range of alternatives to the proposed action was developed to 1: Meet the purpose and need for the project, and 2: Consider a reasonable range of solutions for the significant issues.

This chapter includes a detailed description of each alternative, a list of design criteria, and other features of the alternatives. A summary of the alternatives is provided in Table 51.

Each alternative is analyzed in detail to disclose environmental effects associated with its implementation in chapter 3. A summary comparing the effects to the significant and analysis issues is provided at the end of this chapter in Table 53.

Alternatives Considered but Eliminated from Detailed Study

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

Closure of National Forest System Roads

Public comments during the scoping period requested road closures to be considered as part of the proposed action. A recent access travel management plan was implemented in Logan Valley area with the Merit Project. Over the last several years several miles of road closures and decommissioning were implemented in areas overlapping portions of the Logan Valley, Lake Creek, and McCoy Creek

allotments benefiting aquatic and wildlife habitat. The Line Officer made a decision to not propose additional road closures in this analysis.

Beaver Recovery Projects

Public comments requested that a credible and substantive beaver restoration alternative be considered. Although alternatives considered in detail do not specifically propose to restore beaver habitat, grazing management changes considered are expected to move riparian areas toward desired conditions resulting in improved habitat for beaver across the project area. The quality of beaver habitat will depend on the stream-type and vegetation potential. Closing roads was a beaver restoration strategy recommended in public comments. As stated above, the responsible official decided not to include road closures within the scope of the analysis.

Corridor Fencing of Big Creek

A proposal was brought forward from the Burns Paiute Tribe to consider constructing corridor fences on Big Creek to eliminate livestock access and rest. Proper functioning condition (PFC) assessments on big creek stream reaches were conducted in 2007. All reaches of big creek assessed were determined to be in a proper functioning condition with an upward recovery trend, therefore corridor fencing of all stream reaches was eliminated from detailed study. The Forest Service is working cooperatively with the Burns Paiute Tribe and the Logan Valley allotment permittee to restore aquatic habitat on Big Creek and Lake Creek. In 2011, the Prairie City District Ranger authorized creating a riparian pasture on approximately 0.2 miles of Big Creek that was not reviewed during the 2007 proper functioning condition assessments. The pasture fence is scheduled to be completed in 2012. In all alternatives the riparian pasture (West Bosenberg Riparian Pasture) is proposed to be rested and planted with willows to expedite recovery.

Reduction of Permitted Grazing Numbers

An alternative was considered that would have decreased the annual permitted livestock numbers and Animal Unit Months (AUMs) to improve stream conditions and habitat for bull trout. A capability and suitability and forage production analysis was completed for all allotments in the project area. The study showed that forage availability with the currently permitted livestock AUMs is not a limiting factor in the allotments within the project area.

Reducing numbers as a stand-alone strategy would have economic impacts to the permittee and fails to fully consider the stressors on the riparian systems that are slowing or preventing their recovery. Recovery of stream conditions can successfully be accomplished using a combination of timing, duration and frequency of grazing. Within the alternatives considered in detail, changes in management were designed specifically for the stream reaches based on the existing condition. Strategies considered related to the timing, duration, and frequency of grazing include: periodic rest of entire grazing units, fencing to create riparian pastures and exclosures to better control the duration and frequency of grazing, changes in allowable streambank impacts and forage use levels in riparian areas, and development and management requiring daily riding by the permittee to move livestock away from riparian areas. In addition, the AUMs proposed in all alternatives considered in detail were established as a maximum limit, maintaining flexibility for periodic adjustments in livestock numbers if needed to achieve desired conditions for streams.

Current Management

Although current grazing strategies are facilitating recovery of most stream reaches, it was eliminated as an alternative studied in detail because there is still a need for changes in management to improve shrub,

herbaceous vegetation, bank stability and stream shade conditions on specific reaches of Summit Creek. Summit Creek is critical habitat for bull trout.

Scheduling Rest on all Stream Reaches that are Functioning at Risk

Several sources of data were used by the Interdisciplinary team to determine the existing condition and desired condition (see appendix A, Table 102). This includes a proper functioning condition assessment completed in 2007 (Elmore 2007). The assessment identified several stream reaches in the project area as "functional at risk". Some stream reaches that are functioning at risk, have an upward recovery trend and scheduling rest to achieve the desired condition is not always necessary. Combinations of management that change the timing, duration and frequency of grazing are being considered based on the specific recovery needs of each stream reach. Scheduling rest as a stand-alone strategy for recovery all streams that are functioning at risk was eliminated from detailed study.

Keep all Livestock out of Riparian Zones

An alternative was considered that would have removed livestock grazing from riparian areas. The strategies proposed in the action alternatives address the timing, duration, and frequency of grazing in riparian areas without removing livestock entirely from all riparian zones. The strategies vary by alternative with consideration of the existing condition and desired condition of riparian conditions. Strategies proposed include periodic rest of riparian areas, fencing to create riparian pastures and exclosures to better control the duration and frequency of grazing, variations in use levels and move triggers, and herding techniques such as daily riding to move livestock away from riparian areas.

Alternatives Considered in Detail

This FEIS assesses the potential effects of four alternatives: a no action alternative and three action alternatives.

Alternative 1 – No Action (No Grazing)

For this FEIS, the no action alternative is interpreted to be no grazing.

Under alternative 1, all term grazing permits would be cancelled upon implementation of the decision and resolution of the appeal process. No permits would be issued for any of the affected allotments until or unless there was a subsequent NEPA analysis and a decision made to re-stock any or all of the allotments. Permittees would be given two years written advance notice of cancellation of their permits as provided for under 36 CFR 222.4 (a)(1).

Upon cancellation of the existing permit, there would be no livestock grazing under this alternative. During the two years prior to cancellation of the permits, livestock would continue to be managed under current management regimes for the existing permits.

Permittees would be reimbursed for their amortized share of cooperative range improvements where they participated in the development (FSH 2209.13 Chapter 70).

Allotment exterior boundary fences would be assigned to adjacent permittees for continued maintenance. Private land boundary fences would remain intact with ownership assumed to belong to the private landowners. Subsequent decisions would need to be made regarding retention of any improvements for other resource needs.

The purpose of the no grazing alternative is to describe the effects of cancellation of grazing permits, with no livestock grazing taking place. Other management activities taking place in the area would continue if

this alternative was selected. Activities such as motorized access travel management, road maintenance, dispersed recreation, noxious weed management and fire protection would be allowed to continue as they currently take place in the project area.

Actions Common to Alternatives 2, 3 and 4

Adaptive Management

All action alternatives are based on "adaptive management," a process/model that uses monitoring and assessment information to determine if management changes are needed and, if so, what changes and to what degree. It is a process to cope with uncertainty and changing conditions over time. It gives the authorized officer the flexibility to adapt to changes on a yearly basis or after a period of longer term monitoring.

Adaptive management strategies that may be used with each alternative are identified in appendix A (Table 104). Monitoring would be used to determine if management objectives identified in appendix A (Table 103) are being achieved in a timely manner. If it is determined through monitoring that objectives are not being achieved through the actions prescribed, then the pre-determined adaptive management strategy would be applied.

The factors that would be considered in determining if or when adaptive management strategies would be applied include:

- Were management objectives identified in appendix A (Table 103) achieved within the desired timeframes?
- If management objectives were not achieved:
    - Did unplanned circumstances cause non-attainment of the objectives (i.e., unauthorized or natural disturbance [ice scour, wildfire, flood event])?
    - If some of the objectives were achieved, but not others: Were the objectives met for the indicators driving the upward trend for steam recovery and bull trout habitat reached? If so, then other management objectives need more time to develop but the rate of recovery is similar to reference designated monitoring areas (DMAs).
    - Were the objectives achievable or appropriate? This provides flexibility of changing the numerical values or indicators for management objectives as time progresses, more monitoring data becomes available and future research improves the understanding of structure and function of riparian area.

Chapter 3 discloses the effects of implementing the specific adaptive management strategies proposed, so they can be implemented without additional analysis in the future.

Other Requirements

Grazing would be based on AUMs; Permits would be based on average animal use and cow/calf pairs or yearlings

The action alternatives establish a maximum limit for animal unit months (AUMs) for each allotment. Alternatives propose livestock numbers (an average number of livestock) and the average season of use. Flexibility is maintained for annual adjustment of both numbers and/or season as long as the permitted use level (AUMs) is not exceeded. On an annual basis the actual livestock numbers and period of use may be adjusted in response to discussions with resource specialists and in response to resource needs, range readiness and monitoring. The grazing season beginning and ending dates could be varied by as much as

two weeks (from the average season of use) allowing flexibility for differences in annual range readiness. Flexibility that allows for annual adjustments provides a management tool to assure that riparian and rangeland objectives are met.

Changes to numbers and season of use would be displayed in the annual operating instructions. The permit would display the "average" number of livestock for the "average" season of use (Grazing Permit Administration Handbook FSH 2209.13, Section 15.13; these dates and numbers may vary year by year in annual operating instructions but when combined, would be equal to or less than the maximum permitted AUMs).

Allotment Facilities are maintained

Permittees would be required to perform all annual maintenance of range improvements (i.e. fences and water developments) assigned in their permits. All fences would be functional before animals are turned out into the unit to be used. Range improvements would be reconstructed as the need arises (i.e., end of life span).

Appropriate Administrative Actions Would Occur

Appropriate administrative actions would be taken when the permittee's management is not in compliance with the annual operating instructions. Consequences would occur (as described in FSH 2209.13, Section 16.21). Under the terms and conditions of the Forest Service term grazing permit (Part 2, number 8(b) and Part 3) the Forest Officer in charge may modify the permitted number to protect resources. This is consistent with Forest Service Manual (FSM 2200).

Recent Changes in Current Management

Since completion of proper functioning condition assessments in 2007, several projects were authorized within the Logan Valley, McCoy Creek, and Summit Prairie Allotments to enhance livestock management and improve shade and hardwood communities associated with bull trout habitat on Big Creek and Lake Creek; and to provide aquatic restoration and improve livestock distribution along Summit and West Fork Summit Creeks. Projects include:

- Construction of riparian pasture fences on approximately 0.2 miles of Big Creek and 1.0 mile of Lake Creek. Riparian pasture fences are called West Bosenberg Riparian pasture and West Lake Creek Riparian pasture. (The contract was let for this project, but it has not been built yet due to fire restrictions)
- Construction of riparian exclosure fences on approximately 0.7 miles of Lake Creek.
- Hardwood planting in riparian pastures and exclosures on Lake Creek and Big Creek.
- Development of solar water systems from Big Creek and Lake Creek to troughs located in the uplands.
- Reconstruction of 1.0 mile of division fence in the McCoy Creek allotment to control livestock movement.
- Fence construction to create a temporary livestock pasture called West Summit Recovery unit. Streambank protection with trees on West Fork Summit Creek.
- Construction of a buck and pole fence on 0.25 miles of Summit Creek. Existing willow cage replacement, enlargement, and removal on Summit Creek. (This project is scheduled to occur in the fall of 2013).
- Construction of upland stock ponds to provide functional upland water sources.

Decisions were signed in 2011 for all projects and are expected to be completed prior to 2014 turnout. These projects are considered as part of current management for all action alternatives (see chapter 1, Current Management for more detail).

Alternative 2 (Proposed Action)

Alternative 2, the proposed action, was developed to establish a grazing system that provides opportunities for rest and deferment (flexibility in season of grazing) in the Logan Valley and Summit Prairie allotments to recover important attributes of aquatic habitat including riparian vegetation and hardwoods, stream shade, and streambank stability. Portions of the vacant Lake Creek allotment would be added to the Logan Valley and Summit Prairie allotments, creating a larger landscape for grazing with no proposed increase in livestock numbers (AUMs). Adding additional acres to these allotments, combined with other grazing unit adjustments within the allotments provides the flexibility to periodically rest entire grazing units or defer the season of grazing to restore riparian area conditions, while maintaining enough acres to be grazed annually to support a viable grazing operation.

Proposed allotment boundary and pasture adjustments in the McCoy Creek allotment establish a deferred rotation grazing system allowing flexibility to change the time of year when units would be used. Alternative 2 in combination with ongoing activities described in chapter 1 (current management) was developed to address the purpose and need to improve resource conditions for aquatic habitat. Ongoing activities include fence construction that excludes grazing from most of the Lake Creek riparian area to recover hardwoods,stream shade, and critical habitat for bull trout.

Management plans for each allotment are discussed in detail below and summarized in Table 51. See appendix B (maps) showing allotment and unit configurations and proposed activities.

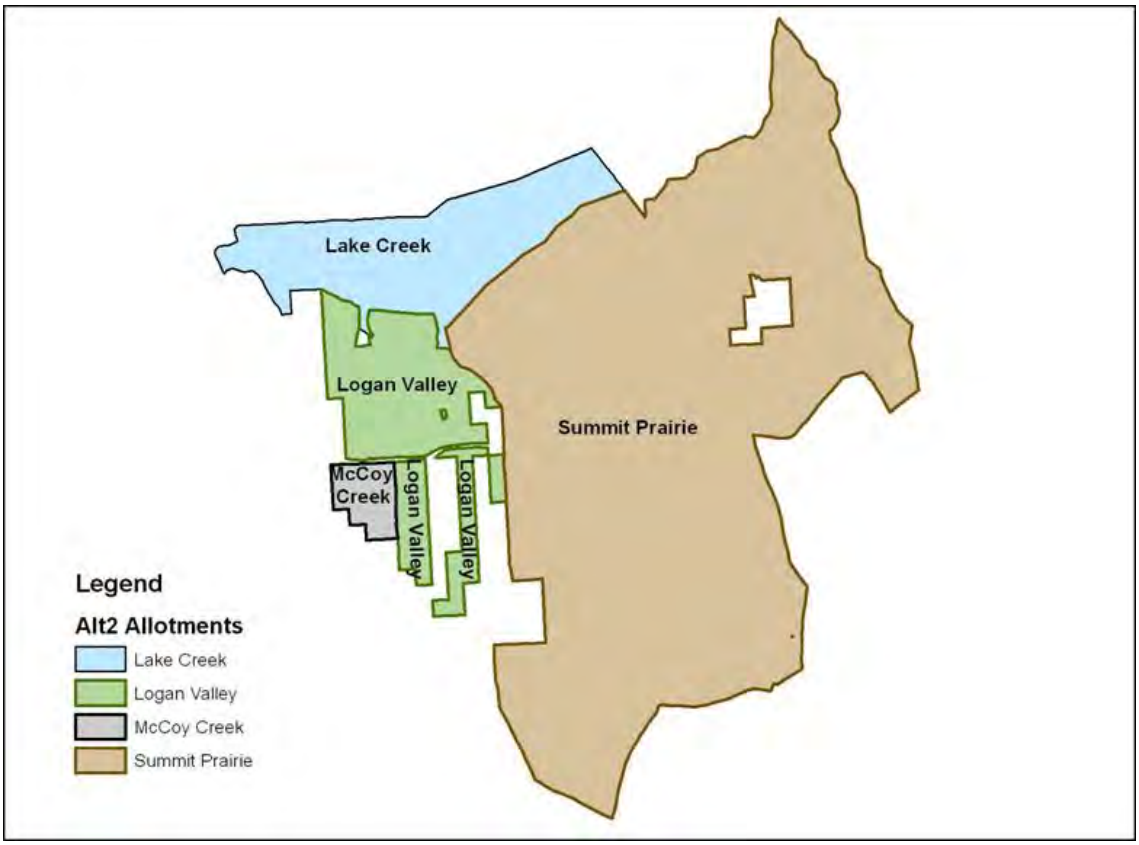

Figure 15. Proposed action range allotment configurations

Lake Creek Allotment

Grazing System

About half of this allotment would be added to the Logan Valley and Summit Prairie allotments. The remaining half would remain vacant in the McCoy Creek and Corral Basin units (see Table 18 below).

Table 18. Alternative 2, proposed Lake Creek allotment units to remain vacant

Unit	Acres
McCoy Creek unit	2,639
Corral Basin unit[a]	2,430
Total	5,069

Part of the existing Bosenberg Unit

Boundary Changes

Refer to Figure 16 which illustrates the following boundary changes for this allotment.

The southwest corner of the McCoy Creek unit (approximately 349 acres) would be removed from the Lake Creek allotment. This area may be added to the Dollar Basin allotment in the future in a separate environmental analysis.

Approximately 4,449 acres of the 6,970 acre Bosenberg Unit in the Lake Creek Allotment would be added to the Summit Prairie Allotment. This pasture would retain the Bosenberg Unit name in the Summit Prairie Allotment. Of the remaining 2,521 left in the Bosenberg Unit in Lake Creek Allotment, about 2,430 acres would be renamed the Corral Basin Unit and 91 acres would be added to the McCoy Creek Unit.

Approximately 388 acres of the Lake Creek Allotment would be added to the Logan Valley Allotment. (About 298 acres comes from the McCoy Creek Unit and 90 acres comes from the Horse Pasture Unit of the Lake Creek Allotment). The resulting new pasture would become the Deardorff Unit in the Logan Valley Allotment.

The remainder of the Lake Creek Allotment (McCoy Creek Unit and the newly designated Corral Basin) would remain vacant. Lake and Big Creeks which lie within the McCoy Creek Unit of the vacant allotment contain occupied bull trout habitat.

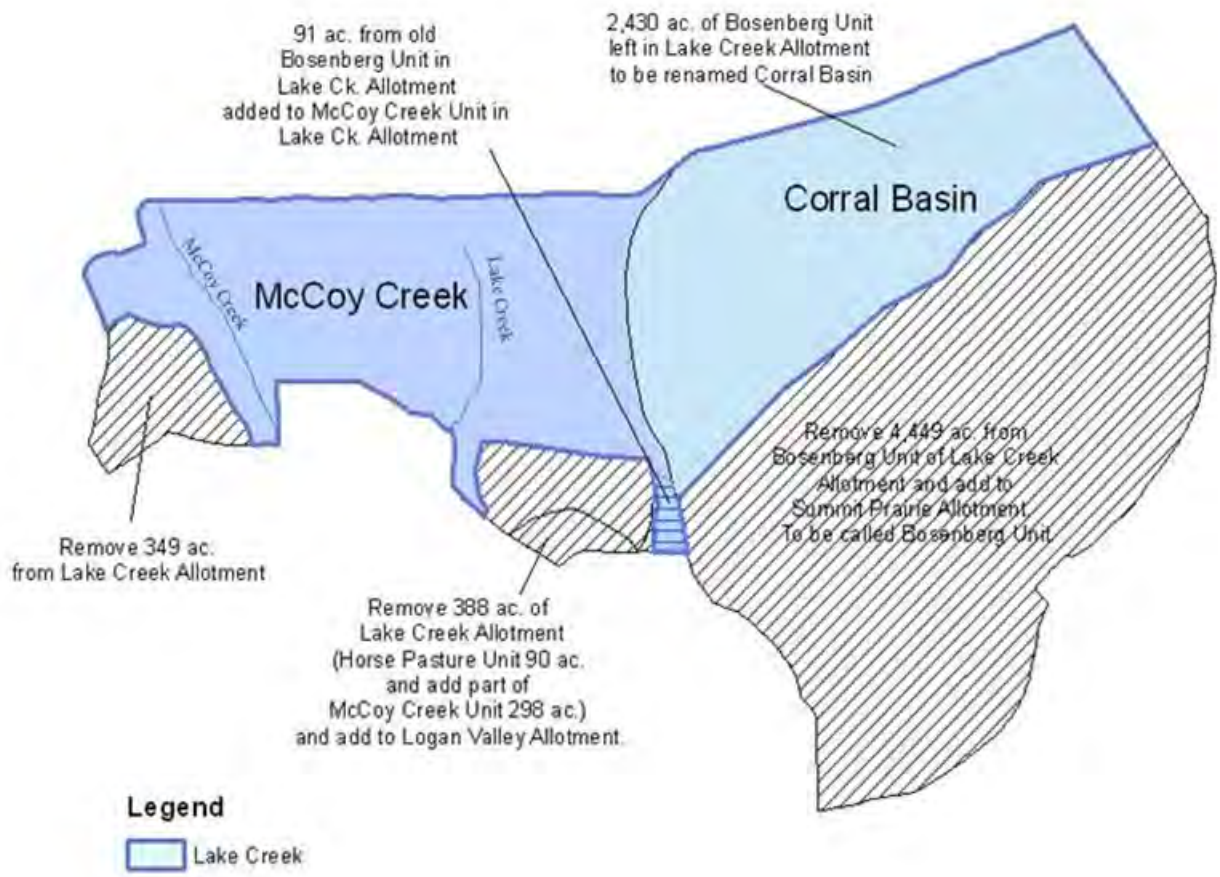

Figure 16. Alternative 2 - Lake Creek Allotment boundary changes

Livestock numbers and Grazing Season

No livestock would be authorized on 5,069 acres of the allotment.

Table 19. Alternative 2, Lake Creek allotment summary

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
Lake Creek	5,069	0	0	Vacant	None

Improvements and Structures

Construct 2.5 miles of new fencing to exclude the southwest corner of the McCoy Creek unit from the Lake Creek allotment.

Adaptive Management

No adaptive management strategies are proposed.

Logan Valley Allotment

Grazing System

The Logan Valley Allotment would be managed with periods of rest or deferment during the season of use. Deferment and rest periods would be determined based on resource needs and would not be a systematic or scheduled rotation. The rest periods would vary from a period critical to plant development, full growing season or one forage crop (one year). Emphasis would be placed on resting units with aquatic habitat recovery needs. See Table 21 for minimum rest requirements.

Table 20. Alternative 2, proposed Logan Valley allotment grazing units

Unit	Acres
Big Creek Riparian pasture	623
Big Field unit	1,024
Corral holding unit	22
Deardorff unit	388
East Bosenberg unit	118
East Lake Creek unit	399
Flat Field unit	595
Lake Creek unit	218
Lower Field unit	283
West Bosenberg unit	269
West Bosenberg Riparian pasture	14
West Lake Creek unit	271
West Lake Creek Riparian pasture	135
Total	4,359

The following table shows the rest requirements for the grazing units in the Logan Valley allotment.

Table 21. Alternative 2, Logan Valley allotment minimum rest requirements

Unit	Required Rest
West Bosenberg Riparian pasture	Rest would occur for 3-5 years after the fence is constructed (estimated 2013) and willows are planted. Grazing would resume after management objectives have been achieved[a], with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
West Lake Creek Riparian pasture	Rest would occur for 3-5 years after the fence is constructed (estimated 2013 or 2014) and willows are planted. Grazing would resume after willows have established, with rest (season long rest) required 3 years out of a 10 year period. When grazing is resumed the move trigger and use levels in appendix E would be applied.
Big Creek Riparian pasture	Rest 3 years out of 10 year period (season long rest).

a - Management objective is defined as conditions that have resilient vegetation and stream channel characteristics capable of withstanding disturbance and moving towards the desired condition when grazing is resumed. Site specific management objectives by target time periods are shown in appendix A (Table 103). If it is determined through monitoring that management objectives are not being achieved through the actions prescribed, then the respective adaptive management strategy would be applied to accelerate recovery. Adaptive management strategies are shown in appendix A (Table 104).

Boundary Changes

The Logan Valley allotment would increase from 3,756 acres to 4,359 acres. Approximately 655 acres Figure 17 displays the boundary changes for this allotment.

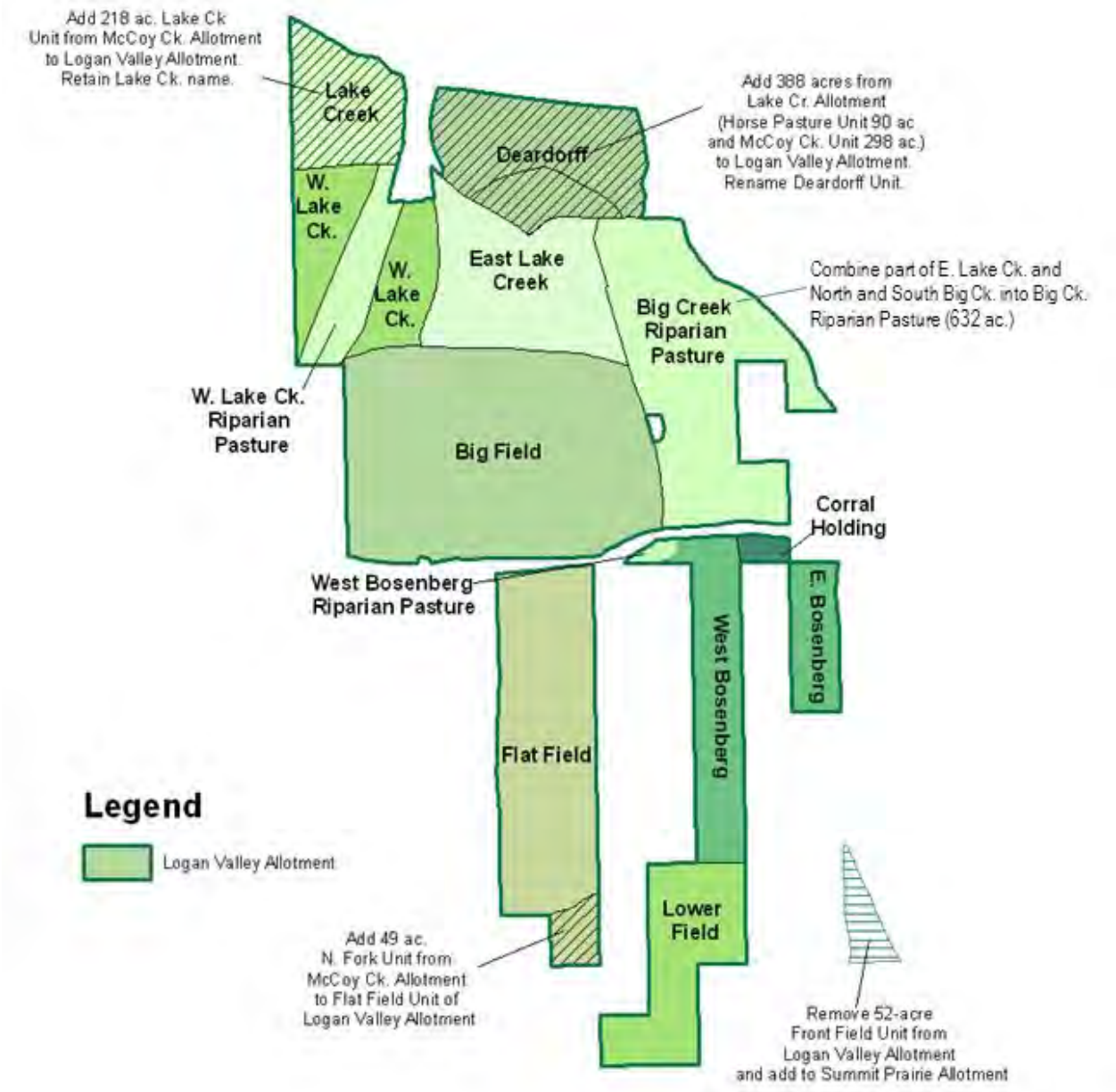

Figure 17. Alternative 2 - Logan Valley Allotment boundary changes

The Logan Valley allotment would increase from 3,756 acres to 4,359 acres. Approximately 655 acres from the Lake Creek and McCoy Creek allotments would be added to the Logan Valley allotment and about 52 acres of the Logan Valley Allotment would be added to the Summit Prairie Allotment. Specific allotment and unit changes include:

- A total of 388 acres of the Lake Creek Allotment (*Horse Pasture unit – 90 acres and McCoy Creek unit 298 acres*) would be moved to the Logan Valley Allotment. This new unit would be called the Deardorff unit.
- The Lake Creek unit (218 acres) and North Fork unit (49 acres) of the McCoy Creek allotment would be absorbed into the Logan Valley allotment (totaling approximately 267 acres). The Lake Creek unit would remain as an individual unit and North Fork unit would be absorbed into the Flat Field unit for better livestock distribution.
- The Big Creek portion of the East Lake Creek, North Big Creek, and South Big Creek would be combined into a single large unit known as Big Creek Riparian pasture.
- The Front Field unit (approximately 52 acres) would be removed from the Logan Valley allotment and absorbed into the Summit Prairie allotment.

Livestock numbers and Grazing Season

The permitted livestock number and grazing seasons would remain as currently permitted, distributed over the larger landscape provided by adding areas from the Lake Creek and McCoy allotments to the Logan Valley allotment.

Up to 357 head of cattle would be authorized for a season generally between June 10th and October 15th. Authorized use would not exceed 1,983 AUMs. Forage allowable use, move triggers and endpoint indicators are listed in appendix E.

The Big Creek portion of the East Lake Creek, North Big Creek and South Big Creek units that would be combined into a single riparian pasture would require livestock removal by August 15th to protect bull trout spawning habitat in Big Creek.

Table 22. Alternative 2, Logan Valley allotment summary

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
Logan Valley	4,359	357[a]	1,983	06/10-10/15	Periods non-scheduled rest and deferment

a - Cow/calf pairs or individual steers or heifers not to exceed AUMs

Improvements and Structures

The North Fork unit of the McCoy Creek allotment would be absorbed into the Flat Field unit requiring removal of approximately 0.3 miles of fence.

Approximately 0.3 miles of electric fence in the North Fork unit would be converted to a permanent let-down fence to exclude livestock from a small section of Big Creek. A let-down fence is a three or four-stand fence that can be laid down as a unit. It is commonly used in mountainous areas where snow packs tend to loosen or break wires, or pull posts over, in standard fences.

Absorbing a portion of the McCoy Creek unit along with the Horse Pasture from the Lake Creek allotment into the Logan Valley allotment would require 2.5 miles of additional fence and 0.8 miles of fence removal. The new unit would be identified as the Deardorff unit.

Combining the Big Creek Portion of the East Lake Creek, North Big Creek and South Big Creek units would require removal of 1.2 miles of fence.

Adaptive Management

Adaptive management strategies shown in appendix A (Table 104) are summarized in Table 23 below.

Table 23. Alternative 2, Logan Valley allotment adaptive management strategies

Stream/Unit	Adaptive Management Strategy
Lake Creek/West Lake Creek Riparian pasture	Additional rest within riparian pasture
Big Creek/West Bosenberg Riparian pasture	Additional rest within riparian pasture
Big Creek/Big Creek Riparian pasture	Scheduled rest or additional rest
Big Field (Fen area)	Install fence around Fen area

McCoy Creek Allotment

Grazing System

A deferred rotation grazing system would be applied throughout the allotment. This system provides for a systematic rotation of deferment among units and provides flexibility to change the time of year when units would be used.

Table 24 below shows the grazing units and associated acres.

Table 24. Alternative 2, Proposed McCoy Creek allotment grazing units

Unit	Acres
Cow Camp unit	157 (23 ac. excluded in riparian protection exclosures[a])
Ridge unit (Combed Ridge/Dry)	292
Government Flat unit	211
Total	**660**

a - Includes Lake Creek and Lake Creek Willow exclosures

Boundary Changes

Refer to Figure 18 which illustrates the following boundary changes for this allotment.

The existing 980-acre allotment would decrease to 660 acres. The Dry (28 acres) and Ridge (264 acres) units of the allotment would be combined into a single unit, as currently managed, and would be identified as the Ridge unit (totaling 292 acres). The Lake Creek unit (218 acres) and North Fork unit (49 acres) of the McCoy Creek allotment would be removed from the McCoy Creek allotment and would be absorbed into the Logan Valley allotment (a total of 267 acres). Both units are isolated from the main body of the McCoy Creek allotment and would be more efficiently managed as part of the Logan Valley allotment.

The Starvation unit (53 acres) is a small, isolated area not easily managed with the McCoy Creek allotment. This unit would be removed from the McCoy Creek allotment and possibly added to the Dollar Basin allotment in the future in a separate environmental analysis.

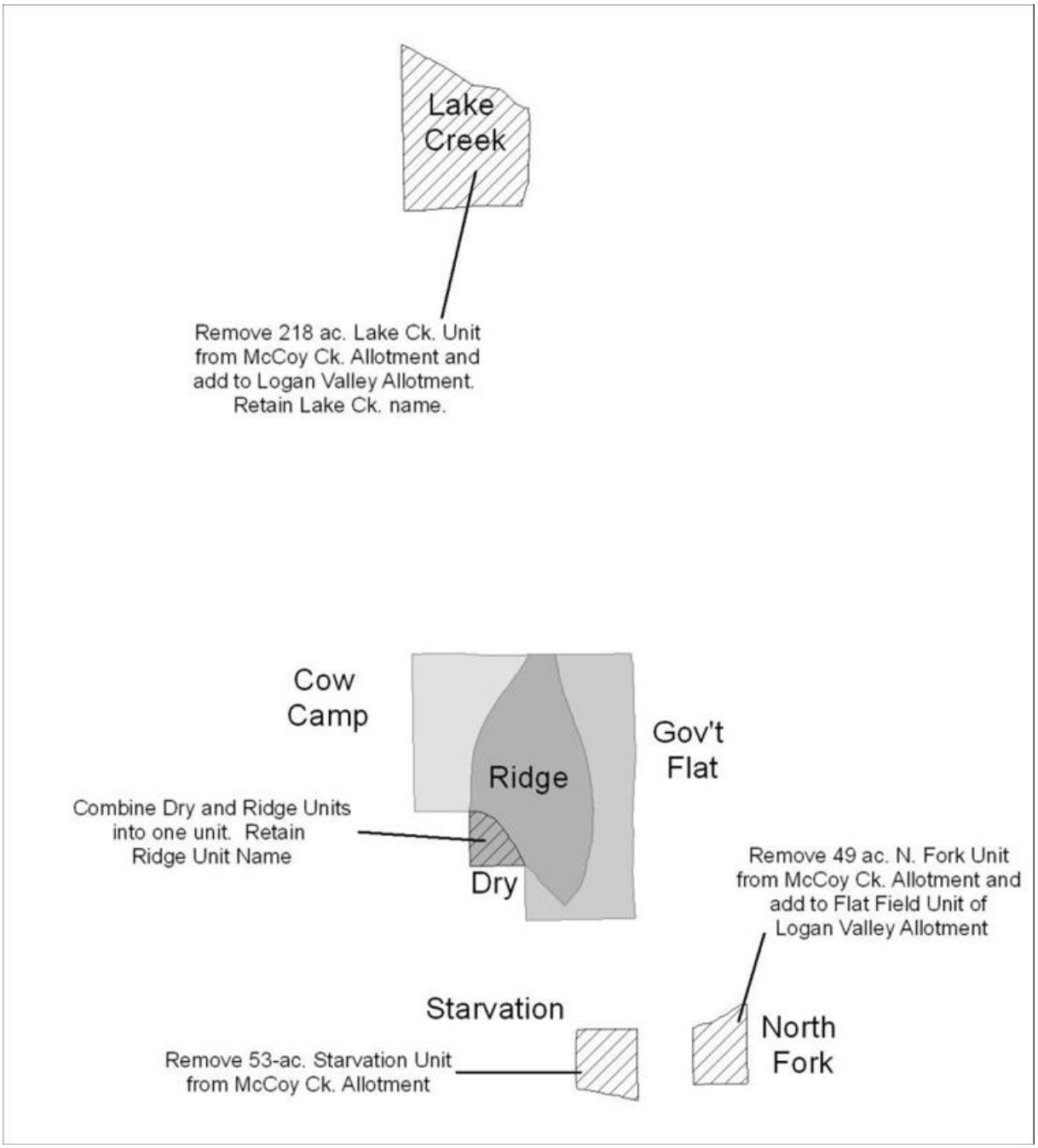

Figure 18. Alternative 2 - McCoy Creek Allotment boundary changes

Livestock numbers and Grazing Season

The permitted livestock number and grazing seasons would remain as currently permitted.

Up to 63 head of cattle would be authorized for a season generally between June 1th and October 30th. Authorized use would not exceed 416 AUMs. Forage allowable use, move triggers, and endpoint indicators are listed in appendix E.

Table 25. Alternative 2, McCoy Creek allotment summary

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
McCoy Creek	660[a]	63[b]	416	06/01-10/30	Deferred Rotation

a – Cow/calf pairs or individual steers or heifers not to exceed AUMs

b - Although the allotment acres would decrease from approximately 980 acres to 660 acres the authorized head of cattle would remain as presently grazed. Grazing numbers would not change for the following reasons: 1) the Lake Creek, North Fork, and Starvation units are currently disconnected from the main body of the allotment and therefore are not often grazed; 2) The three grazing units (Cow Camp, Government Flat, and Ridge) remaining in the allotment are primarily upland areas reducing the potential for concentrations of livestock within the Lake Creek riparian area and bull trout habitat.

Improvements and Structures

The Dry and Ridge units would be combined into a single unit (as currently managed) requiring removal of 1 mile of fence. The combined units would be identified as the Ridge unit, providing better livestock distribution.

Adaptive Management

No additional adaptive management strategies are proposed.

Summit Prairie Allotment

Grazing System

The Summit Prairie allotment would be managed with periods of rest or deferment during seasons of use. Deferment and rest periods would be determined based on resource needs and would not be a systematic or scheduled rotation. The rest periods would vary from a period critical to plant development, full growing season or one forage crop (one year). Emphasis would be placed on resting units with aquatic habitat recovery needs. See Table 27 for minimum rest requirements.

Upon the completion of the boundary fences to incorporate the portion of the Bosenberg unit (4,449 acres) into the Summit Prairie allotment, the Sagehen unit would be rested 3 years out of the 10 year period. This would provide a period of non-use or rest to allow desired vegetation composition and stream channel characteristics to improve. Until completion of the new boundary fences, the Sagehen unit would continue to be grazed early season with reduced numbers.

Part of the Bosenberg Unit was burned in early 1990 wildfires. To allow continued recovery of Bosenberg Creek, specific monitoring criteria and stream bank alteration standards would be applied. See chapter 2 (Monitoring) and appendix E (Move Triggers and Allowable Use Levels).

Table 26. Alternative 2, proposed Summit Prairie allotment grazing units

Unit	Acres
Bosenberg unit	4,449
Crane Rock unit	7,838
Little Logan unit	3,270
North Summit unit	195
Sagehen unit	3,767
South Summit unit	45
Summit Rock unit	10,222
West Summit unit (holding unit/handing facility)	27
West Summit Recovery unit (temporary)	19
Total	**29,832**

Table 27. Alternative 2, Summit Prairie allotment minimum rest requirements

Unit	Required Rest
Sagehen	3 years out of 10 year period (season long rest).
West Summit Recovery unit (temporary fence)	Rest would occur for 3-5 years after the fence is constructed (estimated 2012). Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
Bosenberg	Rest 3 years out of 10 year period (season long rest).
Little Logan	Rest 3 years out of 10 year period (season long rest).

Note: Entire unit would be rested

Boundary Changes

Figure 19 illustrates the boundary changes for the Summit Prairie allotment.

The present allotment consisting of 25,331 acres would increase to 29,832 acres. Changes to the allotment include the following:

- The Front Field unit (52 acres) from the Logan Valley allotment would be absorbed into the Little Logan unit to provide a larger unit for better livestock distribution.
- The Bosenberg unit (4,449 acres) from the vacant Lake Creek allotment would be added as a separate grazing unit.

Livestock numbers and Grazing Season

The permitted livestock number and grazing seasons would remain as currently permitted, distributed over the larger landscape provided by adding areas from the Lake Creek allotment to the Logan Valley allotment.

Up to 260 head of cattle would be authorized for a season generally between June 10th and October 24th. Authorized use would not exceed 1,546 AUMs. Forage allowable use, move triggers, and endpoint indicators are listed in appendix E.

Since direct impacts to bull trout spawning is not likely to occur from livestock activities, livestock may use the North Summit Unit after August 15 (start of the bull trout spawning period).

Table 28. Alternative 2, Summit Prairie allotment summary

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
Summit Prairie	29,832	260[a]	1,546	06/10-10/24	Periods non-scheduled rest and deferment

a - Cow/calf pairs or individual steers or heifers not to exceed AUMs

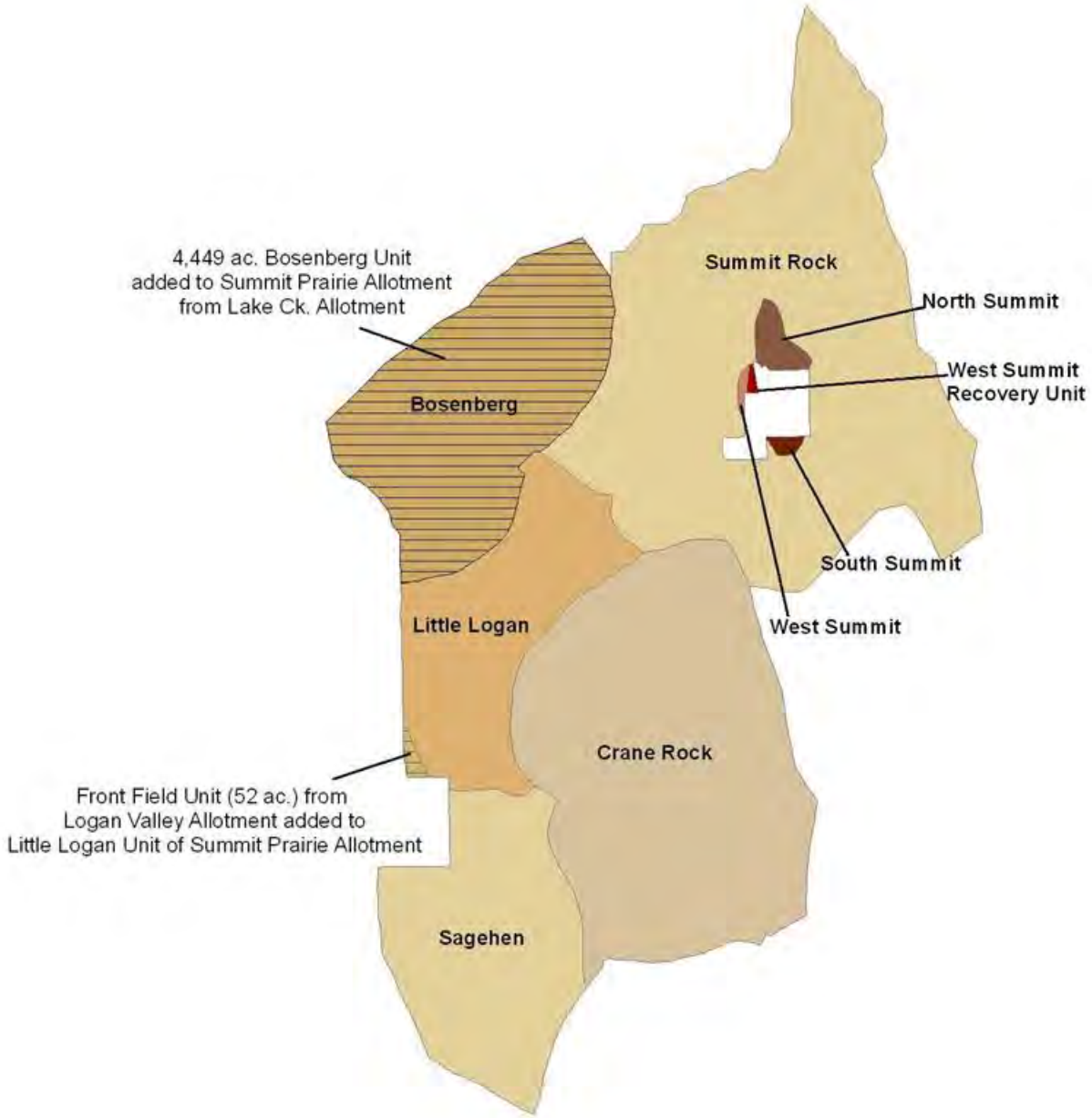

Figure 19. Alternative 2 Summit Prairie Allotment boundary changes

Improvements and Structures

Approximately 0.7 miles of fence would be removed to absorb the Front Field unit (52 acres) from the Logan Valley allotment with the Little Logan unit.

Adding the Bosenberg unit (4,449 acres) from the Lake Creek allotment would require construction of approximately 7 miles of additional fence. Water gaps in the fence line would be located where National Forest System road 1648 crosses Bosenberg Creek and an unnamed tributary of Big Creek. Three ponds would be developed in the uplands to provide alternative water away from perennial streams. Ponds would be constructed in the far northeastern portion of the unit well above the headwaters of Bosenberg

Creek and Corral Basin Creek. A spring would be developed off a headwater spring for Bosenberg Creek. The spring source would be fenced and water piped to a water trough located 300 feet from the spring. The spring is located approximately 1.5 miles from the junction of the National Forest System road 1648 and 1649. Water would also be piped from Bosenberg Creek to a trough located approximately 100 feet from the stream. The withdrawal site would be located approximately ½ mile from the junction of National Forest System road 1648 and 1649. To ensure adequate protection of all streams in the unit, riding in the Bosenberg unit would be required to maintain livestock concentrations in the uplands.

To alleviate existing safety concerns on National Forest System road 1647, a loading ramp with attached catch pen would be constructed in the uplands of the Sagehen unit near the private property boundary (T. 16 S. , R. 34 E., NE corner of Section 1). The loading ramp would be constructed with railroad timbers. The attached catch pen would be approximately 300 feet by 500 feet in size and constructed out of wood or wire material.

Adaptive Management

Adaptive management strategies shown in appendix A (Table 104) are summarized in Table 29 below.

Table 29. Alternative 2, Summit Prairie allotment adaptive management strategies

Stream/Unit	Adaptive Management Strategy
Bosenberg Creek/Bosenberg unit	Scheduled rest or additional rest
Summit Creek/Sagehen unit	Scheduled rest or additional rest
Summit Creek/Little Logan unit	Scheduled rest or additional rest
Summit Creek & West Fork Summit Creek/ Summit Rock unit	Change allowable use levels (see appendix E)
Summit Creek/North Summit unit	Change allowable use levels (see appendix E)
West Fork Summit Creek/West Summit Recovery unit	Additional rest within the Recovery unit

Alternative 3

Alternative 3 was developed in response public concern over bull trout critical habitat. All of the Lake Creek allotment would remain vacant in this alternative. The Lake Creek allotment contains all or portions of Lake Creek, Big Creek, Corral Basin Creek, and Bosenberg Creek which are designated critical habitat for bull trout.

In the Logan Valley, McCoy Creek, and Summit Prairie allotments, proposed move triggers and allowable use levels for herbaceous forage and shrub use, and bank alteration vary by pasture based on the existing condition of the specific riparian area, its resiliency to grazing effects and other disturbances, and the presence of critical bull trout habitat. See appendix E for specific details.

Ongoing water developments in the Logan Valley allotment would provide opportunities to defer the season of grazing and a change to a deferred grazing system.

Proposed allotment boundary and pasture adjustments in the McCoy Creek allotment establish a deferred rotation grazing system allowing flexibility to change the time of year when units would be used. Ongoing activities described in chapter 1 (Current Management) would construct fences that exclude grazing from most of the Lake Creek riparian area to recover hardwoods,stream shade, and critical habitat for bull trout.

Riparian pastures and exclosures would be constructed on Summit Creek in the Little Logan and Sagehen pastures. Riparian pastures would be rested for several years to accelerate recovery of riparian vegetation to enhance stream shade, riparian vegetation composition and vigor, and streambank stability.

Management plans for each allotment are discussed in detail below and summarized in Table 51. See appendix B (maps) showing allotment and unit configurations and proposed activities.

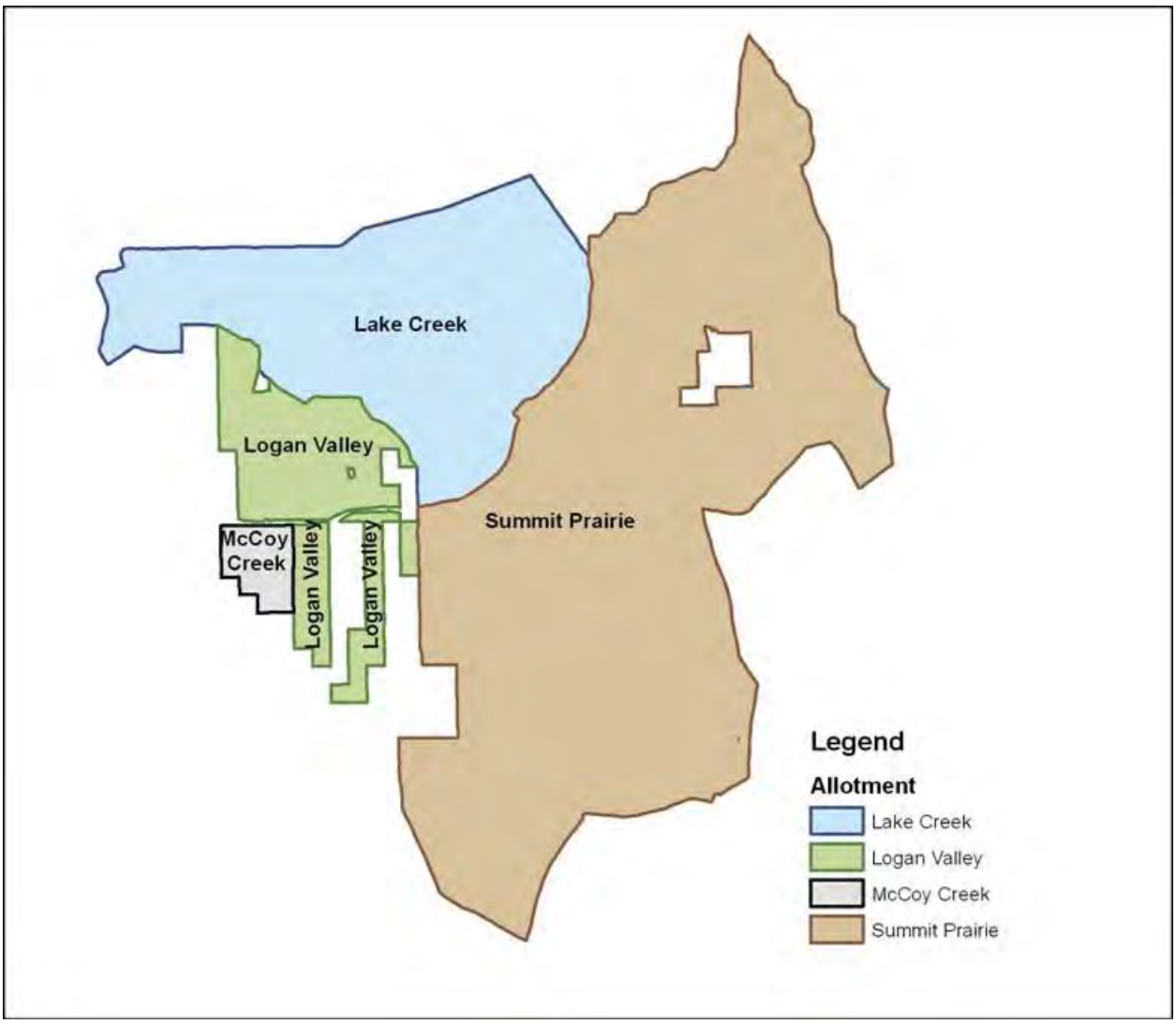

Figure 20. Alternative 3 range allotment configuration

Lake Creek Allotment

Grazing System

The allotment (Bosenberg, Horse Pasture and McCoy Creek units) would remain vacant with no authorized grazing in the three existing grazing units.

Table 30. Alternative 3, Proposed Lake Creek allotment units to remain vacant

Unit	Acres
Bosenberg unit	6,970
Horse Pasture unit	90
McCoy Creek unit	3,136
Total	10,196

Boundary Changes

The entire allotment would remain vacant with no change in the allotment boundary.

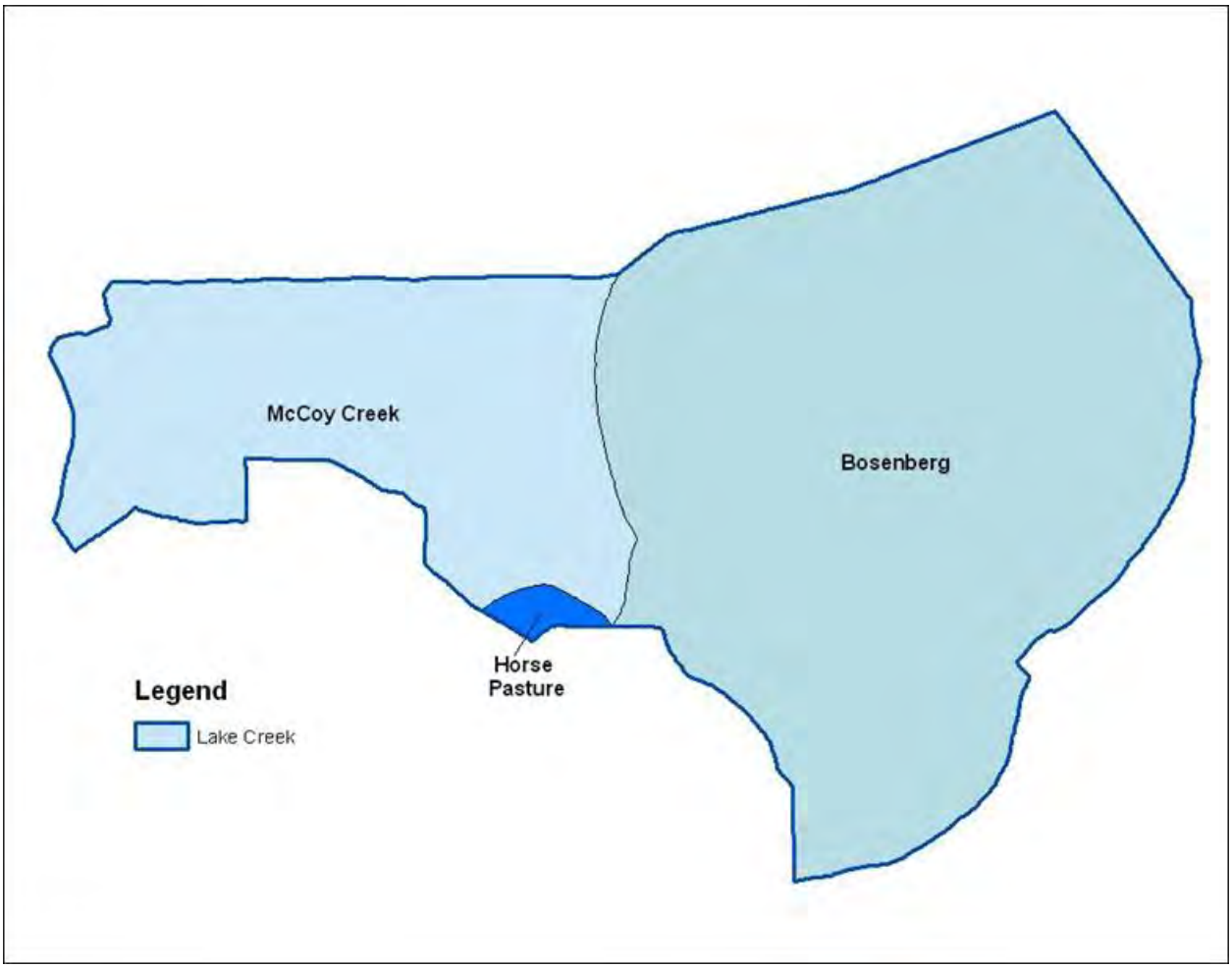

Figure 21. Alternative 3 Lake Creek Allotment - no proposed boundary changes

Livestock numbers and Grazing Season

No livestock would be authorized on the allotment.

Table 31. Alternative 3, Lake Creek allotment summary

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
Lake Creek	10,196	0	0	Vacant	None

Improvements and Structures

There are no proposed improvements or structures. Existing structures needed for other resource management such as existing aspen protection fences would continue to be maintained.

Adaptive Management

No adaptive management strategies are proposed.

Logan Valley Allotment

Grazing System

The grazing system would change to a deferred system with opportunities to defer the season of use.

Table 32. Alternative 3, Proposed Logan Valley allotment grazing units

Unit	Acres
Big Creek Riparian pasture	623
Big Field unit	1,024
Corral holding unit	22
East Bosenberg unit	118
East Lake Creek unit	399
Flat Field unit	595
Lake Creek unit	218
Lower Field unit	283
West Bosenberg unit	269
West Bosenberg Riparian pasture	14
West Lake Creek unit	271
West Lake Creek Riparian pasture	135
Total	3,971

Table 33 shows the rest requirements for the grazing units in the Logan Valley allotment.

Table 33. Alternative 3, Logan Valley allotment minimum rest requirements

Unit	Required Rest
West Bosenberg Riparian pasture	Rest for 3-5 years after the fence is constructed (estimated 2013) and willows are planted. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing resumes. When grazing resumes the move trigger and use levels in appendix E would apply.
West Lake Creek Riparian pasture	Rest for 3-5 years after the fence is constructed (estimated 2013) and willows are planted. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing resumes. When grazing resumes the move trigger and use levels in appendix E would be applied.

Boundary Changes

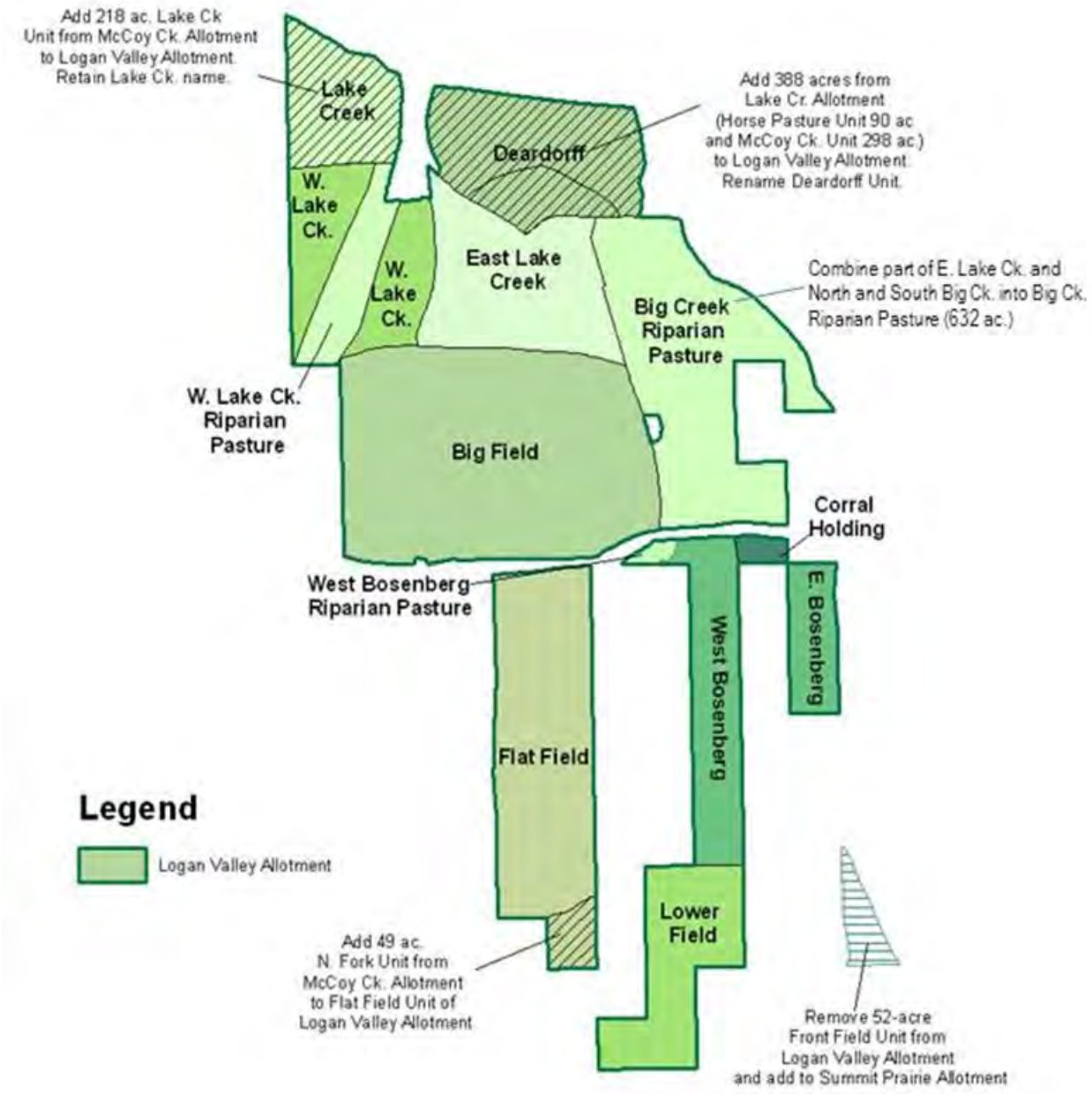

Figure 22. Alternative 3 Logan Valley Allotment boundary changes

The Front Field unit (approximately 52 acres) would be removed from the Logan Valley allotment and absorbed into the Summit Prairie allotment.

The Lake Creek and North Fork units of the McCoy Creek allotment would be absorbed into the into the Logan Valley allotment (approximately 267 acres). The Lake Creek unit would remain as an individual unit, while the North Fork unit would be absorbed into the Flat Field unit. The added acres would allow for additional rest within the Logan Valley allotment.

The Big Creek Portion of the East Lake Creek, North Big Creek and South Big Creek units that would be combined into a single 623 acre Big Creek Riparian Pasture.

The Logan Valley allotment would increase from 3,756 acres to 3,971 acres. This change would allow for additional rest for this allotment.

Livestock numbers and Grazing Season

The permitted livestock number and grazing seasons would remain as currently permitted.

Up to 357 head of cattle would be authorized for a season generally between June 10th and October 15th. Authorized use would not exceed 1,983 AUMs. Forage allowable use, move triggers and endpoint indicators are listed in appendix E.

The Big Creek Portion of the East Lake Creek, North Big Creek and South Big Creek units that would be combined into a single riparian pasture that would require livestock removal by August 15th to protect bull trout spawning habitat in Big Creek.

Table 34. Alternative 3, Logan allotment summary

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
Logan Valley	3,971	357[a]	1,983	06/10-10/15	Deferred Rotation

a - Cow/calf pairs or individual steers or heifers not to exceed AUMs

Improvements and Structures

The North Fork unit of the McCoy Creek allotment would be absorbed into the Flat Field unit, requiring the removal of approximately 0.3 miles of fence.

Approximately 0.3 miles of electric fence in the North Fork unit would be converted to a permanent let-down fence to exclude livestock from a small section of Big Creek.

The combining the Big Creek portion of the East Lake Creek, North Big Creek and South Big Creek units would require the removal of 1.2 miles of fence.

Adaptive Management

Adaptive management strategies shown in appendix A (Table 104) are summarized in Table 35 below.

Table 35. Alternative 3, Logan Valley allotment adaptive management strategies

Stream/Unit	Adaptive Management Strategy
Lake Creek/West Lake Creek Riparian pasture	Additional rest within the riparian pasture
Big Creek/West Bosenberg Riparian pasture	Additional rest within the riparian pasture
Big Creek Riparian pasture	Change allowable use levels (see appendix E)
Big Field (Fen area)	Install fence around Fen area

McCoy Creek Allotment

The grazing system, boundary changes, livestock numbers and grazing season, improvement and structures, and adaptive management strategies are the same as in alternative 2.

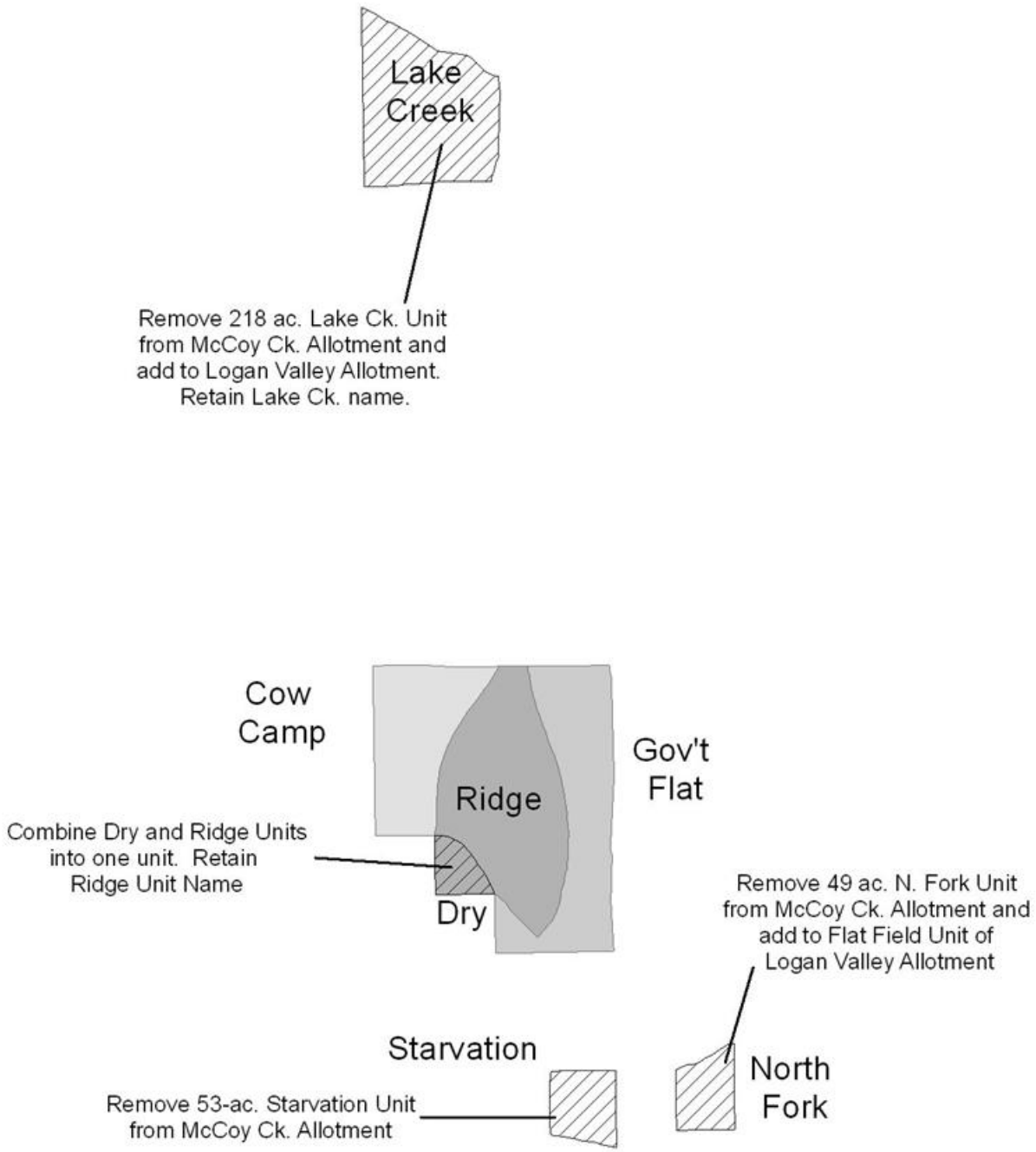

Figure 23. Alternative 3 McCoy Creek Allotment boundary changes

Summit Prairie Allotment

Grazing System

The grazing system would not change from current management. Livestock would generally move from unit to unit with opportunities to defer the season of use. Riparian exclosures (with no grazing) and riparian pastures would be constructed along portions of Summit Creek. The riparian pastures would be rested as proposed in Table 37 below.

Table 36 shows the grazing units and associated acres.

Table 36. Alternative 3, proposed Summit Prairie allotment grazing units

Unit	Acres
Crane Rock Unit	7,838
Little Logan Unit	3,191
Lower Little Logan Riparian pasture	64
Upper Little Logan Riparian pasture	15
North Summit unit	108
North Summit Riparian pasture	87
Sagehen unit	3,730
Sagehen Riparian exclosure	8
Sagehen Riparian pasture	29
South Summit unit	45
Summit Rock unit	10,222
West Summit unit (holding unit/handing facility)	27
West Summit Recovery unit (temporary)	19
Total	25,383

Table 37shows the rest requirements for the grazing units in the Summit Prairie allotment.

Table 37. Alternative 3, Summit Prairie allotment minimum rest requirements

Unit	Required Rest
Sagehen Riparian pasture	Rest would occur for 3-5 years after the fence is constructed (estimated 2012). Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
Upper and Lower Little Logan Riparian pastures	Rest would occur for 3-5 years after the fence is constructed (estimated 2012). Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
West Summit Recovery unit (temporary fence)	Rest would occur for 3-5 years after the fence is constructed (estimated 2012). Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
North Summit Riparian pasture	Rest would occur for 3-5 years after the fence is constructed (estimated 2012). Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.

Note: Only the riparian pasture or recovery area would be rested

Boundary Changes

The present allotment consisting of 25,331 acres would increase to 25,383 acres. Changes to the allotment include the following:

- The Front Field unit (52 acres) from the Logan Valley allotment would be absorbed into the Little Logan unit.

Riparian pastures or grazing exclosure would be constructed in the Sagehen, Little Logan and North Summit units allowing portions of Summit Creek to be rested. No grazing would occur within the exclosure.

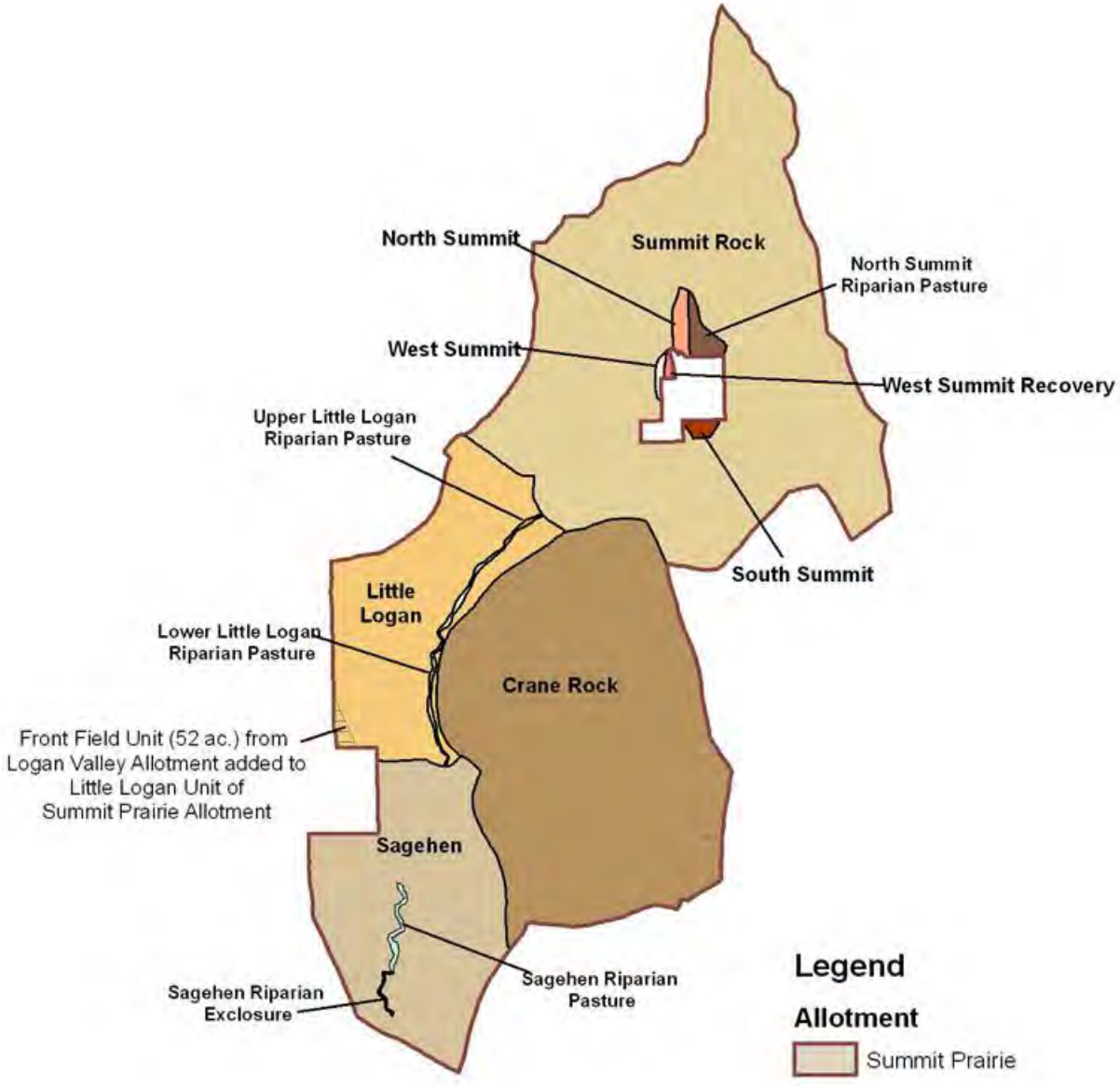

Figure 24. Summit Prairie Allotment boundary changes

Livestock numbers and Grazing Season

The permitted livestock number and grazing seasons would remain as currently permitted.

Up to 260 head of cattle would be authorized for a season generally between June 10th and October 24th. Authorized use would not exceed 1,546 AUMs. Forage allowable use, move triggers, and endpoint indicators are listed in appendix E.

Table 38. Alternative 3, Summit Prairie allotment summary

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
Summit Prairie	25,383	260[a]	1,546	06/10-10/24	Deferred Rotation

Cow/calf pairs or individual steers or heifers not to exceed AUMs

Improvements and Structures

Approximately 0.7 miles of fence would be removed to absorb the Front Field unit (52 acres) from the Logan Valley allotment to the Little Logan unit.

Approximately 7.3 miles of fence would be constructed in the Little Logan unit to create the Lower Little Logan Riparian pasture fence (5.9 miles) and the Upper Little Logan Riparian pasture fence (1.4 miles) along Summit Creek.

Approximately 4.1 miles of fence would be constructed in the Sagehen unit to create the Sagehen Riparian exclosure fence (1.5 miles) and the Sagehen Riparian pasture (2.6 miles) fence containing Summit Creek.

Approximately 0.8 miles of fence would be constructed in the North Summit unit to create the North Summit Riparian pasture fence.

To alleviate current safety concerns on National Forest System road 1647, a loading ramp with attached catch pen would be constructed in the uplands of the Sagehen unit near the private property boundary (T. 16 S., R. 34 E., NE corner of Section 1). The loading ramp would be constructed with railroad timbers. The attached catch pen would be approximately 300 feet by 500 feet in size and constructed out of wood or wire material.

Adaptive Management

Adaptive management strategies shown in appendix A (Table 104) are summarized in Table 39.

Table 39. Alternative 3, Summit Prairie allotment adaptive management strategies

Stream/Unit	Adaptive Management Strategy
Summit Creek/Sagehen Riparian pasture	Change allowable use levels (see appendix E)
Summit Creek/Sagehen unit (outside of Riparian pasture)	
Summit Creek/Little Logan unit	Additional rest within the Riparian pasture
Summit Creek/Lower Little Logan	
Summit Creek/Upper Little Logan	
Summit Creek & West Fork Summit Creek/ Summit Rock unit	Change allowable use levels (see appendix E)
West Fork Summit Creek/West Summit Recovery unit	Additional rest within the Recovery unit
Summit Creek/North Summit Riparian pasture	

Alternative 4

Alternative 4 was developed using public scoping comments and recommendations from Summit Prairie allotment grazing permittees.

Part of the vacant Lake Creek allotment would be added to the Logan Valley allotment. The portions of the Lake Creek allotment containing Lake Creek, Big Creek, Corral Basin Creek, and Bosenberg Creek (critical bull trout streams) would remain vacant.

In the Logan Valley, McCoy Creek, and Summit Prairie allotments, proposed move triggers and allowable use levels for herbaceous forage and shrub use, and bank alteration vary by pasture based on the existing condition of the specific riparian area, its resiliency to grazing effects and other disturbances, and the presence of critical bull trout habitat. See appendix E for specific details.

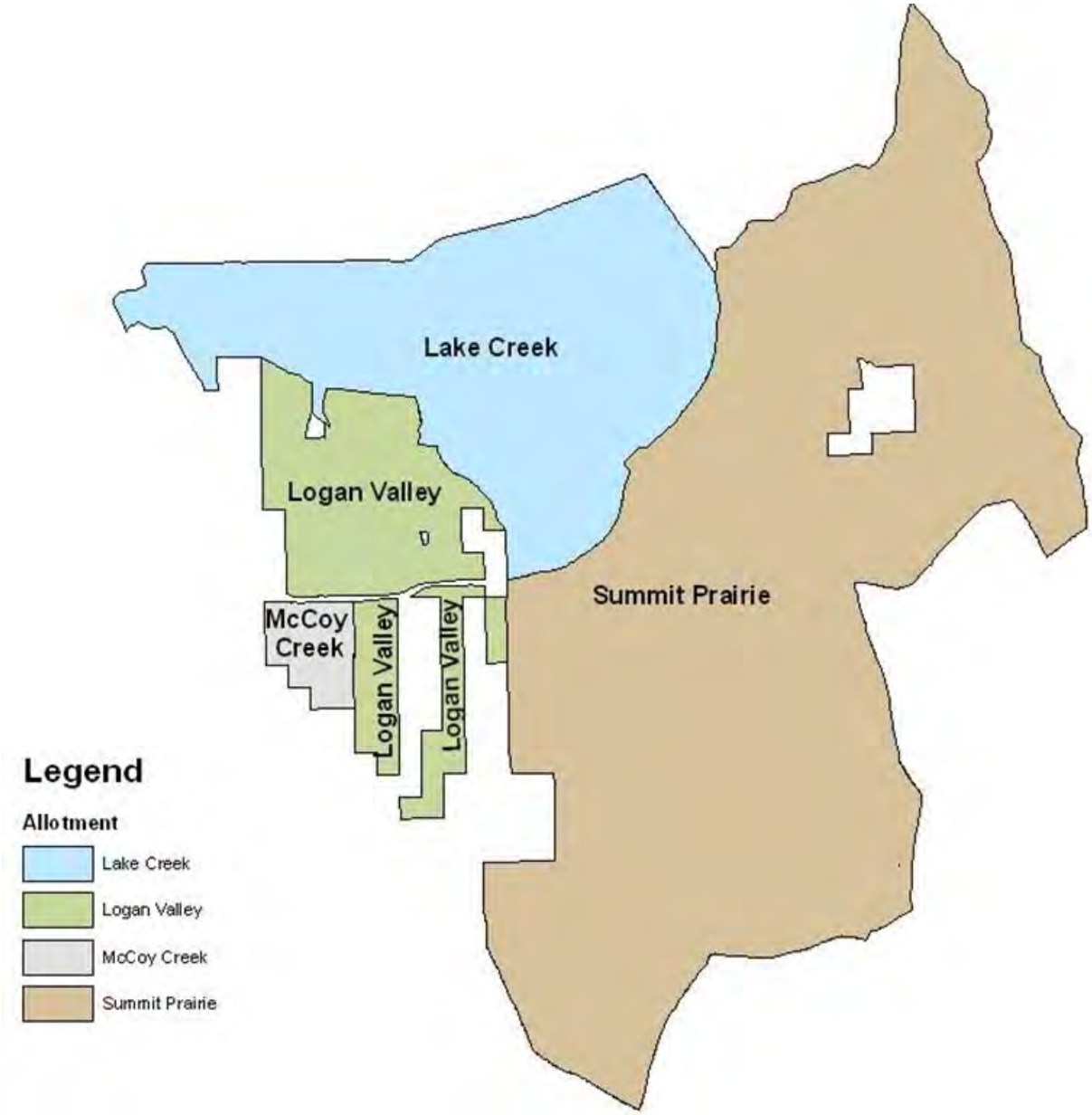

Figure 25. Alternative 4 range allotment configuration

Adding acres from the Lake Creek allotment to the Logan Valley allotment establishes a larger grazing landscape providing the flexibility to rest and defer (flexibility in season of grazing) grazing to recover important attributes of aquatic habitat, while maintaining enough acres to be grazed annually to support a viable grazing operation.

Proposed allotment boundary and pasture adjustments in the McCoy Creek allotment establish a deferred rotation grazing system allowing flexibility to change the time of year when units would be used. Alternative 4 in combination with ongoing activities described in chapter 1 (Current Management) was developed to address the purpose and need to improve resource conditions for aquatic habitat. Ongoing activities would construct fences that exclude grazing from most of Lake Creek within the allotment To recover hardwoods, stream shade, and critical habitat for bull trout.

Management changes are proposed in the Summit Prairie allotment to encourage recovery of riparian vegetation to enhance stream shade, riparian vegetation composition and vigor, and streambank stability. Daily riding by the permittee would be required when livestock are within the Sagehen and Little Logan units to move and distribute animals into the uplands away from Summit Creek. Small exclosures would be constructed and cages placed in the Sagehen and Little Logan units. A riparian pasture would be constructed from a portion of the Summit Rock and North Summit units containing portions of Summit Creek and West Fork Summit Creek.

Management plans for each allotment are discussed in detail below and summarized in Table 51. See appendix B (maps) showing allotment and unit configurations and proposed activities.

Lake Creek Allotment

Grazing System

Portions of the allotment would be added to the Logan Valley allotment. The remaining 9,459 acres would remain vacant in the McCoy Creek and Bosenberg units.

Table 40. Alternative 4, proposed Lake Creek allotment units to remain vacant

Unit	Acres
McCoy Creek unit	2,581
Bosenberg unit	6,878
Total	9,459

Boundary Changes

Approximately 388 acres of the Lake Creek allotment would be absorbed into the adjacent Logan Valley allotment. Areas containing Lake Creek, Big Creek, Corral Basin Creek and Bosenberg Creek would remain vacant. Lake Creek and Big Creek contain occupied bull trout habitat.

The southwest corner of the McCoy Creek unit (349 acres) would be removed from the Lake Creek allotment. This area may be added to the Dollar Basin allotment in the future. A separate environmental analysis would be required to add this area to the Dollar Basin allotment.

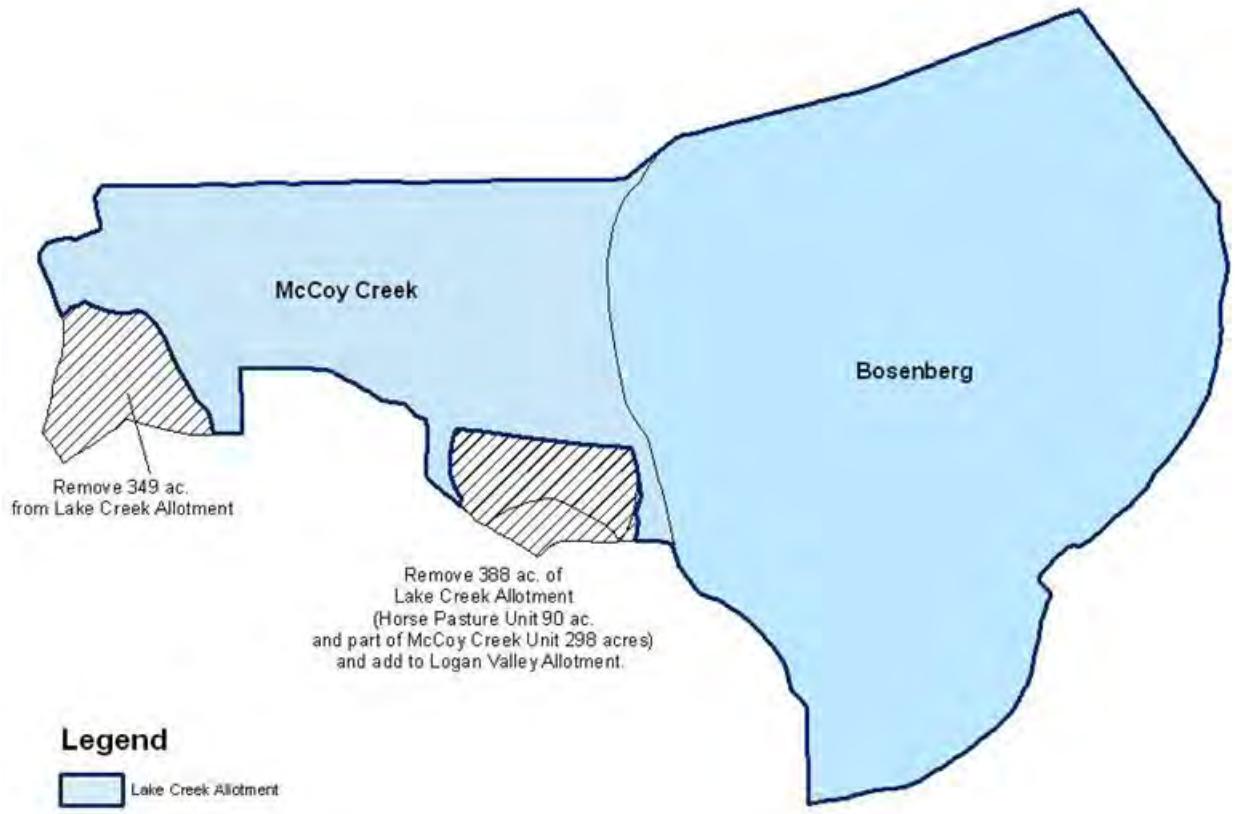

Figure 26. Alternative 4 Lake Creek Allotment boundary changes

Livestock Numbers and Grazing Season

No livestock would be authorized on 9,459 acres of the allotment.

Table 41. Alternative 4, Lake Creek Allotment

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
Lake Creek	9,459	0	0	Vacant	None

Improvement and Structures

The removal of the southwest corner of the McCoy Creek unit from the Lake Creek allotment would require the construction 2.5 miles of new fencing.

Adaptive Management

No adaptive management strategies are proposed.

Logan Valley Allotment

Grazing System

The Logan Valley Allotment would be managed with periods of rest or deferment during the season of use. Deferment and rest periods would be determined based on resource needs and would not be a systematic or scheduled rotation. The rest periods would vary from a period critical to plant development, full growing season or one forage crop (one year). Emphasis would be placed on resting units with aquatic habitat recovery needs. See Table 43 for minimum rest requirements.

Table 42. Alternative 4, proposed Logan Valley grazing units

Unit	Acres
Big Creek Riparian pasture	623
Big Field unit	1,024
Corral holding unit	22
Deardorff unit	388
East Bosenberg unit	118
East Lake Creek unit	399
Flat Field unit	595
Lake Creek unit	218
Lower Field unit	283
West Bosenberg unit	269
West Bosenberg Riparian pasture	14
West Lake Creek unit	271
West Lake Creek Riparian pasture	135
Total	4,359

Table 43 shows the rest requirements for the grazing units in the Logan Valley allotment.

Table 43. Alternative 4, Logan Valley allotment minimum rest requirements

Unit	Required Rest
West Bosenberg Riparian pasture	Rest would occur for 3-5 years after the fence is constructed (estimated 2012) and willows are planted. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
West Lake Creek Riparian pasture	Rest would occur for 3-5 years after the fence is constructed (estimated 2012) and willows are planted. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
Big Creek Riparian pasture	Rest 3 years out of 10 year period (season long rest).

Boundary Changes

The Logan Valley allotment would increase from existing 3,756 acres to 4,359 acres. Approximately 655 acres from the Lake Creek and McCoy Creek allotments would be added to the Logan Valley allotment. Specific allotment and unit changes include:

- The Horse Pasture and a portion of the McCoy Creek unit of the Lake Creek allotment would be absorbed into the Logan Valley allotment (approximately 388 acres). This new unit is identified as the Deardorff unit.
- The Lake Creek and North Fork units of the McCoy Creek allotment would be absorbed into the Logan Valley allotment (approximately 267 acres). The Lake Creek unit would remain as an individual unit and North Fork unit would be absorbed into the Flat Field unit for better livestock distribution.

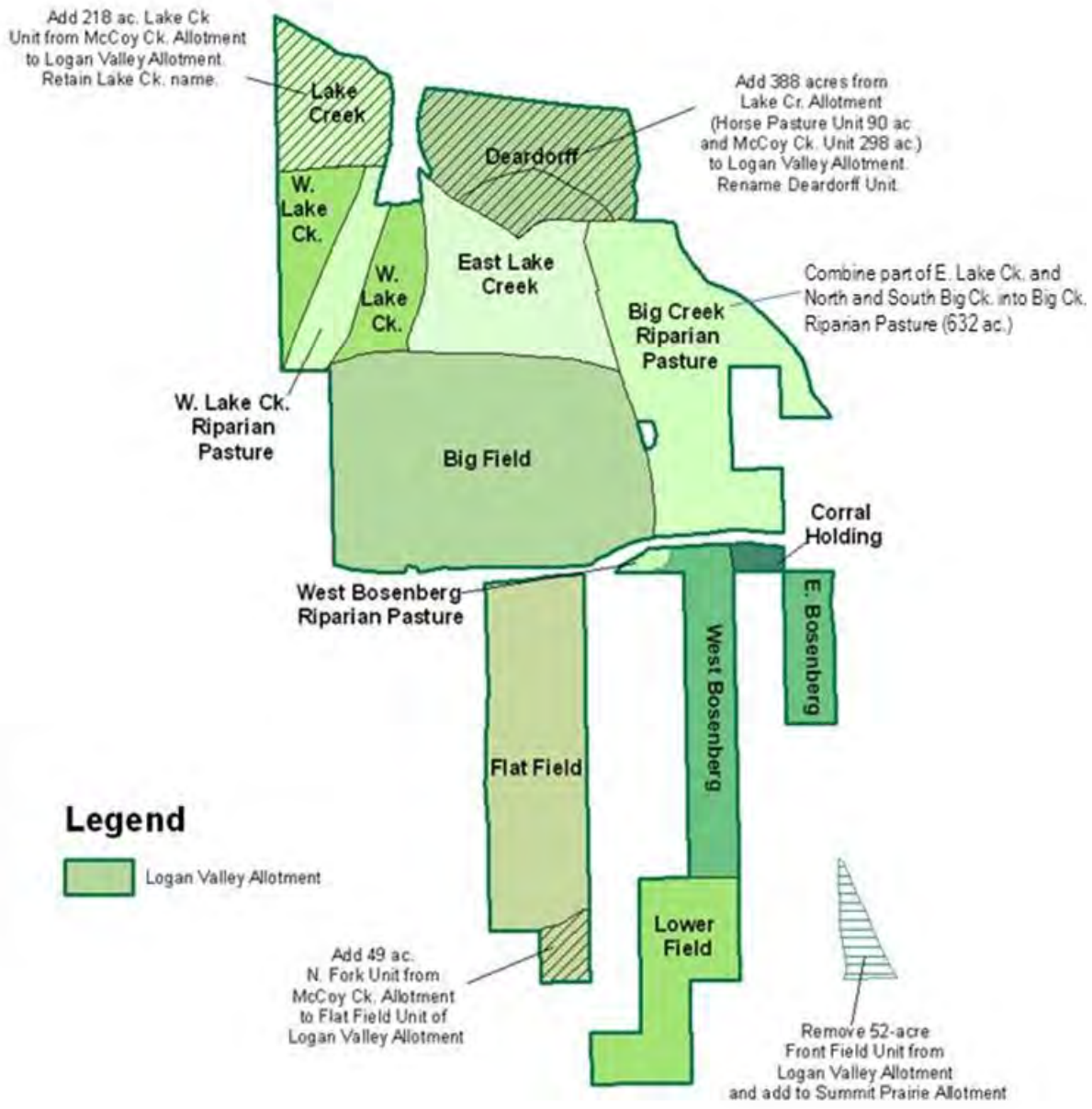

Figure 27. Alternative 4 Logan Valley Allotment changes

The Big Creek portion of the East Lake Creek, North Big Creek, and South Big Creek would be combined into a single large unit known as Big Creek Riparian pasture.

The Front Field unit (approximately 52 acres) would be removed from the Logan Valley allotment and absorbed into the Summit Prairie allotment.

Livestock Numbers and Grazing Season

The permitted livestock number and grazing seasons would remain as currently permitted, distributed over the larger landscape provided by adding areas from the Lake Creek and McCoy allotments to the Logan Valley allotment.

Up to 357 head of cattle would be authorized for a season generally between June 10th and October 15th. Authorized use would not exceed 1,983 AUMs. Forage allowable use, move triggers and endpoint indicators are listed in appendix E.

The Big Creek Portion of the East Lake Creek, North Big Creek and South Big Creek units that would be combined into a single riparian pasture that would require livestock removal by August 15th to protect bull trout spawning habitat in Big Creek.

Table 44. Alternative 4, Logan Valley allotment summary

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
Logan Valley	4,359	357[a]	1,983	06/10-10/15	Periods of deferment and non-scheduled rest

Cow/calf pairs or individual steers or heifers not to exceed AUMs

Improvements and Structures

The North Fork unit of the McCoy Creek allotment would be absorbed into the Flat Field unit requiring removal of approximately 0.3 miles of fence.

Absorbing a portion of the McCoy Creek unit along with the Horse Pasture from the Lake Creek allotment into the Logan Valley allotment would require 2.5 miles of additional fence and 0.8 miles of fence removal. The new unit would be identified as the Deardorff unit.

Combining the Big Creek Portion of the East Lake Creek, North Big Creek and South Big Creek units would require removal of 1.2 miles of fence.

Approximately 0.3 miles of electric fence in the North Fork unit would be converted from a permanent to a let-down fence to exclude livestock from a small section of Big Creek.

Adaptive Management

Table 45. Alternative 4, Logan Valley allotment adaptive management strategies

Stream/Unit	Adaptive Management Strategy
Lake Creek/West Lake Creek Riparian pasture	Additional rest within riparian pasture
Big Creek/West Bosenberg Riparian pasture	Additional rest within riparian pasture
Big Creek/Big Creek Riparian pasture	Scheduled rest or additional rest
Big Field (Fen area)	Install fence around Fen area

McCoy Creek Allotment

The grazing system, boundary changes, livestock numbers and grazing season, improvement and structures, and adaptive management strategies are the same as in alternatives 2 and 3.

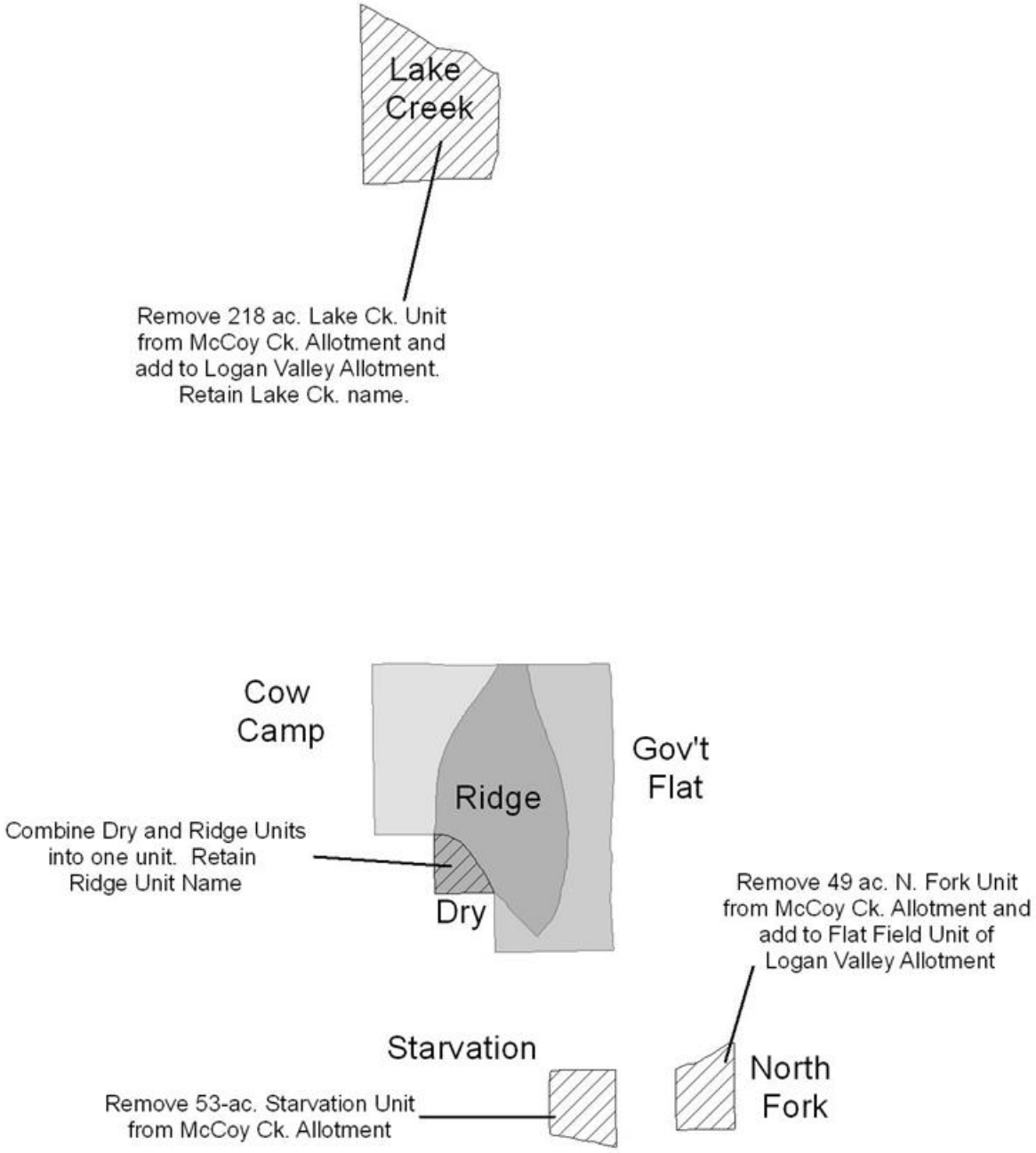

Figure 28. Alternative 4 McCoy Creek Allotment boundary changes

Summit Prairie Allotment

Grazing System

The grazing system would change to a deferred system with opportunities to defer the season of use. Riparian exclosures (with no grazing), willow cages and a riparian pasture would be constructed along portions of Summit Creek and West Fork Summit Creek. The riparian pasture would be rested as proposed in Table 47 below.

Daily riding by the permittee would ensure livestock stay in the uplands, reducing grazing use along Summit Creek in the Sagehen and Little Logan units during the season of use.

Table 46 shows the grazing units and associated acres.

Table 46. Alternative 4, proposed Summit Prairie allotment grazing units

Unit	Acres
Crane Rock Unit	7,838
Little Logan Unit	3,270
North Summit unit	143
Prairie Riparian pasture	126
Sagehen unit	3,767
South Summit unit	45
Summit Rock unit	10,148
West Summit unit (holding unit/handing facility)	27
West Summit Recovery unit (temporary)	19
Total	25,383

Table 47shows the rest and season of use requirements for the grazing units in the Summit Prairie allotment.

Table 47. Alternative 4, Summit Prairie allotment minimum rest requirements

Unit	Required Rest
Prairie Riparian pasture	A deferred rest grazing system would be applied. The riparian pasture would be grazed early season one year and late season the following year.
West Summit Recovery Unit (temporary fence)	Rest would occur for 3-5 years after the fence is constructed (estimated 2013). Grazing would resume after management objectives have been achieved. When grazing is resumed, the area within the recovery unit would be grazed as part of the Prairie Riparian pasture utilizing the same use levels and use triggers (see appendix E).

Boundary Changes

The Front Field unit (approximately 52 acres) from the Logan Valley allotment would be absorbed into the Little Logan unit.

The total acres in the allotment would increase from 25,331 to approximately 25,383 acres. A riparian pasture named Prairie Riparian pasture would be constructed from a portion of the Summit Rock and North Summit units containing portions of Summit Creek and West Fork Summit Creek.

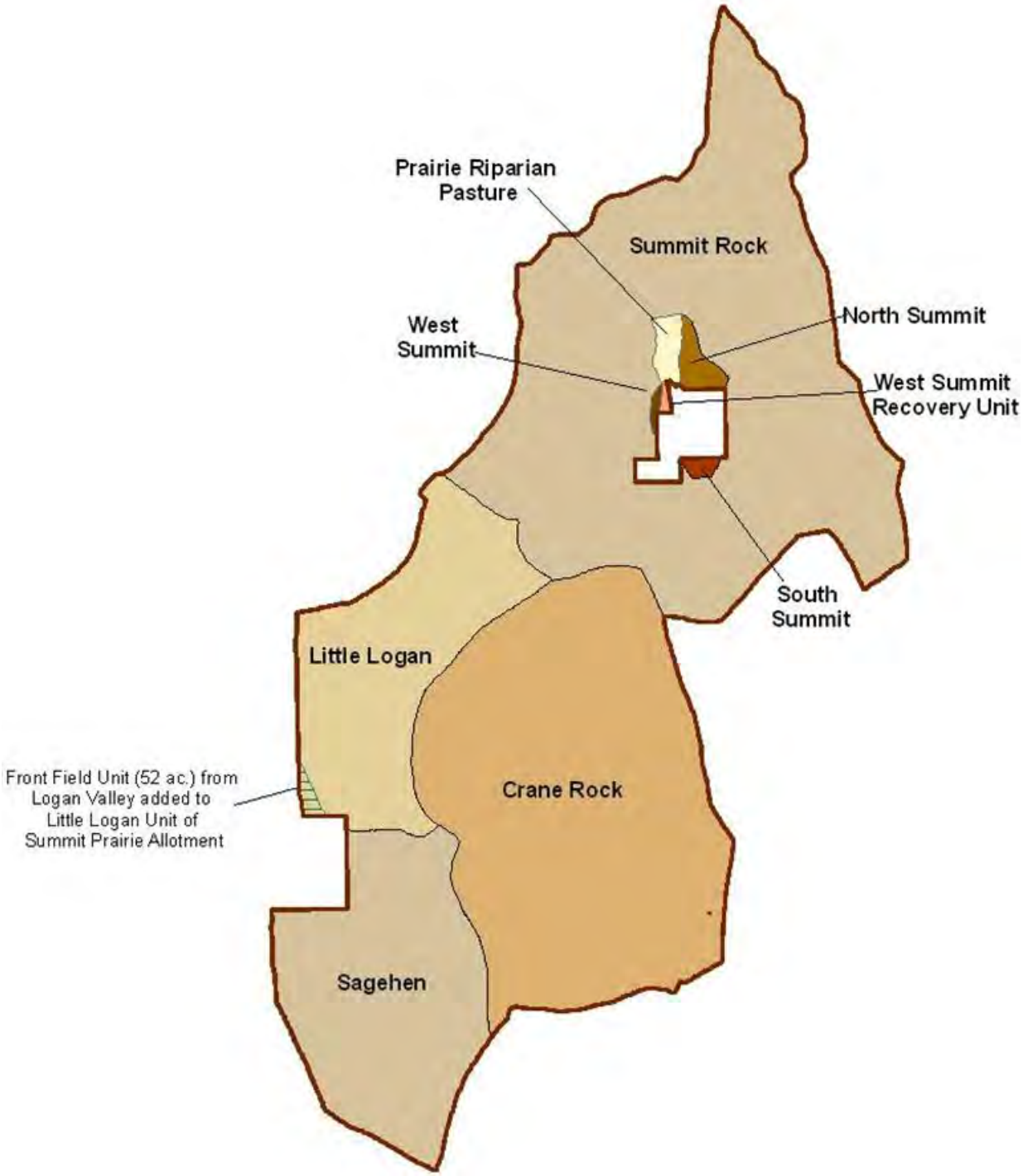

Figure 29. Alternative 4 Summit Prairie Allotment boundary changes

Livestock numbers and Grazing Season

The permitted livestock number and grazing seasons would remain as currently permitted.

Up to 260 head of cattle would be authorized for a season generally between June 10th and October 24th. Authorized use would not exceed 1,546 AUMs. Forage allowable use, move triggers, and endpoint indicators are listed in appendix E.

Table 48. Alternative 4, Summit Prairie allotment summary

Allotment Name	Acres	Number of Livestock	AUMs	Season of Use	Grazing System
Summit Prairie	25,383	260[a]	1,546	06/10-10/24	Deferred Rotation

Cow/calf pairs or individual steers or heifers not to exceed AUMs

Improvements and Structures

Approximately 0.7 miles of fence would be removed to absorb the Front Field unit (52 acres) from the Logan Valley allotment to the Little Logan unit.

Small exclosures (combination of buck and pole, and wire) and cages would be constructed along approximately 10 percent of the total riparian length along Summit Creek within the Little Logan and Sagehen units. Exclosures and cages would be located in areas with the highest potential for willow development (as identified by the Carex Working Group).

The Prairie Riparian pasture would absorb part of the North Summit and Summit Rock units. Approximately 3.1 miles of fence would be constructed to create a riparian pasture.

To alleviate current safety concerns on National Forest System road 1647, a loading ramp with attached catch pen would be constructed in the uplands of the Sagehen unit near the private property boundary (T. 16 S. , R. 34 E., NE corner of Section 1). The loading ramp would be constructed with railroad timbers. The attached catch pen would be approximately 300 feet by 500 feet in size and constructed out of wood or wire material.

Adaptive Management

Adaptive management strategies shown in appendix A (Table 104) are summarized in Table 49 below.

Table 49. Alternative 4, Summit Prairie allotment adaptive management strategies

Stream/Unit	Adaptive Management Strategy
Summit Creek/ Prairie Riparian pasture	Rest riparian pasture
Summit Creek/Sagehen unit	Change allowable use levels (see appendix E)
Summit Creek/Little Logan unit	Change allowable use levels (see appendix E)
West Fork Summit Creek/West Summit Recovery unit	Additional rest within the recovery unit
Summit Creek/Little Logan unit	Construct exclosure around a higher percentage of the area
Summit Creek/Sagehen unit	Construct exclosure around a higher percentage of the area

Consistency with Forest Plan Standards and Guidelines, as Amended

Alternatives 2, 3, and 4 propose amendments to the Malheur Forest Plan as amended by amendment 29. Specifically, the numeric value for shade in hardwood/meadow complexes from Forest Plan amendment 29 would be modified for site specific stream reaches. The numeric values in amendment 29 were based upon the best information available at the time the Decision Notice (DN) was signed by the Malheur National Forest Supervisor in August of 1994. The DN stated that "if new information becomes available in the future which indicates changes in the numeric values to achieve the stated desired condition, these values may be inserted as a clarification/correction to the individual standard". New available information and data collected for the Summit Logan project would be used to amend the numberic values for hardwood meadow complexes on several stream reaches on Summit Creek, West Fork Summit Creek, Lake Creek, Big Creek, and Bosenberg CreekThe proposed amended percent shade values developed for hardwood/meadow complexes within the Summit Logan allotments are based on work by the Carex Working Group (2012) and the Malheur River Basin Total Maximum Daily Load (TMDL) and Water Quality Management Plan completed by State of Oregon Department of Environmental Quality (2010). Work carried out by the Carex Working Group involved estimating the expected (and perhaps maximum) level of streamside shade (height and density) that could be attained from willows, sedges, and other hardwoods under near-natural rates of recovery at two time scales: (a) five years, and (b) twenty years from all stream reaches on Summit Creek. To determine the historic range of variability of the various reaches of Summit Creek the Carex Working Group considered the habitat characteristics of each reach, the habitats occupied by mature willow thickets, alder thickets, and sedge meadows on the reference sites, and similar plant communities we have observed elsewhere in Grant and Harney Counties (Carex Working Group 2010, 2011a, and 2011b).

The stream reaches where modifications are proposed to Amendment 29 Numeric Values are shown in Table 50. Potential values for shade in the TMDL plan were derived using Ecoregion Based Effective Shade Curves if reference data was not available. These effective shade curves are general heat load allocations that are identified by region and channel width for various riparian plant communities. The given values represent the maximum possible effective shade if the potential height and density are present. The curves account for latitude, critical summertime period and stream aspect. The Carex Working Group only collected reference data for alder and/or willow riparian plant communities. As a result, the Native Floodplain Grasses effective shade curve was used from the TMDL plan (Oregon Department of Environmental Quality 2010).

Table 50. Proposed modifications to the Malheur Forest Plan

Reach	Amendment 29 Numeric Value to be Modified			Proposed Modification
	Amendment 29 Element	Location	Specific Value	
Summit Creek				
Reach 1	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade 65% or greater[a]
Reach 2	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade ≥60% in areas with hardwoods[b] or ≥25% in areas with native floodplain grasses[a]
Reach 4	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade ≥60% in areas with hardwoods[b] or ≥25% in areas with native floodplain grasses[a]
Reach 5	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Increase hardwood shade component; shade ≥ 60%[b]
Reach 6	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	≥ 25% for native floodplain grasses[a]
Reach 7	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Increase hardwood shade component; shade ≥ 80% for alder-dominated areas (Amendment 29)[c], ≥ 60% for mixed shrub areas[b], or ≥ 25% in areas with native floodplain grasses[a].
West Fork Summit Creek				
Reach 1	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	≥ 25% for native floodplain grasses[a]
Reach 2	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Increase hardwood shade component; shade ≥ 80% for alder-dominated areas (Amendment 29)[c], ≥ 60% for mixed shrub areas[b], or ≥ 25% for native floodplain grasses[a].

Reach	Amendment 29 Numeric Value to be Modified			Proposed Modification
	Amendment 29 Element	Location	Specific Value	
Lake Creek				
Reach 1	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Increase hardwood shade component; shade ≥ 60% in hardwood areas[b] or ≥ 25% in areas with native floodplain grasses[a].
Reach 2	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Increased hardwood shade component: shade ≥ 60%[b] or ≥ 25% for native floodplain grasses[a].
Reach 3	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade 60-80% in mixed shrub and conifer[b] or ≥ 25% for native floodplain grasses[a].
(no PFC assessment)	D. Riparian Vegetation: 4) Shade/Canopy Closure	d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade 60-80% in mixed shrub[b] or ≥ 25% for native floodplain grasses[a]
Big Creek				
no proper functioning condition assessment, south side of FS rd 16 for 0.15 miles	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade 60-80% in mixed shrub[b] or ≥ 25% for native floodplain grasses[a]
Reach 1	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade 60-80% in mixed shrub and conifer[b] or ≥ 25% for native floodplain grasses
Reach 2	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade 60-80% in mixed shrub and conifer[b] or ≥ 25% for native floodplain grasses[a].
Reach 3	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species d) Hardwood/ Meadow Complex	Hardwood/Meadow Complex 80% shaded	Shade 60-80% in mixed shrub and conifer[b] .
Bosenberg Creek				
Bosenberg Creek	D. Riparian Vegetation: 4) Shade/Canopy Closure	b) Mixed Conifer species	Hardwood/Meadow Complex 80% shaded	Shade 60-80% in mixed shrub[b] or ≥ 25% for native floodplain grasses[a]

a – Oregon Department if Environmental Quality 2010
b – Carex Working Group 2012
c – USDA Forest Service 1994

Summary of Alternatives

Table 51. Summary of alternatives 2, 3, and 4

	Alternative 2	Alternative 3	Alternative 4
Lake Creek Allotment			
Grazing System	5,069 acres would remain vacant.	10,196 acre allotment would remain vacant.	9,459 acres would remain vacant.
Boundary Changes	4,778 acres would be would be absorbed into the adjacent Logan Valley and Summit Prairie allotments. The southwest corner of McCoy Creek (349 acres) would be removed from the Lake Creek allotment.	No change in allotment boundary. Boundary would remain as approximately 10,196 acres.	Approximately 388 acres of the allotment would be absorbed into the Logan Valley allotment. The southwest corner of McCoy Creek (349 acres) would be removed from the Lake Creek allotment.
Unit and Acres (all units would remain vacant)	McCoy Creek unit: 2,639 acres Corral Basin unit: 2,430 acres	Bosenberg unit: 6,970 acres Horse Pasture unit: 90 acres McCoy Creek unit: 3,136 acres	McCoy Creek unit: 2,581 acres Bosenberg unit: 6,878 acres
Livestock numbers and Grazing	0 Head of Cattle 0 AUMs No Season of Use	See alternative 2 for details.	See alternative 2 for details.
Improvements and Structures	2.5 miles of fence construction to remove the southwest corner of the McCoy Creek unit from this allotment.	No improvements or structures are proposed.	See alternative 2 for details.
Logan Valley Allotment			
Grazing System	This allotment would be managed with periods of rest of deferment during the season of use. Rest or deferment would be determined based on resource needs.	The grazing system would change to a deferred system with opportunities to defer the season of use.	See alternative 2 for detail.

	Alternative 2	Alternative 3	Alternative 4
Boundary Changes	The Big Creek Portion of the East Lake Creek, North Big Creek and South Big Creek would be combined into a single large unit (Big Creek Riparian pasture). The Front Field unit (approximately 52 acres) would be removed from this allotment. Approximately 655 acres from the Lake Creek and McCoy allotments would be added to the Logan Valley allotment: Horse Pasture and a portion of McCoy Creek unit of the Lake Creek allotment (388 acres). New unit identified as Deardorff unit. Lake Creek and North Fork units of the McCoy Creek allotment would be absorbed into Logan Valley allotment (267 acres). The Lake Creek unit would remain as an individual unit while the North Fork unit would be absorbed in to the Flat Field unit. The allotment size would be approximately 4,359 acres.	Alternative 3 would include the same boundary changes as described in alternative 2, expect alternative 2 would not create the Deardorff unit (excluding 388 acres from this alternative). The allotment size would be approximately 3,971 acres.	See alternative 2 for details.
Unit and Acres	Big Creek Riparian pasture: 623 acres Big Field unit: 1,024 acres Corral Holding unit : 22 acres Deardorff unit: 388 acres East Bosenberg unit: 118 acres East Lake Creek unit: 399 acres Flat Field unit: 595 acres Lake Creek unit: 218 acres Lower Field unit: 283 acres West Bosenberg unit: 269 acres West Bosenberg Riparian Pasture: 14 acres West Lake Creek unit: 271 acres West Lake Creek Riparian Pasture: 135 acres	Acres for this alternative are the same as alternative 2, excluding the Deardorff unit and acres.	See alternative 2 for details.
Livestock numbers and Grazing	357 Head of Cattle 1,983 AUMs June 10th to October 15th	See alternative 2 for details.	See alternative 2 for details.

	Alternative 2	Alternative 3	Alternative 4
Improvements and Structures	Absorbing the North Fork unit of the McCoy Creek allotment into the Flat Field would require removal of 0.3 miles of fence. Approximately 0.3 miles of electric fence in the North Fork unit along Big Creek converted to a permanent let-down fence. Absorbing a portion of the McCoy Creek unit along with the Horse Pasture from the Lake Creek allotment creating the Deardorff unit (2.5 miles of additional fence and 0.8 miles of fence removal). Combining the Big Creek Portion of the East Lake Creek, North Big Creek and South Big Creek units would require removal of 1.2 miles of fence.	Alternative 3 would include all of the improvements and structures as described in alternative 2 except the creation of the Deardorff unit.	See alternative 2 for details.
McCoy Creek Allotment			
Grazing System	A deferred rotation grazing system would be applied throughout the allotment.	See alternative 2 for details.	See alternative 2 for details.
Boundary Changes	The present allotment consisting of 980 aces would decrease to 660 acres. The Dry and Ridge units would be combined into a single unit (called Ridge unit) as currently managed. The Lake Creek and North Fork units (267 acres) would be absorbed into the Logan Valley allotment. The Starvation unit (53 acres) would be removed from the Lake Creek allotment.	See alternative 2 for details.	See alternative 2 for details.
Unit and Acres	Cow Camp unit: 157 acres (23 acres excluded in riparian protection exclosure) Ridge unit: 292 acres Government Flat unit: 211 acres	See alternative 2 for details.	See alternative 2 for details.
Livestock numbers and Grazing	63 head of Cattle 416 AUMs June 1st to October 30th	See alternative 2 for details.	See alternative 2 for details.
Improvements and Structures	Combining the Dry and Ridge units would require 1 mile of fence removal.	See alternative 2 for details.	See alternative 2 for details.

	Alternative 2	Alternative 3	Alternative 4
Summit Prairie Allotment			
Grazing System	This allotment would be managed with periods of rest or deferment during the season of use. Rest or deferment would be determined based on resource needs.	The grazing system would change to a deferred system with opportunities to defer the season of use.	The grazing system would mirror alternative 3. Additionally, daily riding by the permittee to ensure livestock stay in the uplands in the Sagehen and Little Logan units.
Boundary Changes	The total allotment acres would be increased to approximately 29,832 acres: The Front Field unit (52 acres) from the Logan Valley allotment would be absorbed into the Little Logan unit. The Bosenberg unit (4,449 acres) from the vacant Lake Creek allotment would be added as a separate grazing unit.	The total allotment acres would be increased to approximately 25,383 acres: The Front Field unit (52 acres) from the Logan Valley allotment would be absorbed into the Little Logan unit.	See alternative 3 for details.
Unit and Acres	Bosenberg unit: 4,449 acres Crane Rock unit: 7,838 acres Little Logan unit: 3,270 acres North Summit unit: 195 acres Sagehen unit: 3,767 acres South Summit unit: 45 acres Summit Rock unit: 10,222 acres West Summit unit: 27 acres (holding unit/handling facility) West Summit Recovery unit: 19 acres	Crane Rock unit: 7,838 acres Little Logan unit: 3,191 acres Lower Little Logan Riparian pasture: 64 acres Upper Little Logan Riparian pasture: 15 acres North Summit unit: 108 acres North Summit Riparian pasture: 87 acres Sagehen unit: 3,730 acres Sagehen Riparian exclosure: 8 acres Sagehen Riparian pasture: 29 acres South Summit unit: 45 acres Summit Rock unit: 10,222 acres West Summit unit: 27 acres (holding/handling facility) West Summit Recovery unit: 19 acres	Crane Rock unit: 7,838 acres Little Logan unit: 3,270 acres North Summit unit: 143 acres Prairie Riparian pasture: 126 acres Sagehen unit: 3,767 acres South Summit unit: 45 acres Summit Rock unit: 10,148 acres West Summit unit: 27 acres (holding/handling facility) West Summit Recovery unit: 19 acres
Livestock numbers and Grazing	260 head of Cattle 1,546 AUMs June 10th to October 24th	See alternative 2 for details.	See alternative 2 for details.

	Alternative 2	Alternative 3	Alternative 4
Improvements and Structures	Remove approximately 0.7 miles of fence to absorb the Front Field from the Logan Valley allotment to the Little Logan unit. Adding the Bosenberg unit would require construction of 7 miles of fence. Three upland ponds would be developed. A spring would be developed off a headwater spring for Bosenberg Creek. A loading ramp with attached catch pen would be constructed in the Sagehen unit near the private property boundary.	Remove approximately 0.7 miles of fence to absorb the Front Field from the Logan Valley allotment to the Little Logan unit. Approximately 7.3 miles of fence constructed to create Lower Little Logan and Upper Little Logan Riparian pastures in Little Logan unit. Approximately 4.1 miles of fence construction to create the Sagehen Riparian exclosure and the Sagehen Riparian pasture in Sagehen unit. Approximately 0.8 miles of fence construction in North Summit unit to create North Summit Riparian pasture. A loading ramp with attached catch pen would be constructed in the Sagehen unit near the private property boundary.	Remove approximately 0.7 miles of fence to absorb the Front Field from the Logan Valley allotment to the Little Logan unit. Small exclosures (combination of buck and pole, and wire) and cages would be constructed along approximately 10% of the total riparian length along Summit Creek within the Little Logan and Sagehen units. Exclosures and cages would be located in areas with the highest potential for willow development. Approximately 3.1 miles of fence would be constructed to create the Prairie Riparian pasture along Summit and West Fork Summit Creeks. The new pasture would absorb 86 acres from the North Summit unit and 311 acres from the Summit Rock unit. A loading ramp with attached catch pen would be constructed in the Sagehen unit near the private property boundary.

Design Criteria and Resource Protection Measures

The Forest Service developed the following additional design criteria to be used as part of the alternatives.

Design Criteria for Alternatives 2, 3 and 4

Throughout the project, all applicable watershed management and vegetative management best management practices (BMPs) (General Water Quality Best Management Practices, Pacific Northwest Region, USDA Forest Service 2011) would be used to enable the achievement of water quality standards.

Table 52. Design criteria (alternatives 2, 3, and 4)

Objective	Design Criteria	Alternative	Responsible Person
To avoid damaging regeneration	Place salt blocks outside of conifer where the trees are less than 6' high. Salt blocks would not be placed in aspen stands or aspen plantations.	2,3,4	Range Specialist, Silviculturist
To avoid over utilization of hardwoods	Reference to Use Level Table (Table 108 appendix E)	2,3,4	Range Specialist
Protect Water Quality	Livestock would be herded when moving to a new unit on or off the Forest. Drift movement (e.g., simply opening a gate and allowing stock to move of their own accord) is not permitted.	2,3,4	Range Specialist, Hydrologist, Fish Biologist
	Throughout the project, all applicable Watershed Management and Vegetative Management Best Management Practices (Nonpoint Source Pollution Control for Water Quality Management on National Forest System Lands, USDA Forest Service 2011) would be used to facilitate the achievement of water quality standards, including: • RM-1: Rangeland Management Planning • RM-2: Rangeland Permit Administration • RM-3: Rangeland Improvements	2,3,4	
Spring Developments	Avoid impacting vegetation and creating wheel tracks in wet meadows or riparian areas. Preferable to implement project when sites and access are dry. Alternately, designate access routes to cross areas of higher and drier ground. Rehabilitate any impact to vegetation after project implementation to remove visible wheel tracks (to avoid encouraging additional use by the general public).	2	Range Specialist, Wildlife Biologist
	Water source must be fenced if wet or boggy	2	Range Specialist, Hydrologist, Fish Biologist
	Do not place water troughs in draw bottoms or ephemeral channels.	2	
	Bosenberg unit (spring developments): developed spring source would be fenced and water piped to troughs located a minimum of 300 feet from the spring. Bosenberg unit (Bosenberg Ck.): The trough from the developed water source that withdraws water from the stream channel would be located a minimum of 100 feet away from the channel.	2	
	Water not utilized shall be returned to the existing draw or channel with the appropriate slope in order to prevent cutting of the channel banks.	2	
	Trench excavation for pipe shall be buried in a manner that does not impede overland flow of water nor concentrate/capture overland flow on hill slopes. Trench excavation area would be re-vegetated using natural grass seed.	2	
	For channel protection trees > 21 inches in diameter would not be cut.	2	
	Where available in forested areas, retain effective shade of water developments and associated channels at >50%.	2	
	Use suitable measures to protect the spring when preparing the site for construction or maintenance activities. • Locate access and staging areas near the project site but outside of work area boundaries, streamside management zones, wetlands and sensitive soil areas. • Refuel and service equipment only in designated staging areas • Consider using small, low ground pressure equipment and/or hand labor where practicable. • Ensure all equipment operated in or adjacent to the waterbody is clean of aquatic invasive species as well as oil and grease.	2	

Objective	Design Criteria	Alternative	Responsible Person
Spring Developments (cont'd)	Use suitable measures to protect the waterbody when clearing the site. • Clearly delineate the geographic limits of the area to be cleared. • Use suitable drainage measures to improve the workability of wet sites. • Avoid or minimize unacceptable damage to existing vegetation, especially plants that are stabilizing the spring.	2	Range Specialist, Hydrologist, Fish Biologist
	Use suitable measures to avoid or minimize impacts to the waterbody when implementing construction and maintenance activities. • Minimize heavy equipment entry into/or crossing water as is practicable. • Conduct operations during dry periods. • Promptly rehabilitate or stabilize disturbed areas as needed following construction or maintenance activities. • Stockpile topsoil for reuse in site re-vegetation. • Properly compact fills to avoid or minimize erosion. • Contour site to disperse runoff, minimize erosion, stabilize slopes and provide a favorable environment for plant growth. • Use suitable species and establishment techniques to re-vegetate the site in compliance with local direction and requirements per FSM 2070 and FSM 2080 for vegetation ecology and prevention and control of invasive species.	2	
	Excavate head boxes by shovel and hand tools or small low ground pressure excavator.	2	
	All troughs will have float to conserve water and will be turned off when the pasture not in use.	2	
Protect Wildlife	To avoid disturbance or potential trampling of nesting upland sandpipers, delay grazing Big Field pasture (upland sandpiper nesting area) until late season (August 1). To negotiate early season grazing of this pasture, monitoring would be required for upland sandpiper presence in May and June. If upland sandpipers are documented in any given year, turn-out in affected pastures would be postponed to avoid impacts to nesting sandpipers during critical breeding and nesting periods. Avoid grazing Big Field and Flat Field at the same time; upland sandpipers may use areas north and south of the FS 16 road.	2,3,4	Range Specialist, Wildlife Biologist
	Retain wildlife snags (dead trees) at levels to provide for 100% population levels of primary cavity excavators. Avoid as much as possible layout of new fencelines through snag patches or near large snags (12 inch dbh or greater).	2,3,4	
	If active nests (raptors, sensitive species, sandhill cranes) are discovered during project implementation (fence construction, construction of water developments, etc.), the District wildlife biologist would be consulted to determine appropriate buffers or timing restrictions, if necessary, to minimize disturbance for nesting birds.	2,3,4	
	Greater Sage-Grouse- If an existing or newly established lek or greater sage-grouse nest(s) are discovered during monitoring, the District wildlife biologist and range managers would evaluate and negotiate the timing and location of cattle turnout to avoid concentrations of cattle in the vicinity of the lek or nest.		
	Chainsaw or large equipment use (for fence construction, spring/pond development, etc.) within ½ mile of occupied goshawk nest sites within or adjacent to the project area are prohibited between April 1-September 30. Management activities are prohibited at all times within occupied nest stands. Exceptions to this element would require clearance from District Wildlife Biologist and Ranger.	2,3,4	
	Chainsaw or large equipment use (for fence construction, spring/pond development, etc.) within 666 feet of occupied raptor nest sites (including osprey and eagles) within or adjacent to the project area are prohibited between April 1-September 30. Management activities are prohibited within 100 feet of occupied nest tree. Exceptions to this element would require clearance from District Wildlife Biologist and Ranger.	2,3,4	
	In known calving/fawning areas, off-road vehicle use is restricted from May 1 through June 31 (Forest Plan 36, IV-29). Most of these animals readily move and avoid areas of human activity. However, if newborn fawns (antelope, mule deer) or elk calves are observed, the area should be avoided, allowing the mothers to move the young away from the project.	2,3,4	

Objective	Design Criteria	Alternative	Responsible Person
Protect Wildlife (cont'd)	Four-wire fence construction would consist of smooth wire on the lower wire, to facilitate fawn movement. Lower wire height would be a minimum of 16 inches above the ground. Maximum height of the topmost wire would be 42 inches. Spacing between top wire and next wire down would be a minimum of 10 inches to avoid catching back legs (between the two wires) of animals jumping the fence (Oregon Department of Environmental Quality 2011).See handbook "A Landowner's Guide to Wildlife Friendly Fences" (Paige 2008) for additional recommendations for increasing fence visibility to reduce impacts to big game as well as raptors, bats, and neotropical songbirds.	2,3,4	Range Specialist, Wildlife Biologist
	Minimize impacts to riparian vegetation by placing fences on higher ground outside of the active floodplain, except where crossing are necessary for designed water gaps.	2,3,4	
	To protect amphibians: Avoid early season pond clean-out or resealing, to reduce impact to egg masses or tadpoles.	2,3,4	
	Wildlife escape ramps: Expanded metal ramps would be installed to provide a means of escape for birds and small mammals that may fall into the trough when seeking water. (See "Water for Wildlife" handbook for (Taylor 2007) examples of effective placement and design of escape ramps.)	2,3,4	
Protect NRHP[a] eligible and potentially eligible sites from significant grazing related impacts	If site inspection indicates a need for mitigation measures at any archaeological or historic sites these would be developed in consultation with the Oregon State Historic Preservation Office (SHPO) and would be tailored to the specific conditions at each site.	2,3,4	Archaeologist, Range Specialist
	Cultural sites identified in the project report that were not monitored during this project would be placed on a monitoring schedule to be visited in the future.	2,3,4	
	If cultural resources are located during implementation of the alternatives, work would be halted and the District Archaeologist would be notified. The cultural resource would be evaluated and a mitigation plan would be developed in consultation with Oregon SHIP, if necessary.	2,3,4	
	Salt blocks would not be located on archeological and historic sites. Site specific salting areas would be established for each grazing unit.	2,3,4	
	For proposed range improvement projects, clearances under Section 106 of the National Historic Preservation Act would be completed and concurred with as needed by the Oregon State Historic Preservation Office before the projects are implemented.	2,3,4	
To maintain visual quality along the visual corridor	Move prolonged congregation of livestock at the junction of National Forest System roads 1600-815 and 1600 (visual corridor).	2,3,4	Range Specialist, Recreation Specialist
	Watering troughs would be built with natural colored materials to blend with the surrounding landscape if visible from National Forest System road 1600 (visual corridor).	2,3,4	
	Structures such as fences would be constructed with materials that would blend with the existing landscape where they can be seen from Forest Road 1600 (visual corridor).	2,3,4	
To reduce the risk of introducing noxious weeds	Any gravel, fill, sand and rock used in the construction, reconstruction or maintenance of water developments would be judged to be weed free by district weed specialists.	2,3,4	Range Specialist
	Native plant materials are to be used for re-vegetation unless accepted extenuating circumstances are identified.	2,3,4	
	Permittees would identify infestations of noxious weeds and report these annually to the Forest Service. New populations of weeds would be scheduled for treatment (introduction, spread and establishment of noxious weeds).	2,3,4	
	All equipment used (including ORVs) would be cleaned in a manner sufficient to prevent noxious weeds from being carried onto the project area. This requirement does not apply to passenger vehicles or other equipment used exclusively on roads. Cleaning would occur off of National Forest System lands. Cleaning would be inspected and approved by the Forest Officer in charge of administering the project.	2,3,4	

Objective	Design Criteria	Alternative	Responsible Person
Defer season of use to maintain vegetation health	Rotation of livestock from unit to unit may change from one year to the next and would be reflected in the annual operating instructions. This would be worked out jointly between the Forest Service and grazing permittee with end of the season allowable use levels.	2,3,4	Range Specialist
Aquatic Restoration Biological Opinion (Endangered Species Act) compliance and minimize effects to Bull Trout Critical Habitat	Fence placement should allow for lateral movement of stream.	2,3,4	Range Specialist, Hydrologist, Fish Biologist
	Minimize vegetation removal, especially potential large wood recruitment source, when constructing fence lines.	2,3,4	
	When constructing livestock crossings and water gaps, use the following design criteria: • Locate crossings or water gaps where streambanks are naturally low. • When possible, crossings and gaps should not be constructed within known or suspected spawning areas (e.g. pool tailouts where spawning may occur). • Fences at stream crossings and water gaps should not inhibit upstream or downstream movement of fish or significantly impede bedload movement. Where appropriate, construct fences at water gaps as to allow passage of large wood and other debris. • If necessary, the streambank and approach lanes can be stabilized with native vegetation and angular rock to reduce chronic sedimentation. The stream crossing or water gap should be armored with cobble-size rock, and use angular rock if natural substrate is not of adequate size. • Livestock crossings or water gaps must not be located in areas where compaction or other damage can occur to sensitive soils and vegetation (e.g., wetlands) due to congregating livestock. • The maximum width of a water gap or stream crossings should be no less than 10 feet and no more than 20 feet in the upstream-downstream direction. • When using pressure treated lumber for fence posts only, complete all cutting/drilling offsite so that treated wood chips and debris do not enter water or flood prone areas.	2,3,4	
	If other aquatic restoration activities are used as complementary actions, follow the associated design criteria and conservation measures.	2,3,4	

a - National Register of Historic Places

Monitoring

The following monitoring is applicable to alternatives 2, 3 and 4.

Monitoring is a key component of successful management and compliance with pertinent laws and policy. Decisions regarding identifying any need to change management, and the direction that the change should take are based upon evaluation of the results of monitoring. Monitoring should be targeted at those indicators that are both annually influenced by livestock grazing (implementation monitoring) and those that indicate the long term condition (effectiveness monitoring) from annual effects. The management objectives (appendix A, Table 103) were developed with the most pressing issues identified for each site specific reach during data collection and analysis. This was primarily developed from analyzing the departure of the existing to desired conditions in appendix A, Table 102 and reviewing the proper functioning condition assessments. Annual implementation monitoring, including allowable use are used to make short-term adaptive decisions regarding removal of livestock and adjustments in timing, intensity, duration, and frequency of grazing. The long term effectiveness monitoring is used to determine if satisfactory progress is being made toward meeting the management objectives and thus the desired conditions (appendix A, Table 102). If not, this would inform the decision maker to determine what additional changes to management would be needed from the suite of adaptive management options.

Annual Implementation and Compliance Monitoring for Range and Aquatics

Use Levels

Allowable use levels proposed for annual implementation monitoring of Riparian and Upland Vegetation are found in appendix E. Riparian implementation monitoring for bank alteration, stubble height and woody browse would be collected as outlined in Multiple Indicator Monitoring (MIM) of Stream Channels and Streamside Vegetation (USDI 2011). Implementation monitoring would be done at designated monitoring areas.

Compliance with Permit and Annual Operating Instructions

Follow FSH 2209.13 Grazing Permit Administration Handbook and Terms and Condition of the Term Grazing Permit parts 1, 2 and 3.

Future Consultation (BA for project)

Consultation for this project with the US Fish and Wildlife Service may identify additional monitoring needs that would supplement this plan.

Long Term Effectiveness for Range and Aquatics

Overview

The Forest Plan established utilization standards for grass and grass-like species and shrubs. In 1995, the Forest Plan was amended by PACFISH[3] and INFISH[4]. PACFISH INFISH amendments identified six riparian management objectives and four standards and guidelines for grazing management activities (USDA Forest Service 1995a, Attachment A Standards and Guidelines GM-1 to GM-4).

[3] PACFISH – Interim strategies for managing anadromous fish-producing watersheds in Eastern Oregon, Washington, Idaho and Portions of California.
[4] INFISH – Inland Native Fish Strategy to provide inteim direction to protect habitat and populations of resident native fish outside of anadromous fish habitat in Eastern Oregon, Eastern Washington, Idaho, western Montana and part of Nevada.

Among other things, PACFISH INFISH standards and guidelines call for modification of grazing practices that retard or prevent the attainment of riparian management objectives [5]. Enclosure B of the PACFISH Grazing Guidelines (USDA Forest Service 1995b) clarifies this direction by stating that its primary objective to not "retard" or "measurably slow" recovery of degraded riparian features is to avoid authorizing grazing practices that are likely to "carry over to the next year." Any effect of sufficient magnitude such that its influence is still present in some meaningful way at the beginning of the following grazing season has the potential to result in cumulative negative effects, and therefore measurably slow recovery of degraded riparian features to an unacceptable rate under the PACFISH INFISH standards and guidelines. Thus, a primary focus of the standards and guidelines is to avoid negative effects, the influence of which is likely to still be existent at the beginning of the next grazing season to a degree that would meaningfully impede recovery. Some environmental impacts are inherent with the presence of livestock. However, "near natural" rates of recovery can be provided if environmental impacts are limited to those that do not carry through to the next year, thereby avoiding cumulative, negative effects (USDA Forest Service 1995, PACFISH INFISH Enclosure B).

The PACFISH INFISH riparian management objectives that may be most directly affected by grazing activities are: 1) bank stability, 2) bank angle, 3) width to depth ratio, 4) and percent undercut banks. As reported in the Multiple Indicator Monitoring (MIM) 2011 Tech Reference (1737-23), unstable banks can lead to accelerated bank erosion and subsequent channel widening, increased sediment supply, decreased sediment transport capability, and damaged fisheries habitat (Burton et al. 2011). Of all the indicators of a correct channel type, the relation between its width and depth is perhaps the most revealing (Bengeyfield 2006). It is this relationship that determines whether or not the stream can perform the various tasks that lead to a healthy riparian area (Bengeyfield 2006).

Clearly understanding the direction of change would ensure compliance with Forest Plan amendment 29 and INFISH goals, objectives and standards, the Clean Water Act and the Endangered Species Act. INFISH provides overview related to long-term trends, INFISH, appendix A (Table 102 and Table 103). The effectiveness monitoring would show if plant communities and channel characteristics are moving towards desired conditions. Monitoring grazed and exclosed reaches in Summit Creek Reaches 2 and 5 would best illustrate the natural rate of recovery that should be expected in herbaceous and hardwood plant communities, bank stability and habitat complexity characteristics that are ideal for aquatic dependent species.

Monitoring protocols for each indicator may change into the future. Research is actively being done to reduce the variability of monitored data and trying to make it as accurate to the measured disturbance that is cost effective.

Management objectives that were developed identify which riparian monitoring protocol that would be used in appendix A (Table 103).

Riparian Monitoring

Monitoring Locations

Three types of designated monitoring areas that inform land managers include Representative, Reference and Critical. Representative designated monitoring areas are sites in a riparian complex that are

[5] More specifically, GM-1 states as follows: “Modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, and timing of grazing) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objects and avoiding adverse effects on listed anadromous fish.”

representative of the riparian resources found in a pasture. If more than one riparian complex is present in a pasture, the most sensitive complex is chosen for monitoring. Reference designated monitoring areas are sites in riparian complexes that are not grazed and representative of grazed riparian complexes in adjacent pastures. Critical designated monitoring areas are monitoring sites that warrant monitoring because of higher sensitivity within the riparian complex. Critical designated monitoring areas are not representative of the larger area. Monitoring would occur at all established representative designated monitoring areas other than Big Creek (see appendix B).

The representative designated monitoring area in the Big Creek Riparian Pasture would be moved to a more sensitive riparian complex than where it is currently located. This is due to the pasture increasing in size and adding different riparian complexes to the larger unit. A representative designated monitoring area would be established in the Bosenberg Unit on Bosenberg Creek in a riparian complex in 2013.

Reference designated monitoring areas would be established in the exclosure on Summit Creek Reach 2 in the Sagehen Unit and in the ¼ mile buck and pole fence that would be built in Summit Creek Reach 5 in the Little Logan Unit. These designated monitoring areas would serve to provide a baseline in ungrazed natural recovery rates of vegetative and channel attributes. This would validate if the management objectives are achievable.

One Critical designated monitoring area would be established in the Bosenberg Unit on Bosenberg Creek. The purpose of this designated monitoring area is to monitor grazing effects on the areas that were burnt in the 1990 High Roberts Wildfire. A 10 percent bank alteration endpoint indicator was established for this designated monitoring area to ensure bank stability and bankfull width/depth characteristics continue to maintain and improve.

Designated monitoring areas may not be monitored if livestock grazing is not authorized for any unit.

Monitoring Types

PACFISH/INFISH Biological Opinion (PIBO) monitoring sites exist within the project area. This information would provide effectiveness monitoring of riparian vegetation species, channel characteristics and macroinvertebrate assemblages every five years. PACFISH/INFISH Biological Opinion monitoring sites were read in 2001, 2006, 2011 and would be read again in 2016 and 2021. PACFISH/INFISH Biological Opinion monitoring tracks riparian vegetation species composition along the greenline[6] and perpendicularly across the stream channel. They monitor channel attributes of undercut bank, bank stability, bank angle, bankfull width/depth, pool quality and quantity that would inform us of the channel characteristics. PACFISH/INFISH Biological Opinion monitoring also tracks macroinvertebrate assemblages. PACFISH/INFISH Biological Opinion monitoring has a crew from Logan, Utah that monitors indicators. Information on PIBO monitoring can be found http://www.fs.fed.us/biology/fishecology/emp/

The multiple indicator monitoring (MIM) of Stream Channels and Streamside Vegetation (Interagency Technical Reference 1737-23) protocol would be used to monitor both implementation and effectiveness indicators. Multiple indicator monitoring monitors riparian vegetative species composition along the greenline only. Multiple indicator monitoring tracks channel characteristics for the greenline to greenline width and bank stability. Multiple indicator monitoring is collected by District interdisciplinary teams of a range and aquatics (fisheries or hydrologist) specialists. Effectiveness monitoring is usually conducted every five years on riparian areas and stream banks. This period of time is usually necessary to detect long term changes.

[6] The greenline is defined as the first communities dominated by perennial vegetation as you proceed outward from the center of the channel.

Channel characteristics would be monitored using surveyed cross sections and longitudinal profiles to assess changes in bankfull width and width/depth, pool quality and quantity. These sites would be located mainly at designated monitoring areas and would be permanently benchmarked. Survey procedures would follow principles outlined in Harrelson et al. 1994. Channel characteristics would be collected by district aquatics specialists.

Carex Working Group (CWG) monitoring sites were used to describe a baseline of riparian shrub heights and densities across 32 representative plots across all reaches of Summit Creek. The Carex Working Group monitoring protocol was developed to be a rapid, simple, and easily repeatable assessment of key riparian vegetation types over relatively long stream reaches. The method provides basic data useful for monitoring changes in important plant community traits, such as density and height classes of riparian shrubs. Carex Working Group monitoring would be collected by District range and aquatics (fisheries or hydrologist) specialists.

Shade measurements would be monitored at designated monitoring areas in coordination with PIBO, multiple indicator monitoring and channel characteristic measurements. Shade would be measured using a solar pathfinder on the order of every 10 years.

Monitoring of the fen areas and associated sensitive species populations and habitats would be accomplished using (1) the USDA Forest Service Groundwater Dependent Ecosystem (GDE) Level 2 protocol with modifications to adequately assess the extent and distribution sensitive moss populations, (2) methods described in the fen proper functioning condition assessment guide, (3) the threatened, endangered, and sensitive species module of the USDA Forest Service Natural Resource Information System, and (4) photo points. This would achieve the goal of monitoring key components of fen condition and function, such as peat formation and peatland maintenance, as well as trends of the extent and distribution sensitive species.

Photo point monitoring would occur at benchmarked locations to ensure photos are repeatable and can be used to illustrate clearly change in vegetative and channel characteristics. Photo point locations would be selected by the interdisciplinary team.

USDA Forest Service Region 6 stream surveys may be collected into the future on the creeks in the project area. This may inform land managers on changing channel conditions from previous Stream Surveys for larger geographical areas than already mentioned monitoring sites. Stream surveys are identified as an inventory and not a monitoring tool and should be used with caution. With this, they are not tested for repeatability and accuracy as rigidly as multiple indicator monitoring and PIBO monitoring designs. However, using stream surveys with monitoring results may provide a better understanding of trends across larger areas.

Upland Monitoring

Beginning in the 1930s, permanent camera points were established on the Malheur National Forest. Their purpose was to monitor the effects of management on the resources of the Forest (USDA 1989). Many camera points have been re-photographed a number of times. This monitoring would continue.

In the 1950s and early 1960s Parker Three-Step condition and trend transects were installed throughout the Forest. The majority of these were established in the uplands. Over the last five years some of these transects have been re-examined. The procedure has been to read the transect using the original three-step method and then reread the transect using a modified Daubenmire cover /frequency method (see USDI 1996). This allows comparisons between old and new information to determine ecological condition and trend and establishes a baseline using the more accurate cover/frequency method for gathering future

data. The re-examining of these established transects would continue. If new trend transects are established the modified Daubenmire cover/frequency would be used.

There are a variety of additional or other monitoring methods available for use. The method or methods to be used would depend on the questions needing to be answered and considering other priorities. In some cases ocular observation (qualitative) would be sufficient to measure utilization, but when specific concerns are identified the forest may need quantitative methods such as Paired Clipped plots or development and use of height/weight curves may be necessary. Some of the more commonly used methods can be found in "Utilization Studies and Residual Measurements" (USDI and USDA 1996). (Please refer to Malheur National Forest Range Monitoring Guidelines, October 16, 2006 for additional accepted methodology).

All of the monitoring methods used by the Forest are also intended to facilitate communications between forest range and resource personnel, grazing permittees and consulting agency personnel. This would largely be accomplished through participation and one-on-one interaction during the interdisciplinary, on the ground implementation.

Other Resources

Wildlife

Upland Sandpiper Monitoring

For any early season grazing (prior to August 1) of the Big Field pasture, monitoring for upland sandpipers would occur. If upland sandpipers are documented in any given year, turn-out in affected pastures would be postponed to avoid impacts such as trampling to nesting sandpipers during critical breeding and nesting periods.

To protect upland sandpiper breeding and nesting areas, lack of monitoring, whether because of funding or personnel constraints, would automatically postpone cattle turnout into the Big Field pasture until after August 1.

Monitoring would consist of qualified birders (district wildlife biologist, district wildlife technician, trained volunteers, etc.) walking, watching, and listening for upland sandpipers in vicinity of their historic nesting and use areas within the Big Field pasture. Monitoring would occur weekly during morning hours (dawn to noon) from May 1st through June 15th. Weather conditions would be calm, with no rain, to maximize potential detection of the birds. If upland sandpipers are discovered, no further walk-throughs of the area would occur to minimize disturbance from Forest Service personnel and volunteers as well.

Areas covered during monitoring, and results (upland sandpipers found or not found) would be documented in the Natural Resources Information System (NRIS) wildlife database, with a summary report shared with district range management personnel.

Aspen Monitoring

In addition to aspen that may be associated with currently established monitoring plots within riparian areas, one to two representative upland aspen stands within each allotment and one to two aspen stands associated with the Logan Valley Fen would be chosen to monitor sucker release and growth, and sapling recruitment. One recently fenced aspen stand protected by 4-strand barb wire (fenced in 2010) would be monitored to determine success of sucker growth with exclusion of cattle. Elk and mule deer may still utilize the stand. Taller cages would be placed in this stand, providing a measure of sucker recruitment in absence of all grazing by any ungulates, whether wild or domestic.

Photo points would be established, and baseline evaluation of existing suckers, both relative numbers and condition, would be recorded. Stands would be evaluated every other year. The District wildlife biologist, Forest botanist, or qualified field technicians would be responsible for monitoring. If sucker and sapling recruitment in unprotected stands are still impacted by grazing pressure, adaptive management strategies including fencing or other protection methods may be utilized.

Heritage

All monitoring activities would be in accordance with the Grazing Allotment Review Strategy for Section 106 Compliance, which implements the Regional Forester policy letter of May 19, 2006 "Grazing Permit Reauthorization and the National Historic Preservation Act". See Section 5: Monitoring, in the Grazing Allotment Review Strategy for Section 106 Compliance.

Summary of Effects in Relation to Issues

Table 53 compares the effects of the alternatives in relation to the issues identified in chapter 1.

The information used to compare alternatives in Table 53 is summarized from chapter 3, "Affected Environment and Environmental Consequences." For a full understanding of the effects of the alternatives, refer to chapter 3, as well as the specialist reports available in the project file at the Prairie City Ranger District.

Comparison of Alternatives

The following tables provide a summary comparison of the effects of implementing each alternative in regard to purpose and need and the significant and analysis issues identified in chapter 1.

Table 53. Summary comparison of alternatives

Measure		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Bull Trout Critical Habitat					
Miles of occupied bull trout habitat grazed during spawning season by stream		0	0	0	0
Miles of critical bull trout habitat for occupied and unoccupied:	Not grazed	35	9.9	14.3	14.3
	Grazed annually	0.0	7.3	12.1	15.4
	Grazed with periods of rest	0.0	14.5	0.0	0.0
	Riparian pasture with rest	0.0	2.7	7.4	4.8
	Riparian exclosures not grazed	0.0	0.0	0.8	0.0
Rate of Recovery:	Miles of Critical Habitat expected to achieve proper functioning condition in 5 years	31.1	29.6	33.3	31.7
	Miles of Critical Habitat expected to achieve proper functioning condition in 10years	35	30.9	34.4	34.5
	Miles of Critical Habitat expected to achieve desired vegetation and channel conditions in 10 years	31	17.2	32.1	25.5

Measure			Alternative 1	Alternative 2	Alternative 3	Alternative 4
Economic Impacts to Permittees and the Local Community						
Animal Unit Months (AUMs)			0	Upper limit AUMs are the same for every alternative: Lake Creek: 0 Logan Valley: 1,983 McCoy Creek: 416 Summit Prairie: 1,546		
Total Available Forage (lbs. acre)/ Animal Unit Months Supported by Available Forage (AUMs) Note: Total Available forage was calculated using a 45% forage use level by livestock. Wildlife use was not included in the estimate.	Lake Creek		No Forage or AUMS for Livestock	2,275,922/ 2,918 No Livestock Use of Forage	4,382,366/ 5,618 No Livestock Use of Forage	4,055,049/ 5,199 No Livestock Use of Forage
	Logan Valley			4,329,288/ 5,550	4,164,989/ 5,340	4,329,288/ 5,550
	McCoy Creek			775,585/ 994	775,585/ 994	775,585/ 994
	Summit Prairie			8,030,701/ 10,296	7,109,413/ 9,115	7,111,601/ 9,117
Costs of Improvements:	Lake Creek		$0	67,500	0	67,550
	Logan Valley			74,400	12,600	80,100
	McCoy Creek			3,000	3,000	3,000
	Summit Prairie			224,100	333,800	155,600
Acres Rested or Not Grazed (average minimum on an annual basis over the next 10 years):	Lake Creek		10,196	5,056	10,196	9,459
	Logan Valley		3,756	246	60	246
	McCoy Creek		980	0	0	0
	Summit Prairie		25,331	3,453	94	20
Acres available for Grazing (average minimum on an annual basis over the next 10 years)[a]:	Lake Creek		0	0	0	0
	Logan Valley			4,113	3,911	4,113
	McCoy Creek			660	660	660
	Summit Prairie			26,379	25,289	25,363
Miles of Added Fence Maintenance[b]:	Lake Creek		0	0	0	0
	Logan Valley			4.8	2.3	2.3
	McCoy Creek			1.4	1.4	1.4
	Summit Prairie			7.3	12.5	4.6
Analysis Issues						
Fences are movement barriers to wildlife	Miles of Fence Removed	Lake Creek	0	0	0	0
		Logan Valley		2.3	1.5	1.5
		McCoy Creek		1.0	1.0	1.0
		Summit Logan		0.7	0.7	0.7

Measure		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Fences are movement barriers to wildlife (cont'd)	Miles of Fence Constructed	See Significant Issue "Miles of Added Fence Maintenance" for miles of fence constructed. The miles of fence construction is the same as listed in under the Significant Issue "Miles of Added Fence Maintenance". See Table 4 for fence miles.			
	Design Elements to Reduce Impacts	Not Applicable	To reduce the impact of fences to big game, Design Element requirements include a smooth bottom wire at least 16 inches above the ground to facilitate fawn movement, with a maximum top wire height of 42 inches, and spacing of 10 inches between the top and next lower wire to reduce the potential of back legs being caught when animals jump the fence.		
Proposed Move Triggers, End-Point Indicators not capable of allowing for riparian recovery	Move Triggers and End-Point Indicators	See FEIS appendix E			
Limited hardwoods have resulted in a loss of beaver habitat and reduction of animals within the project area	Short – and Long – Term Effects on Shrub Development	Not Applicable	Adding the Bosenberg unit and requiring yearlong rest (3 out of 10 years) would improve the height and vigor of existing shrubs.	The creation of riparian pastures and exclosures with immediate rest (5 years) along with reduced woody browse would improve height, vigor and potential expiation of willow densities.	Site specific willow exclosures and a range rider along with reduced woody browse would improve height, vigor and potential expiation of willow densities.
Shifting parts of vacant allotments into active livestock use	Acres of Currently Vacant Allotment Grazed	0	4,478	0	388
	Miles of Critical Bull Trout Habitat Grazed in Currently Vacant Allotment	0	4.4	0	0
Livestock stocking levels should be reduced	Capability, Suitability and Forage Production	No Grazing	The AUMs proposed are maximum limits and may be adjusted to allow flexibility for annual adjustment of both numbers and/or season. The analysis of available forage and stocking rates shows that adequate forage is available to support AUMs levels currently permitted including any proposed allotment boundary and management changes.		

a – Miles do not include 0.5 miles of Lake Creek to be excluded from grazing (riparian exclosures) in ongoing/foreseeable projects.
b – Miles are cumulative, including acres from ongoing projects (see current management in chapter 1 for further detail).

Implementation and Management Schedule

Depending on which alternative is selected by the Responsible Official, activities included in the decision would occur in approximately the following timescale. All activities and improvements are expected to occur within 10 grazing seasons of the decision. All improvements would be maintained during the same time period. Boxes checked represent the approximate time period when all or portions of the proposed activity would be completed.

Table 54. Implementation schedule by alternative

Activity	Timeframe		
Alternative 1 – No Grazing	**2014**	**2017**	
Notices of permit cancellation given to permittees	X		
No grazing implemented		X	
Alternative 2 – Proposed Action	**2014-2016**	**2017-2020**	**2021-2024**
Lake Creek Allotment: No AMP needed.			
Logan Valley Allotment: Complete AMP Logan Valley allotment.	X		
Application of grazing use levels and move triggers shown in appendix F.	X		
Remove fence to combine Big Ck. portion of East Lake Ck., North Big Ck. and South Big Ck. units. New unit called Big Ck. Riparian pasture.	X		
Remove fence to absorb the North Fork unit of the McCoy allotment into the Flat Field unit of the Logan Valley allotment.	X		
Begin resting (3-5 years rest) the West Lake Creek Riparian pasture and West Bosenberg riparian pasture.	X		
Convert about 0.3 miles of electric fence in the North Fork unit along Big Creek to a permanent let-down fence.	X		
Absorb Lake Creek unit of the McCoy Creek allotment into the Logan Valley allotment.	X		
Construct new fence and remove exiting fence to absorb a portion of the McCoy Creek unit with the Horse Pasture from the Lake Creek allotment (new unit would become part of the Logan Valley allotment, named the Deardorff unit).		X	X
Begin resting the Big Creek Riparian pasture (3 years out of 10).	X	X	X
Begin rest and deferment grazing system in the Logan Valley allotment.	X	X	X
McCoy Creek Allotment: Complete AMP McCoy Creek allotment.	X		
Application of grazing use levels and move triggers shown in appendix F.	X		
Remove fence to combine the Ridge and Dry units. Combined areas would be called the Ridge unit.	X		
Begin deferred rotation grazing system in the McCoy Creek allotment.	X		
Summit Prairie Allotment: Complete AMP for Summit Prairie allotment.	X		
Application of grazing use levels and move triggers shown in appendix F.	X		
Begin resting the West Summit Recovery unit for 3-5 years.	X		
Remove fence to absorb Front Field unit from the Logan Valley allotment to into the Little Logan unit. The additional 52 acres would be grazed as part of the Summit Prairie allotment.	X		
Construct a loading ramp with catch pen in the Sagehen unit near the private property boundary.		X	
Construct fence and water gap to add the Bosenberg unit of the Lake Creek allotment to the Summit Prairie allotment. New unit would be named the Bosenberg unit.	X		
Construct pond and develop spring in the Bosenberg unit.	X		

Activity	Timeframe		
Begin grazing the Bosenberg unit.		X	
Begin resting the Sagehen, Little Logan and Bosenberg units (3 years out of 10 years).	X	X	X
Begin rest and deferment grazing system in the Summit Prairie allotment.		X	
Alternative 3	**2014-2016**	**2017-2020**	**2021-2024**
Lake Creek Allotment: No AMP needed.			
Logan Valley Allotment: Complete AMP Logan Valley allotment.	X		
Application of grazing use levels and move triggers shown in appendix F.	X		
Remove fence to combine the Big Creek portion of the East Lake Creek, North Big Creek and South Big Creek units. New unit would be named the Big Creek Riparian pasture.	X		
Remove fence to absorb the North Fork unit of the McCoy Creek allotment into the Flat Field unit of the Logan Valley allotment.	X		
Convert about 0.3 miles of electric fence in the North Fork unit along Big Creek to a permanent let-down fence.	X		
Begin resting (3-5 years rest) the West Lake Creek Riparian pasture and West Bosenberg Riparian pasture.	X		
Absorb the Lake Creek unit of the McCoy Creek allotment into the Logan Valley allotment.	X		
Begin rest and deferment grazing system in the Logan Valley allotment.	X		
McCoy Creek Allotment: Complete AMP McCoy Creek allotment.	X		
Application of grazing use levels and move triggers shown in appendix F.	X		
Remove fence to combine the Ridge and Dry units. Combined areas would be named the Ridge unit.	X		
Begin deferred rotation grazing system in the McCoy Creek allotment.	X		
Summit Prairie Allotment: Complete AMP for Summit Prairie allotment.	X		
Application of grazing use levels and move triggers shown in appendix F.	X		
Begin resting the West Summit Recovery unit for 3-5 years.	X		
Remove fence to absorb the Front Field unit from the Logan Valley allotment into the Little Logan unit.	X		
Construct a loading ramp with catch pen in the Sagehen unit near the private property boundary.		X	
Construct fence to create the Lower Little Logan, Upper Little Logan, North Summit, Sagehen, Riparian pastures and the Sagehen Riparian exclosure.	X		
Begin resting the Lower Little Logan, Upper Little Logan, North Summit, Sagehen Riparian pastures and the Sagehen Riparian exclosure. All areas would be rested from 3-5 years after fences are constructed.	X		
Begin deferment rotation on Summit Prairie allotment.	X		
Alternative 4	**2014-2016**	**2017-2020**	**2021-2024**
Lake Creek Allotment: No AMP needed.			
Logan Valley Allotment: Complete AMP Logan Valley allotment.	X		
Application of grazing use levels and move triggers shown in appendix F.	X		
Remove fence to combine the Big Ck. portion of the East Lake Ck., North Big Ck. and South Big Ck. units. New unit called Big Creek Riparian pasture.	X		
Remove fence to absorb the North Fork unit of the McCoy Ck. allotment into the Flat Field unit of the Logan Valley allotment.	X		

Activity	Timeframe		
Begin resting (3-5 years rest) the West Lake Creek Riparian pasture and West Bosenberg Riparian pasture.	X		
Convert about 0.3 miles of electric fence in the North Fork unit along Big Creek to a permanent let-down fence.	X		
Absorb the Lake Creek unit of the McCoy Creek allotment into the Logan Valley allotment.	X		
Construct new fence and remove existing fence to absorb a portion of the McCoy Ck. unit with the horse pasture from the Lake Ck. Allotment (new unit would become the part of the Logan Valley Allotment and called the Deardorff unit).		X	
Begin resting the Big Creek Riparian pasture (3 years out of 10 years).	X	X	
Begin rest and deferment grazing system in Logan Valley allotment.	X	X	
McCoy Creek Allotment: Complete AMP McCoy Creek allotment.	X		
Application of grazing use levels and move triggers shown in appendix F.	X		
Remove fence to combine the Ridge and Dry units. Combined areas would be named the Ridge unit.	X		
Begin deferred rotation grazing system in the McCoy Creek allotment.	X		
Summit Prairie Allotment: Complete AMP for Summit Prairie allotment.	X		
Application of grazing use levels and move triggers shown in appendix F.	X		
Begin resting the West Summit Recovery unit for 3-5 years.	X		
Start use of rider in the Sagehen and Little Logan units.	X		
Remove fence to absorb the Front Field unit form the Logan Valley allotment into the Little Logan unit.	X		
Construct the Prairie Riparian pasture along Summit and West Fork Summit Creeks.	X	X	
Start resting Prairie Riparian pasture in North Summit unit (3 to 5 years).		X	X
Install cages and small riparian exclosures in Sagehen and Little Logan units. Begin resting riparian exclosures.	X		
Construct a loading ramp with catch pen in the Sagehen unit near the private property boundary.		X	
Begin deferment rotation on the Summit Prairie allotment.		X	X

Chapter 3. Affected Environment and Environmental Consequences

Introduction

This chapter provides information concerning the affected environment of the Summit Logan Project area, and potential consequences to that environment from the Proposed Action (alternative 2), alternative 3, alternative 4, or the likely results of taking no action (alternative 1). All types of effects, including direct, indirect and cumulative effects, are disclosed. Effects are quantified where possible, or discussed qualitatively. The means by which potential adverse effects would be reduced are described (see also chapter 2).

Specialist Reports and Project Record

This Draft Environmental Impact Statement hereby incorporates by reference the Rangeland Vegetation and Invasive Species, Botany, Soils, Hydrology, Aquatics, Recreation, Visual Quality, Heritage, Social and Economics, and Wildlife Specialist Reports in the Summit Logan Valley Grazing Authorization Record (40 CFR 1502.21). Specialist Reports are located in each specialist's section of appendix F (Specialist Reports) and contain the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation that the resource specialists relied upon to reach the conclusions in this environmental impact statement. Appendix F is available for review upon request.

The project record for the Summit Logan Valley Grazing Authorization Project includes all project-specific information, including field investigations and other data. The record also contains information resulting from public involvement efforts. The project record is located at the Prairie City Ranger District Office in Prairie City, Oregon, and is available for review during regular business hours.

Changes from the Draft to Final Environmental Impact Statement

The following changes were made between the Draft and Final EIS. The listing does not include minor correction, explanations, or edits to grammar and spelling. Some of the changes resulted from public comments on the Draft Environmental Impact Statement (DEIS).

Rangeland Vegetation and Management Section

- Numerical errors in the forage production and stocking rate analysis were corrected. The analysis was supplemented by providing available forage and stocking rate estimates for each grazing pasture by alternatives.
- Additional analysis of the effects of adaptive management on rangeland management was added.
- The references cited were updated and corrected.
- A consistency error between the Range Vegetation and Social-Economic sections was noted. The miles of fence to be constructed in the Summit Prairie allotment (alternative 4) were corrected in the Range Vegetation section.

Invasive Species Section

- The direct, indirect, and cumulative effects were updated and additional references were added.

Botany Section

- The assumptions used in the effects analysis were updated.
- Information regarding the potential presence of some sensitive species in the project area was updated.
- The analysis of potential cumulative effects was supplemented.

Soils Section

- Numerical table errors were corrected regarding percent ground cover.
- Clarifications were made to the effects analysis to address public comments.
- Clarification regarding consistency with Forest-Wide standard #127 was added.

Hydrology and Aquatics Section

- New Clean Water Act information has been added.
- Citation errors related to the Bull Trout Recovery Plan were corrected.
- The overall section was edited to improve the readability.
- Additional analysis was added for bull trout, bull critical habitat, and spotted frog.
- The section on Endangered Species Act consistency was updated to correct errors factual errors.
- The references section was updated.
- An error was corrected. The Regional Forester removed redband trout from the sensitive species list in 2011, except in the Oregon closed basin. This project is outside of the closed basin, so redband trout are not considered sensitive here. They are however, a management indicator species (MIS) and are addressed in that section of the document.

Recreation Section

- Additional information defining and clarifying the Malheur Forest Niche was added to address public comments.
- Information clarifying unauthorized livestock accessing Murray Campground was added.
- Information regarding a horse group special use event in the Lake Creek allotment has been clarified.

Social Economics Section

- Additional information was added to supplement the social-economics analysis. This includes providing additional disclosure on adaptive management effects.

Wildlife Section

- Additional references were added.
- The affected environment for aspen habitat was supplemented.
- The status, existing condition, and effects analysis for California wolverine and greater sage-grouse were updated. Both species are now Region 6 candidate species.
- The status, existing condition and effects analysis for gray wolf was updated with new information.
- The existing condition and effects determination for upland sandpiper were supplemented.

Analyzing Effects

Direct, Indirect and Cumulative Effects

Direct environmental effects are those occurring at the same time and place as the initial cause or action.

Indirect effects are those that occur later in time or are spatially removed from the activity.

Cumulative effects are those effects that result from the incremental impact of the action when added to other past, present or reasonably foreseeable future actions regardless of the agency or person that undertakes such other actions (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time. These "related actions" may be influencing current conditions. If so, their current (or foreseeable) effects are relevant to considerations of whether the proposed action would add to their effects.

In the descriptions of cumulative effects of the proposed action, relevant related actions that are known are identified and discussed. (A full listing of relevant related actions is provided in appendix C). Each cumulative effects analysis, for each environmental component, is guided by and consistent with the Council on Environmental Quality letter, "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis" of June 24, 2005.

Irreversible and Irretrievable Commitments

NEPA regulations also state that the Forest Service must show any irreversible or irretrievable commitments of resources that may result from the alternatives. An irreversible commitment is a permanent resource loss including the loss of future options. It usually applies to nonrenewable resources, such as minerals or cultural resources, or to factors that are renewable only over long periods, such as soil productivity. Such commitments are considered irreversible because the resource has deteriorated to the point that renewal can occur only over a long period of time, at a great expense or because the resource has been permanently destroyed or removed. An irretrievable commitment is the loss of use or production of a natural resource for some time. This analysis determined there are no irreversible or irretrievable commitments of resources due to this project.

Forest Plan Consistency

The proposed action is consistent with the Malheur Forest Plan (USDA Forest Service 1990) and its amendments. Applicable Forest-wide and land use designation standards and guidelines have been incorporated. The Forest Service uses design elements in the planning and implementation of land management activities. The application of these elements begins during the planning and design phases of a project.

Plans of Other Agencies

The CEQ regulation implementing NEPA requires a determination of possible conflicts between the proposed action and the objectives of Federal, State, and Local land use plans, policies, and controls for the area. The major land use regulation of concern is the Oregon Smoke Management Plan. See the "Other Disclosures" section at the end of this chapter for a discussion of compliance with this and other laws.

Rangeland Vegetation and Rangeland Management

Introduction

This is a summary of the Rangeland Vegetation and Rangeland Management Report that evaluates the potential effects of livestock grazing on the rangeland within the Summit Logan Valley Grazing Authorization Project. The full report can be found in appendix F which is available for review by request.

Regulatory Framework

Granger-Thye Act of 1950

Granger-Thye authorizes the Forest Service to issue grazing permits and use grazing receipts for range improvements; provides direction on establishment of local grazing advisory boards and other purposes.

National Forest Management Act of October 22, 1976

The National Forest Management Act reorganized, expanded and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on National Forest lands. The National Forest Management Act requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. It is the primary statute governing the administration of National Forests.

The Rescission Act of 1995 (Public Law 104-19)

Requires each National Forest to establish and adhere to a schedule for completing NEPA analysis and decisions on all grazing allotments within a 15 year period.

Malheur National Forest Land and Resource Management Plan (Forest Plan)

The principle guiding document relevant to range management on the Forest is the 1990 Malheur National Forest Land and Resource Management Plan, referred to as the Forest Plan for the remainder of this section. The Forest Plan provides standards and guidelines for range management. Standards and guidelines are presented at the Forest level (USDA Forest Service 1990, Forest Plan, pp. IV-34 to IV-35) or Management Area level (Applicable sections of the Forest Plan to this report include: Management Area 3A -Non-Anadromous Riparian Areas pp. IV-57 to IV-58)

Analysis Method

Vegetation Information

The project area was mapped using an existing vegetation cover according to the R6 Ecological Classification (Ecoclass) standards. The mapping was completed using existing GIS mapping and field reconnaissance. Forage production is related to the plant communities and species, soil productivity, and tree densities (canopy cover) on the landscape. The Forest Plan established percent allowable use of available forage based on vegetation type (i.e. forested stands, grasslands, and shrublands). Vegetation information was used in combination with Forest Plan direction to conduct the forage production and livestock stocking rate analysis.

Condition and Trend

In the 1950s and early 1960s Parker three-step condition and trend transects were installed throughout the Forest. The majority of these were established in the uplands. Four sites were established in the Summit Logan project area between 1953 and 1956. The procedure has been to read the transect using the original Three-Step method and then reread the transect using a modified Daubenmire cover/frequency method (Coulloudon, 1999). This allows comparisons between old and new information to determine ecological condition and trend and establishes a baseline using the more accurate cover/frequency method for gathering future data. These sites have been re-examined which allows comparisons between old and new information to determine ecological condition and trend. In the 1990s and 2000s ecology plots were established across the Blue Mountains with some plots overlapping the project area. Information from condition and trend transects and ecology plots were used in the analysis to analyze forage conditions and trends.

Forage Condition

Forage condition is a resource value rating for livestock forage condition and is designed to depict grazing impacts on understory vegetation; the condition is derived from species density and species composition. Forage condition evaluates departure from potential under existing environmental conditions, including density of woody cover. There are four classes of forage condition: good, which equals 76-100 percent of species density and composition; fair, which equals 51-75 percent of species density and composition; poor, which equals 26-50 percent of species density and composition; or, very poor, which equals 0-25 percent of species density and composition. Current forage condition was also determined based on the condition and trend data from 1995 and scored using Hall 1973. This source was chosen over the Tentative Forage Condition Guide (USDA Forest Service 1984) because it is more site specific and comparable to past data.

Photo Points

Beginning in the 1930s, permanent camera points (photo points) were established on the Malheur National Forest. Their purpose was to monitor the effects of management on the resource. Many camera points have been re-photographed a number of times. In the Summit Logan project area several points have been identified from which photographs are taken at periodic intervals. In the analysis photographs were used to supplement data and served as a valuable tool in determining and/or interpreting vegetation trends. Photo point information is available in the Summit Logan Valley Grazing Authorization Project file.

Global Information System (GIS)

An analysis of rangeland capability was completed for the project area using existing GIS data and mapping. Site conditions such as slope, soil type and productivity, and landscape features were used to determine the percentage of the landscape that is capable of producing forage and grazing management at a given level.

Forest Plan

The analysis also considered direction in the Forest Plan regarding range and livestock management for specific management areas. Developed campgrounds (MA-12) and administrative sites (where not compatible with livestock grazing), (MA-19), are designated as unsuitable in the Forest Plan. In addition, fenced road rights of ways, long-term enclosures that exclude livestock grazing, and areas with over-story tree canopy cover greater than seventy percent (70 percent) were considered to be unsuitable.

Other Information

The analysis also uses information from a variety of sources including:

- Annual compliance monitoring
- Submitted permittee monitoring
- Contracted surveys and assessments
- Actual use records and end of year reports.
- Existing range and environmental analysis files (1950, 2080, 2210/2230/2240/2270)
- Other historical records of the allotments/pastures.

Affected Environment

This section provides an overview of rangeland vegetation and forage conditions, and rangeland management for the Summit Logan Valley project area. The rangeland vegetation section discusses vegetation types in the project area and trends in range and forage conditions. The rangeland management discussions provide an overview of past grazing management, existing grazing management, current monitoring protocols, capability and suitability of the area for grazing, and potential forage production/stocking rates for each of the allotments.

Rangeland Vegetation

Vegetation Types

Vegetation in the project area consists primarily of forested types with shrub and elk sedge/pinegrass understories. At the lower elevations, sagebrush, bunchgrass communities, and dry meadows are some common plant communities. As the elevation rises, ponderosa pine and grand fir become dominant. Lodgepole pine is found on poorly drained cold pockets. Aspen stands are interspersed throughout the project area. The following descriptions of the plant associations found in the project area are from Plant Association of the Blue and Ochoco Mountains (Johnson and Clausnitzer 1992), Mid-Montane Wetland Plant Associations of the Malheur, Umatilla and Wallow-Whitman National Forests (Crowe and Clausnitzer 1997), Plant communities of the Blue Mountains in eastern Oregon and southeastern Washington (Hall 1973), and Bunchgrass Plant Communities of the Blue and Ochoco Mountains a Guide for Mangers (Johnson and Swanson 2005).

For this analysis, the project area has been mapped at an existing vegetation cover according to the R6 Ecological Classification (Ecoclass). The mapping was completed using existing GIS mapping and field reconnaissance. In 2007, forage production studies were conducted on these allotments to support that areas are capable of supporting livestock grazing across the project area.

The Summit Logan Valley Grazing Authorization Project Area is a mix of forested and non-forested vegetation types as well as other land features such as rock and water. Forested lands account for 86 percent of the area, non-forested lands account for 13 percent of the area and rock and water account for 1 percent of the area.

Forested Types

Of the forested vegetation types, all but the grand fir associations are considered capable of producing forage for livestock.

The majority of the conifer plant association acres are thought to be outside the range of the natural fire regimes represented by the type with the exception of portions in the Lake Creek allotment which has had

two major wildland fires (Snowshoe Fire in 1990 and the High Roberts Wildland Fire in 2002). Commercial thinning activities have recently been completed on this allotment with the Merit Timber Sale.

The Sheep Mountain Fire occurred in 1990, overlapping a small portion of the Summit Rock unit of the Summit Prairie Allotment. Much of the fire area was salvage logged and replanted. Throughout the fire large patches of snowbrush ceanothus exist, some of which are inaccessible to livestock grazing.

Subapline Fir Types

Subalpine fir stands occur across approximately 988 acres within the project area. High elevations, cold, dry habitats, subalpine fir dominants in absence of spruce due to the droughtiness of the sites. The dominant herbaceous plant is elk sedge. Sites are too cold to support pinegrass which requires warmer, moister conditions to complete and persist with elk sedge.

Mixed Conifer, Pinegrass, Elk Sedge Types

Mixed conifer stands occur across approximately 20,063 acres within the project area. The mixed conifer plant community occupies drier sites than grand fir. Soils have the lowest water-holding capacity of the grand fire plants associations. Residual soils are prominent substrates; this reduces pinegrass abundance and favors elk sedge.

Other conifers species found within the mixed conifer stands are lodgepole pine stands which occur across approximately 1,118 acres within the project area. Ponderosa pine stands occur across approximately 4,161 acres within the project area. Douglas-fir stands occur across approximately 314 acres within the project area. Grand fir stands occur across approximately 5,242 acres within the project area.

Non-Forested Types/Juniper

Juniper stands occur across approximately 120 acres within the project area. This plant community forms a mosaic with scattered western juniper among mountain big sagebrush and bunchgrass.

The majority of the sage types are thought to be outside the range of the historical fire disturbance regime for these types. Fire return intervals of 10 to 50 years maintained these types in a mix of structural height and ecological status. Fire suppression and the focus on timber management have caused these types to miss at least one and probably several fire disturbance events. These plant community types are mostly in late seral condition, with sagebrush dominating and grasses and forbs decreasing as cover components. Fire suppression has also contributed to the encroachment of conifer into non-forested vegetation types.

Other non-forested types of lands found within the project area are grassland which is comprised 853 acres. Aspen which includes 126 aspen stands totals approximately 372 acres in the project area. Encroachment by conifers is typical with the suppression of fire. Lack of fire, as well as a combination of historic overuse by livestock combined with timing of grazing and use by wildlife has resulted in a decrease of aspen regeneration. Decadent stands benefit from the introduction of fire and thinning of encroaching conifers. Where aspen stands have been treated by removal overstory conifers or protection to exclude or restrict browsing, regeneration has been successful. Within the project area approximately 39 acres of aspen have been protected with fences.

Meadows comprise 2,864 acres. Non-forested uplands within the watershed are characterized by dry, moist, and wet meadows. The majority of the Logan Valley and McCoy Creek allotments are comprised of moist and dry meadows. Logan Valley is the most expansive grassland area and is dominated by several introduced grasses which were seeded after the valley was plowed and disked in the 1920s. These

species have replaced the native Idaho fescue and bunchgrass communities that were native to the area. Introduced grasses including timothy, crested wheatgrass, orchard grass, and red fescue are the dominant grasses within the Logan Valley and McCoy grazing allotments. Bull trout were listed at threatened under the Endangered Species Act in 1998, resulting in changes to grazing seasons to protect bull trout spawning areas. With season of use changes these species have become “wolfy” and decadent, which has started to reduce their vigor and palatability to ungulates. Lodgepole pine is currently encroaching into Logan Valley as a result of fire suppression.

Low sage is comprised of 898 acres. These sites are characterized by shallow to very shallow soils with rock fragments common while big sage is comprised of 714 acres. The majority of the sagebrush-dominated communities are in mid-to-late seral ecological status, primarily due to the suppression of fire on these rangelands.

Measured upland vegetative conditions varied throughout all of the pastures under analysis from poor to excellent. Factors which resulted in poor condition did not appear to be related only to livestock grazing.

The data collection forms for specific monitoring sites provide additional detail on the reasons for individual condition determinations. This data is maintained within the ecology database located on the Wallow-Whitman National Forest Tri-Forest Ecology Department. A print out of these sites is located in the analysis file for this project at the Prairie City Ranger District Office.

Condition and Trend

Available data shows that forage condition and trends are improving in the project area. At the most recent reading, forage condition ranges from fair to good and trend range from fair to good at all condition and trend and Ecology plot sites. The general trend for the condition and trend plots is an increase in litter and canopy cover and a decrease in bare soil in ponderosa pine and western juniper sites.

Table 55. Summary of condition and trend transect and ecology plot data

Allotment	Site	Year Read	Trend	Forage Condition	Rationale
Lake Creek	Ecology Plot (MA057)	2002	Fair	Fair	Quaking aspen/ponderosa pine/elk sedge/mountain brome/pinegrass community rated in fair forage condition base on the amount of palatable species to livestock.
	Ecology Plot (QA514)	2000	Fair	Fair	Quaking aspen/elk sedge/sweet-cicely community rated in fair forage condition because of the amount of palatable species to livestock.
	Condition and Trend Plot (C-201)	1991 1993 1995 1997 2004 2010	Good Poor Poor Poor Fair Fair	Good Poor Poor Poor Fair Fair	In 2010, the Ponderosa pine/shrub/bunchgrass community was rated in fair condition with an increase in pinegrass over the years following the Snowshoe fire. The fire was seeded in 1990 and 1991 with seral rye. Over a 20 year period, seral rye has decreased and native plants (pinegrass and elk sedge) have increased.
	Condition and Trend Plot (C-202)	1991 1993 1995 1997 2004 2010	Poor Very Poor Very Poor Very Poor Poor	Poor Very Poor Very Poor Very Poor Poor Fair	

Allotment	Site	Year Read	Trend	Forage Condition	Rationale
Logan Valley	Condition and Trend Plot (Logan 3)	1954 1995 2003	Poor Fair Fair	Poor Good Good	In 2003, the grassland community rated in fair forage condition with an increase in desirable species such as red fescue, orchard grass, and crested wheatgrass which where all seeded in the late 1950's.
Summit Prairie	Ecology Plot 9312	1995		Good	The site is transitioning from a sagebrush bunchgrass community to a lodgepole pine sagebrush understory. The site was rated in fair forage condition because of the amount of palatable species to livestock.
	Condition and Trend Plot (Logan 1)	1953 1995	Fair Fair	Fair Fair	In 1995, the decreaser species composition was over 65% and the percentage of palatable increaser species was only 20%, with a ground cover score of 84%. The site was rated in fair forage condition because of the amount of palatable species to livestock.
	Condition and Trend Plot (Logan 4)	1954 1995	Fair Fair	Fair Fair	In 1995, the decreaser species composition was 66% and the percentage of palatable increaser species was 6 %, with a ground cover score of 92%. The site was also rated in fair forage condition because of the amount of palatable species to livestock.
	Condition and Trend Plot (Logan 11)	1956 2004 2010	Good Good Good	Good Good Good	The percentage of decreaser species composition was 66% and the percentage of palatable increasers was only 6 % with a ground cover score of 92%. The site was rated in fair forage condition because of the amount of palatable species to livestock.

Rangeland Management

History and Past Livestock Grazing Management

Domestic livestock grazing first occurred in the project area as early as the mid-1850s when the first miners and homesteaders entered the area. The Malheur National Forest, like many areas in the Western United States, has a reputation of livestock overuse that started in the late 1800s and continued into the mid-1930s. Thousands of sheep grazed the planning area from the late 1860s until the 1940s. From the 1940s until the present day, domestic livestock grazing in the area has been primarily cattle. Sheep and cattle utilized available forage in a continuous season grazing regime. Early grazing was essentially unregulated and resulted in significant impacts, some of which are still observable today. High stocking levels, stock driveways, and lack of management resulted in degraded upland and riparian conditions (Erickson 1906).

Livestock use was not managed until the early 1900s with establishment of the Forest Reserves in 1906 and the Malheur National Forest in 1908. Historical livestock grazing data for Grant County ranges from 1890 through 1959, after that time actual use records were reported. In 1918, the Forest Service instituted a permit system, which defined areas to be grazed, set the season of use and established the number of livestock to be permitted. During the early part of the century, the Forest Service also took significant

action to regulate numbers and seasons, and to establish workable grazing seasons and allotments. This action continued into the latter half of the century when emphasis shifted to development of management systems and regulation of effects on specific resources.

Allotment Management Plans (AMPs) were developed in the 1960s-70s to manage livestock grazing. The allotment and unit boundaries in the analysis area have been changed numerous times.

Improved grazing systems and pasture designs were implemented to accelerate riparian area recovery in the late 1970s to the present. Specific changes have included construction of fences, installation of water tanks and ponds, and herding and strategic salt placement to improve livestock distribution while reducing riparian area impacts. Implementation of the Malheur Forest Plan in the early 1990s lowered the allowable use standard for livestock grazing to accelerate the rate of recovery in riparian areas. In the late 1990s, when bull trout were listed as threatened under the Endangered Species Act, changes to utilization levels of grass and riparian species were further.

More recent management changes have occurred and are ongoing to improve upland and riparian area conditions, reduce negative effects to aquatic species and increase management flexibility. In 2011, three Decision Memos were signed by the Prairie City District Ranger authorizing projects within the Logan Valley, McCoy Creek and Summit Prairie Allotments to enhance livestock management and improve shade and hardwood communities associated with bull trout habitat on Big Creek and Lake Creek; and to provide aquatic restoration and improve livestock distribution along Summit and West Fork Summit Creeks. All projects are scheduled to be implemented between 2012 and 2013. Projects include construction of exclosure and riparian pasture fences, water and pond development, and hardwood planting (see Current Livestock Grazing Management below for a summary of projects).

Grazing Utilization Standards (History)

In 1990, Region 6 of the Forest Service developed grazing utilization standards to be included in the Forest Land Management Planning process. Upon approval, the Forest Plan incorporated the Region 6 utilization standards and guidelines. The Malheur Forest Plan lists a range of allowable use standards to be applied based upon:

1. Management area designation (riparian or non-riparian). See Forest Plan table IV-2, page IV-35 (non-riparian areas) and table IV-4, page IV-58 (non-anadromous riparian areas) for more detail.
2. The allotment condition classification. Is the area in a satisfactory or unsatisfactory condition (to be determined in a site-specific analysis completed in accordance with the activity schedule in Forest Plan appendix A, Table A-10 on page A-18 through 21
3. The management intensity level (Stewardship or Extensive).

The four allotments in the Summit Logan analysis have been managed under an extensive management strategy since the Forest Plan was approved in 1990. The Forest Plan (page IV-35) defines extensive management as a strategy where “management seeks full utilization of forage available to livestock. Cost-effective management systems and techniques, including fencing and water development, are designed to obtain relatively uniform livestock distribution and use of forage to maintain plant vigor.”

Range forage conditions in the project area were evaluated using a combination condition and trend transects, ecology plots, and photo point information. The evaluation determined that forage conditions on suitable rangeland are in a satisfactory condition[7] based on the Forest Plan definition.

Table 56 summarizes the Forest Plan allowable use levels for allotments in satisfactory condition under extensive management.

Table 56. Allowable use of forage by percent weight removed

Plant Community	Sub-type	Range Condition	
		Satisfactory	Unsatisfactory
Non-Anadromous Riparian	Grassland	45	0-35
	Shrubland	40	0-30
Non-riparian	Grassland	55	0-35
	Shrubland	50	0-30
	Forestland	45	0-35

Note: Utilization of grasslands is based on percent removed by weight for grass, grasslike, and forbs. Utilization of shrubs is based on weight and twig length.

After bull trout were listed as threatened in 1998, utilization standards were developed for allowable use of herbaceous riparian species, riparian woody shrubs, grass and grasslike species, and bank alteration through the consultation process with the US Fish and Wildlife Service (USFWS). From 1998 through 2004, utilization levels were 6-inch stubble height along the greenline, moderate browse use, 45 percent utilization in uplands, and 10 percent bank alteration.

From 2005 through 2011, utilization standards were 4-inches stubble height along the greenline, light to moderate browse use, 45 percent utilization in uplands, and 20 percent bank alteration. These levels are used as both livestock move triggers and end-point indicators.

Between 2005 and 2011 utilization standards have been met consistently in most grazing units with the exception of the West Lake Creek unit in the Logan Valley allotment and the North Summit and Sagehen units in the Summit Prairie Allotment.

Rangeland Capability and Rangeland Suitability Analysis

Forest planning regulations require the determination of capability and suitability at the Forest level. These regulations are derived from the Forest and Rangeland Renewable Resources Planning Act of 1974 (Section 6, (g) (2) (a) & (3).

The 1990 Malheur Forest Plan FEIS (USDA Forest Service 1990, FEIS V-20, and appendix B, B-60 and B-71-75) used FORPLAN[8] to estimate Animal Unit Months (AUMs) and rangeland capability/suitability of the Forest, including Lake Creek, Logan Valley, McCoy Creek and Summit Prairie allotments. A capability/suitability analysis was conducted during the development of the Forest Plan for the Malheur National Forest, which made management direction determinations based upon Management Area designation. Subsequent changes to the definitions of capability and suitability have been made since the

[7] The Forest plan defines Satisfactory Range Condition as “on suitable range, forage condition is at least fair with stable trend, and allotment is not classified as PC (basic resource damage) or PD (other resource damage)”.
[8] FORPLAN is a Forest Planning Language Simulator which is a linear programming model used for multiple use planning.

Forest Plan was completed. Information queries have updated the capability and suitability analysis to incorporate the most current information available and most recent Region 6 Guidance in Attachment C of the Range Specialist Report (USDA Forest Service 2003).

Rangeland Capability

Capable rangelands comprise approximately 94 percent of the total acres within the allotments in the planning area (Table 57). Capability is defined as the potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current resource conditions and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices, such as silviculture or protection from fire, insects, and disease.

The analysis of capability began with all lands in the project area. The following were subtracted from these acres.

- Soil types that are dominated by large percentage of rock, areas with highly erosive soils, very wet and boggy soils and sites with high mass movement risk.
- Areas with soil types that are not inherently capable of producing more than 200 pounds or forage/acre.
- Lakes, reservoirs, and ponds.
- Major rivers
- Perennial streams
- National Forest System Roads
- Steep slopes

The remaining acres were considered Capable Rangeland.

Table 57 summarizes the amount of capable range within the project area by allotment and the amount of land that meets the capability and suitability criteria for the variables identified in the Region 6 guidance. See appendix C in the range report for more detail.

Table 57. Summary of capable and suitable range by allotment

Allotment	Acres	Capable Range	Capable & Suitable Range
Lake Creek	10,196	9,130	9,041 (87%)
Logan Valley	3,756	3,698	3,698 (98%)
McCoy Creek	980	958	955 (97%)
Summit Prairie	25,331	23,890	23,293 (92%)
	Total	**37,676 (94%)**	**36,987 (92%)**

Source: Malheur NF GIS. May 2009 (Janet Braymen)

Note: The capability and suitability analysis acres are slightly different than the project area acres. This is the result of small mapping differences in the project area boundary.

Rangeland Suitability

Forest Service Manual 1905 (91) indicates that suitability is a determination of "the appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequence and alternative uses forgone…"

Most Forest Plan management areas in the Summit Logan Valley Grazing Authorization project area are suitable for grazing. The project area includes the Big Creek and Murray Campgrounds (MA 12), and Lake Creek Organization Camp (MA 19) which were determined to be unsuitable for grazing.

In the suitability analysis for the project area fenced road rights of ways, long-term enclosures, areas with over-story tree canopy cover greater than seventy percent (70 percent) were also considered to be unsuitable. Within the project area unsuitable acres total approximately 689 acres.

Capable and suitable rangelands comprise approximately 92 percent of the project area. Based on this information the majority of the project area is capable and suitable for livestock grazing; and consistent with the analysis in 1990 Forest Plan.

Forage Production and Stocking Rates Analysis

Forage production helps determine a guideline for carrying capacity on allotments. Forage production is related to the plant communities and species on the landscape and determines how much vegetation is available for forage. There are many different ways to calculate forage production, ranging from collecting data in the field to using maps. To determine production in this analysis, the focus was on plant associations mapped in a GIS database by acres, supplemented with production field data collected in 2007. Forage pounds per acre (pounds/acre), as determined by the Plant Associations of the Blue and Ochoco Mountains (Hall 1973 and Johnson and Clausnitzer 1992), were calculated with some adjustments, as follows. See appendix D in the range report for more detail.

- Rangelands not suitable or capable were removed from the forage production analysis.
- The average annual production of the Plant Association was used (pounds/acre air dry). Where supplemental information from field data (clipping information) was available, average plant association estimates were adjusted.
- Percent forage allocated. A 45 percent use level was used to generate allocated forage levels. Allowable utilization levels from the Forest Plan in satisfactory condition with an extensive management strategy (See Forest Plan Tables IV-2 on page IV-35) are show below. See previous discussions (above) under Grazing Utilization Standards.
    - Forested 45 percent
    - Grasslands 55 percent
    - Shrublands 50 percent
- Wildlife use of available forage was not factored into forage estimates.

To determine the carrying capacity (typically expressed in AUMs, or how many 1,000 lb. cows with a calf could graze for one month) you take the total production of an area divided by the pounds of forage required (26 pounds/day) divided by the days in a month (30).

For Example Lake Creek Allotment:

- 2,638,833 lbs. Forage Produced X .45 = 1,187,474 lbs. of Forage Available
- 1,187,474 lbs./26 lbs./30 days = 1,522 AUMS

Table 58 summarizes forage production and carrying capacity (AUMs) by allotment and pastures; please refer to the project file (Prairie City Ranger District) for further information.

Areas not capable or suitable for grazing were removed from forage estimates (See Table 57). Approximately 8 percent of the total project area acres are not capable or suitable. The percentage in the Logan Valley (2 percent) and McCoy Creek (3 percent) allotments is lower than the project area average.

Summit Prairie is at the project area average of 8 percent and the vacant Lake Creek allotment has the highest percentage of acres not capable or suitable acres at 13 percent. Available forage and AUM calculations shown in Table 58 were generated using a 45 percent use level for all vegetation types (forested, grasslands, and shrublands). The Forest Plan allows higher use levels in grasslands (55 percent) and shrublands (50 percent), therefore the analysis under-estimates the available forage for livestock in these vegetation types.

Table 58. Forage production and AUMs

Allotment	Total Forage (lbs.)	Available Forage (lbs.)	Calculated AUMs	Existing Permitted AUMs
Lake Creek (total)	**9,739,767**	**4,382,895**	**5619**	**0**
Bosenberg	6,294,417	2,832,488	3631	
Horse Pasture	42,154	18,969	24	
McCoy Creek	3,403,196	1,531,438	1963	
Logan Valley	**9,056,136**	**4,075,261**	**5,225**	**1,983**
West Lake Creek	82,643	37,189	48	
East Lake Creek	1,245,377	560,420	718	
North Big Creek	911,655	410,245	526	
South Big Creek	420,742	189,334	243	
West Bosenberg	548,657	246,896	317	
East Bosenberg	151,086	67,989	87	
Corral Holding	32,435	14,596	19	
Front Field	161,783	72,802	93	
Lower Field	539,964	242,984	312	
Big Field	3,108,164	1,398,674	1,793	
Flat Field	1,853,630	834,134	1,069	
McCoy Creek (total)	**2,350,278**	**1,057,625**	**1,356**	**416**
Cow Camp	82,644	37,190	48	
Dry	162,363	73,063	94	
Government Flat	1,198,285	539,228	691	
Lake Creek	353,837	159,227	204	
North Fork	33,601	15,120	19	
Ridge	280,575	126,259	162	
Starvation	238,973	107,538	138	
Summit Prairie (total)	**15,650,691**	**7,042,811**	**9,029**	**1,546**
Sagehen	1,976,561	889,452	1,140	
Crane Rock	5,384,364	2,422,964	3,106	
Little Logan	1,837,942	827,074	1,060	
Summit Rock	6,173,112	2,777,900	3,561	
North Summit	204,076	91,834	118	
South Summit	21,465	9,659	12	
West Summit	53,171	23,927	31	

The analysis of available forage and corresponding animal unit months (AUMs) indicates that adequate forage is available to support AUMs at currently permitted levels in the McCoy Creek, Logan Valley and Summit Prairie Allotments. The ability to utilize available forage is dependent on several factors. These include:

- The distribution of livestock and the ability to evenly utilize forage in the pasture. In some pastures water availability in uplands has limited distribution.
- The ability to utilize upland forage before riparian area move triggers are met.
- The amount of wildlife forage use. Wildlife use is factored into Forest Plan grazing utilization standards. When use levels are achieved, regardless of the type of use (i.e. livestock or big game), livestock are moved out of the pasture.
- Weather conditions. Available forage is reduced during drought years.

Permitted Livestock Use

For the most part authorized use has been the same as permitted use over the last 12 years. Actual use of livestock grazing, however, has declined in the allotments over the last several years. Actual use is monitored throughout the season to ensure grazing effects are consistent with meeting Forest Plan standards and bull trout consultation requirements. Over the last five years the average of actual use has decreased on the allotments due to livestock distribution and water availability, range readiness, and operational changes to address resource needs. Actual use (average annual head months) has fluctuated 24 percent on Logan Valley, 13 percent on McCoy Creek and 13 percent on Summit Prairie.

Current Livestock Grazing Management

The allotments in the analysis area are currently permitted for livestock grazing as follows:

Table 59. Summary of allotment status and permitted use

Allotment	Acres	Status	Grazing System	AMP	Permit Type	Permitted Numbers	Permitted AUMs	Season
Lake Creek	10,196	Vacant	Vacant	1966	Term	0	0	--
Logan Valley	3,756	Active	Continuous/Seasonal	1971	Term	357 cow/calf pairs	1,983	6/10-10/15
McCoy Creek	980	Active	Continuous/Seasonal	1971	Term	63 cow/calf pairs	416	6/1-10/30
Summit Prairie	25,331	Active	Continuous/Seasonal	1965	Term	260 cow/calf pairs	1,546	6/10-10/24

Lake Creek Allotment

Allotment contains three units (Bosenberg, Horse Pasture and McCoy Creek) with separation fences, although some portions of the fence were burned during the 1990 Snowshoe fire.

Prior to the Snowshoe Fire in 1990, this allotment was unmanageable due to the dense overstory canopy and reduced forage base; the permittee waived the allotment back to the Forest Service. Since then it has been vacant and not been grazed for over 20 years. Currently, range conditions are capable and suitable for grazing.

Logan Valley Allotment

Livestock generally enter the unit on the south side of the 1600 road (East Bosenberg, West Bosenberg, Front Field, Lower Field, and Flat Field) when the range is ready and stock water is available. The livestock are moved to the units on the north side of the 1600 road (North and South Big Creek, East and West Lake Creek, and Big Field) when the range is ready later in the season. Per consultation agreement livestock grazing is not permitted after August 15th in the North and South Big Creek and Big Creek portion of the East Lake Creek units to prevent livestock redd interaction.

In the Logan Valley allotment the lack of off-stream water sources has been a problem. One existing developed water source helps distribute livestock through the Flat Field unit. Other livestock water is provided by Lake Creek and Deardorff Ditch. Because of the lack of water opportunities to defer the season of use has been very limited. Some units can only be grazed early season because water sources are not available later in the year.

Several projects are ongoing in the Logan Valley allotment that reduce the impacts of livestock along Lake Creek and Big Creek by providing functional water sources in the uplands which would provide for better livestock distribution throughout grazing units.

McCoy Creek Allotment

Livestock generally enter the unit on the south side of the 1600 road (Ridge/Dry, Government Flat, Starvation and Cow Camp) when the range is ready and stock water is still available. The livestock are moved to Lake Creek unit when the range is ready later in the season.

There are limited opportunities to defer the season of grazing because of current pasture configurations and water availability. Off-stream water sources are needed to reduce livestock use of the Lake Creek riparian area while allowing better use of upland forage. The primary stock water source is Lake Creek. One other existing water development is located within the Lake Creek unit.

Several projects are ongoing in the McCoy Creek allotment that are reducing the impacts of livestock along Lake Creek and allowing vegetation and stream channel recovery while still maintaining a functional water source for livestock.

Summit Prairie Allotment

Livestock would generally enter the Sagehen and Crane Rock units when the range is ready for grazing. Then move up Summit Creek to the Little Logan, Summit Rock, North Summit, West Summit and South Summit units as the range is ready.

Upland water sources are needed to pull livestock use away from Summit Creek and allow better forage utilization in upland areas. Use levels are generally reached in the Summit Creek riparian area before forage can be fully utilized in upland areas.

Several projects are ongoing in the Summit Logan Allotment. These ongoing projects are to improve aquatic habitat conditions on Summit Creek and improve the distribution of cattle through the development of upland water sources.

Environmental Consequences

Alternative 1 - No Grazing

Direct and Indirect Effects

Rangeland Vegetation

Alternative 1, the no action alternative, is the no grazing alternative. No action does not result in direct or indirect effects but rather removes the effects of previous management that authorized and managed livestock grazing. While not technically an effect of a Federal action, when compared to the effects of the action alternatives there would be an evolution of vegetation conditions as biophysical processes continue to occur on the ground in the absence of domestic livestock grazing. The degree that this evolving condition would differ from current conditions for any given portion of land would be determined in part on the past level or degree of the grazing activities impacts on that portion of land. In general, the degree of impact from past grazing activities relates to location on the landscape particularly as that location relates to other resource factors such as water and forage. The primary category division related to landscape location is the split between upland vegetation types and riparian vegetation types.

Removal of livestock grazing as a disturbance to the forest and non-forest vegetative upland portions of the planning area is not expected to result in substantial changes in plant distribution, density, or composition.

The elimination of livestock grazing would result in the fastest improvement to riparian vegetation. The production and composition of sedges, rushes, and hardwoods in riparian areas and mesic meadows should improve more rapidly than uplands due to their inherent productivity and resiliency as a result of greater soil moisture availability. The effects to riparian vegetation are discussed in detail in the Aquatic Habitat Specialist Report.

Discontinuation of grazing and other activities associated with livestock use would allow areas where vegetation has been impacted in the past to recover over time. The rate of recovery would vary based on current site condition and other factors like recreation and wildlife use. Overall an upward trend in range conditions is expected to continue with vegetation compositions slowly changing late seral species in locations where the potential exists.

As vegetation increases, the percentage of bare ground would be expected to decrease. Dead plant matter (litter) would accumulate, helping to protect and stabilize soils. In the absence of grazing, plant matter accumulates on the soil surface. After years of this accumulation (which surpasses the rate of decay in arid environments), some plants (many grass species in particular) go into a “self-imposed stress” whereby the litter chokes out new shoots competing for light (Knapp et al. 1986). The vigor of the entire plant is reduced. When this occurs over a broad scale rangelands become less productive and healthy. Healthy and productive grass and shrub lands are important for many invertebrate and wildlife species that depend upon them particularly for winter range. With the accumulation of dead plant matter (litter) fine fuels would build potentially increasing the susceptibility of the landscape to wildfire.

Some grass species that evolved with the periodic removal of vegetative material by fire, insects, or ungulates would probably not benefit over the long term under this alternative. Plant productivity, diversity and species composition may change over time. Plants with low tolerance to grazing may actually increase in abundance. Shrub communities without fire or other disturbance would gradually move towards the predominance of shrubs over grasses and forbs.

Rangeland Management

Under this alternative, all existing Term Grazing Permits would be cancelled two years after the decision and resolution of the appeals process. No permits would be issued for any of the affected allotments until or unless there was a subsequent NEPA analysis and a decision was made to restock any or all of the allotments. The existing permittees would be given two years written advance notice of the cancellation of their permits as provided for under 36 CFR 222.4(a)(1).

With no action (no grazing) all range improvements and fences would be, abandoned, removed, or assigned to another entity (i.e. adjacent permittee, private land owner, etc.) for maintenance. Maintenance of range developments such as fences and water improvements on the allotments would no longer be the responsibility of the permittees. Existing improvements may continue to be maintained by the Forest Service if considered a benefit to other resources.

Elimination of livestock grazing permits in this locality could jeopardize the viability of the ranches associated with those permits. Re-zoning and land use changes such as development of smaller subdivisions on private lands could occur adjacent to Forest Service Lands, and could affect soils and vegetation in watersheds already impacted by other uses, potentially leading to increased runoff and stream sedimentation, and decreased soil productivity.

Cumulative Effects

Because there are no direct or indirect effects with no action (no grazing), there are no cumulative or additive effects. Ongoing and foreseeable activities listed in appendix C would continue in the project area. However, ongoing activities directly associated with grazing management may be terminated or cancelled.

Effects Common to All Action Alternatives

Direct and Indirect Effects

Rangeland Vegetation (All Allotments)

Grazing Use Levels

Allowable use levels of herbaceous forage for the action alternatives are displayed in detail in appendix E of the FEIS.

All action alternatives allow use of herbaceous vegetation by livestock. Herbaceous vegetation includes grasses, grasslike, and forbs (nonwoody flowing plants). In general cattle prefer grasses and grasslike vegetation over forbs, but preferences depend on many variables, including season of use and available forage. Application of allowable use is based on the concept that plants can withstand removal of part of their current year's growth and still achieve normal growth the following year.

A review of available science (summarized below) on the intensity of grazing shows that proposed use levels in all action alternatives are adequate to maintain or improve plant vigor (health) and allow continued improvement in forage condition trends. Studies show that light to moderate levels of livestock grazing have positive effects on maintaining, sustaining, and improving rangelands that are either in a satisfactory or unsatisfactory condition. All alternative propose the same use levels with riparian benches and upland areas of grazing units. Action alternatives vary in the proposed standards for the riparian communities along the "greenline" directly adjacent to streams. The greenline is defined as the first communities dominated by perennial vegetation as you proceed outward from the center of the channel. The amount of forage left along the stream's edge has been found to be important in catching sediments

during the runoff periods, both from the stream channel as well as from overland flow. The trapping of sediment is critical in rebuilding of streambanks and maintaining water quality.

In an intensive literature review Clary and Webster (1989) concluded that vegetation appears to be more affected by grazing intensity than by grazing systems. They found that the success of grazing systems depend in part upon managerial control of intensity and forage utilization. Eight years of research at Meadow Creek, Starkey, Starkey Experimental Forest and Range, Wallowa-Whitman National Forest, in Northeastern Oregon, indicated that herbage production was increased 1-to-4 fold through timing and intensity of grazing (Bryant 1985). Several grazing rotations were tested including deferred rotation, rest-rotation, and season-long grazing. There was no statistically different change in plant composition among the systems tested however the production of riparian vegetation increased dramatically when utilization was 70 percent or less.

Use levels for riparian areas have been studied by many authors. Clary and Webster (1989) compiled information from numerous sources and recommended that "utilization of streamside herbaceous forage should be limited to about 65 percent of current growth. Utilization based on current growth, however, does not translate directly to utilization based on annual production. The authors went on to note that recommendations of 40-50 percent utilization (approximately 3 to 4 inches of residual height) would maintain plant vigor. They noted, however, that stubble height (e.g. 6 inches or more) might be necessary to protect riparian ecosystem function. The values or stubble heights in each alternative vary by stream reach and were based on the departure of the existing condition to the desired condition. Best available science was considered for establishing allowable use levels of forage along the stream edge (greenline). The effects of proposed differences in greenline stubble heights between the action alternatives on riparian vegetation and stream function and recovery is discussed in detail in the Aquatic Habitat section.

In more recent publications, Hall and Bryant (1995) maintain that undesirable grazing impacts can occur any time stubble height in riparian areas reaches three inches or less. Maintaining a minimum stubble height can help preserve forage plant vigor, reduce browsing on willows, stabilize sediments and indirectly limit streambank trampling (Clary and Leininger 2000). Clary 1995 noted that 10 cm (4 inches) or greater stubble heights appear to be required to ensure full biomass production in mountain meadow sedge communities. Clary also noted that non-riparian vegetation grazed to about 5 cm (2-inch) stubble height at end of growing season would maintain vigor and biomass. Clary and Leininger (2000) explain that stubble height is a short-term monitoring tool and not an objective itself. Desired conditions are the long-term objective.

Available data shows that forage condition and trends are improving in the Summit Logan project area. The most recent information from Condition and Trend Transects and Ecology plots shows that forage conditions ranges from fair to good and trend range from fair to good (see Affected Environment for more detail). Literature acknowledges a relationship between range condition and appropriate grazing intensities. Buckhouse et al. 1979, Chaney et al. 1990, Buckhouse et al. 1981, Clary and Webster 1989, Chaney et al. 1993 documents that light to moderate grazing/proper stocking levels sustains and improved degraded rangeland areas, restoring long-term productivity.

Deferred Rotation Grazing System

All action alternatives propose deferred rotation as part of the grazing system. Rotational grazing, where each area is grazed at a different season each year, was developed because different plant communities and physical features are affected differently at different seasons. All sites and species, over the grazing cycle, are grazed equally during seasons beneficial for each characteristic and seasons that are detrimental. This prevents preferred sites from receiving continuous detrimental timing (seasonal) effects and also limits the frequency of use during any one year.

Deferment is defined as a period of non-grazing during part of the growing season. There are several benefits to upland and riparian vegetation with application of deferred grazing. This type of system provides flexibility to change the timing, frequency, and intensity of grazing on an annual basis. The frequency and severity of defoliation of individual plants and species of plants varies depending on preference and availability. In a given grazing season, the result is that most preferred plants would be defoliated more frequently or severely than less preferred plants. With variations in the season of use there is decreased likelihood of multiple defoliations of desired plants species, allowing for longer periods of plant recovery. In general, the year to year variability in pasture use under a deferred rotation grazing system would protect the phonological stages of plant species and improve species compositions. Plant vigor would be increased and species recruitment would improve.

Deferred grazing has been successful in restoring and improving riparian areas (Wyman et al. 2006). The season of grazing is important factor for willow recovery. Kovalchik and Elmore (1991) documented that early season upland grasses have crude protein levels of 15-17 percent, but levels fall below 5 percent as grasses mature. As this occurs, cattle increase the amount of available palatable forbs and browse in their diets and soon move into the riparian zone. In the spring, cattle often avoid riparian zones because of the cold temperatures, soil wetness, and forage immaturity (Kruger 1983). Therefore, spring grazing can encourage cattle to graze uplands where forage maturity and climate are more favorable compared to the riparian zone (Platts 1984). As a result, spring-grazed riparian zoned have less than half the cattle occupancy compared to fall use (Kruger 1983). As spring grazing precludes late-summer use, willow browsing is light and seedling survival high (Kovalchik and Elmore 1991).

Riparian Pastures

All action alternatives propose to construct riparian pastures. The quantity and location of pastures varies by alternative. With riparian pastures there is closer management and control to achieve goals and objectives (Wyman et al. 2006).

In the project area, pastures along Lake Creek, Big Creek, Summit Creek, and West Fork Summit Creek contain a mix of riparian and upland vegetation. The riparian zones within the pasture are much different from the terrestrial systems, making management of the riparian systems difficult. Livestock are selective grazers, therefore the frequency and severity of defoliation of individual plants or species of plants varies depending on preference and availability. The result is that most preferred plants would be defoliated more frequently or severely than less preferred plants. Because of this preference livestock tend to concentrate in the riparian areas, making management of the frequency and intensity of use in these areas a challenge. Use levels and move triggers in the riparian portion of units have historically been reached before authorized forage in upland areas can be utilized.

Rest

All alternatives include rest as part of proposed management. All alternatives proposed resting of riparian pastures or riparian exclosures. Alternatives 2 and 4 propose rest as part of the grazing system (termed periods of non-scheduled rest and deferment). In most cases, rest is proposed as part of the management strategy to meet riparian area recovery objectives. The length of rest proposed in all action alternatives for the West Bosenberg, West Lake Creek, and West Summit Recovery unit pastures is 3 to 5 years. After this period of rest, grazing would resume with management strategies that vary between action alternatives (effects of rest are similar to those discussed under alternative 1, no grazing.)

In all action alternatives rest would benefit vegetation recovery. With rest, “plants are not affected by herbivory, and streambanks are not affected by livestock trampling. Woody riparian plants are allowed to reach escapement height. There is quick recovery period, especially in the first few years after grazing is eliminated (Wyman et al. 2006).” Rest or non-use may be one of the best methods for rapid improvement

of woody plant regeneration (Davis 1982). Grinder et al. (1995) referenced Manning and Padgett (1995) who noted that while there is not data that specifically state how long it will take a community to change from unsatisfactory to satisfactory condition, the amount of time it takes to move toward the desired future condition can be decreased through increased rest.

Skovin (1984) found that exclusion of livestock had produced improved riparian and aquatic habitat following 4 to 7 years of rest, woody plant (shrub) recovery following 5 to 8 years of rest. A study in northern Utah concluded that a minimum of 6 to 8 years of rest was necessary to restore a deteriorated streamside riparian area to the point where livestock grazing would be allowed at reduced levels (Duff 1983). However, recovery of streambanks and vegetation was observed following 4 years of rest from grazing.

Adaptive Management

All actions alternatives are based on "adaptive management," a process that uses monitoring information to determine if management changes are needed. Adaptive management strategies proposed for each alternative are shown in appendix A (Table 104). Strategies have been identified to ensure that riparian recovery objectives are met with specified timeframes. Short-term objectives for riparian areas are primarily focused on vegetation recovery. Specific recovery objectives for the streams in the project area are identified by stream reach and pasture (see appendix A Table 103). If monitoring indicates that specific objectives are not being achieved, at any given time the Line Officer can choose to apply the analyzed adaptive strategy to reduce delays in recovery timeframes. Specific adaptive management strategies with their potential effects are described below:

- Changes in use levels of riparian areas (herbaceous forage use, bank alteration, shrub use) – An increased rate of riparian vegetation recovery is expedited by decreasing the grazing intensity.
- Rest or exclusion of riparian areas from grazing – Rest would benefit vegetation recovery. With rest, plants are not affected by herbivory, and streambanks are not affected by livestock trampling. Woody riparian plants are allowed to reach escapement height. There is quick recovery period, especially in the first few years after grazing is eliminated. Rest or non-use may be one of the best methods for rapid improvement of woody plant regeneration (Davis 1982). Padgett (1995) noted that while there is not data that specifically state how long it would take a community to change from unsatisfactory to satisfactory condition, the amount of time it takes to move toward the desired future condition can be decreased through increased rest, lower utilization levels, and/or rehabilitation.
- Fencing to create riparian pastures – Construction of fences would have minimal ground effects to vegetation. With riparian pastures there is closer management and control to achieve goals and objectives (Wyman et al. 2006). Each riparian pasture may be managed individually or rested depending on current conditions.

Logan Valley Allotment

All action alternatives would combine the Big Creek portion of East Lake Creek, North Big Creek and South Big Creek units into one large riparian unit. These units are currently being grazed as a single unit which is allowing riparian recovery with noted improvement in density, cover, and composition of stabilizing riparian vegetation species (i.e. sedges and rushes). Removal of fences to combine the pastures is expected to continue the upward recovery trend in vegetation.

Over the last several years a section of electric fence (0.3 miles) has been maintained in the North Fork unit to exclude livestock grazing from Big Creek. All alternatives would replace the electric fence with a permanent let-down fence. The permanent fence would continue to protect the Big Creek Riparian area and effectively distribute livestock into the upland portions of the unit.

The Lake Creek and North Fork units of the McCoy Creek allotment would be absorbed into the Logan Valley allotment (approximately 267 acres). The Lake Creek unit would remain as an individual unit and North Fork unit would be absorbed into the Flat Field unit for better livestock distribution. A larger unit would improve distribution of forage use (effects to vegetation are similar to those in the Effects Common to All Action Alternatives, Deferred Rotation Grazing).

McCoy Creek Allotment

A deferred rotation grazing system would be applied throughout the allotment (see Deferred Rotation Grazing System under Effects Common for additional effects analysis). This grazing system provides for a systematic rotation of deferment among units and provides flexibility to change the time of year when units would be used.

To develop pasture sizes and configurations that will facilitate a rotation of deferment several unit and allotment boundary changes are proposed. The Dry and Ridge units of the allotment would be combined into a single unit as currently managed and would be identified as the Ridge unit.

The Lake Creek and North Fork units (267 acres) of the McCoy Creek allotment would be absorbed into the Logan Valley allotment. Due to past private land fencing, these pastures are geographically isolated from the main allotment and are best suited for management with the adjacent allotment. This would also decrease fence maintenance.

The Starvation unit (53 acres) would be removed from the McCoy Creek allotment as it is geographically isolated from the main allotment. This area may be added to the Dollar Basin allotment in the future. A separate environmental analysis would be required to add this area to the Dollar Basin allotment.

Summit Prairie Allotment

All the action alternatives propose enlarging the Little Logan unit by adding the Front Field unit (52 acres) from the Logan Valley allotment. The larger unit would provide a larger landscape for better livestock distribution. The Front field unit does not have adequate water for livestock and the Little Logan unit has adjacent water sources. Improve livestock water availability is expected to improve use distribution and continue recovery of forage conditions.

Rangeland Management (All Allotments)

Grazing Use Levels

The proposed stubble heights in upland areas are the same for all action alternatives. Allowable use levels of herbaceous forage for the action alternatives are displayed in detail in appendix E of the EIS.

The values or stubble heights adjacent to the stream edge (greenline) in each alternative vary by stream reach and were based on the departure of the existing condition to the desired condition. Best available science was considered for establishing allowable use levels of forage along the greenline. The forage use levels (required endpoint stubble heights) that are proposed along the greenline are generally higher in alternatives 3 and 4 than proposed in alternative 2, ranging from 4 to 7 inch stubble heights. Requiring higher stubble heights in the area along the edge of the stream will result in some direct loss of available forage. More restrictive stubble heights along the greenline may compound problems in pastures where forage use levels in the riparian portions of units have been historically been reached before authorized forage in upland areas. Separating the riparian and uplands into separate pastures (riparian pastures) provides an opportunity to better utilize forage in the uplands and allows for closer management and control to achieve recovery of riparian areas.

Forage Production and Animal Unit Months (AUMs)

All action alternatives propose to retain the currently permitted AUMs. The analysis of available forage and stocking rates for each alternative (Table 60) indicates that adequate forage is available to support AUMs at these levels. The ability to utilize permitted forage in the allotments is dependent on several factors. These include:

- The proposed grazing strategies of each alternative to achieve the management objectives and long term desired conditions for specific riparian areas (See appendix A, Table 102 and Table 103).
- The ability to utilize upland forage before move triggers and allowable use levels are reached in riparian areas. Specific move triggers for each alternative are listed in appendix E.
- The amount of wildlife forage use. Wildlife use is factored into Forest Plan grazing utilization standards. When use levels are achieved, regardless of the type of use (i.e. livestock or big game), livestock are moved out of the pasture.
- Yearly weather conditions. Available forage is reduced during drought years.

The AUMs proposed are maximum limits and may be adjusted to allow flexibility for annual adjustment of both numbers and/or season based on the above factors. The action alternatives identify the permitted livestock numbers (an average number of livestock) and the average season of use which includes the earliest possible "on" dates related to range readiness and the latest dates that livestock are permitted to be on the allotment. Flexibility that allows for annual adjustments provides a management tool to assure that riparian and rangeland objectives are met.

Table 60. Forage production and AUM summary by alternative

Allotment	Measure	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Proposed AUMs
		Total	Total	Total	Total	
Lake Creek	Acres	0	5,069	10,196	9,459	
	Allocated Forage		2,275,922	4,382,366	4,055,049	
	AUMS	0	0	0	0	0
Logan Valley	Acres	0	4,359	3,971	4,359	
	Allocated Forage		4,329,288	4,164,989	4,329,288	
	AUMS	0	5,550	5,340	5,550	1,983
McCoy Creek	Acres	0	660	660	660	
	Allocated Forage		775,585	775,585	775,585	
	AUMS	0	994	994	994	416
Summit Prairie	Acres	0	29,832	25,383	25,383	
	Allocated Forage		8,030,701	7,109,413	7,111,601	
	AUMS	0	10,296	9,115	9,117	1,546

Areas where grazing is not allowed in the Forest Plan (i.e. developed campgrounds, Lake Creek Youth Camp) were removed from the forage analysis. The forage estimates were generated using the average pounds per acres for each pasture shown in Table 59. Where pastures were combined a weighted average of pounds per acre was use. Some areas not capable or suitable for grazing were still included in the forage analysis acre which results in a slight over-prediction of the amount forage that would be available

for grazing (See Table 57). The over prediction in forage is mostly compensated for by using a 45 percent use level for all vegetation types (forested, grasslands, and shrublands). The Forest Plan allows higher use levels in grasslands (55 percent) and shrublands (50 percent) which would allow higher use of forage by livestock than the analysis estimates.

Management Practices

Implicit in all action alternatives is active livestock management, with distribution tools, (including additional infrastructure). Each alternative prescribes a series of actions that include physical changes (such as constructing new water developments, fences and changes in allotment/pasture boundaries and configurations) to address the site specific concerns within the planning area.

Management practices may affect cattle distribution. Neither salt placement nor alternate water location away from riparian zones influenced the use of riparian areas appreciably in a study by Bryant (1982). Bryant found that the best alternative for rapid restoration of streamside riparian zones is fencing. A study by Workman indicated that cost effective measures for improving distribution were spring development, salting (18.6 percent improvement) and herding (20 percent improvement), but that fencing was not cost effective (Workman and Hooper 1968). It may be concluded from these seemingly contradictory study results that water development and salting are effective methods of improving distribution, but by themselves may not be adequate to obtain desired levels of use on riparian areas. Fencing may change the location of excessive use from one site to another, but does little for overall distribution. Fencing may be cost effective if it provides for implementation of improved grazing systems which improve timing and duration of use more than distribution. Salting practices have been utilized for many years and, with few exceptions, appear to be effective to improve livestock distribution, especially on gentle slopes within the project area. Activities proposed are expected to improve livestock forage use and distribution in upland areas while allowing rest and lower use levels in riparian areas.

Fence Maintenance

Fence maintenance would be required as part of the term grazing permit. All action alternatives propose to construct new fences which would increase the miles of fence maintenance required by the permittee. Fence maintenance requirements include replacement or splicing of broken wires, removal of trees or limbs that have fallen across the fence, and replacement of deteriorated wood pieces and structures. The time and cost of completing fence maintenance repairs depends on the terrain (steep or gentle slopes, accessibility (access by ATV or vehicle), age or state of deterioration of the fence, and vegetation type (timbered or grassland). Year to year maintenance needs can vary based on weather conditions. High winds can increase the number of down trees or limbs that fall across the fence. Cold weather and heavy snows can increase wire breakage and structural damage.

Adaptive Management

Specific adaptive management strategies with their potential effects to rangeland management are described below:

- **Changes in use levels in riparian areas** (herbaceous forage use, bank alteration, shrub use) – The duration of grazing riparian areas may decrease. The amount of forage available for livestock in the unit may also decrease. Decreased forage availability in riparian areas may also reduce forage utilization in upland areas that are part of the same pasture unless strategies that attract livestock away from the riparian area or herding techniques such as range riding that control livestock distribution are used. Frequent riding and herding of livestock may increase utilization of the upland and decrease grazing pressure in the riparian area (Wyman et al. 2006). Labor intensive management techniques such as range riding would potentially increase grazing operator costs.

- **Rest or exclusion of riparian areas from grazing** - Rest or livestock exclusion may impose additional economic hardship (Wyman et al. 2006) on the grazing operator with reduced land base and forage available for grazing.
- **Fencing to create riparian pastures**- Construction of fences and fence maintenance could increase operation costs to the grazing operator. See Social Economic section for more detail.

Cumulative Effects

Several ongoing projects in the Summit Logan Valley Grazing Authorization project area would provide additive benefits when combined with the actions proposed in the action alternatives. The specific ongoing projects and their effects are described in Table 61. Additional cumulative effects discussions are provide for each specific alternative.

Table 61. Ongoing allotment activities

Project Name	Specific Management Technique and General Effects
Logan Valley Allotment	
Big Creek Fence and Water-Gap Creates West Bosenberg Riparian pasture	Constructing a riparian pasture would protect riparian values. The pasture would provide closer management and control to achieve riparian goals and objectives. In the pasture may be managed individually or rested depending on resource conditions. Depending on the type and level of management in the riparian pasture there may be a loss of forage to the livestock operator. For this specific fence construction costs and maintenance labor costs would be incurred by a Forest Service partner. The water gap in the fence would maintain access to Big Creek from the adjacent upland unit for watering. The water gaps would limit access to only a few feet of the stream (approximately 20 feet) minimizing streambank impacts. The water gap would be hardened with rock material to reduce hoof impacts.
Big Creek & Lake Creek Off-Site Water Source	Water developments would provide key water in units that currently lack distributed water sources, and/or units where the available water from streams would be excluded by fences (i.e., exclosures and riparian pastures). Water developments would reduce livestock concentrations in riparian areas allowing recovery of vegetation and aquatic habitat. Water developments would improve livestock distribution and more uniform utilization of forage in the uplands. In some upland pastures operators have not been able to utilize available forage because move triggers and utilization levels in riparian areas are reached first. Improved water and livestock distribution would provide better utilization of forage in some upland pastures.
West Lake Creek Riparian Fence Creates West Lake Creek Riparian pasture	The effects would be similar to the Big Creek Fence (Bosenberg Riparian Pasture). Effects that are different include: Fence maintenance labor costs would be incurred by the grazing permittee. Water gaps would not be constructed.
Big Creek and Lake Creek Riparian Hardwood Planting	Planting of hardwood would increase the rate of willow recovery on Big Creek and Lake Creek. Expediting recovery would improve vegetation resiliency, allowing the pastures to be managed for grazing in the future.
Ongoing Activities in the McCoy Creek Allotment	
Lake Creek Unit Division Fence Reconstruction	Fencing would control livestock movement and distribution to protect critical bull trout habitat. Fence maintenance labor costs would be incurred by the grazing permittee.
Lake Creek Fence and Water-Gap	Riparian exclosure fence to exclude livestock from this portion of Lake Creek to allow vegetation and stream channel recovery while also providing a functional water source to livestock. Constructed water-gap would maintain livestock water to upland portions of the unit. The fence maintenance labor costs would be incurred by a Forest Service partner.
Lake Creek Willow Gallery Fence	Riparian exclosure to provide protection of a willow gallery along Lake Creek. The stream is being utilized by beaver and is critical habitat for bull trout. The fence maintenance labor costs would be incurred by a Forest Service partner.

Project Name	Specific Management Technique and General Effects
Big Creek & Lake Creek Off-Site Water Source	See Big Creek & Lake Creek Off-Site Water Source (above)
Lake Creek Riparian Hardwood Planting	See Big Creek and Lake Creek Riparian Hardwood Planting (above)
Ongoing Activities in the Summit Prairie Allotment	
West Fork Summit Creek Fence and Water Gap Creates West Summit Creek Riparian pasture	Constructing a riparian pasture would protect riparian values and improve degraded stream bank conditions. The pasture would provide closer management and control to achieve riparian goals and objectives. In the pasture may be managed individually or rested depending on resource conditions. Depending on the type and level of management in the riparian pasture there may be a loss of forage to the livestock operator. For this specific fence construction costs and maintenance labor costs would be incurred by a Forest Service partner. The water gap in the fence would maintain access to the stream from the adjacent upland unit for watering. The water gaps would limit access to only a few feet of the stream (approximately 20 feet) minimizing streambank impacts. The water gap would be hardened with rock material to reduce hoof impacts. Fence maintenance labor costs would be incurred by the grazing permittee.
West Fork Summit Creek Parallel Tree Felling	Barriers formed by placing trees and brush on the edge of the stream would discourage livestock use and help stabilize eroding streambanks. Felled trees would protect established hardwoods and other riparian plant communities from livestock and ungulate use.
Little Logan Willow Restoration	Riparian exclosure and caging would improve age class and height development of willows on Summit Creek.
Sagehen Stock Ponds	Ponds would help reduce impacts of livestock on Summit Creek by providing functional water sources in the uplands.

Alternative 2 - Proposed Action

Direct and Indirect Effects

Rangeland Vegetation

Lake Creek Allotment

Approximately 4,733 acres of the Lake Creek Allotment would remain vacant. Effects to rangeland forage would be same similar to those described under alternative 1, no action.

Logan Valley Allotment

Portions of the Lake Creek and McCoy Creek allotments would be absorbed into the Logan Valley allotment. The larger landscape (which is made up of larger grazing units) would be managed with periods of rest or deferment during the season of use. The grazing system would allow changes in the timing, frequency, and intensity of grazing which benefit both upland and riparian plant species development and vigor (effects to vegetation are similar to those in the Effects Common to All Action Alternatives, Deferred Rotation Grazing).

The portions of the Lake Creek allotment absorbed into the Logan Valley Allotment have not been grazed since 1988. Initiation of the proposed use levels would keep grass vegetation vigorous by removing the

decadence (wolfiness) from the plants which would increase the photosynthetic surface and the plants ability to synthesize carbohydrates. This would increase root mass as well as plant mass.

Summit Prairie Allotment

The addition of approximately 4,449 acres from the Lake Creek allotment to the Summit Prairie allotment would allow periods of rest or deferment during seasons of use. Rangeland vegetation would benefit from periods of rest and deferment in the season of grazing. Effects to vegetation are similar to those in the Effects Common to All Action Alternatives, Deferred Rotation Grazing.

A new fence could be constructed to configure the new Bosenberg unit added from the Lake Creek allotment. Big Creek and Corral Basin Creek would not be included within the new unit. To ensure adequate protection of Bosenberg Creek and other streams in the unit, riding to move livestock away from riparian areas into the uplands would be required. Ponds or springs would be developed in the uplands to provide alternative water away from the streams. The new water developments would facilitate desired cattle distribution in the upland by providing more water in appropriate locations. Upon establishment of the new fences in the allotment, the Bosenberg, Sagehen, and Little Logan units would be rested 3 years out of the 10 year period. This would provide a period of non-use or rest to allow desired vegetation composition and stream channel characteristics to maintained or improved. Until completion of the new boundary fences, the Sagehen unit would continue to be grazed early season with reduced numbers. Herbaceous vegetation recovery has been observed since management was changed in 2008 to early season with reduced numbers. See aquatic habitat specialist report, located in the project record, for more detail.

The Lake Creek allotment has not been grazed since 1988. Initiation of proper grazing would have positive effects to plant physiology including increased photosynthesis, increased tillering, reduced shade, reduction of excessive mulch accumulations that may be inhibiting growth (Holecheck et al. 1989).

Rangeland Management

Forage Production and Animal Unit Months (AUMs)

Alternative 2 proposes to retain the currently permitted AUMs. The AUMs proposed are maximum limits and may be adjusted to allow flexibility for annual adjustments of both numbers and/or season.

The analysis of available forage and stocking rates in Table 62 indicates that adequate forage is available to support AUMs at levels currently permitted with proposed allotment boundary and management changes. The table shows acres, available forage, and AUMS that would potentially be grazed on average over the next 10 years with the minimum rest requirements. Even with proposed minimum rest requirements, the analysis indicates that adequate forage would be available to support proposed AUMS.

Table 62. Alternative 2 available forage and AUMs

Allotment	Pasture	Acres	Available Forage	Available AUMs	Minimum Rest Requirements (Table 63 and Table 64)		
					Acres Grazed Per Year	Available Forage Per Year	AUMS
					10 Year Average		
Lake Creek	Corral Basin	2430	987431	1266	0	0	0
	McCoy Creek	2639	1288492	1652	0	0	0
	Total	**5069**	**2275922**	**2918**	**0**	**0**	**0**
Logan Valley	Big Creek Riparian	623	710968	911	436	497677	638
	West Lake Creek Riparian Pasture	135	12332	16	81	7399	9
	West Lake Creek	271	24756	32	271	24756	32
	East Lake Creek	399	448875	575	399	448875	575
	W. Bosenberg	269	234595	301	269	234595	301
	West Bosenberg Riparian Pasture	14	12209	16	8	7326	9
	East Bosenberg	118	59844	77	118	59844	77
	Corral Holding	22	14593	19	22	14593	19
	Lower Field	283	242984	312	283	242984	312
	Big Field	1024	1398528	1793	1024	1398528	1793
	Lake Creek	218	159216	204	218	159216	204
	Deardorff	388	164299	211	388	164299	211
	Flat Field	595	846090	1085	595	846090	1085
	Total	**4359**	**4329288**	**5550**	**4113**	**4106181**	**5264**
McCoy Creek	Cow Camp	157	37162	48	157	37162	48
	Ridge (Combined Ridge/Dry)	292	199202	255	292	199202	255
	Government Flat	211	539221	691	211	539221	691
	Total	**660**	**775585**	**994**	**660**	**775585**	**994**
Summit Prairie	Bosenberg	4449	1807851	2318	3114	1265496	1622
	Sagehen	3767	1695	2	2637	1187	2
	Crane Rock	7838	2419591	3102	7838	2419591	3102
	Little Logan	3270	899087	1153	2289	629361	807
	Summit Rock	10222	2778340	3562	10222	2778340	3562
	North Summit	195	91787	118	195	91787	118
	South Summit	45	9437	12	45	9437	12
	West Summit Holding	27	13450	17	27	13450	17
	West Summit Recovery Unit	19	9465	12	11	5679	7
	Total	**29832**	**8030701**	**10296**	**26379**	**7214325**	**9249**

Lake Creek Allotment

Approximately 4,778 acres of the Lake Creek allotment would be added to the Logan Valley and Summit Prairie allotments. The remaining 5,069 acres of the Lake Creek allotment would continue to be vacant and not managed for livestock grazing. Effects for the vacant acres would be the same as that described under the No Action alternative (alternative 1).

Logan Valley Allotment

The Logan Valley allotment would have a larger landscape (gain of 603 acres) for grazing with no net gain in number of grazing units allowing a change from a deferred rotation grazing system to a system that includes rest and deferment. Although there would be an overall increase in allotment acres, there is no proposed change in currently permitted AUMs. The objective of alternative 2 is to increase flexibility in allotment management to adapt to future changes. The acres added from the Lake Creek and McCoy Creek allotments would increase the overall forage available in the allotment, which would help offset forage losses with resting pastures. The majority of rest would occur in units with riparian habitat. The following table shows the minimum rest requirements for the units in the allotment.

Table 63. Logan Valley allotment minimum rest requirements

Unit	Unit Acres	Required Rest
West Bosenberg Riparian pasture	14	Rest would occur for 3-5 years after the fence is constructed (estimated 2013) and willows are planted. Grazing would resume after management objectives have been achieved, with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed.
West Lake Creek Riparian pasture	135	Rest would occur for 3-5 years after the fence is constructed (estimated 2013 or 2014) and willows are planted. Grazing would resume after willows have established, with rest (season long rest) required 3 years out of a 10 year period.
Big Creek Riparian pasture	623	Rest 3 years out of 10 year period (season long rest).
Acres Rested or Not Grazed on an Annual Basis (Average)	246	Note: Average is based on the minimum rest requirements listed above.

Approximately 2.8 miles of additional fences would be constructed and 2.3 miles removed with implementation of alternative 2.

Summit Prairie Allotment

To ensure adequate protection of Bosenberg Creek and other streams in the Bosenberg unit, riding would be required to maintain livestock concentrations in the uplands. A rider may be able to train cows and calves to use uplands and discourage their use of riparian areas by consistently moving them away from riparian area to other locations. When cattle are regularly herded from riparian areas to uplands, generally the best practice is to herd cattle away from the stream after they have watered. Some research has found that herding combined with strategic placement of desirable supplement appears to be even more effective in attracting cattle to graze previously underutilized areas. Herding lessens impacts on riparian areas and provides better distribution of livestock. Better distribution increases useable forage and thus capacity of a pasture or allotment. It may also result in the ability to keep livestock in management units longer because they spend less time in riparian area. Use of a rider would be an economic impact to the permittee.

Table 64. Summit Logan allotment minimum rest requirements

Unit	Unit Acres	Required Rest
Sagehen	3,767	3 years out of 10 year period (season long rest).
West Summit Recovery unit (temporary fence)	19	Rest would occur for 3-5 years after the fence is constructed (estimated 2013). Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
Bosenberg	4,449	Rest 3 years out of 10 year period (season long rest).
Little Logan	3,270	Rest 3 years out of 10 year period (season long rest).
Acres Rested or Not Grazed on an Annual Basis (Average)	3,453	Note: Average is based on the minimum rest requirements listed above.

Approximately 7.0 miles of new fence would be constructed and 0.7 miles removed with implementation of alternative 2.

Cumulative Effects to Rangeland Vegetation and Rangeland Management

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on rangeland vegetation and rangeland management. Past activities such as timber harvest, road construction, fire suppression, grazing, and wildfire have combined to create the current condition in the analysis area. See Affected Environment discussions.

The effects of several ongoing projects in the Summit Logan project area were considered cumulatively with the effects of actions proposed in the alternatives. The specific ongoing projects and their effects are described in Table 61.

Logan Valley Allotment

In the Logan Valley allotment the combination of ongoing off-site water developments in upland areas and construction of the West Bosenberg and West Lake Creek riparian pastures would allow riparian area recovery while still allowing upland areas to be grazed (See Table 61). Proposed resting of riparian pastures in alternative 2 would improve herbaceous vegetation and hardwood recovery (see Aquatic report for specific details). Ongoing off-site water developments (See Table 61) in upland areas in combination with proposed actions in alternative 2 would provide better water distribution and opportunities to defer the season of grazing providing for better livestock distribution and even forage utilization. Riparian areas generally receive heavier grazing use than upland areas. Separating the riparian and uplands into separate pastures provides for closer management and control to achieve recovery of riparian areas.

The availability of livestock water in Logan Valley allotment has been problem, limiting the opportunity to vary the season of grazing within the allotment. Improved water distribution and providing late season water in some pastures would provide greater flexibility in grazing rotations and season of use to adapt to resource needs in the future. The ongoing or foreseeable construction of the West Bosenberg and West Lake Creek riparian pastures facilitates the ability to rest riparian pastures as proposed in alternative 2 which would be beneficial to vegetation recovery. With rest, plants would not be affected by herbivory. Willows and other woody riparian plants would be allowed to reach escapement height (See Effects Common to All Action Alternatives under Deferred Rotation Grazing, Riparian Pastures, and Rest).

Riparian areas in the Logan Valley allotments are productive forage areas and resting or excluding these acres from grazing will reduce the amount of forage available to livestock which may pose economic hardship to the grazing operators in the short-term. Alternative 2 adds acres from the vacant Lake Creek and McCoy Creek allotments to the Logan Valley allotment. By adding these additional acres it helps offset the economic impacts of periodically resting areas within the allotment (see minimum rest requirements). The areas being added from the Lake Creek allotment exclude areas containing occupied bull trout habitat in Lake Creek, Big Creek, Corral Basin Creek, and Bosenberg Creeks. These areas would continue to remain vacant (no grazing) in the Lake Creek allotment.

The Big Creek and Lake Creek Riparian Hardwood project would plant willows in the West Bosenberg and West Lake Creek riparian pastures which is expected to expedite the rate of recovery in these areas. With accelerated vegetation recovery the time needed for rest may be reduced, thereby lessening the economic impact to the grazing operators. Grazing would resume in these areas after management objectives for respective riparian area have been achieved.

Areas that were thinned and underburned in the Merit project over the last decade in the vacant Lake Creek allotment would be added to the Logan Valley allotment. Thinning and fuel treatments reduced debris on the forest floor and density of tree thickets. Past wildfires reduced dense tree canopies and excessive down material. Vegetative conditions have recovered from past wildfires. The combined effect of thinning, underburning, and past wildfires has increased water, sunlight and nutrients available to grasses and shrubs, thereby improving forage conditions. Adding areas thinned and underburned from the Lake Creek allotment to the Logan Valley allotment would provide additional forage for livestock. Several vegetation restoration activities are ongoing in the Logan Valley allotment with the Logan Valley Meadow/Grassland Enhancement/Aspen Restoration Project. This project includes removal of encroaching conifers in meadows, underburning, commercial thinning, and aspen restoration on more than 300 acres in the Logan Valley area which is expected to increase the forage production potential for livestock and big game. Restoration activities exclude livestock grazing within approximately 18 acres of aspen. As a whole, activities in the Merit project combined with activities in the Logan Valley Meadow/Grassland Enhancement/Aspen Restoration project are expected to increase available forage and forage production in the Logan Valley allotment.

Approximately 2.8 miles of additional fences would be constructed and 2.3 miles removed with implementation of alternative 2. Ongoing projects listed in Table 61 would add an additional 2.8 miles of fence. Combined a total of 5.2 miles of fence would be constructed, of which 4.8 miles would be permittee maintenance responsibility. The other 0.4 miles of fence would be maintained by a Forest Service Partner. The miles of proposed fence construction combined with fence construction in ongoing projects would increase the fence maintenance responsibilities and operational costs of the grazing operator (permitee). See Effects Common to All Action Alternatives under Fence Maintenance.

McCoy Creek Allotment

Several range/aquatic projects are ongoing in the McCoy Creek allotment. These include the Big Creek & Lake Creek Off-Site Water Source project that would be beneficial to grazing operations by providing water in upland portions of units that currently lack water sources or where available water from streams would be excluded by exclosures constructed in the Lake Creek Fence (with water gap) and Lake Creek Willow Gallery Fence projects. Providing water in the uplands affords most of Lake Creek in the McCoy Creek allotment to be excluded from grazing allowing recovery of vegetation and aquatic habitat. Water development projects would improve livestock distribution and more uniform utilization of forage in the uplands. Having upland water also facilitates the proposed deferred rotation grazing system allowing the rotation and season of use to be adjusted. There are several benefits to upland and riparian vegetation with application of deferred grazing. In general, the year to year variability in grazing pasture use under a

deferred rotation grazing system would protect the phonological stages of plant species and improve species compositions. Plant vigor would be increased and species recruitment would improve. (See Effects Common To All Action Alternatives under Deferred Rotation).

The Big Creek and Lake Creek Riparian Hardwood project would plant willows along Lake Creek riparian pastures which is expected to accelerate willow recovery in these areas. Grazing would resume in these areas after management objectives for respective riparian area have been achieved.

Summit Prairie Allotment

Several ongoing projects would continue to be implemented in the Summit Prairie allotment (see Table 61). The combination of ongoing projects and proposed actions proposed in alternative 2 would improve livestock water availability (Sagehen Stock ponds) and livestock distribution and riparian recovery in the Sagehen unit (see Aquatic report for specific details). This is especially important because the operators have not been able to utilize available upland forage because move triggers and utilization levels in Summit Creek riparian areas are generally reached first.

Creation of the West Summit Creek riparian pasture with scheduled rest for 3 to 5 year period plus parallel tree felling (see Table 61) will aid in vegetation and stream channel recovery of West Fork Summit Creek (see Aquatic report for specific details).

Resting of the West Summit Creek riparian pasture combined with periodic rest of the Little Logan, Sagehen, and Bosenberg units (3 years out of 10) would result in a loss of forage and potential economic impact on the grazing operators. The riparian areas within these units are productive forage areas. The economic impacts of proposed rest of grazing units containing Summit Creek and West Fork Summit Creek would be offset by adding the Bosenberg unit from the vacant Lake Creek allotment (approximately 4,449) acres to the Logan Valley allotment..

Approximately 7.0 miles of additional fences would be constructed under the implementation of alternative 2. Ongoing projects listed in Table 61 would add an additional 0.3 miles of fence. Combined a total of 7.3 miles of fence would be constructed. Maintenance of all new fences constructed would be the permittee responsibility which would increase operational costs. See Effects Common to All Action Alternatives under Fence Maintenance.

Alternative 3

Direct and Indirect Effects

Rangeland Vegetation

Lake Creek Allotment

All of the Lake Creek Allotment would remain vacant. The effects of alternative 3 would be the same as no action (alternative 1).

Logan Valley Allotment

No acres from the vacant Lake Creek Allotment would be added to the Logan Valley Allotment.

Approximately 267 acres from the Lake Creek and North Fork units of the McCoy Creek allotment would be absorbed into the into the Logan Valley allotment. See effects Common to All Action alternatives.

The grazing system would not change from current management. Livestock would generally move from unit to unit with opportunities to defer the season of use on an annual basis. Opportunities to utilize more

uplands of the allotment would improve with water source development (See cumulative effects discussions).

Summit Prairie Allotment

This alternative would create several riparian pastures and exclosures on Summit creek and West Fork Summit Creek. Portions of Summit Creek in the Sagehen unit would be fenced into riparian pastures (29 acres) and riparian exclosure (8 acres). The riparian pasture (Sagehen Riparian Pasture) would be rested for 3-5 years after the fence is constructed. The constructed Lower Little Logan Riparian Pasture (87 acres) and Upper Little Logan Riparian Pasture (15 acres) would be rested the same as the Sagehen riparian pasture. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. Within the fenced areas the density, cover and composition of stabilizing riparian vegetation species (i.e. sedges and rushes) are expected to improve. Water gaps would be constructed into the riparian pastures and exclosures on Summit Creek to provide access to water from upland pastures. Management objectives for each of the reaches on Summit Creek and West Fork Summit Creek are identified in appendix A (Table 103). A primary objective in the Sagehen and Little Logan unit is to expand willow species shrub density and heights across the floodplain over the next 5 to 10 years. Excluding livestock use is expected allow recovery to meet these objectives. See Aquatic report for specific details.

Recovery in upland areas of these units is expected with application of proposed use levels. Forage use in upland areas should increase with riparian portions of the units being removed and fenced into exclosures and riparian pastures. With current management, use levels in riparian areas has been a limiting factor with use levels and move triggers being reached before allocated forage in upland areas can be utilized.

The North Summit Riparian pasture (87 acres) would be created containing Summit Creek in the North Summit unit. The riparian pasture would be rested for 3-5 years after the fence is constructed with an objective of improving the greenline vegetation and streambank stability.

Rangeland Management

Forage Production and Animal Unit Months (AUMs)

Alternative 3 proposes to retain the currently permitted AUMs. The AUMs proposed are maximum limits and may be adjusted to allow flexibility for annual adjustments of both numbers and/or season.

The analysis of available forage and stocking rates in Table 65 indicates that adequate forage is available to support AUMs at levels currently permitted with proposed allotment boundary and management changes. The table shows acres, available forage, and AUMS that would potentially be grazed on average over the next 10 years with the minimum rest requirements. Even with proposed minimum rest requirements, the analysis indicates that adequate forage would be available to support proposed AUMS.

Table 65. Alternative 3 available forage and AUMs

Allotment	Pasture	Acres	Available Forage	Available AUMs	Minimum Rest Requirements (Table 66 and Table 67)		
					Acres Grazed Per Year	Available Forage Per Year	AUMS
					10 Year Average		
Lake Creek	Bosenberg	6970	2832260	3631	0	0	0
	Horse Pasture	90	18954	24	0	0	0
	McCoy Creek	3136	1531152	1963	0	0	0
	Total	**10196**	**4382366**	**5618**	**0**	**0**	**0**
Logan Valley	Big Creek Riparian	623	710968	911	623	710968	911
	West Lake Creek Riparian Pasture	135	12332	16	81	7399	9
	West Lake Creek	271	24756	32	271	24756	32
	East Lake Creek	399	448875	575	399	448875	575
	W. Bosenberg	269	234595	301	269	234595	301
	West Bosenberg Riparian Pasture	14	12209	16	8	7326	9
	East Bosenberg	118	59844	77	118	59844	77
	Corral Holding	22	14593	19	22	14593	19
	Lower Field	283	242984	312	283	242984	312
	Big Field	1024	1398528	1793	1024	1398528	1793
	Lake Creek	218	159216	204	218	159216	204
	Flat Field	595	846090	1085	595	846090	1085
	Total	**3971**	**4164989**	**5340**	**3911**	**4155173**	**5327**
McCoy Creek	Cow Camp	157	37162	48	157	37162	48
	Ridge (Combined Ridge/Dry)	292	199202	255	292	199202	255
	Government Flat	211	539221	691	211	539221	691
	Total	**660**	**775585**	**994**	**660**	**775585**	**994**

Allotment	Pasture	Acres	Available Forage	Available AUMs	Minimum Rest Requirements (Table 66 and Table 67)		
					Acres Grazed Per Year	Available Forage Per Year	AUMS
					10 Year Average		
Summit Prairie	Sagehen	3730	879534	1128	3730	879534	1128
	Sagehen Exclosure	8	1886	2	0	0	0
	Sagehen Riparian Pasture	29	6838	9	17	4103	5
	Crane Rock	7838	2419591	3102	7838	2419591	3102
	Little Logan	3191	877365	1125	3191	877365	1125
	Upper Little Logan Riparian	15	4124	5	9	2475	3
	Lower Little Logan Riparian	64	17597	23	38	10558	14
	Summit Rock	10222	2778340	3562	10222	2778340	3562
	North Summit	108	50836	65	108	50836	65
	North Summit Riparian	87	40951	53	52	24571	32
	South Summit	45	9437	12	45	9437	12
	West Summit Holding	27	13450	17	27	13450	17
	West Summit Recovery Unit	19	9465	12	11	5679	7
	Total	**25383**	**7109413**	**9115**	**25289**	**7075937**	**9072**

Lake Creek Allotment

All of the existing 10,196 acres of the Lake Creek Allotment would remain vacant and would not be managed for grazing.

Logan Valley Allotment

The grazing system will not change from current management. Livestock would generally move from unit to unit with opportunities to defer the season of use. The Logan Valley allotment would increase from 3,756 acres to 3,971 acres as a result of adding the Lake Creek and North Fork units (267 acres) from the McCoy Creek allotment into the Logan Valley allotment.

The West Bosenberg and West Lake Creek Riparian pastures (149 acres) would be rested for a minimum of 3-5 years after the fences are constructed. Although this is a relatively small number of acres when compared to the allotment as a whole, the acres are very productive forage areas which may have an impact to the economics of the grazing operation. The added productive forage acreage from the McCoy Allotment is anticipated to offset the planned rest.

Table 66. Logan Valley allotment minimum rest requirements

Unit	Unit Acres	Required Rest
West Bosenberg Riparian pasture	14	Rest would occur for 3-5 years after the fence is constructed (estimated 2013) and willows are planted. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
West Lake Creek Riparian pasture	135	Rest would occur for 3-5 years after the fence is constructed (estimated 2013) and willows are planted. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
Acres Rested or Not Grazed on an Annual Basis (Average)	60	Note: Average is based on the minimum rest requirements listed above.

Approximately 0.3 miles of additional fences would be constructed and 1.5 miles removed with implementation of alternative 3.

Summit Prairie Allotment

The grazing system would not change from current management. Livestock would generally move from unit to unit with opportunities to defer the season of use.

Table 67. Summit Prairie allotment minimum rest requirements

Unit	Unit Acres	Required Rest
Sagehen Riparian pasture	29	Rest would occur for 3-5 years after the fence is constructed. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
Upper and Lower Little Logan Riparian pastures	75	Rest would occur for 3-5 years after the fence is constructed. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
West Summit Recovery unit (temporary fence)	27	Rest would occur for 3-5 years after the fence is constructed. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
North Summit Riparian pasture	87	Rest would occur for 3-5 years after the fence is constructed. Grazing would resume after management objectives have been achieved with rest (season long rest) required 3 years out of a 10 year period after grazing is resumed. When grazing is resumed the move trigger and use levels in appendix E would be applied.
Acres Rested or Not Grazed on an Annual Basis (Average)	94	Note: Average is based on the minimum rest requirements listed above.

Note: Only the riparian pasture or recovery area would be rested.

Riparian exclosures (with no grazing) and riparian pastures (with controlled gazing) would be constructed along portions of Summit Creek and West Fork of Summit Creek. Approximately 8 acres would be fenced into exclosures and 218 acres fenced into riparian pastures in this alternative. All riparian pastures would be rested for 3-5 years. Although this is a relatively small number of acres when compared to the allotment as a whole, the acres are very productive forage areas which would have an impact to the economics of the grazing operation. Table 67 shows the minimum rest requirements for the Summit Logan allotment.

Approximately 12.2 miles of additional fences would be constructed and 0.7 miles removed with implementation of alternative 3.

Cumulative Effects to Rangeland Vegetation and Rangeland Management

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on rangeland vegetation and rangeland management. Past activities such as timber harvest, road construction, fire suppression, grazing, and wildfire have combined to create the current condition in the analysis area.

Logan Valley Allotment

Cumulative effects of alternative 3 are similar to alternative 2 (see alterative 2 effects discussions). In the Logan Valley allotment the combination of ongoing offsite water developments in upland areas and construction of the West Bosenberg and West Lake Creek riparian pastures (with water gaps) would allow riparian area recovery while still allowing upland areas to be grazed (See Table 61). Proposed resting of these riparian pastures would improve herbaceous vegetation and hardwood recovery (see Aquatic report for specific details). Ongoing offsite water developments (See Table 61) in upland areas in combination with proposed actions would provide better water distribution and opportunities to defer the season of grazing providing for better livestock distribution and even forage utilization. The availability of livestock water in Logan Valley allotment has been problem, limiting the opportunity to vary the season of grazing within the allotment. Improved water distribution and late seasons water availability in some pastures would provide greater flexibility in grazing rotations and the ability to adapt to resource needs in the future.

The ongoing or foreseeable construction of the West Bosenberg and West Lake Creek riparian pastures facilitates the proposed resting of these areas for approximately 3-5 years which would be beneficial to vegetation recovery. With rest, plants would not be affected by herbivory. Willows and other woody riparian plants would be allowed to reach escapement height (See Effects Common to All Action Alternatives under Deferred Rotation Grazing, Riparian Pastures, and Rest). Riparian areas in the Logan Valley allotments are productive forage areas and resting or excluding these acres from grazing would reduce the amount of forage available to livestock which could pose economic hardship to the grazing operators in the short-term. Willow planting in the West Bosenberg and West Lake Creek riparian pastures is expected to accelerate the rate of recovery in these areas. With the expedited vegetation recovery the time needed for rest may be reduced, thereby lessening the economic impacts to the grazing operators.

The main difference between alternative 3 and alternative 2 is that acres from the vacant Lake Creek allotment would not be added to the Logan Valley Allotment. Forage enhanced by thinning and underburning in the Merit project would not be added to the Logan Valley allotment. The ongoing Logan Valley Meadow/Grassland Enhancement/Aspen Restoration Project which includes removal of encroaching conifers in meadows, underburning, commercial thinning, and aspen restoration in the Logan Valley area would increase the forage production potential for livestock and big game on more than 300 acres in the Logan Valley allotment.

Approximately 0.3 miles of additional fences would be constructed and1.5 miles removed with implementation of alternative 3. Ongoing projects listed in Table 61 would add an additional 0.3 miles of fence. Combined 2.7 miles of fence would be constructed of which 2.3 miles would be permittee maintenance responsibility. The other 0.4 miles of fence would be maintained by a Forest Service Partner. Maintenance of all new fences constructed would be the permittee responsibility which would increase operational costs. See Effects Common to All Action Alternatives under Fence Maintenance.

McCoy Creek Allotment

Cumulative effects are the same as alternative 2.

Summit Prairie Allotment

Several ongoing projects would continue to be implemented in the Summit Prairie allotment (see Table 61). The combined effects of these projects and the action proposed in alternative 3 would aid in vegetation and stream channel recovery of Summit Creek and West Fork Summit Creek. The actions combined would increase the availability of upland water sources, while maintaining access to water in streams through constructed water gaps. Combined the actions would allow better utilization forage and more even distribution of forage in upland areas allowing vegetation condition to continue their upward recovery trend.

Construction and resting of riparian pastures and exclosures on Summit Creek and West Fork of Summit Creek as part of ongoing actions and actions proposed in alternative 3 would reduce the amount of available forage thus having potential economic impact to the grazing operator. The Sagehen Riparian Pastures, Upper and Lower Little Logan Riparian Pastures, West Summit Recovery unit, and North Summit Riparian pasture would all be rested for 3 to 5 years after fences are constructed. The forage within these exclosures is high quality and more productive compared to the forage in the uplands.

Approximately 7.0 miles of additional fences would be constructed with implementation of alternative 3. Ongoing projects listed in Table 61 would add an additional 0.3 miles of fence. Combined 7.3 miles of fence would be constructed. Maintenance of all new fences would be the permittee responsibility. Maintenance of all new fences constructed would be the permittee responsibility which would increase operational costs. See Effects Common to All Action Alternatives under Fence Maintenance.

Alternative 4

Direct and Indirect Effects

Rangeland Vegetation

Lake Creek Allotment

Approximately 9, 459 acres of the Lake Creek Allotment would remain vacant. Effects to rangeland forage would be same similar to those described under alternative 1, no action.

Logan Valley Allotment

Effects are the same as described for alternative 2

Summit Prairie Allotment

The allotment would be managed with a deferred grazing system with livestock generally moving from unit to unit with opportunities to defer the season of use.

A key part of this alternative is the required use of a rider on a daily basis to ensure livestock stay in the upland portions of the Little Logan and Sagehen units. A comparison of the existing and desired conditions for the stream reaches in the Sagehen and Little Logan units shows a difference for stream shade, shrub development, and stable stream banks. The general management objectives established for the stream reaches is to improve willow and stream bank recovery (see Aquatics report, located in the project record, for specific details). To accomplish these objectives more restrictive move triggers and allowable use levels for herbaceous riparian species on the greenline, shrubs, and percent bank alteration would be applied with this alternative compared to current management (see appendix E for specific use levels). With use of a rider, cattle would be consistently moved away from the Summit Creek riparian area and distributed in upland areas. In the past move trigger and use levels in the riparian area have been reached prior to allowable use levels being met in the uplands. The goal in using a rider is to increase upland forage use and distribution, while decreasing the shrub use levels and stream bank impacts on Summit Creek. In addition to using a rider, riparian small riparian exclosures and cages would be placed on approximately 10 percent of the length of Summit Creek within the Sagehen and Little Logan units to provide additional protection and expedited recovery of willows (see Aquatics report, located in the project record, for more detail).

Based on these management changes upland and riparian vegetation recovery is expected to improve (see Aquatic report for specific details regarding riparian areas).

A riparian pasture containing portions of Summit Creek and West Fork Summit Creek would be constructed from a portion of the Summit Rock and North Summit units containing portions of Summit Creek and West Fork Summit Creek.

The creation of the Prairie Riparian pasture along Summit Creek and the West Fork Summit Creek in portions of the North Summit and Summit Rock units with the construction of 3.1 miles of fence would allow the rest of the unit to be grazed in the upland portions. Livestock grazing is not expected to slow the upward or improving trend of upland vegetation conditions because riparian management standards would be expected to be met far in advance of substantial livestock grazing impacts occurring on the uplands.

Rangeland Management

Forage Production and Animal Unit Months (AUMs)

Alternative 4 proposes to retain the currently permitted AUMs. The AUMs proposed are maximum limits and may be adjusted to allow flexibility for annual adjustments of both numbers and/or season.

The analysis of available forage and stocking rates in Table 68 indicates that adequate forage is available to support AUMs at levels currently permitted with proposed allotment boundary and management changes. The table shows acres, available forage, and AUMS that would potentially be grazed on average over the next 10 years with the minimum rest requirements. Even with proposed minimum rest requirements, the analysis indicates that adequate forage would be available to support proposed AUMS.

Table 68. Alternative 4 available forage and AUMs

Allotment	Pasture	Acres	Available Forage	Available AUMs	Minimum Rest Requirements (Table 66 and Table 67)		
					Acres Grazed Per Year	Available Forage Per Year	AUMS
					10 year average		
Lake Creek	Bosenberg	6878	2794875	3583	0	0	0
	McCoy Creek	2581	1260173	1616	0	0	0
	Total	**9459**	**4055049**	**5199**	**0**	**0**	**0**
Logan Valley	Big Creek Riparian	623	710968	911	436	497677	638
	West Lake Creek Riparian Pasture	135	12332	16	81	7399	9
	West Lake Creek	271	24756	32	271	24756	32
	East Lake Creek	399	448875	575	399	448875	575
	West Bosenberg	269	234595	301	269	234595	301
	West Bosenberg Riparian Pasture	14	12209	16	8	7326	9
	East Bosenberg	118	59844	77	118	59844	77
	Corral Holding	22	14593	19	22	14593	19
	Lower Field	283	242984	312	283	242984	312
	Big Field	1024	1398528	1793	1024	1398528	1793
	Lake Creek	218	159216	204	218	159216	204
	Deardorff	388	164299	211	388	164299	211
	Flat Field	595	846090	1085	595	846090	1085
	Total	**4359**	**4329288**	**5550**	**4113**	**4106181**	**5264**
McCoy Creek	Cow Camp	157	37162	48	157	37162	48
	Ridge (Combined Ridge/Dry)	292	199202	255	292	199202	255
	Government Flat	211	539221	691	211	539221	691
	Total	**660**	**775585**	**994**	**660**	**775585**	**994**
Summit Prairie	Sagehen	3763	887315	1138	3763	887315	1138
	Sagehen Exclosures	4	943	1	0	0	0
	Crane Rock	7838	2419591	3102	7838	2419591	3102
	Little Logan	3262	896887	1150	3262	896887	1150
	Little Logan Exclosures	8	2200	3	0	0	0
	Summit Rock	10148	2758226	3536	10148	2758226	3536
	North Summit	143	67310	86	143	67310	86
	Prairie Riparian Pasture	126	46778	60	126	46778	60
	South Summit	45	9437	12	45	9437	12
	West Summit Holding	27	13450	17	27	13450	17
	West Summit Recovery Unit	19	9465	12	11	5679	7
	Total	**25383**	**7111601**	**9117**	**25363**	**7104672**	**9109**

Lake Creek Allotment

Approximately 388 acres of the Lake Creek allotment would be added to the Logan Valley allotment. The remaining 9,459 acres of the Lake Creek allotment would continue to be vacant and not managed for livestock grazing. Effects for the vacant areas would be the same as that described under the no action alternative (alternative 1).

Logan Valley Allotment

Effects are the same as described for alternative 2.

Summit Prairie Allotment

Small riparian exclosures (with no grazing) and riparian pastures would be constructed along portions of Summit Creek. There would be some forage lost by excluding livestock from the exclosures. The exclosures would be small in size (built tight to the steam) and contain approximately 10 percent of the total length of Summit Creek in these two pastures.

Daily riding by the permittee would ensure livestock stay in the uplands, reducing grazing use along Summit Creek in the Sagehen and Little Logan units during the season of use. Providing the rider would be the permittees responsibility which would increase management costs.

Approximately 4.3 miles of additional fences would be constructed and 0.7 miles removed with implementation of alternative 4. All new fences would be the maintenance responsibility of the permittee.

Table 69. Summit Prairie allotment minimum rest requirements

Unit	Acres	Required Rest
Prairie Riparian pasture	126	A deferred rest grazing system would be applied. The riparian pasture would be grazed early season one year and late season the following year.
West Summit Recovery Unit (temporary fence)	19	Rest would occur for 3-5 years after the fence is constructed (estimated 2013). Grazing would resume after management objectives have been achieved. When grazing is resumed, the area within the recovery unit would be grazed as part of the Prairie Riparian pasture utilizing the same use levels and use triggers (see appendix E).
Sagehen and Little Logan Exclosures	12	Approximately 10% of Summit Creek Riparian Area
Acres Rested or Not Grazed on an Annual Basis (Average)	20	Note: Average is based on the minimum rest requirements listed above.

Cumulative Effects to Rangeland Vegetation and Rangeland Management

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on rangeland vegetation and rangeland management. Past activities such as timber harvest, road construction, fire suppression, grazing, and wildfire have combined to create the current condition in the analysis area.

Several projects in the allotments are ongoing in the Logan Valley, McCoy Creek, and Summit Prairie Allotments. The combined effects of the actions proposed in alternative 4 with these ongoing projects would continue to improve vegetation conditions throughout the allotments.

Logan Valley Allotment

Cumulative Effects are the same as described for alternative 2.

McCoy Creek Allotment

Cumulative Effects are the same as described for alternative 2.

Summit Prairie Allotment

Daily riding by the permittee would ensure livestock stay in the uplands, reducing grazing use along Summit Creek in the Sagehen and Little Logan units during the season of use. Use of a rider combined with upland water source development (Sagehen Pond Construction) will help retain livestock in the upland areas. Some research has found that herding combined with strategic placement of desirable supplement appears to be even more effective in attracting cattle to graze previously underutilized areas. Herding lessens impacts on riparian areas and provides better distribution of livestock. Better distribution increases useable forage and thus capacity of a pasture or allotment. It may also result in the ability to keep livestock in management units longer because they spend less time in riparian area. Providing the rider would be the permittees responsibility which would increase operational costs.

Creation of the West Summit Creek riparian pasture with scheduled rest for 3 to 5 year period plus parallel tree felling (see Table 61) will aid in vegetation and stream channel recovery of West Fork Summit Creek (see Aquatic report for specific details).

Approximately 4.3 miles of additional fences would be constructed with implementation of alternative 4. Ongoing projects listed in Table 61 would add an additional 0.3 miles of fence. Combined 4.6 miles of fence would be constructed. Maintenance of all new fences would be the permittee responsibility. Maintenance of all new fences constructed would be the permittee responsibility which would increase operational costs. See Effects Common to All Action Alternatives under Fence Maintenance.

Summary of Effects

Table 70. Summary of alternative effects

	Allotment	Existing Management	Alternative 1 (No Grazing)	Alternative 2	Alternative 3	Alternative 4
Allotment Acres	Lake Creek	10,196	--	5,056	10,196	9,459
	Logan Valley	3,756	--	4,359	3,971	4,359
	McCoy Creek	980	--	660	660	660
	Summit Prairie	25,331	--	29,832	25,383	25,383
Grazing System	Lake Creek	Vacant	No Grazing	Vacant	Vacant	Vacant
	Logan Valley	Continuous/ Seasonal	No Grazing	Periods of Non-Scheduled Rest and Deferment	Deferred Rotation	Periods of Non-Scheduled Rest and Deferment
	McCoy Creek	Continuous/ Seasonal	No Grazing	Deferred Rotation	Deferred Rotation	Deferred Rotation
	Summit Prairie	Continuous/ Seasonal	No Grazing	Periods of Non-Scheduled Rest and Deferment	Deferred Rotation	Deferred Rotation

	Allotment		Existing Management	Alternative 1 (No Grazing)	Alternative 2	Alternative 3	Alternative 4
Proposed Animal Unit Months (AUMs) Note: AUMs are Upper Limits	Lake Creek		0	0	0	0	0
	Logan Valley		1,983	0	1,983	1,983	1,983
	McCoy Creek		416	0	416	416	416
	Summit Prairie		1,546	0	1,546	1,546	1,546
Estimated Available Forage in pounds and available AUMs	Lake Creek		--	No Forage or AUMS for Livestock	2,275,922 lbs (2,918 AUMs) No Livestock Use	4,382,366 lbs (5,618 AUMs) No Livestock Use	4,055,049 lbs (5,199 AUMs) No Livestock Use
	Logan Valley		--	No Forage or AUMS for Livestock	4,329,288 lbs (5,550 AUMs)	4,164,989 lbs (5,340 AUMs)	4,329,288 lbs (5,550 AUMs)
	McCoy Creek		--	No Forage or AUMS for Livestock	775,585 lbs (994 AUMs)	775,585 lbs (994 AUMs)	775,585 lbs (994 AUMs)
	Summit Prairie		--	No Forage or AUMS for Livestock	8,030,701 lbs (10,296 AUMs)	7,109,413 lbs (9,115 AUMs)	7111,601 lbs (9,117 AUMs)
Average Available for Livestock Grazing Over Next 10 years (using minimum rest requirements)	Lake Creek	Acres	--	0	0	0	0
		Available Forage	--	No Forage for Livestock	No Forage for Livestock	No Forage For Livestock	No Forage For Livestock
		AUMs	--	0	0	0	0
	Logan Valley	Acres	--	0	4,113	3971	4,113
		Available Forage	--	No Forage For Livestock	4,106,181	4,155,173	3,875,102
		AUMs	--	0	5,264	5,327	4,968
	McCoy Creek	Acres	--	0	660	660	660
		Available Forage	--	No Forage For Livestock	775,585	775,585	775,585
		AUMs	--	0	994	994	994
	Summit Prairie	Acres	--	0	26,379	25,289	25,363
		Available Forage	--		7,214,325	7,075,937	7,104,672
		AUMs	--	0	9,249	9,072	9,109
Miles of new fence construction (cumulative miles w/ added miles from ongoing projects)	Lake Creek		--	0	2.5	2.5	2.5
	Logan Valley		--	0	2.8 (5.2)	0.3 (2.7)	0.3 (2.7)
	McCoy Creek		--	0	0 (1.4)	0 (1.4)	0 (1.4)
	Summit Prairie		--	0	7.0 (7.3)	12.2 (12.5)	4.3 (4.6)
Miles of Fence Removal	Lake Creek		--	0	0	0	0
	Logan Valley		--	0	2.3	1.5	1.5
	McCoy Creek		--	0	1.0	1.0	1.0
	Summit Prairie		--	0	0.7	0.7	0.7

	Allotment	Existing Management	Alternative 1 (No Grazing)	Alternative 2	Alternative 3	Alternative 4
Added Fence Maintenance (cumulative miles w/ added miles from ongoing projects)	Lake Creek	--	0	--	0	0
	Logan Valley	--	0	2.8(4.8)	0.3(2.3)	0.3(2.3)
	McCoy Creek	--	0	0(1.4)	0(1.4)	0(1.4)
	Summit Prairie	--	0	7.0(7.3)	12.2(12.5)	4.3(4.6)

Consistency with Direction and Regulations

All alternatives are consistent with the Malheur Forest Plan standards related to range management. Key Forest Plan standards include:

- Forest Wide Standard #80, page IV-34
- Forest Wide Standard #84, page IV-34
- Forest Wide Standard #86, Page IV-34
- Forest Wide Standard #87, Page IV-35
- Forest Wide Standard #88, Page IV-35
- Management Area 3A Standard #16, Page IV-57
- Management Area 3A Standard #18, Page IV-57
- Management Area 3A Standard #19, Page IV-58
- Management Area 3A Standard #20, Page IV-58
- Management Area 3A Standard #21, Page IV-58

Irreversible and Irretrievable Commitments

No irreversible or irretrievable effects would occur to rangeland vegetation as the result of implementing the action alternatives.

Invasive Species

Introduction

The lands comprising the Summit Logan Valley Grazing planning area on the Malheur National Forest are managed to achieve a desired condition as described in the Malheur Forest Plan and to maintain a healthy ecosystem. Once introduced, noxious weeds interfere with the achievement of the desired conditions. Therefore, to achieve the desired condition on the land, noxious weeds must be managed. Areas of soil disturbance or plant communities of low health and vigor are more susceptible to weed establishment than areas with healthy, diverse vegetation. Simply killing a weed is an inadequate objective in most situations, especially for large scale infestations. Management must foster a healthy, weed-resistant plant community which consists of a collection of species diverse enough to fill all the niches (Sheley et al. 2002).

The Malheur National Forest recognizes and emphasizes prevention as the first and most important aspect of noxious weed management. The most effective strategy against noxious weeds is to prevent them from ever being introduced and established. The primary method to the prevention of noxious weeds is to detect and ameliorate (improve) the conditions that cause or favor the presence of competing or unwanted

vegetation. Undisturbed or otherwise healthy, vigorous native plant communities are fairly resistant to invasion by weeds. Unfortunately, much of the planning area has been actively managed, creating windows of opportunity for noxious weed introduction and establishment.

Sometimes considered the "second line of defense" after prevention, early detection and rapid response is a critical component of the Forest's weed management program. When new weed sites are discovered, a quick response can reduce environmental and economic impacts. With limited resources, effective prevention, detection and rapid response must include education of both administrative personnel, contractors, permittees and the public.

Noxious weeds are spread by many agents including wind, water, animals, vehicles, and people. Weed infestations within the planning area are primarily located along roads, old logging units and landings, recreational use areas (campgrounds and trailheads), rock-pits and other disturbed areas. Livestock appear to be a minor causal agent or vector within the planning area.

The majority of the planning area has been inventoried for noxious weeds. Currently eight Oregon Department of Agriculture and Grant County listed noxious weed species occur within the planning area.

This project proposes no specific treatments of noxious weeds on National Forest System land, as the Malheur National Forest does not have an approved noxious weed management plan for use of herbicides. This has effectively limited control to manual and biological treatments. Noxious weed prevention and manual treatment is an on-going Forest program.

Noxious Weeds Defined

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

Noxious weeds have acquired attributes which allow them to gain a competitive edge over other plants, rapidly invade, establish and dominate disturbed sites. These traits also make them difficult or impossible to eradicate once established. These characteristics include wide ranges of adaptability, rapid growth rates from vegetative stage to flowering, abundant seed production (up to one half million per single plant), the ability to re-sprout from root nodes, the ability to spread through vegetative or root fragments, and the extended duration of seed viability in the soil (ten years or more for some weeds).

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

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

Regulatory Framework

Forest Service Strategies, Regulations and Policies

- National Strategy and Implementation Plan for Invasive Species Management
- National Interagency "Pulling Together" Strategy
- Federal Noxious Weed Act
- Invasive Species Executive Order (Feb. 3, 1999)
- Forest Service National Weed Direction, FSM 2080
- Pacific Northwest Region, Preventing and Managing Invasive Plants FEIS and Record of Decision (October 2005). The following standards from the 2005 record of decision are relevant to this project:
    - **Standard 1**: Prevention of invasive plant introduction, establishment and spread will be addressed in watershed analysis; roads analysis; fire and fuels management plans, Burned Area Emergency Recovery Plans; emergency wildland fire situation analysis; wildland fire implementation plans; grazing allotment management plans, recreation management plans, vegetation management plans, and other land management assessments.
    - **Standard 3**: Use weed-free straw and mulch for all projects, conducted or authorized by the Forest Service, on National Forest System Lands. If State certified straw and/or mulch is not available, individual Forests should require sources certified to be weed-free using the North American Weed Free Forage Program standards or a similar certification process.
    - **Standard 6**: Use available administrative mechanisms to incorporate invasive plant prevention practices into rangeland management. Examples of administrative mechanisms include, but are not limited to, revising permits and grazing allotment management plans, providing annual operating instructions, and adaptive management. Plan and implement practices in cooperation with the grazing permit holder.
- Record of Decision for Managing Competing and Unwanted Vegetation (1988) and the Mediated Agreement (1989)
- Malheur Forest Plan (1990), Forest-Wide Standard 188 - Requires Implementation of a weed control program to confine present infestations and prevent establishment of noxious weeds in now areas.

Oregon Noxious Weeds Laws

- Chapter 452-Vector and Weed Control
- Chapter 541-State Department of Agriculture
- Chapter 570-Plants: Inspection, Quarantine, Pest and Weed Control
- Noxious Weed Quarantine; OAT 603-52-1200

Analysis Methods

The analysis area for evaluating existing noxious weed populations is consistent with the planning area, with the exception of noteworthy adjacent infestations or infestations in road rights of way to and through the Summit Logan Valley Grazing Authorization planning area.

Noxious weed surveys have been conducted throughout the Malheur Forest. All documented weed sites from these surveys are recorded in a National data base, Natural Resources Information System (NRIS). The data base includes individual site records indicating the location, size of infestation, plant numbers and density, type of treatment implemented, follow-up treatments and effectiveness. The NRIS data base was used as a source to identify known weed sites within the Summit Logan Valley Grazing Authorization Project planning area.

Other sources of information used in this analysis include:

- Malheur National Forest GIS data base
- Malheur Forest Plan
- Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005.

The units of measures would be the number of sites and the size of the sites.

Affected Environment

Prairie City Ranger District personnel continually identify new noxious weed infestations and report occurrences to the District weed specialist for inclusion into the national/forest/district database, Natural Resources Information System (NRIS). This database includes individual species site records that include location and size of infestation, plant numbers and density, type of treatment implemented, follow-up treatments and effectiveness of treatments. Noxious weed species occurring in the Malheur National Forest and Prairie City Ranger District are hounds-tongue (*Cynoglossum officinale*), spotted and diffuse knapweeds (*Centaurea* sp.), Canada thistle (*Cirsium arvense*), dalmation toadflax (*Linaria dalmatica*),white top (*Cardaria draba*), yellow toadflax (*Linaria vulgaris*), St. Johnswort (*Hypericum perforatum*), cheatgrass (*Bromus tectorium*), and bull thistle (*Cirsium vulgare*).

The noxious weeds found in the Summit Logan Valley Grazing Authorization Project Area by allotment area as follows:

- Lake Creek allotment has spotted knapweed (3.0 acres), Canada thistle (0.2 acres), and yellow toadflax (0.2 acres);
- Logan Valley allotment has spotted knapweed (0.3 acres), diffuse knapweeds (2.1 acres), Canada thistle (0.1acres), dalmation toadflax (0.1 acres), yellow toadflax (0.1 acres), and bull thistle (0.1 acres);
- McCoy Creek allotment has diffuse knapweed (0.1 acres); and
- Summit Prairie allotment has hounds-tongue (0.1 acres), spotted knapweed (0.3 acres), diffuse knapweeds (0.2 acres), Canada thistle (2.1 acres), dalmation toadflax (1.5 acres), and St. Johnswort (0.2 acres).

Species known to occur along highways and roadsides accessing the project area are houndstongue, spotted knapweed diffuse knapweeds, Canada thistle, dalmation toadflax, yellow toadflax, St. Johnswort. These areas can be vectors for the spread of weeds into other areas in the Malheur National Forest.

Design criteria are in place to help prevent the introduction of noxious weeds (See chapter 2).

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

Environmental Consequences

Alternative 1 - No Grazing

Direct and Indirect Effects

There would be no direct or indirect effects under alternative 1 because no actions are being proposed. Introduction and spread of noxious weeds by cattle, horses used by range riders and associated vehicles would not occur. Soil disturbance from cattle movement would not occur so there would be fewer places for weeds to become established. A natural rate of spread and introduction of weeds would be expected. Existing upland and riparian conditions would continue to improve over time (EIS chapter 3, Rangeland Vegetation). Competitive desirable grasses and forbs would not be grazed by livestock and would provide more competition with invasive species, slowing the establishment and spread. Weed surveys conducted by Forest Service personnel would continue however there would be no livestock management and much less range vegetation management on the allotments. This could reduce the degree of new infestation recognition and reporting, resulting in longer establishment time frames and larger infestation sizes prior to initial treatment.

Cumulative Effects

Because alternative 1 has no direct or indirect effects, there would be no additive or cumulative effects. Even though no activities are proposed under alternative 1 there have been a number of past activities which have occurred within the planning area which can and do provide a moderate to high risk of the introduction and spread of noxious weed propagules. Eliminating livestock grazing would not eliminate this risk. Information indicates that areas that are not grazed are still susceptible to invasion (Sheley et al. 1997, Wagner et al. 2001). As a consequence of past activities such as timber sales, wildfires, fire suppression efforts, road construction and maintenance, underburning, range improvements, and roads areas of damaged and disturbed soils exist and provide a potential risk of noxious weed introduction and spread. Other vectors, such as people, vehicles and wildlife would still be present, so new introductions are likely. Therefore, weed risk would continue under no action.

Alternative 2, 3 & 4

Direct and Indirect Effects

Alternatives 2, 3, and 4 allow livestock grazing to continue within the Summit Logan Valley Authorization Project planning area. Alternatives 2 and 4 initiate grazing on portions of the 10,196 acre Lake Creek allotment which has been vacant for the last 20+ years. Under alternative 2 - 4,778 acres would be absorbed into the Summit Prairie and Logan Valley allotments, 5,069 acres would remain vacant. Under alternative 4 - 388 acres of the Lake Creek allotment would be absorbed into the Logan Valley allotment and 9,459 acres would remain vacant. Under alternative 3 the entire allotment would remain vacant and there would be no direct or indirect effects to the Lake Creek Allotment. The effects for the portions of the Lake Creek allotment where grazing is reinitiated are described below. Domestic grazing animals can contribute to plant invasion through: (1) selective eating of native plants which means invasive species not preferred by cattle would be left, thus favoring an increase in invasive plants; (2) ingesting invasive plant seeds in one area and spreading them to other areas through scat, digestive products, skin, fur and hooves, and (3) disturbing the soil and creating conditions favorable to invasive plants or the germination of invasive plant seed though scarification (USDA Forest Service 2005). In many instances cattle and other browsers will avoid areas where invasive weeds are prevalent in monocultures, and move to areas where there is desirable forage. In areas where invasive species are interspersed with desirable forage, it is likely that seed would either attach to hair or mud on hooves or even be ingested and dispersed in feces. Some weed seeds are destroyed within the gastrointestinal tract;

however, seeds can pass through grazing animals with some of the seeds still remaining viable (Lacey et al. 1992). Long-lived seeds and hard seeded species of forbs and grasses consumed by grazers have been reported to survive passage through gastrointestinal tracts of cattle (Janzen 1984).

The action alternatives provide for new structural improvements (fence construction and removal, a loading ramp and catch pen, and three upland ponds and a spring development under alternative 2) which are ground disturbing. This would create risk for noxious weed introduction. The risk would be reduced by following the design criteria to reduce the risk of introducing noxious weeds described in chapter 2 of the EIS. The applicable design criteria include but are not limited to any gravel, fill, sand and rock used in the construction. Reconstruction or maintenance of water developments would be judged to be weed free by district weed specialists. Native materials are to be used for revegetation unless accepted extenuating circumstances are identified; all equipment used (including ATVs) would be cleaned in a manner sufficient to prevent noxious weed from being carried into the planning area. Cleaning would occur off of National Forest System lands and approved by the Forest Officer in charge of administering the project.

Livestock water developments with frequent animal visitation and other range structural improvements such as corrals where the ground is disturbed have the potential for invasive plant establishment and spread. Additionally, livestock often exhibit trailing behavior that may result in disturbed areas for invasive species to establish and spread. Areas with the highest potential for trailing impacts from livestock are fence lines, road shoulders, and travel routes between foraging areas and water sites. Cattle loafing areas create suitable disturbance for invasive plant establishment. The cattle may carry new invader weed seeds on their coats or in their intestinal tracts that could cause weed infestations. The risk of invasive plant establishment and spread would be reduced by range personnel surveying for noxious weeds while conducting compliance checks and monitoring and the permittee surveying for weeds while performing required management and maintenance, allowing more early detection and treatment before threshold damage can occur.

Under alternatives 2, 3, and 4 livestock would graze competitive desirable grasses and forbs, potentially reducing their ability to compete with invasive plants. All action alternatives propose deferred rotation as part of the grazing system. This type of system provides the flexibility to change the timing, frequency, and intensity of grazing on an annual basis (EIS chapter 3, Rangeland Vegetation). Under this grazing system plant vigor and species composition would be improved increasing their ability to compete with invasive plants. Additionally, the potential for noxious weed seed dispersal would be reduced in pastures with a deferred rotation grazing strategy where there is alternating early and late season rest. By annually alternating early and late season grazing, the potential for weed spread by cattle would be every other year. There would be no reduction in the potential for weed spread by cattle in those pastures that are grazed late each year. On the landscape scale, forage utilization would be managed to maintain the vigor of desirable plants, however, within localized areas of high forage utilization (hot spots) and/or loafing areas desirable vegetation can be diminished to the extent that invasive plants can dominate the species composition. Range personnel would survey for noxious weeds while conducting compliance checks and monitoring and the permittee would survey for weeds while performing required management, allowing more early detection and treatment before threshold damage can occur. Proper grazing management is important to on-going weed management programs in order to minimize these hot spots. Utilization monitoring indicates that available forage is adequate for the numbers of livestock allowed to graze under alternative 2, 3, and 4 (EIS chapter 3, Rangeland Vegetation) and it is expected that the desirable vegetation will continue to provide competition for noxious weeds.

Noxious weeds may threaten riparian systems by directly displacing native vegetation, potentially affecting resources such as forage used by livestock and wildlife. Weeds can also indirectly threaten riparian habitats and water quality by increasing risk of erosion, as these non-native plants commonly

provide little root-binding strength to soils (Sheley et al. 1999). This could alter riparian habitat and affect resources such as sensitive plants, fish, and wildlife. The action alternatives create riparian pastures. Some riparian pastures would be rested 3-5 years after they are created, others would be rested for 3 years out of a 10 year period to allow recovery of riparian vegetation to recover. Riparian vegetation vigor and species composition would be improved increasing their ability to compete with invasive plants. Additionally, if monitoring indicates that specific objectives are not being achieved, at any given time the Line Officer can choose to apply an analyzed adaptive management strategy to reduce delays in recovery timeframes. Adaptive management strategies include: Changes in use levels (herbaceous forage use, bank alteration, shrub use); rest or exclusion from grazing; and fencing to create riparian pastures. For a more detailed discussion of adaptive management refer to the Rangeland Vegetation section in chapter 3 of the EIS and appendix A Table 104 of the EIS. Alternative 4 also requires daily riding by the permittee along Summit Creek in the Sagehen and Little Logan units during the season of use. The goal of using a rider is to increase upland forage use and distribution, while decreasing the shrub use and stream bank impacts on Summit Creek. Based on these management changes upland and riparian vegetation recovery is expected to improve which would increase their ability to compete with noxious weeds.

Livestock grazing or associated permittee actions have not been identified as a major factor in the establishment and spread of noxious weeds in the project area. Alternatives 2, 3 and 4 may increase the chance of noxious weed spread by livestock within the project area. However, the presence of permittees and Forest Service Range Management Personnel on the allotments would assist in detection and control of noxious weeds. In addition, grazing fee funds (range betterment funds) would be available for noxious weed treatment under these alternatives.

Specific instructions on weed prevention practices would be included in the annual operating instructions including weed identification and mapping procedures. Instructions that the permittees use only pelletized or certified weed free feed on all National Forest System lands would be enforced. Grazing management practices, including riparian area fencing, water source development, and grazing systems would be implemented to properly distribute livestock on the allotments. As previous discussed under the action alternatives there would be more management options available to reduce soil disturbance from livestock. The proposed changes in livestock management (creating riparian pastures, manipulating pasture use periods) under the action alternatives would reduce impacts to soil and vegetation reducing the risk of noxious weed introduction and spread. Implementing the proposed grazing management practices and the design criteria described in chapter 2 would help slow or prevent the increase in established noxious weed populations, or reduce the weed spread to new areas.

Cumulative Effects

Cumulative effects are those that are expected from implementing the alternatives, when added to other past, present, and reasonably foreseeable actions. These actions are discussed below and are described in detail in appendix C of the Summit Logan Valley Grazing Project Environmental Impact Statement. The geographic boundary is the entire Summit Logan Valley Planning Area plus adjacent private lands. The temporal boundary is the period of time when the activities associated with this project are occurring from the 1800s to 10 years in the future, when the allotment management plan would be scheduled for renewal.

Past road construction and maintenance, road closures and decommissioning, water withdrawal, timber harvest, cattle and sheep grazing, wildlife, recreational activities, firewood cutting, railroad line construction, and wildfire and suppression activities have provided environments for noxious weed species establishment, vectors for noxious weed dispersal, and infestations to provide propagule source material. Some of these conditions continue to exist and have increased the potential for introduction and spread by removing vegetation and exposing soils, creating an ideal seedbed for noxious weeds. The planning area currently has 34 known noxious weed sites. These sites total approximately 11 acres. The

exact source of present infestations is unknown. The location pattern shows concentrated sites along roads. The primary vector for noxious weeds appears to be vehicles.

Not all past activities have increased the long term risk for noxious weed introduction and spread. For example, the Merit Road Closure and Decommissioning Project was completed in 2010. Approximately 10.4 miles of road were closed with gates and another 15.3 miles with dirt berms. Additionally 12.6 miles of road were decommissioned. Decommissioned roads were reseeded with native or non-native grasses and forbs to occupy the site and reduce potential for noxious weed introduction or spread. The seed used was certified noxious weed-free by an approved testing laboratory. Closing and decommissioning roads reduces vehicle access and the potential for noxious weed spread.

Non-native invasive plants primarily occupy heavily disturbed areas, such as roads, log landings, and mineral material sources. Existing conditions favor establishment and spread of noxious weeds, and weeds are likely to continue to be introduced and spread to new areas within the Malheur National Forest. A history of grazing, road construction, and logging has increased the potential for introduction and spread by removing vegetation and exposing soils, increasing susceptibility to invasion by noxious weeds.

Present and reasonably foreseeable activities, including recreation, wildfire suppression, and other activities suggest a risk for introduction and spread of noxious weeds. As described earlier, this risk can be exacerbated by livestock grazing (DiTomaso 1997, Belsky and Gelbard 2000).

Human use on the Malheur National Forest is greatest September through November during hunting seasons. Late hunting season is a wet time of year, and is particularly conducive to weed spread due to mud clinging to tires. The potential for new infestations and spread is somewhat reduced by compliance with the FEIS for the Invasive Plant Program-Preventing and Managing Invasive Plants. Standard #4 requires use of state certified weed-free hay or crop products on all National Forest System lands within the Pacific Northwest Region. Standard # 2 requires prevention of invasive plant introduction, establishment and spread to be addressed in recreation management plans.

Fire suppression can result in introduction or spread of weeds by equipment brought in from different areas that may contain weed seed or plant parts. Due to the emergency nature of wildfire, prevention measures including equipment cleaning are not always implemented or feasible. Dozer lines, hand lines, drop points, safety zones, staging areas, etc. all create bare ground with heavy travel and disturbance. Vehicle traffic, during and after suppression activity can introduce weeds to highly susceptible soils. Fire rehabilitation efforts mitigate many of the negative effects through seeding, weed control, erosion control and closing off areas to vehicles. Additionally, Standard #2 from the ROD for the FEIS for the Invasive Plant Program-Preventing and Managing Invasive Plants requires prevention of invasive plant introduction, establishment and spread to be addressed in fire and fuels management plans; Burned Area Emergency Recovery Plans; emergency wildland fire situation analysis; and wildland fire implementation plans.

The Forest's weed management program consisting of annual surveys combined with mechanical and hand pulling treatments would continue. The amount of treatment within the project area would vary annually based on funding and Forest priorities. Upon completion of the Malheur National Forest Site-Specific Invasive Plant Treatment NEPA analysis and plan for treatment of invasive plants Forest wide, additional weed treatments may occur in the planning area.

Proposed road closure and decommissioning combined with past road closures would reduce vehicle access and the potential for noxious weed spread. It is foreseeable that the Malheur National Forest Access Travel Management Plan (travel management plan) would prohibit cross country travel on the Malheur National Forest, with the exception of cross country travel from designated open routes for the

sole purpose of dispersed camping (see appendix C). The access travel management plan would include a motorized vehicle use map showing roads that are designated to allow motor vehicle use. It is expected that with the implementation of the travel management plan and motorized vehicle use map, there would be reduced vehicle access and decrease in the spread of noxious weeds.

Ongoing or foreseeable future restoration projects include: The Big Creek and Lake Creek Off-site Water Source Project, The West Lake Riparian Fence Project, The Big Creek and Lake Creek Riparian Hardwood Restoration Project, The Logan Valley Meadow/Grassland Enhancement, Aspen Restoration Project, and the Summit Creek Range Aquatics Project. All of these projects disturb soil and have the potential to introduce or spread noxious weeds. All of the projects have design criteria to minimize the potential risks associated with noxious weed introduction and spread. These design criteria include: all equipment associated with treatment to be cleaned prior to arriving on site; seed, straw, and other material used for road decommissioning and erosion control to be certified to be free of noxious weed seed; all temporary roads, landings, and skid trails to be seeded with native seed mix after activities occur; the use of only gravel, fill, sand, and rock that are judged to be weed free by district weed specialist if needed for the project; and noxious weed surveys to be done 1 to 5 years after the project.

The Logan Valley/Meadow Grassland Enhancement, Aspen Restoration Project is the only timber sale currently active in the planning area. Standard # 2 from the ROD for the FEIS for the Invasive Plant Program-Preventing and Managing Invasive Plants requires actions conducted or authorized by written permit by the Forest Service that will operate outside the limits of the road prism (including public works and service contracts), require the cleaning of all heavy equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering National Forest System lands. Compliance with this standard reduces the potential for the establishment and spread of noxious weeds.

The cumulative effects of present and reasonably foreseeable activities indicate a risk for introduction and spread of noxious weeds. Studies have shown that noxious weeds have the potential to invade sites with relatively little grazing or other activity (Sheley et al 1997, Wagner et al. 2001). Weeds will continue to be introduced and spread by vehicles, wildlife, windborne seed, and other sources. Therefore, new infestations are likely in the analysis area, regardless of the alternative chosen, including no action.

The degree of environmental impact due to noxious weeds is relative to the acres infested. Though approximately 34 sites have been recorded within the analysis area, collectively they occupy less than 0.001 percent (11 acres) of the analysis area. Therefore, at present, environmental effects due to noxious weeds is minimal, and is therefore considered low. Assuming noxious weed control continues, anticipated short term (<10 years) effects resulting from infestation and spread of noxious weeds is expected to remain relatively low.

Consistency with Direction and Regulations

All alternatives are consistent with Forest-wide standards for rangeland resources and noxious weeds, including Forest plan modifications made by the Pacific Northwest Region Invasive Plant Program FEIS (USDA Forest Service 2005).

Irreversible and Irretrievable Commitments

None of the alternatives result in irreversible or irretrievable effects to soil.

Botany

Introduction

This is a summary of the Biological Evaluation which analyzes the effects or impacts from the proposed action and alternatives of the Summit Logan Valley Grazing Authorization Project to plant and lichen species that are federally-listed as threatened, endangered, or proposed for federal listing under the Endangered Species Act of 1973 as amended, and species currently identified as sensitive (FSM 2670.5, USDA Forest Service 2011) by the Regional Forester of the Pacific Northwest Region (collectively called threatened, endangered and sensitive species). The full Biological Evaluation can be found in appendix G which is available for review by request.

Only sensitive plant and lichen species that are documented or suspected to occur within general biophysical area where the project would occur (i.e. the headwaters of the Malheur River watershed) are analyzed. Furthermore, only those species which may possibly be directly, indirectly, or cumulatively affected by the proposed actions are considered. Species that are not suspected to occur within the analysis area, or are eliminated from consideration due to other factors, are not described and are not considered in the detailed effects analysis [as per 40 CFR §1500.4, 40 CFR §1500.1(b)]. However, information on these species is available at the Supervisor's Office of the Malheur National Forest, upon request.

Regulatory Framework

Regional Forester's Sensitive Species List

There are not threatened, endangered or proposed plant species documented or suspected to occur on the Forest. However, forty-seven sensitive plant species listed on the 2008 Regional Forester's Sensitive Species List are documented or suspected to occur in the Malheur National Forest. This Biological Evaluation fulfills the applicable standards and guidelines of the Malheur Forest Plan.

Analysis Methods

A pre-field analysis (or pre-field review) was used to determine the probability that threatened, endangered, and sensitive species, and/or their respective habitats, are located within or adjacent to the project area, and to determine the extent and intensity of previous survey efforts. Information from the pre-field review, in conjunction with the project description, was used to determine the need and intensity of field surveys and, in part, fulfills the standards and procedures for conducting a biological evaluation (FSM 2672.42).

A complete list of previous and historical surveys for sensitive and rare plants in the project area were determined by querying the Forest Service's Natural Resource Information System for Threatened, Endangered, and Sensitive Plant Species (NRIS-TESP 2012) and by examining historical survey forms and maps, NEPA records, and electronic botanical databases.

The following sources of information were used to determine which threatened, endangered, and sensitive species and their respective habitats, occur or may occur within or near the project area:

- The Regional Forester's most current Sensitive Species List, released December 2011 (USDA Forest Service 2011);
- The Forest Service's Geographic Information System (GIS) corporate database: Natural Resource Information System – Threatened, Endangered, and Sensitive Plant species (NRIS-TESP 2012);

- The Malheur National Forest sensitive plant species database and Geographic Information System (GIS) layer, and other pertinent GIS mapping layers;
- Rare, Threatened, and Endangered Species of Oregon (Oregon Biodiversity Information Center 2010);
- Sensitive Plants of the Umatilla and Malheur National Forests (USDA Forest Service 2006);
- Sensitive Plants of the Malheur, Ochoco, Umatilla, and the Wallowa-Whitman National Forests (Brooks et al. 1991);
- Flora of the Pacific Northwest (Hitchcock and Cronquist 1973);
- Flora of North America (FNA 2007);
- Moonwort (*Botrychium*) Workshop handbook (Farrar and Johnson-Groh 2004) and Conservation Assessment for 13 Species of Moonworts (*Botrychium Swartz Subgenus Botrychium*) (Ahlenslager and Potash 2007);
- Field Guide to the Sedges of the Pacific Northwest (Wilson et al. 2008) and Field Guide to Intermountain Sedges (Hurd et al. 1998);
- Species Fact Sheets provided by the Interagency Special Status / Sensitive Species Program website [http://www.fs.fed.us/r6/sfpnw/issssp/] of the Pacific Northwest Region, Forest Service and Bureau of Land Management's Oregon and Washington State Offices;
- Available literature, reports, conservation plans, conservation assessments, and species descriptions on file at the Malheur National Forest Supervisor's Office; and
- Project maps and aerial photographs provided by the Interdisciplinary Team.

More than 46 separate surveys have been conducted in the Summit Logan Valley analysis area, over a nine year period (2003-2012). This includes work accomplished by District, Forest, Area, and Regional staff, as well as contractors, partners, universities, and numerous volunteers. In total, over 120 individuals have participated in the survey efforts; this easily represents over 3,000 personnel-hours of equivalent work covering more than 2,000 acres of rare plant habitat.

Affected Environment

As a result of all of the survey efforts, 14 sites of five different sensitive species have been discovered: three sensitive mosses, *Helodium blandowii* (Blandow's feather moss), *Tomentypnum nitens* (tomentypnum moss), and *Meesia uliginosa* (meesia moss), and two sensitive moonwort ferns *Botrychium crenulatum* (crenulate moonwort) and *Botrychium montanum* (mountain grape-fern). All of these species were found in or near the fen/peatland complex in the Big Field unit, West Lake Creek Riparian pasture, and Big Creek Riparian pasture of the Logan Valley Allotment. Table 71 lists the sensitive species populations, management units, and approximate extent of the population. No sensitive species were found in the Lake Creek, McCoy Creek, and Summit Creek Allotments, even though the Summit Creek is one of the most intensively surveyed riparian areas on the Forest.

In addition to the discovery of the fen-dependent sensitive species listed above, qualitative and quantitative assessments of their habitats in the fen complex were also conducted. Habitat assessments utilized standardized procedures and protocols designed for evaluating and monitoring conditions of fens and other groundwater-dependent ecosystems (Weixelman and Cooper 2009, USDA Forest Service 2010, 2012).

Table 71. Documented sensitive species populations

Sensitive Species	Population Location by Unit	Extent of Population[a]
Botrychium montanum	Big Field unit	> 2 m2
Botrychium crenulatum	Big Field unit	> 1 m2
Helodium blandowii	Big Field unit	1.0 acres
	West Lake Creek Riparian pasture	0.8 acres
	Big Creek Riparian pasture	0.3 acres
	Big Creek Riparian pasture	0.5 acres
Meesia uliginosa	Big Field unit	0.1 acres
	Big Field unit	0.7 acres
	Big Field unit	0.1 acres
	Big Creek Riparian pasture	0.3 acres
	Big Creek Riparian pasture	0.1 acres
Tomentypnum nitens	Big Field unit	0.3 acres
	Big Creek Riparian pasture	0.1 acres
	Big Creek Riparian pasture	0.3 acres

a - This represents the geographic extent of the population; not all of this area is occupied by the species

The fen complex, which houses the sensitive species populations and habitats, can be described as a broad helocrene spring system with a mosaic of peatlands, fen pools, wet and moist meadows, mesic shrublands, aspen stands, lodgepole pine swamps, and occasional mixed conifer stands. The fen complex and associated wetland systems are primarily dominated by wetland mosses, graminoids, and willow species (USDA Forest Service 2009, Rausch 2009, Mellmann-Brown and Rausch 2010).

The three sensitive moss species occur exclusively on permanently saturated or flooded peatlands. Peatlands, or fens, are some of the most sensitive, endangered, and fragile ecosystems in the western United States. Damage or substantial degradation to peatland systems should be avoided to prevent loss of rare species habitat integrity, among many other reasons (ISSSSP 2012, Mitsch and Gosselink 2007, USDA Forest Service 2010, Vitt and Wieder 2008, Weixelman and Cooper 2009; and references cited herein). Hydrologic function, peat development, and species composition are some of the general components used to evaluate peatland condition. Appendix A, Table 102 of the Summit Logan Valley Grazing Authorization FEIS and addendum B-1 of the Biological Evaluation for Sensitive Plants and Lichens of the Summit Logan Valley Grazing Authorization Project describe the existing condition of the Logan Valley fen complex as it relates to sensitive plant habitat and ecosystem integrity.

Twenty-six sensitive species are further analyzed for potential effects (Table 72). These species are either documented or are suspected to occur in the project area, and the specific characteristics of the species' habitat, ecology, and/or biology are such that a more detail analysis of potential effects are needed.

Table 72. Selected sensitive species habitats, and presence in the area

Sensitive Species (Common Name)	Habitat(s)	Presence in the Project Area
Carex cordillerana (cordilleran sedge)	Woodlands and forested lands in the shade of conifers, deciduous trees, and shrubs; rocky slopes, grassy slopes, and stream benches; often growing in leaf litter and duff.	Suspected – high probability
Muhlenbergia minutissima (annual dropseed)	Intermittent and ephemeral streams, sandy or gravelly drainages; open, lightly-disturbed areas; also on rocky slopes, flats, and old roads.	Suspected – low probability
Trifolium douglasii (Douglas' clover)	Moist meadows, prairie remnants, vernally wet areas, riparian areas along streams.	Suspected – low probability
Botrychium ascendens (upward-lobed moonwort)	Moist meadows, riparian zones, openings in cold forests, grassy fields, and moist roadsides.	Suspected – moderate probability
Botrychium hesperium (western moonwort)	Moist meadows, riparian areas, openings and edges of forests, grassy slopes, sand dunes, snow fields, moist roadsides, and road ditches.	Suspected – high probability
Botrychium lunaria (common moonwort)	Moist meadows, riparian areas, openings and edges of cold forests, open fields, and moist roadsides.	Suspected – high probability
Botrychium montanum (mountain grape-fern)	Dark coniferous forests, usually near swamps, streams, and springs; wet meadows, saturated soils. Often growing in a bed of mosses.	Documented
Botrychium paradoxum (twin-spiked moonwort)	Moist meadows, riparian zones, openings and edges of cold coniferous forests, grasslands, fallow pastures, forb-dominated meadows, moist roadsides, and snowfields.	Suspected – moderate probability
Botrychium pedunculosum (stalked moonwort)	Moist meadows, riparian zones, brushy secondary-growth habitats along streams and roadsides, openings or on edges of cold coniferous forest, moist roadsides.	Suspected – moderate probability
Bryum calobryoides (beautiful bryum moss)	Rock outcrops, exposed boulder fields, cliffs, and soils in montane meadows.	Suspected – moderate probability
Eleocharis bolanderi (Bolander's spikerush)	Vernally wet meadows with poorly drained soils, moist meadows, intermittent stream margins, springs and seeps.	Suspected – high probability
Listera borealis (northern twayblade)	Springs, seeps, swamps, and cold water streams in moist, rich soils of shady coniferous forests.	Suspected – high probability
Mimulus evanescens (disappearing monkeyflower)	Vernally wet sites and fluctuating banks of intermittent streams or pools in sagebrush, juniper, and ponderosa pine zones. Often in sites with sand or heavy gravel.	Suspected – low probability
Phacelia minutissima (dwarf phacelia)	Moist meadow and seep edges, or on vernally wet open meadows and barren slopes. Reported to occur with aspen.	Suspected – moderate probability
Schistidium cinclidodonteum (schistidium moss)	Intermittent streams, rock outcrops, on wet or dry rocks, on soil in crevices of rocks and boulders.	Suspected – moderate probability
Tortula mucronifolia (mucronleaf tortula moss)	Springs, seeps, riparian forests, aspen stands, exposed tree roots, sheltered ledges and crevices of rock outcrops and cliffs.	Suspected – moderate probability

Sensitive Species (Common Name)	Habitat(s)	Presence in the Project Area
Anthelia julacea (alpine liverwort)	Peatlands, fens; associated with low ericaceous shrubs.	Suspected – moderate probability
Botrychium crenulatum (crenulate moonwort)	Peatlands, fens, springs, seeps, marshy areas, moist and wet meadows, riparian zones, openings in cold forests, and moist roadsides.	Documented
Harpanthus flotovianus (great mountain flapwort)	Peatlands, fens, on soil covered rocks and decaying wood in moist forests.	Suspected – moderate probability
Helodium blandowii (Blandow's feather moss)	Peatlands, rich fens, springs, wet meadows, and along streams with highly organic soils.	Documented
Meesia uliginosa (meesia moss)	Peatlands, rich fens, springs, wet meadows, and other areas saturated with groundwater.	Documented
Ophioglossum pusillum (adder's-tongue)	Open fens and other peatlands, wet meadows, springs, seeps, marsh edges, pastures, grassy shores, roadside ditches, damp sand, grassy swales, pastures, old fields, and floodplain woodlands in wet acid soil.	Suspected – low probability
Pseudocalliergon trifarium (blunt water moss)	Peatlands, rich fens, pools, and other areas saturated with groundwater.	Suspected – moderate probability
Splachnum ampullaceum (small capsule dung moss)	Peatlands or other wetlands on old dung of herbivores, or on soil enriched by dung.	Suspected – high probability
Tomentypnum nitens (tomentypnum moss)	Peatlands, fens, springs, wet meadows, and other areas saturated with groundwater.	Documented
Utricularia minor (lesser bladderwort)	Open water in peatlands, in low nutrient lakes and ponds, beaver ponds, sloughs, marshes, mudflats, and other low energy waterways.	Suspected – moderate probability[a]

a - reported in the area, but report is not confirmed

Environmental Consequences

Alternative 1 - No Grazing

Direct and Indirect Effects

Sensitive Species with Potential Impacts from Grazing/Herbivory

Absence of livestock grazing would result in less overall herbivory in the area (although herbivory from wildlife would continue) would likely have beneficial consequences for these species.

Sensitive Species with Potential Impacts from Trampling and Defecation

These species are often recognized as being threatened by livestock grazing therefore the absence of livestock grazing could be a beneficial consequence for these species.

Potential Impacts to Sensitive Peatland Species

Absence of livestock grazing would have beneficial consequences for these species and their associated habitats.

Alternative 2, 3 and 4

Direct and Indirect Effects

The twenty-six sensitive plant species that may be affected are analyzed for potential effects from the action alternatives. These species are either documented or are suspected to occur in the project area and are listed and analyzed by three potential impact groups: (1) impacts from grazing and herbivory, (2) impacts from trampling and/or defecation, and (3) impacts to peatlands and peatland-dependent species from trampling, trailing, herbivory, and defecation. Potential impact group are roughly based on groupings of species by preferred habitat, but also takes into consideration the general biology, growth habits, and taxonomy of the species.

Table 73. Direct/indirect effects to sensitive species by alternative

Concern / Impacts	Sensitive Species	Alternative(s)		Rationale
		1	2, 3, 4	
Species where impacts from herbivory / grazing is a concern.	*Carex cordillerana* *Muhlenbergia minutissima* *Trifolium douglasii*	BI	MDI	These three species are palatable and have the potential to be negatively impacted by intensive grazing[a].
Species where impacts from trampling and defecation is a concern.	*Botrychium ascendens* *Botrychium hesperium* *Botrychium lunaria* ***Botrychium montanum*** *Botrychium paradoxum* *Botrychium pedunculosum* *Bryum calobryoides* *Eleocharis bolanderi* *Listera borealis* *Mimulus evanescens* *Phacelia minutissima* *Schistidium cinclidodonteum* *Tortula mucronifolia*	BI	MDI	These species are very small, delicate, and exists in areas with high soil moisture. Livestock are often concentrated in these areas. For these species, a single hoof print or cow pie can destroy an individual plant, and even a relatively small amount of hoof action and/or defecation can eliminate a small population.
Species where impacts from trampling, trailing, herbivory, and defecation in peatlands is a concern.	*Anthelia julacea* ***Botrychium crenulatum*** *Harpanthus flotovianus* ***Helodium blandowii*** ***Meesia uliginosa*** *Ophioglossum pusillum* *Pseudocalliergon trifarium* *Splachnum ampullaceum* ***Tomentypnum nitens*** *Utricularia minor*	BI	MDI/BI	Adaptive management strategies that benefit these species would be implemented if detrimental effects are occurring and management objectives are not met within a 5 year period (appendix A, Table 103 and Table 104, and addendum B-1 of the Biological Evaluation for Sensitive Plants and Lichens of the Summit Logan Valley Grazing Authorization Project).

BI = Beneficial Impact, NI = No Impact, MDI = May Detrimentally Impact, but will not lead to a trend toward federal listing [40 CFR §1508.8, FSM 2672.42(5)]. Species identified in bold font are documented within the project area.

a - Bakker et al. 2010, NatureServe 2012, Wilson et al. 2008

Sensitive Species with Potential Impacts from Grazing/ Herbivory

Species in this group are those which are known to be palatable to livestock, and are unlikely to be affected by any other potential impacts from livestock grazing. This includes the sedge *Carex cordillerana*, the grass *Muhlenbergia minutissima*, and the clover *Trifolium douglasii*. Currently, there are no known populations in the area. While these three species occur in different habitats, each species is palatable to livestock and have the potential to be negatively impacted by grazing (Bakker et al. 2010, NatureServe 2012, and Wilson et al. 2008). Continued grazing under any of the three "action" alternatives may detrimentally impact these species, but would not lead to a trend toward federal listing.

Sensitive Species with Potential Impacts from Trampling and Defecation

This species group includes those species that are susceptible to impacts from trampling or defecation from livestock. These plants are all too small and/or devoid of nutritional value to be consumed by livestock. This group is comprised of tiny plants that often occur in isolated patches (i.e. individuals are less than 3 inches high and occurrences are often less than 1 square foot in total area). These are most often found in areas with high levels of soil moisture for all or some of the growing season. Such species include many Botrychium species, bryophytes, and other inconspicuous plants. There is one documented population of *Botrychium montanum*; all other species are suspected to occur in the area.

As stated above, these species are very small, delicate, and exists in areas with high soil moisture (e.g. springs, intermittent streams, glades, aspen stands, and moist to wet meadows). Livestock are often concentrated in these areas. For these species, a single hoof print or cow pie can destroy an individual, and even a relatively small amount of hoof action and defecation can eliminate an entire population. These species are often recognized as being threatened by livestock grazing (ISSSSP 2012). Conversely, continued grazing under any of the three "action" alternatives may detrimentally impact these species, but should not lead to a trend toward federal listing.

Potential Impacts to Sensitive Peatland Species

Peatlands are unique and important types of wetlands. In the Blue Mountains, peatlands are dependent upon a constant supply of groundwater. Groundwater-dependent peatlands are referred to as fens. Fens require thousands of years to develop, are hotspots of biodiversity, and cannot be easily restored once degraded or destroyed (Rydin and Jeglum 2009; USDA Forest Service 2010a, 2010b, 2012a, 2012b; Vitt and Wieder 2008; Weixelman and Cooper 2009). They often contain a disproportionate amount of rare and sensitive plant and animal species (NRIS 2012, Weixelman and Cooper 2009).

Domestic livestock grazing is often recognized as a potential threat to fen ecosystems (ISSSSP 2012, Weixelman and Cooper 2009). The following impacts that are recognized as major contributors to the degradation of fens: exposed peat and subsequent peat loss due to livestock trampling, loss of peat forming species due to trampling and grazing, alteration of hydrologic regimes due to entrenched livestock trails and effluent channels, and introduction of non-native and non-peat-forming species in areas with substantial soil disturbance.

The fen complex in the Logan Valley Allotment can be described as a broad helocrene spring system with a mosaic of peatlands, fen pools, wet and moist meadows, mesic shrublands, aspen stands, lodgepole pine swamps, and occasional mixed conifer stands. The fen and wetland systems are primarily dominated by wetland moss, graminoids, and willow species (Rausch 2009 and references in appendix A). Portions of the fen complex exist throughout the allotment.

Four sensitive plant species are documented within the fen complex (*Botrychium crenulatum* and the mosses *Helodium blandowii*, *Meesia uliginosa*, and *Tomentypnum nitens*,), and six other sensitive plants are suspected to occur. These species can be impacted by cattle in the same way as described in the

section above (Potential Impacts from Trampling and Defecation). Additionally, these species are intricately dependent on an intact peatland system. Thus, any negative changes to the water table, peat, or species composition of the peatland habitat would cause the loss of these species from the system. To address this, a series of management objectives and associated adaptive management strategies have been developed.

Management objectives for peatland habitats and peatland-dependent sensitive species focus on three general topics which address the integrity and resiliency of these sensitive ecosystems: hydrologic function, peat development, and species distribution and composition. Within five years the following management objective shall be met (appendix A, Table 102 and Table 103):

- Exposed or bare peat is less than or equal to 15 percent.
- Livestock trails are re-vegetating and are diverting less early season flow of water.
- The proportion of peat forming species is equal to or greater than 90 percent.
- The proportion of obligate wetland plant species is equal to or greater than 90 percent.
- Non-native and invasive plant species are absent or are not expanding.
- Sensitive plant species populations are maintained at current extent or are expanding.
- Sensitive plant habitats are maintained at current extent or are expanding.

A more detailed description of the management objectives and existing conditions are provided in appendix A, Table 102 and Table 103, of this EIS and in addendum B-1 of the Biological Evaluation for Sensitive Plants and Lichens of the Summit Logan Valley Grazing Authorization Project. Failure to meet these management objectives within a five year period will trigger an adaptive management strategy. In this case, a riparian pasture fence shall be constructed around the fen complex; this is common to all three "action" alternatives (appendix A, Table 104). Construction of a riparian pasture would allow better control of livestock use in the fen complex, and would provide the option of rest or non-use of the riparian pasture(s).

Continued grazing under any of the three "action" alternatives may detrimentally impact documented populations of these species in the short-term, but would not lead to a trend toward federal listing. Furthermore, in the long-term (> 5 years), there should be a beneficial impact if either (1) the management objectives are met, or (2) adaptive management strategies are enacted.

Cumulative Effects

Potential cumulative effects to sensitive plant species may include past, present, and foreseeable future activities described in appendix C. Possible effects from past activities, such as grazing, timber harvest, road construction, fire suppression, and other activities, are unknown and are assumed to be accounted for in the current description of existing condition of rare plants. These are difficult to accurately assess as the details of the activities and existing condition of sensitive species at the time of the actions were either not known or not described. However, since 1990, protection and management of sensitive species has been included in analysis and design of all projects. Therefore, present and future projects, and those that have occurred in the recent past are not likely to contribute any negative impacts to the sensitive species described above. In addition to Forest activities, browsing and herbivory from insects, wild ungulates, and other wildlife, or trampling and trailing from wild ungulates, may also possibly contribute to cumulative effects on sensitive plant species.

Since 1990, protection and management of sensitive species and their habitats (in the form of design criteria or other mitigation) should have been included in the proposals and designs of all projects (following forest-wide standards 56, 62, 65, 66, and standards for management areas 3A and 3B in the Malheur Forest Plan; and in direction and policy set forth in the FSM 2670). Therefore, present and

foreseeable future projects (other than those related to livestock grazing – addressed in this document), and those that have occurred in the recent past, are not likely to contribute any negative impacts to the sensitive species described above.

In addition to Forest Service actions, browsing and herbivory from insects, wild ungulates, and other wildlife, or trampling and trailing from wild ungulates, may also possibly contribute to cumulative effects on sensitive plant species. However, when considering potential negative effects from native wildlife (and Forest Service actions described in appendix C of this EIS), it is difficult to assess any accumulation of negative (and/or beneficial) impacts to these species as (1) there generally is a lack of available empirical science that specifically reports impacts to the rare plant species addressed in this document, (2) there has not been any long-term monitoring or research of the specific rare plant populations that are documented in the project area, (3) any of the "may impact" or "beneficial impact" determinations that have been made in this document or in the effects analysis of previous action proposals are speculative or are based on professional opinion and thus cannot be quantified to an extent where an accurate or tractable description of cumulative effects possible.

Consistency with Direction and Regulations

This analysis has shown that the Summit Logan Valley Grazing Project is consistent with the Malheur Forest Plan, as amended. This analysis also indicates that there may potentially be detrimental impacts individuals, populations, and habitats of some sensitive plant species, but that this would not result in the loss of population or species viability nor cause a trend toward federal listing under the Endangered Species Act. Furthermore, with adaptive management strategies in place, there may be beneficial impacts to individuals, populations, and habitats of some sensitive plant species.

Irreversible and Irretrievable Commitments

The Summit Logan Valley Grazing Authorization Project should not result in an irretrievable and irreversible commitment of resources.

Soils

Introduction

For soils, the following sections describe the regulatory framework, affected environment and environmental consequences of the alternatives.

Regulatory Framework

The Malheur Forest Plan and FSM R6 Supplement 2500-98-1 describe all legal and regulatory requirements for soil conservation for this EIS.

Two Forest Plan standards in particular are applicable to this EIS. Forest Wide Standard 127 (page IV-40) gives minimum percent effective ground cover levels as follows:

Table 74. Standard 127

Soil Erosion Hazard	Minimum Ground Cover, %
Low	30-40
Medium	40-60
High	60-75
Very High	75-90

If ground cover meets Standard 127, erosion would not be expected. Small amounts of erosion from roads are acceptable and similarly small amounts of erosion from small areas of rangeland are acceptable, as long as water quality standards are met.

Forest Wide Standard 126 says detrimental soil conditions (including compaction and puddling which decrease infiltration rates and productivity) shall not exceed 20 percent of the total acreage within any activity area. For this soil section "activity area" means each allotment.

Analysis Methods

In order to check on how commonly current livestock use increases erosion, the project soil scientist visited the allotments (except Lake Cr. Allotment), examining selected areas for signs of erosion and overland runoff on September 22 and 26, 2008.

The analysis area for this soil analysis is each allotment. The analysis time period for this soil analysis is the period that the management practices are applied.

Affected Environment

Livestock detrimentally compact and puddle soil in areas where they concentrate. Extreme examples are the small areas around salting grounds and water troughs. Livestock also concentrate in moist and wet meadows, but much less so than around salting grounds and water troughs, so the effects are less. However, on forested areas, current cattle impacts on the soil are minor because of the abundant ground cover and relatively small amounts of forage. Thus, over the whole activity area of an allotment, livestock plus other sources of compaction (such as roads, logging, firewood gathering, and ATVs) cause a cumulative amount of compaction and puddling less than the 20 percent limit of forest-wide standard 126. This is true even on McCoy Creek and Logan Valley Allotments, which have relatively large percentages of moist and wet meadows, as described in the soils report.

On parts of Lake Creek Allotment burnt by the 1990 fires, ground cover has recovered so that soils function as forest soils and erosion is close to zero (Table 75). On parts of the Lake Creek Allotment burnt by the 2002 High Robert fire, ground cover is nearly recovered, and soil erosion is close to zero (Table 75, between 1997 and 2004).

However, compaction and puddling caused by cattle can decrease infiltration capacity enough that it increases runoff and erosion. Two types of areas that cattle could detrimentally affect are non-forest upland soil, and grassy riparian areas and meadows.

Erosion effects, of past and ongoing activities listed in appendix C, on non-forest upland soil and grassy riparian areas, are described in this paragraph. Concentrated water from roads is eroding some soil, especially from shallow soil areas, but this erosion is minor and local. Road prisms produce some sediment, but the loss of soil productivity from this erosion is minor, because roads already have been removed from the productive land base. Recreational use of ATVs and hiking trails may cause minor, localized erosion in grassy riparian areas and meadows, but these effects are minor, because these soils have low erosion hazard, and because of the small amount of soil affected. No erosion from ATVs or hiking trails was seen during the soil scientist's inspections. Dispersed camping may have compacted and puddled a negligible amount of soil. Cumulative loss of soil productivity from these erosion sources combined is negligible. Water withdrawals and irrigation has increased the production of some meadows, but may have reduced production along some streams. Other past and on-going activities listed in appendix C (including timber harvest, stand replacing fire, activities on private land, and meadow restoration) have had no effect on non-forest upland soil areas or meadows or grassy riparian areas in the allotments.

On Lake Creek Allotment, soil and vegetation effects from livestock grazing have partially recovered during the period of rest.

Table 75. Ground cover on condition and trend clusters on forested sites

Cluster	Year Read	Bare Soil %	Rock + Erosion Pavement %	Moss %	Litter + Plant %
C-201, Lake Cr. Allotment Burned 1990, Erosion Seeded 1990, Logged 1991, Tree Planted ~ 1992	1991	34	15	0	51
	1993	36	12	1	51
	1995	27	13	6	64
	1997	14	13	8	65
	2004	8	5	1	86
	2010	5	1	0	94
C-202, Lake Cr. Allotment Burned 1990, Logged ~ 1991, Trees Planted ~ 1992	1991	43	0	1	56
	1993	32	4	7	57
	1995	20	3	24	53
	1997	14	5	27	54
	2004	8	7	8	77
	2010	4	0	4	92
Logan 11, LO-11, Summit Prairie Allotment, Stumps in 1956 & 2004 photos	1956	12	1	0	87
	2004	5	0	0	95

Non-Forest Upland Soil

Soil Types

The Malheur Soil Resource Inventory (SRI) (Carlson 1974) is the best source of information about soils at the scale of this project.

Non-forest upland soils tend to occur in two environments: 1) outwash in Logan Valley, and 2) dry environments with shallow, rocky soils. These include soils that support juniper woodland, as well as stands of shrubs or herbaceous plants. Gravel and cobble content, both of outwash and shallow soils, range from 30 to 80 percent. The outwash soil (soil type 15 in the SRI) has slopes less than 10 percent, and it has loam to sandy loam texture, with soil depth greater than 120 inches. The shallow soils, (soil types 7, 44, and 46), have slopes between 2 and 70 percent, and they have loam texture, with soil depth between 4 to 20 inches. Parent materials for the shallow soils are andesite and basalt, with some tuffaceous materials.

Soil type 15 underlies perhaps 80 percent of the Logan Valley and McCoy Creek Allotments. Summit Prairie and Lake Creek allotments are mostly forested. The shallow soils are scattered, mostly in the southwestern part of Summit Prairie Allotment. Perhaps 5 percent of Summit Prairie Allotment is occupied by shallow soil. Shallow soil occupies perhaps 2 percent of Lake Cr. Allotment and 0 percent of the other two allotments.

Soil Erosion on Non-Forest Upland Soils

The USDA Forest Service (1990) noted "Many of the adverse ... grazing impacts occurred before the Malheur became a National Forest. Early sheep and cattle grazing was particularly damaging to meadows and upland range sites, many of which were compacted and eroded" (p. III-4). Also "early sheep and cattle grazing practices have accelerated erosion over a good portion of the range and more open timber types" (p. IV-5). The grazing practices were unregulated over-grazing that severely reduced ground cover. These generalizations probably apply to the planning area. However, some non-forest soils in the planning area show only minor signs of accelerated erosion; either they were never heavily impacted, or they have recovered.

Probably some non-forest upland sites in their natural state, before the unregulated grazing, had less ground cover than prescribed by Standard 127. The unregulated grazing increased the area that has sub-standard ground cover. Some non-forest upland soils have not recovered from the historic erosion, and still have less ground cover than prescribed by Standard 127. They continue to erode at rates greater than prior to the unregulated grazing. In places like these, plant production and resultant ground cover may have been decreased for hundreds of years. However, rates of erosion are fairly low in these allotments because of the relatively level ground.

Almost all of the non-forest uplands observed during field visits by the soil scientist show no signs of erosion, because they are so flat. If sediment is produced from steeper slopes, most of the sediment produced is deposited on flatter areas below, before it reaches a stream.

Impacts from livestock grazing on non-forest uplands generally are minor under current management. Livestock tend to prefer places where water, shade, or better forage is available. However, cattle do decrease ground cover where non-forest areas are adjacent to good forage, water, and/or salting ground, such as part of the North Fork Unit of McCoy Creek Allotment, and places along lower Summit Creek. Areas such as this occupy probably well under 1 percent of any allotment. Burrowing mammals also decrease ground cover on some soils. Any sediment that may be produced from areas with decreased ground cover probably is filtered out on flat, well vegetated riparian soils before it reaches a stream. These observations are similar to other undocumented observations by the soil scientist elsewhere on Malheur National Forest.

In summary, although some areas do not meet the numerical values of standard 127, and cannot meet them because of natural conditions or because of erosion a century ago, the intent of the standard is being met. The intent is being met because on more than 99 percent of the non-forest uplands erosion is as low as possible, and because on the other fraction of a percent impacts from current grazing are localized and do not affect water quality.

Biological Soil Crusts on Non-forest Uplands

It is unknown how much biological soil crust was present on non-forest soils in the planning area before unregulated grazing. Crusts were probably less abundant in the planning area than in drier, hotter arid and semi-arid areas which have less plant and litter cover and less frequent fires (Belnap et al. 2001, pp. 14, 42). So it is difficult to know which, if any, reports of biological soil crusts can be extrapolated to the Planning Area.

Crusts were probably variable, and covered perhaps between 0 percent and 50 percent of the ground on various shallow soil areas. For instance, Kaltenecker et al. (1999) reported between 5 percent and 60 percent ground cover by moss and lichens in sagebrush communities. On the other hand, on desert sites Hansen, Ostler, and Hall (1999) found only 31 to 50 percent of the stands had visible crusts. The planning

area may have had less, because it had more plant and litter cover, and more fires. Despite their probable relative scarcity, biological soil crusts probably contributed to erosion control.

The unregulated grazing decreased the amount of biological soil crusts. Recovery after unregulated grazing has not been complete, due to erosion where ground cover was reduced. In addition, in many places crusts probably were never abundant. The existing crust is mostly moss.

Meadows and Grassy Riparian Areas

Soil Types

Soils in meadows and riparian areas are highly variable, often changing within a few feet. In riparian areas, the parent material has been deposited from adjacent slopes by colluvial transport or from upstream by alluvial transport. In some riparian areas, volcanic ash is important. These soils vary from wet to dry, and from clayey to sandy. In comparison to upland soils in the area, they are usually less steep, with thicker darker, more root-filled topsoil, with more organic matter, with fewer coarse fragments, and often deeper. They vary greatly in these and other properties. Most of these soils are not steep; often less than 5 percent slope so the erodibility is low. Some meadows grade into non-forest, shallow soil areas around their edges.

Grassy riparian areas are found along named and several unnamed streams in Logan Valley and McCoy Cr. Allotments and are also found along Summit Cr. Meadow soils are found away from streams in McCoy Creek and Logan Valley Allotments and Summit Prairie part of Summit Prairie Allotment.

Soil Erosion in Meadows and Grassy Riparian Areas

Conditions in meadows and grassy riparian areas in the project area probably are similar to those in in north-eastern Oregon, where Kauffman et al. (2002 p.20) found an average of 84 percent ground cover and a minimum of 64 percent ground cover. In a meadow in Logan Valley Allotment, ground cover is probably 94 percent (Table 76). On the other hand, cattle do severely decrease ground cover in small areas (for instance near salting grounds). The soil scientist's field inspection indicates that some spots in dry parts of meadows and riparian areas have ground cover less than 40 percent. However, the soil scientist's field inspection indicates that where the soil is moist, even heavily grazed areas often have 90 percent or more ground cover. The high ground cover in moist or wet parts of meadows compensate for areas where burrowing mammals or concentrated cattle use decreased ground cover. Meadows and riparian areas are usually on level ground so they have low erodibility. In summary, current grazing meets Standard 127 on meadows and grassy riparian areas, as indicated by ground cover levels mentioned above and low erodibility.

Table 76. Ground cover on a condition and trend cluster on a meadow

Cluster	Year Read	Bare Soil %	Rock + Erosion Pavement %	Moss %	Litter + Plants %
Logan 3, LV3 Logan Valley Allotment	1954	28	16	19	37
	2003	6	4	30	60

Moss provides some ground cover in some moist meadows. However, this is not usually considered "biological soil crust," which is a term used on dry rangelands.

The minor effects of ongoing livestock use described above have been decreasing, or have disappeared, on Lake Creek Allotment.

Environmental Consequences

The general principle for the following section is that decreased grazing (compared to current grazing) would cause decreased effects, and vice versa.

Alternative 1 - No Grazing

Direct and Indirect Effects

Non-Forest Upland Soils

Ground cover, erosion, detrimental soil conditions, and biological soil crusts would continue their slow recovery on non-forest soils that were degraded by early 20th and late 19th century grazing. In addition the small areas near water, good forage, and/or salting ground where current grazing is affecting ground cover would start recovering.

Meadows and Grassy Riparian Areas

In places where ground cover has been decreased below potential, it would increase above current levels. Erosion of soil from outside stream channels would decrease. The decrease would be negligible because cattle are causing a negligible amount of soil erosion. Detrimental soil conditions would decrease.

Compaction would decrease back to natural levels within 8 years (Kauffman et al. 2004), as root growth, animal burrowing, and soil freezing loosens the soil.

Cumulative Effects

The areas considered for cumulative effects are each allotment individually.

Effects from past and on-going actions are described in the Affected Environment section. Detrimental impacts on areas outside non-forest uplands, meadows and grassy riparian areas would remain at about current levels, as recovery from past activities (such as logging) is counter-balanced by impacts from future activities.

For future actions, implementation of the Travel Management plan would result in negligible decreases in soil erosion, because cross country travel is currently causing negligible erosion. Treatments of invasive weeds would comply with laws, regulations, and the Forest Plan. Thus, these treatments would not significantly increase erosion or detrimental soil conditions. No other foreseeable future action would take place on shallow soils, meadows, or grassy riparian areas, so no additional effects are expected.

In summary, for every allotment, there would be a negligible decrease in erosion and detrimental soil conditions under alternative 1.

Alternative 2 - Proposed Action

Direct and Indirect Effects

Non-Forest Upland Soils

The parts of Lake Creek Allotment that would not be grazed would continue the small, slow recovery of ground cover, erosion, detrimental soil conditions, and biological soil crusts described under alternative 1. On the parts of Lake Creek Allotment that would be grazed, conditions would become like the other three allotments with slightly reduced ground cover and biological soil crusts and slightly increased erosion and detrimental soil conditions.

On the other three allotments, for the small areas near water, good forage, and/or salting ground where current grazing has decreased ground cover, existing conditions would be maintained. For the rest of the non-forest upland soils ground cover, erosion, detrimental soil conditions, and biological soil crusts would continue their slow recovery on soils that were degraded by early 20th and late 19th century grazing. The recovery under the action alternatives would probably be slower than under alternative 1.

Meadows and Grassy Riparian Areas

Parts of the Lake Creek Allotment that would not be grazed would continue the slow recovery of ground cover, erosion, and detrimental soil conditions described under alternative 1. On the parts of Lake Creek Allotment that would be grazed, conditions would become like the other three allotments with slightly reduced ground cover and slightly increased erosion and detrimental soil conditions.

On the other three allotments, existing soil conditions would be maintained, except as described in the next paragraph. Allotments would continue to meet Standard 127. Soil outside stream channels would continue to contribute a negligible amount of sediment to stream channels.

Places where decreased grazing (compared to current grazing) would decrease effects to ground cover, erosion, and detrimental soil conditions are as follows:

Logan Valley Allotment:

- West Bosenberg Riparian pasture
- West Lake Creek Riparian Pasture
- Big Creek Riparian unit

Summit Prairie Allotment:

- Sagehen unit
- West Summit Recovery unit
- Bosenberg unit
- Little Logan unit

In pastures that are being rested for 3-5 years, ground cover may increase during the rest and then decrease somewhat when they are grazed. However, ground cover would remain above current levels because the grazing would be more closely controlled than at present. Any implementation of adaptive management strategies, such as rest or decreasing allowable use levels, would decrease effects a little more.

Cumulative Effects

Non-Forest Upland Soils and Meadows and Grassy Riparian Areas

The areas considered for cumulative effects are each allotment individually. Cumulative effects from past and on-going actions are described in the Affected Environment section. Generally, the same effects would continue, except as described in the Direct and Indirect Effects section.

See the Alternative 1, Cumulative Effects section for a discussion of the cumulative effects of the Travel Management plan and invasive weeds treatments.

The actions listed in chapter 2, Recent Changes in Current Management section and in appendix C would decrease soil impacts in riparian areas and increase them in certain small upland areas. Like existing impacts, these increases in upland effects are expected to be minor.

Because the effects on soil of 1) alternative 2 grazing (including adaptive management), 2) past and ongoing actions as shown in the Affected Environment section above, and 3) foreseeable actions are so minor, the sum and interaction of these effects on soil would also be minor on all allotments.

Alternative 3

Direct and Indirect Effects

Non-Forest Upland Soils

Lake Creek Allotment would continue the small, slow recovery of ground cover, erosion, detrimental soil conditions, and biological soil crusts described under alternative 1.

On the other three allotments, effects on non-forest uplands would be similar to alternative 2.

Meadows and Grassy Riparian Areas

The Lake Creek Allotment would continue the small, slow recovery of ground cover, erosion, and detrimental soil conditions described under alternative 1.

On the other three allotments, existing soil conditions would be maintained, except as described in the next paragraph. Allotments would continue to meet standard 127. Soil outside stream channels would continue to contribute a negligible amount of sediment to stream channels.

Places where decreased grazing (compared to current grazing) would decrease effects to ground cover, erosion, and detrimental soil conditions are as follows:

Logan Valley Allotment:

- West Bosenberg Riparian pasture
- West Lake Creek Riparian Pasture

Summit Prairie Allotment:

- Sagehen riparian pasture
- Upper and Lower Little Logan riparian pastures
- West Summit Recovery unit
- North Summit Riparian pasture

Any implementation of adaptive management strategies, such as rest or decreasing allowable use levels, would decrease effects a little more.

Cumulative Effects

Cumulative effects would be similar to alternative 2.

Alternative 4

Direct and Indirect Effects

Non-Forest Upland Soils

On all four allotments effects would be similar to alternative 2, except the number of un-grazed acres in Lake Creek allotment is greater under alternative 4.

Meadows and Grassy Riparian Areas

On all four allotments effects would be similar to alternative 2, except in Summit Prairie Allotment, where West Summit Recovery unit and Prairie Riparian pasture would be the only areas with increased ground cover and decreased erosion and detrimental soil conditions due to decreased grazing.

Cumulative Effects

Cumulative effects would be similar to alternative 2.

Consistency with Direction and Regulations

All alternatives would be consistent with Forest Plan soil protection standards. Under all alternatives, effects of livestock compaction and puddling, on soil erosion would be negligible, in terms of water quality and soil quality.

Irreversible and Irretrievable Commitments

None of the alternatives result in irreversible or irretrievable effects to soil.

Hydrology and Aquatics

Introduction

This is a summary of the Watershed Specialist Report and Fisheries Biological Evaluation (BE) that evaluates the potential effects of livestock grazing on aquatic species and their associated habitat within the Summit Logan Valley Grazing Authorization Project. The final specialist report and Fisheries Biological Evaluation can be found in appendix G which is available for review by request.

Regulatory Framework

Malheur National Forest Land and Resource Management Plan (Forest Plan)

The amended Forest Plan (1990) provides program direction for resource management on the Malheur National Forest. Standards and guidelines apply either forest wide or specifically to a Management Area. Relevant forest-wide standards and guidelines for hydrology and aquatics in this project include: (Forest Plan, page IV-32 #61 and page IV-33 #65). Pertinent Management Area 3A standards and guidelines for this project include: (Forest Plan, page IV-56 #10, #18; page IV-57 #14; and page IV-58 #19-22 and Table IV-4 (note all alternatives would use Strategy C)).

In 1994 the Forest Plan was amended (Amendment 29) to incorporate the Columbia River Anadromous Fish Habitat Management Policy and Implementation Guide (USDA Forest Service 1994). The amendment included changes to both Management Areas 3A (inland fish habitat) and 3B (anadromous fish habitat). The existing Forest Plan direction would stand; however, if it provided more protection than Amendment 29.

In 1995 the Inland Native Fish Strategy (INFISH) provided riparian goals, management objectives, and standard and guidelines that amended the Regional Guides and the Malheur Forest Plan. The existing Forest Plan direction (including amendment 29) would stand; however, if it provided more protection than INFISH. The management objectives and standard and guidelines provide the specific measurements and guidance to implement the riparian goals identified in INFISH (USDA Forest Service 1995a).

Executive Order 11990 -- Wetlands

The basic requirement of Executive Order 11990 is that a Federal agency would avoid construction or management practices that would adversely affect wetlands unless that agency finds that (1) there is no practicable alternative, and (2) the proposed action includes all practicable measures to minimize harm to the wetlands.

Executive Order 11990 directs all Federal agencies to minimize the destruction, loss, or degradation of wetlands; and preserve and enhance the natural beneficial values of wetlands in the conduct of the agency's responsibilities for:

(1) Acquiring, managing, and disposing of Federal lands and facilities;

(2) Providing federally undertaken, financed, or assisted construction and improvements; and

(3) Conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Clean Water Act

Rivers, streams, and lakes within and downstream of the treatment areas are used for boating, fishing, swimming, and other water sports. Additionally, the Forest streams provide habitat and clean water for fish and other aquatic biota, each with specific water quality requirements. The Clean Water Act (CWA) protects water quality for all of these uses and requires States to set water quality standards to support the beneficial uses of water.

The Clean Water Act also requires States to identify the status of all waters and prioritize water bodies whose water quality is limited or impaired. For Oregon, the Department of Environmental Quality (DEQ) develops water quality standards and lists water quality limited waters. In addition, Region 6 of the Forest Service has entered into a Memorandum of Agreement (MOA) with the Oregon State Department of Environmental Quality to acknowledge the Forest Service as the Designated Management Agency for implementation of the Clean Water Act on National Forest land. In an effort to support the Department of Environmental Quality, the Forest conducts a variety of monitoring and inventory programs to determine status of meeting state water quality standards as well as other regulatory and agency requirements.

By direction of the Clean Water Act, where water quality is limited, the Department of Environmental Quality develops Total Maximum Daily Load (TMDL) plans to improve water quality to support the beneficial uses of water. For water quality limited streams on National Forest System lands, the USDA Forest Service provides information, analysis, and site-specific planning efforts to support state processes to protect and restore water quality. The Malheur River Basin TMDL Plan for stream temperature was approved by the Environmental Protection Agency on September 2010. With an approved TMDL, streams listed for water temperature are removed from the 303(d) list and stream recovery would be achieved through the implementation plan specified in the TMDL.

Oregon’s stream temperature standard is designed to protect cold water fish (salmonids) rearing and spawning as the most sensitive beneficial use. Numeric criteria are based on temperatures that protect various salmonid life stages. To address stream temperature, effective shade is used as a surrogate measure. Effective shade is measured at the stream surface using a Solar Pathfinder. Effective shade is defined as the percent reduction of potential daily solar radiation delivered to the water surface.

The TMDL addresses overgrazing impacts on riparian vegetation disturbance/removal reducing shade and increasing solar radiation, providing micro-climate effects that can provide cooler day time temperatures

(Anderson et al 2007; Chen et al. 1999), and its role in stabilizing the channel characteristics and providing a narrower channel that has less surface area exposed to solar radiation.

The TMDL states that when areas do not meet current effective shade surrogates, then monitoring will take place to determine the trend in the vegetative and channel conditions. Management strategies will be implemented to ensure the trend is upwards towards desired conditions. This monitoring will take place at designated monitoring areas (DMAs) identified in Figure 53 as water temperature monitoring sites. If improving trends are compromised by natural disturbances such as flooding, ice jam scouring and wildfires, DMAs would still be in compliance with the TMDL. Monitoring of conditions will be reported to Oregon Department of Environmental Quality's (ODEQ) every 5 years. The Malheur National Forest is in the process of developing a Water Quality Restoration Plan that will outline how the Forest Service will implement the TMDL. Monitoring identified on pages 84-86 will be essential to demonstrate compliance with the Clean Water Act.

The Regulatory Framework has changed based on a decision by the Environmental Protection Agency (EPA) to add 870 waterbodies to Oregon Department of Environmental Quality's (ODEQ) 2010 303(d) list on December 14, 2012. One stream has been added to the 303(d) list in the Project Area. Summit Creek is 303(d) listed for parameter biological criteria with a Category 3c status, impairing pollutant unknown. This indicator states that waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities (Oregon Department of Environmental Quality 2013). The EIS identifies monitoring objectives developed specifically for Summit Creek for macroinvertebrates (i.e. biological activities) to ensure the trend is positive.

The Endangered Species Act (ESA)

The Endangered Species Act of 1976, as amended, directs each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat (Section 7). The Endangered Species Act also directs each federal agency to confer or consult with the appropriate Secretary on any action, which is likely to jeopardize or affect the continued existence of any species or its habitat. Additionally Section 2(c)(1) of the Endangered Species Act includes affirmative conservation direction, stating "that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this act."

Bull trout Recovery Plan

The U.S. Fish and Wildlife Service issued a final rule listing the Columbia River and Klamath River populations of bull trout (*Salvelinus confluentus*) as a threatened species under the Endangered Species Act on June 10, 1998 (63 FR31647).

A bull trout recovery plan was developed in 2006 to delineate reasonable actions believed necessary to recover and protect the species. The ultimate goal for recovery of bull trout is to "ensure the long-term persistence of self-sustaining, complex interacting groups of bull trout distributed throughout the species' native range so that the species can be delisted" (USFWS 2006).

The plan outlines objectives and defines actions necessary to achieve the overall goal of bull trout recovery. Finally, the plan designates critical habitat and physical and biological features, called Primary Constituent Elements (PCEs) that are essential to the conservation of the species that may require special management considerations or protection.

Analysis Methods

Site visits to the project area to analyze livestock grazing began during 2007 and continued through the spring of 2012. Data was collected to determine the existing condition of the vegetative, channel, and fish habitat attributes, in conjunction with developing a desired condition. During this process differences between existing and desired condition were identified as they related to livestock grazing within specific reaches of streams based on vegetative type, channel type, soil type, and slope. Data used in this analysis included: Proper Functioning Condition assessment (Elmore 2007), Carex Working Group Report (Carex Working Group 2012), USDA Forest Service Region 6 Stream Surveys (USDA Forest Service 1995, 1998, 1999, 2005, 2013), PACFISH-INFISH Biological Opinion Monitoring (PIBO), Multiple Indicator Monitoring (MIM) (Burton and Cowley 2010; USDA Forest Service 2011), water temperature data, and the Malheur National Forest Roads Analysis (USDA Forest Service 2004).

Table 77identifies the strengths and weaknesses associated with the data used for this analysis.

Relevant actions relating to riparian vegetation, channel characteristics, bull trout critical habitat and water quality were compared across alternatives for the project area. Specific monitoring indicators that are responsive to changes in land management were selected based on issues identified during scoping and by the team. It was assumed that all alternatives are consistent with Forest Amendment 29 direction and INFISH in relation to recovery of fish habitat and riparian areas. Specific actions occurring within each alternative were analyzed for their effects to bull trout critical habitat and existing riparian condition as well as their potential for facilitating recovery towards, or achievement of desired conditions outlined in appendix A Table 102 and Table 103. For analysis purposes the miles of bull trout critical habitat, miles of riparian Proper Functioning Condition (PFC) rating (PFC, FAR, FAR UP, FAR DN)[9] were broken down by unit and allotment for each alternative and those miles were related to the relevant actions within each alternative by allotment and unit. Actions in each alternative were analyzed whether they would facilitate recovery of specific riparian areas identified as having issues towards desired conditions or maintain the condition if near the desired potential. The rate of recovery for riparian area is dependent on the actions proposed and the existing condition of the riparian area. For example, in order for a stream with an existing proper functioning condition rating of functional-at risk with a downward trend to move toward a rating of functional-at risk with an upward trend or in proper functioning condition relates to the time it would take for recovery. Changes in management for areas that are functional-at risk are frequently a high priority since these areas often respond quickly or are at the tipping point for being non-functional. Once a riparian area is non-functional it usually takes large investments of time and money to recover the area (Pritchard et al. 1998). Rates of recovery or improvement were expected to be faster for those riparian areas demonstrating a mid seral state or already having suitable vegetative components present or channel characteristics for recovery. Riparian areas already at proper functioning condition are expected to improve beyond proper functioning condition if the actions facilitate continual improvement thus are directly linked to improved bull trout critical habitat, channel characteristics, water quality.

[9] Proper Functioning Condition (PFC) rating are outlined below:
PFC – Proper Functioning Condition: Functioning as desired.
FAR – Functional – At Risk: In a functional condition but has an existing soil, water or vegetative attribute making them susceptible to degradation.
FAR UP – Functional – At Risk – Upward trend: In a functional condition but has an existing soil, water or vegetative attribute making them susceptible to degradation, but is trending upward.
FAR DN (down) – Functional – At Risk – Downward trend: In a functional condition but has an existing soil, water or vegetative attribute making them susceptible to degradation, but is trending downward.

Table 77. Data used for the hydrology and aquatics analysis

Type of Study	Study	What the Data Provides	What the Data Does NOT Provide
Inventory	Proper Functioning Condition	A qualitative assessment by an interdisciplinary team that identifies issues, potential and existing condition in hydrology, vegetative and soils attributes. This data has been collected using a nationally standardized protocol. Proper functioning condition does provide qualitative indicators of existing vegetation and hydrologic function which are interconnected to fish habitat and related to recovery of riparian areas. Proper functioning condition provides a way for determining appropriate monitoring sites	Does not inform fish habitat condition quantitatively. It was not collected on all of the riparian areas present in the project area. Proper functioning condition is not appropriate for monitoring or determining long term trend.
	R6 Stream Surveys	Provides site-specific metrics for fish habitat condition. This data has been collected using a nationally standardized protocol.	Not collected regularly across years because of its intensive design for data collection and high economic cost.
Monitoring	Multiple indicator monitoring includes Implementation (end of year) and Effectiveness (3-5 year trend that indicates condition)	Provides a random, systematic sampling design to collect quantitative metrics for riparian vegetation, hydrological and channel complexity indicators. These indicators are sensitive to changes in livestock management and are used to determine existing condition, trend and for establishing management objectives. Provides linkages between annual effects (herbivory, browsing and bank trampling) on the long term condition (stability). This data has been collected using a nationally standardized protocol. It has been well tested to allow for accurate and repeatable measurements.	Not all data was collected with an interdisciplinary team. The Protocol has been adjusted through the development of a final product. Bank stability and greenline composition are indicators that had protocols changed and can make interpretation of trend difficult.
	Pacfish/Infish Biological Opinion	Strengths are similar to multiple indicator monitoring. More discussion of attributes across the Interior Columbia Basin has been done in the scientific literature. Collects more indicators than multiple indicator monitoring, such as bankfull width/depth, bank angle and vegetative cross section composition. The data is more informative when there are at least three visits to a site or monitored across 10 years.	Weaknesses are similar to multiple indicator monitoring. The indicators are collected using a different protocol than multiple indicator monitoring and makes comparison difficult (i.e. bank stability has longer distances between sampled areas). Protocols change across years. Bankfull width/depth protocol has changed for the third reading, but not first two. Making trend interpretations difficult.
	Carex Working Group	Provides a linkage for comparing the density and height classes of woody shrubs within the Summit Allotment to reference conditions in the local area. The survey method is repeatable. The survey was quantitative.	Density and height classes were not collected for other areas in the project area.
	Water Temperature[a]	Provides continuous data annually that helps identify water characteristics.	Not collected the same years across all sites and may have climatic variability.

a – Data (unpublished) was collected by the USDA Forest Service, Oregon Department of Fish and Wildlife, and Burns Paiute Tribe

Appendix A Table 102 was developed to show the existing and desired condition for stream reaches in the project area utilizing the proper functioning condition surveys (Elmore 2007), Pacfish/Infish Biological

Opinion Effectiveness Monitoring dataset, Multiple Indicator Monitoring sites (Burton and Cowley 2010; USDA Forest Service 2011), and the Carex Working Group Report (Carex Working Group 2012). Within the appendix, reaches are broken out by vegetation community potential, existing condition and desired condition. Appendix A, Table 103 lists the specific indicators selected for monitoring along with the management objective and target time period the response is expected for. Management objectives were developed that are site specific using measured data that is attainable and time oriented. The attributes identified within a reach that were developed into a management objective had either vegetative or channel characteristics that were not in balance with the potential for the site identified. The numeric values identified per site were based on reviewing data collected at that site. Monitoring is critical to determine if actions specified in the alternatives are facilitating recovery or moving towards desired conditions within the project area. One of the assumptions made is that until vegetation recovers channel characteristics would not recover. Recovery of channel characteristics is expected to occur rapidly at first as the vegetation improves and captures sediment (bank building process). As the vegetation improves less sediment is available for deposition and therefore the bank building and channel forming processes may slow. Additionally channel forming events are often dependent on 20-year flood events which are variable and may occur within the first 5 years, 10 years or not for another 20 years or longer.

Monitoring included a phased approach where vegetative objectives were primarily monitored 5 years out and stream channel objectives related to hydrology, channel complexity, and fish habitat objectives were monitored at 10 years. This process was selected based on expected response intervals to changes in management. Vegetation is often the first to respond to changes in livestock management, followed by channel characteristics, and fish habitat. Normally, the most common return interval, high flow (1-2 years), is most important for forming channel characteristics such as flood plains. Flows of 5-10 year intervals are scour and re-deposit events. Flows of 10-20 year return intervals are largely the ones that provide stream and habitat complexity needed by fish. Above these moderately high levels, stream channels are often re-set, especially on streams not at proper functioning condition (Elmore 2007). Quantitative measurements on several of the parameters such as width:depth ratios or undercut banks are not positively sustainable below proper functioning condition, thus lessening their importance for monitoring until a rating of proper functioning condition is obtained or vegetation is recovering. It is not unusual for streams below proper functioning condition to make a series of recovery/degradation progressions that alter important channel characteristics. Therefore, until a rating of proper functioning condition is obtained within those reaches not currently at proper functioning condition within the project allotments, the quantitative indicators relating to channel characteristics and fish habitat were assumed to follow vegetative characteristic recovery and monitoring of these characteristics would happen at longer time scales following vegetative recovery. Once the vegetative component of the proper functioning condition protocol and desired condition (appendix A Table 102) is obtained channel characteristics and fish habitat monitoring would be initiated.

For the small, generally low-gradient stream systems reviewed during the proper functioning condition assessment, vegetation is the key component for long-term maintenance and recovery (Elmore 2007).

Stream temperatures and the quality of habitat for bull trout are the major limiting factors within the Malheur River Watershed which includes the Summit, McCoy, Lake Creek and Logan Valley allotments. Primary effects from grazing are related to vegetation removal and hoof action along the banks and areas of saturated soils. Deep pools, undercut banks, and riparian hardwood are deficient within the mid/lower elevation streams in the project area. Well shaded cover also provides productive terrestrial and aquatic macro-invertebrates for an abundant food base. This complexity of cover also reduces stress to individual trout allowing for productive growth and reproduction.

The Draft Recovery Plan (US Fish and Wildlife Service 2002) indicated past and ongoing human-induced activities have increased stream temperatures, increase sediment delivery, and resulted in the loss of large pools. These activities include the creation and management of Warm Springs and Agency dams, forest management practices, irrigation withdrawals, livestock grazing, past bull trout harvest, and introduction of non-native species (brook trout).

Analysis Process and Rates of Recovery

The following premise was used to analyze effects of the proposed actions on riparian vegetation, channel characteristics, bull trout critical habitat, and water quality recovery: Any action to improve proper functioning condition (PFC) ratings, especially vegetative characteristics, would also improve fish habitat to some degree, within a given stream reach, because of the inter-connectivity of riparian areas and in-stream hydrological functions for fish habitat. The extent and rate of recovery is dependent on the existing condition, the extent of the action, and the intensity of the action within the alternative. It was assumed that vegetation would respond more quickly to passive/active restoration and hydrological function would follow at a slower rate for the improvement of in-stream fish habitat (appendix A Table 103). Riparian and in-stream functionality conditions are consistently in a state of flux and the ratings can vary from year to year especially for riparian areas rated below proper functioning condition. Likewise each stream reach can be in various stages of recovery or degradation. This can be manifested in the resiliency of the streambanks and vegetation along any individual reach (some are more susceptible to impacts than others). For example streambanks may be well armored with large cobble or boulders and thus more resistant to the actions of overland flow or other actions that may impact streambanks. Additionally, riparian areas may be in a more advanced seral state resulting in resiliency to natural disturbances such as fire, 20-50 year flood events, or land management actions such as grazing. The likelihood of recovery beyond a rating of proper functioning condition also increases within a more advanced seral state coupled with the extent and intensity of proposed action. These two factors are correlated with the rate of recovery of a riparian area.

Riparian vegetation, channel characteristics (hydrology), and fish habitat are interrelated and interdependent. Because linkages between these attributes, actions that facilitate recovery of one may also facilitate recovery of the other and have a cascading effect. This also can manifest itself for actions that may impact one or more of the attributes in a negative manner. A dynamic feedback loop exists between these attributes. Also, the rate of recovery of these attributes often varies in space and time.

The difference in rates of recovery for riparian vegetation, channel characteristics, and fish habitat were analyzed among alternatives and the responsiveness of these attributes to changes in land management were used to delineate indicators for monitoring 5 and 10 years out (appendix A Table 103). The desired conditions were based on the Malheur Forest Plan as amended by INFISH and Amendment 29. Modifications are proposed to Amendment 29 numeric values and INFISH riparian management objectives for some specific stream reaches to better reflect conditions that are attainable based on the stream type and vegetation potential. Specific data used to support these modifications came from proper functioning condition surveys (Elmore 2007), Pacfish/Infish Biological Opinion Effectiveness Monitoring dataset, Multiple Indicator Monitoring sites (Burton and Cowley 2010; USDA Forest Service 2011), Carex Working Group Report (Carex Working Group 2012), Forest Service R6 Stream Surveys (USDA Forest Service 1995, 1998, 1999, 2005, 2013), and the Malheur River Basin Total Maximum Daily Load (Oregon Department of Environmental Quality 2010). Table 102 in appendix A displays the relationships between vegetation community potential, existing condition long-term desired condition, and the data sources used. The relationship between recovery of herbaceous and woody vegetation to channel characteristics (channel stability) and how they relate to specific standards for aquatic habitat, water quality, and livestock forage and are shown in Figure 30. The relationship to proper functioning condition ratings is shown at the bottom of the figure.

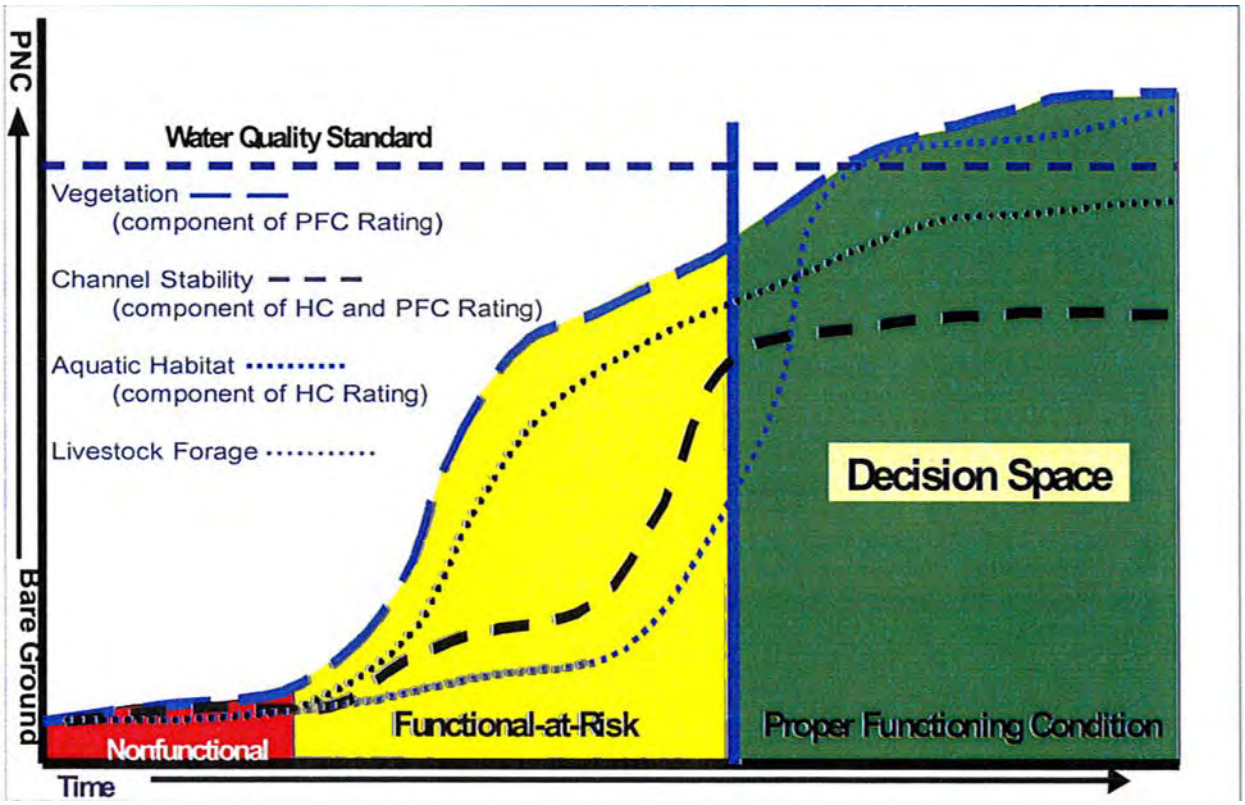

Figure 30. Proper functioning condition rating relationship to vegetation, aquatic habitat composition (channel characteristics), water quality standards and livestock forage

Potential natural condition is the highest ecological status an area can attain given no political, social or economic constraints (Pritchard et al. 1998). As a riparian area recovers toward potential natural condition, resiliency and resistance to disturbances increases above a minimum rating of proper functioning condition.

Below a rating of proper functioning condition, flexibility for the decision maker decreases as a result of the riparian area being functioning at risk and susceptible to impacts related to management actions.

Within the range between proper functioning condition and desired condition, the decision space, the range of flexibility for potential management actions increases.

Key Assumptions

- Channel characteristics can only improve once the appropriate vegetation has become established and is present in sufficient quantity and quality (vigor, diverse age classes).
- Optimal conditions for riparian shrub development and herbaceous vigor occur annually (climate conditions).
- Rates of recovery for riparian areas differ between actions identified in the alternatives based on existing conditions.
- Immediate rest of 3-5 years would facilitate recovery of riparian vegetation at a faster rate than rest of 3 years out of 10 especially with regards to riparian hardwood development.

- Improvements in riparian condition would facilitate improvement in bull trout critical habitat, redband trout habitat and to some degree Columbia spotted frog habitat associated with the lotic, fish bearing, and perennial streams in the project area.
- Streams rated as functional at risk during the functioning condition surveys were more at risk to the effects of actions proposed in the alternatives than those at proper functioning condition.
- The rates of recovery within appendix A Table 103 would occur within the 10 year time frame.
- Riparian areas rated as at proper functioning condition have the ability to improve beyond a minimum rating of proper functioning condition when the appropriate actions are taken and with the appropriate vegetation and channel characteristics.
- Indicators related to bull trout critical habitat and fish habitat in general as well as water quality are often achieved beyond a rating of proper functioning condition.
- Development of resilient riparian areas would allow for resumption of grazing within the pastures.
- Changes in livestock management would result in expression of riparian vegetation within 5 years for reaches rated as functional at risk and potential channel characteristics in 10 years.
- Riparian areas for which the existing condition is related to livestock grazing would improve while riparian areas whose existing condition is related to other legacy effects such as roads, railroad grades, or logging would not improve to the same extent as those related to livestock grazing by the actions proposed in the alternatives.
- Rates of recovery for riparian areas would be the same or similar for those areas with no livestock grazing (alternative 1) compared to those where the appropriate management is proposed.

Lennox et al. (2009) found that stream channel attributes that improved following restoration of riparian vegetation included bankfull width/depth, streambank stability, and woody debris frequency metrics. Additionally, water columnar attributes that improved following restoration of vegetation included shade, canopy cover, number of pools with project age, maximum pool depth, and mean pool depth. Decreasing the bankfull width/depth ratio from vegetation improvement tends to result in deepening, and narrowing of the channel as sedimentation on floodplains increases following willow re-establishment (Hupp and Osterkamp 1996; Opperman and Meren-lender 2004; Corenblit et al. 2007). Thus, until vegetation recovers channel characteristics and criteria associated with bull trout critical habitat and water quality are not expected to achieve desired conditions until vegetative criteria is achieved beyond a rating of proper functioning condition (Figure 30).

The analysis consisted of determining whether the action contributes to attaining the goals and objectives identified in appendix A Table 102, has a neutral effect, or reduces the likelihood that the goals and objective would be achieved within the time frame identified in appendix A Table 103. A certain amount of “risk” is associated with actions in the various alternatives and whether the objectives for riparian management would be met within the 5 and 10 year period identified in appendix A Table 103. The word “risk” refers to uncertainty such as natural events or unforeseen management actions. The less resilient a riparian area is, the more risk of set-back associated with actions proposed for it. When riparian vegetation and channel characteristics are in balance and composed of resistant vegetation (proper functioning condition minimum), the associated risk to riparian areas becomes less and recovery is more likely following these events. This is referred to as riparian resiliency. Because of this, alternatives may have the same amount of miles of riparian area at risk (less than proper functioning condition) but the number of actions, intensity, duration, annual use (endpoint indicator), adaptive management strategy, and periods of rest could vary between the alternatives resulting in one alternative being preferable to another for attainment of the riparian objectives identified in appendix A Table 102.

Affected Environment

The Affected Environment section examines the existing and desired vegetative and channel characteristics, water quality, and aquatic habitat in the project area. Information on climate, hydrology, and channel characteristics was taken from the Malheur Headwaters Watershed Analysis (USDA Forest Service 2000) to provide a general background on the project area and its surrounding watershed.

Background on Malheur Headwaters

The Malheur River is a tributary to the Snake River, which empties into the Columbia River and eventually the Pacific Ocean. Major tributaries (streams) that drain to the Malheur River in the watershed include Big Creek, Bosenberg Creek, Conroy Creek, Crooked Creek, Frazier Creek, Lake Creek, Larch Creek, McCoy Creek, Summit Creek, Tureman Creek, and Wickiup Creek.

The hydrologic regime of the Blue Mountain Ecological Reporting Unit is characterized as a snow pack-dominated system. Peak discharge generally occurs from May through June. Generally, base flow in the late summer is maintained by groundwater and is relatively unaffected by precipitation, although occasional thunderstorms and infrequent showers may cause minor rises in streamflow for short periods of time (Quigley and Arbelbide 1997).

Stream Channel Characteristics

Figure 31 illustrates the Rosgen stream classification system used in stream channel characteristics discussions throughout this section of the document. The chart is divided into three areas: dominant slope range, cross section and plan view. Stream types are given a letter category that describes where it fits in these categories.

- Dominant slope range – This shows stream profiles, which plot typical longitudinal slopes along the bankfull water surface. On the left side of the chart, type A and B streams have steep slopes, while in the center of the chart, slopes are gentle. On the far right, slopes of G type streams are steeper again.
- Cross-section view- The water surface is shown in blue at bankfull elevation, and a dashed line at two-times bankfull (or the flood prone elevation) is also shown. The ratio of these two lines gives the entrenchment of the channel. On the left, the chart begins with a relatively low entrenchment ratio which denotes highly entrenched channels. In the center, the entrenchment increases, indicating moderate entrenchment.
- Plan view – This shows the pattern of stream channels from relatively straight channels on the left, which become increasingly sinuous and wider channels as you move to the right. Followed by threaded and braided channels in the center and then highly sinuous channels, wider channels, and relatively narrow channels.

Streams start as high-gradient, first-order channels (Rosgen A or B channels) in the upper headwater portions of the watershed, and drop rapidly down to low-gradient third-order streams that bisect the meadow complex of Logan Valley (Rosgen E channels). Upper reaches are confined and have gravel substrates. Sinuosity is low, and the streams consist predominantly of step-pool reaches (Rosgen B channels). Woody debris is common in these upper reaches and provides complexity and habitat in the stream ecosystem. Stream reaches in the valley bottoms above Logan Valley have occasional beaver dams and associated pond complexes. As stream gradients decrease in the valley bottoms, sinuosity increases and floodplain features become wider and more pronounced. In contrast to upland stream reaches, channel substrates in valley bottom reaches are generally comprised of a greater proportion of fine material.

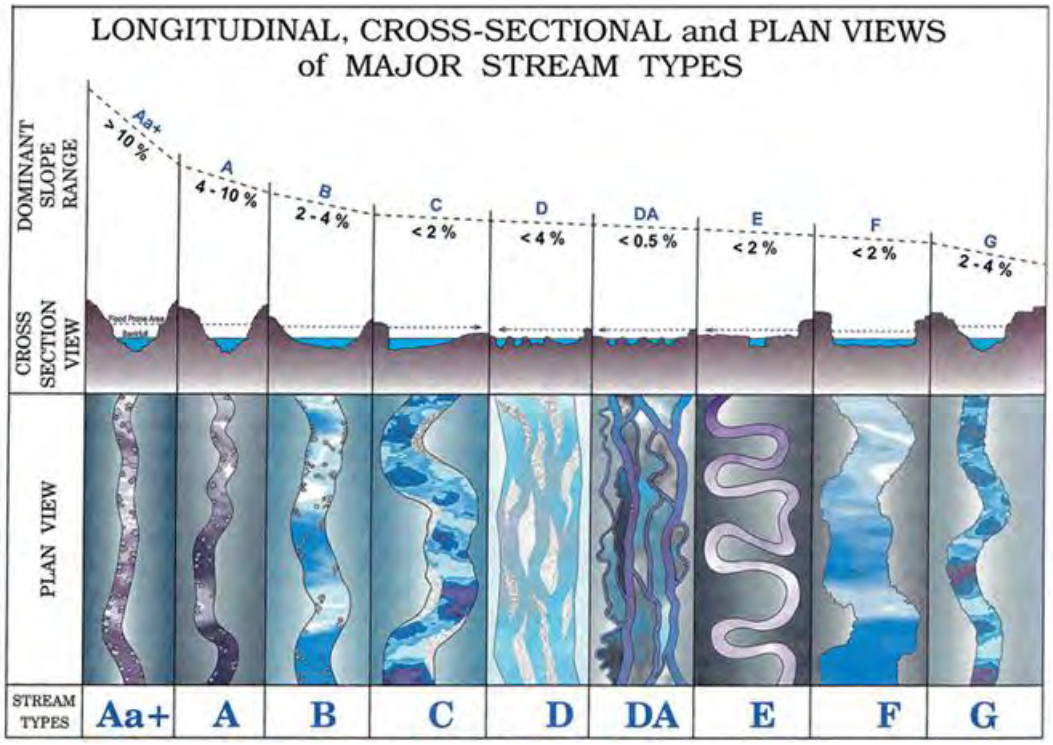

Figure 31. Rosgen stream channel classification

Bankfull flows occur every year in the spring and generally prevail throughout the period of spring snowmelt. Bankfull flow is the dominant process that functions to maintain and shape stream channels in the watershed. Mass wasting from some steep, upland slopes and steep drainage sideslopes are uncommon channel-forming processes. Humans have also influenced channel-shaping processes and altered certain stream reaches with irrigation diversions, ditches in the valley, and road segments that cross streams. There are eight known diversion structures in the valley that redirect stream flow to approximately 11 miles of irrigation ditches. These features, as well as the absence of beavers, have altered the flow route of several of the primary tributaries in the watershed. Sinuous valley bottom (Rosgen E) channels have been changed and more closely resemble Rosgen G channels that eventually evolve back to C and then E channels.

Water Temperature

303(d) listed streams in the project area include Summit Creek, Big Creek and Lake Creek, all listed in 1998 (Table 78).

Table 78. Streams listed as 303(d) in the project area

Stream	River Miles	Reason for 303 (d) listing
Summit Creek	14.2 miles	64°F salmonid fish reading temperature criteria
Big Creek	6.1 miles	50°F Bull Trout Salmonid fish spawning and rearing temperature criteria
Lake Creek	11.9 miles	50°F Bull Trout Salmonid fish spawning and rearing temperature criteria

Bosenberg Creek was added to the database in 1998, but the Oregon Department of Fish and Wildlife provided two years of data and the current Oregon Department of Environmental Quality status is

"attaining" the state standards. A TMDL (Total Maximum Daily Load) has been developed for the Malheur River and has replaced these 303(d) listings. These streams were delisted from 303(d) status by the Environmental Protection Agency approving the Oregon Department of Environmental Quality 2010 plan in March of 2012.

The biological criteria (OAR 340-041-0028(4) Subsection (f)) for the project area is expressed through the seven day average daily maximum stream temperature (7DADM) may not exceed 53.6°F during times and at locations of bull trout spawning and juvenile rearing uses. This criterion applies in the Upper Malheur Subbasin, primarily on the Malheur National Forest in the following streams: On Summit Creek, Big Creek, Lake Creek, Bosenberg Creek, and all upstream tributaries.

Wildfire History

The following table shows the history of large fires in the project area.

Table 79. History of large wildfires in the project area

Fire name	Year	Total Fire Acres	Lake Ck. Allotment		McCoy Ck. Allotment		Logan Valley Allotment		Summit Prairie Allotment	
			Total Acres Burned	Riparian Acres Burned	Total Acres Burned	Riparian Acres Burned	Total Acres Burned	Riparian Acres Burned	Total Acres Burned	Riparian Acres Burned
Bosenberg	1958	497	410	62					87	10
Corral Basin	1990	813	753	45					60	11
Sheep Mtn.	1990	2,067							2,067	
Snowshoe	1990	7,011	6,410	135			122	68	480	43
Totals		**10,388**	**7,573**	**242**	**0**	**0**	**122**	**68**	**2,694**	**64**

Threatened, Endangered and Sensitive Aquatic Species (TES)

See the Environmental Consequences section for further discussion on effects determinations for threatened, endangered and sensitive aquatic species.

Columbia River Bull Trout

See discussion under Management Indicator Species.

Interior Redband Trout (Region 6 Sensitive Species)

The Regional Forester removed redband trout from the sensitive species list in 2011, except in the Oregon closed basin. This project is outside of the closed basin, so redband trout are not considered sensitive here. They are however, a management indicator species (MIS) and will be discussed under that section of the document.

Columbia Spotted Frog (Region 6 Sensitive Species)

Spotted frogs are highly aquatic and are rarely found far from permanent water. They are usually found along the grassy margins of low gradient streams, lakes, ponds, springs, and marshes (Bull 2005, US Fish and Wildlife Service 2010).

During winter, spotted frogs burrow into banks adjacent to streams, ponds, and springs. Breeding occurs in the spring but varies by elevation. In low elevations breeding occurs between March and April and in higher elevations breeding occurs between May and June. Breeding habitat is usually found in shallow

water in ponds or other quiet waters along streams. Breeding may also occur in flooded areas adjacent to streams and ponds. Adults may disperse overland in the spring and summer after breeding (US Fish and Wildlife Service 2010).

Population Status

In Oregon, Columbia spotted frogs appears to be widely distributed east of the Cascade Mountains (Bull 2005, US Fish and Wildlife Service 2010).

The US Fish and Wildlife Service lists livestock grazing and introduction of nonnative fish (salmonid and bass) as threats to the Great Basin population of Columbia spotted frogs (66 FR 1295).

Columbia spotted frog status in project area

The spotted frog is considered present in all subbasins on the Malheur National Forest. Columbia spotted frog habitat is highly associated with wet meadows and drainages in the project area. Where wet meadows are associated with drainages or standing water they provide potential spotted frog habitat. There are four primary wetland types in the project area: freshwater emergent, freshwater forested/shrub, riverine and freshwater pond. Table 80 shows the acreages of each wetland type within the grazing allotments in the project area.

Due to the similarity of aquatic habitat requirements for the Columbia spotted frog, redband trout, and bull trout, any actions that effect riparian areas containing bull trout and redband trout would have similar effects to Columbia spotted frog.

Table 80. Acres of wetland type within the allotments for the Summit Logan Grazing Project

Allotment	Wetland Type	Acres	Percentage
Lake Creek	Freshwater Emergent Wetland	3.5	7
	Freshwater Forested/Shrub Wetland	4	8
	Riverine[a]	46	86
	Total	**53.5**	**3.6**
Logan Valley	Freshwater Emergent Wetland	545	63
	Freshwater Forested/Shrub Wetland	321	37
	Riverine	5	0.6
	Total	**871**	**60**
McCoy Creek	Freshwater Emergent Wetland	181	87
	Freshwater Forested/Shrub Wetland	24	11
	Riverine	3	1.6
	Total	**208**	**14**
Summit Prairie	Freshwater Emergent Wetland	215	65
	Freshwater Forested/Shrub Wetland	39	12
	Freshwater Pond	0.5	0.1
	Riverine	75	23
	Total	**329.5**	**23**
	Project Area Total	**1462**	**3.6**

a - Riverine habitats constitute wetlands along a flowing stream

Percentages that are italicized represent the dominant wetland type within the specific allotment.

Management Indicator Species (MIS)

Aquatic species found within the project area that are Malheur National Forest management indicator species include threatened bull trout (*Salvelinus confuentus*), and redband trout (*Oncorhynchus mykiss*).

Bull Trout

Bull trout within the Upper Malheur Watershed are part of the Malheur River metapopulation that includes populations in the upper Malheur River and the North Fork Malheur River.

For the Upper Malheur River populations, spawning and rearing is limited to headwater streams within the Upper Malheur River. Spawning and rearing habitat was identified in all of McCoy, Lake, Big, Meadow Fork Big, Snowshoe, Corral Basin, Bosenberg, and Summit Creeks during the designation of critical habitat (US Fish and Wildlife Service 2010). These streams include all the major drainages except for Crooked Creek and the Malheur River. Presently, spawning habitat is minimal in areas below the National Forest System road 16 due to limited spawning gravel and high summer and fall stream temperatures.

The populations in the Malheur River and the North Fork Malheur River do not connect with each other or other Snake River populations due to impassable Warm Springs Dam on the Malheur River and the impassible Agency Dam on the North Fork of the Malheur River. Populations were historically thought to use the entire Malheur River where at present use is confined to the upper tributaries. Bull trout have not been documented within the Warm Springs Reservoir, which has the potential to provide overwintering habitat. Since the Upper Malheur River local population lack connectivity, this population is considered to be at risk of genetic drift and failed the distribution criterion in the bull trout recovery plan. The Malheur River metapopulation contains less than 1,000 adults and is isolated from other populations. The Meadow Fork of Big Creek was the apparent stronghold of this population and has yet to recover from the 2002 High Roberts fire and consequent 2003 flood event.

Population Status

A radio telemetry study of fluvial bull trout in the upper Malheur River and tributaries was conducted by the Burns Paiute Tribe beginning in 2000. Bull trout tagged near the confluence of Big Creek and Lake Creek spawned in the Meadow Fork of Big Creek in 2000. Radio tagged bull trout overwintered downstream of Lake Creek subwatershed in the vicinity of Malheur Ford.

In 1997, the Oregon Department of Fish and Wildlife considered the upper Malheur River subpopulation at high risk of extinction. The number of bull trout aged one year and older in the upper Malheur subpopulation was estimated as 3,554 $\pm$ 30 percent (Buchanan et al. 1997).The majority of bull trout were found in the area of Big Creek, lower reaches of Snowshoe Creek, and Meadow Fork of Big Creek. The maximum length observed in 1993, 1994, and 2003 was 440mm suggesting few fluvial adults were present.

Primary spawning areas for the Upper Malheur subpopulation are located in the Meadow Fork, Big Creek, Snowshoe Creek, and Lake Creeks. Meadow Fork is the key spawning stream for the local population. Bull trout redds have been counted within the Meadow Fork of Big Creek every year since 2000 with the exception of 2003 in which no redds were observed. The majority of bull trout spawning within the project area occurs prior to mid-September. Due to the presence of brook trout, redds are only counted as bull trout redds if they are observed prior to mid-September. Redds are assumed to be those of brook trout after mid-September. The estimated number of bull trout redds peaked at 89 in 2001 and declined to 7 redds in 2003. The decline in the estimated number of redds is most likely due to the 2002 High-Roberts Fire and the 2003 flash flooding that originated in that area.

The following table displays the redd counts in the Upper Malheur watershed and in the primary spawning areas.

Table 81. Bull trout redd counts in the Upper Malheur watershed and primary spawning areas

Year	Total Number of Redds counted in upper Malheur watershed	Number of Redds counted in Meadow Fork	Number of Redds counted in Snowshoe Creek	Number of Redds counted in Lake Creek
2008	16	11	2	3
2209	16	5	2	9
2010	16	9		
2011	7	2		

Limiting Factors

Stream temperatures and the habitat quality are the major limiting factors to bull trout recovery within the Malheur River Watershed. Primary effects from grazing are related to vegetation removal, hoof action along the banks, and areas of saturated soils. Though much of the area has improved from historical conditions, wide and shallow streambanks are still prevalent, which increases solar radiation and reduces the cooling effect of deep pools, undercut banks, and hardwood shade. Well-shaded cover also provides productive terrestrial and aquatic macro-invertebrates for an abundant food base. This complexity of cover also reduces stress to individual trout allowing for productive growth and reproduction.

The Draft Bull Trout Recovery Plan (US Fish and Wildlife Service 2002) indicated past and ongoing human-induced activities have contributed to increased stream temperatures and sediment delivery, and resulted in the loss of large pools. Human-induced activities include the creation and management of Warm Springs and Agency dams, forest management practices, irrigation withdrawals, livestock grazing, past bull trout harvest, and introduction of non-native species (brook trout).

The US Fish and Wildlife Service published a proposed rule revising designation of critical habitat for bull trout on January 14, 2010 (75 FR 2270).

Columbia Bull trout Recovery Plan

The Columbia River Bull Trout Recovery plan (Recovery Plan) identified the specific recovery criteria for the Malheur River population. The following is a summary of the recovery of the Malheur River Population as defined in chapter 14 of the recovery plan. The complete plan may be found on the following US Fish and Wildlife Service website: http://ecos.fws.gov/docs/recovery_plan/021129_14.pdf

Recovery Criteria:

1. Bull trout are distributed among two or more local populations in the recovery unit within the Malheur River Core Area.
2. Estimated abundance of adult bull trout in the Malheur River Recovery Unit is between 2,000 and 3,000 individuals between the two local populations.
3. Adult bull trout exhibit a stable or increasing trend for at least two generations at or above the recovered abundance level within the Malheur River Core Area.

4. Specific barriers inhibiting bull trout movement and recovery in the Malheur River Recovery Unit have been addressed, assuring opportunities for connectivity among local populations within the core area.

Livestock grazing has the potential of effecting strategies 1-3. The Recovery Plan lists over grazing and loss of shade as a reason for an increase in mid elevation stream temperatures and decline in bull trout populations. Livestock Grazing was considered a significance threat to recovery for the Malheur River Recovery Unit. The highest priority for the US Fish and Wildlife Service is that no direct effects occur to spawning bull trout or redds after August 15th.

The Recovery Plan addresses sediment issues identified in the upper Malheur River watershed assessment, (e.g., road related sediment in Lake Creek and Bosenberg Creek). Noted was a diversion ditch on Lake Creek that diverts flow into a draw where erosion and head-cutting have been occurring on the return flow ditch.

The Recovery Plan noted that there was a need to restore shade and canopy, riparian cover, and native vegetation in all bull trout spawning, rearing and migration areas. Specifically, Summit Creek, the Malheur River downstream of Logan Valley, and Crooked Creek in the Upper Malheur River subbasin have suppressed woody vegetation in reaches that need this component to become stable. The Recovery Plan recommended reducing grazing impacts in all bull trout spawning areas such as implementing measures to reduce livestock impacts to streams, (e.g., fencing, changes in timing and use of riparian pastures, off-site watering and salting), to accomplish this task. Lower Lake Creek lower Big Creek, Lower Bosenberg Creek, Summit Creek, and lower McCoy Creek are areas that would benefit from shade restoration.

Habitat in the Analysis Area – Rearing Habitat

Currently, occupied rearing habitat for juvenile bull trout is present in Lake Creek, Big Creek, Meadow Fork, and Snowshoe Creek. Potential rearing habitat for juveniles is currently present in McCoy, Bosenberg, and Summit Creeks. Stream reaches with daily maximum water temperatures less than 20ºC were considered to be potential rearing habitat for juvenile bull trout (Dunham, Rieman and Chandler 2001). Currently, juvenile bull trout occupy about 63 percent of potential habitat in the Upper Malheur subpopulation area (Table 82).

Table 82. Miles of potential and occupied habitat for juvenile bull trout in the Upper Malheur subpopulation area

Stream Name	Documented Use Prior to 1990	Miles of Potential Juvenile Rearing Habitat	Miles of Occupied Juvenile Rearing Habitat
Big Creek	Yes	5.8	5.8
Meadow Fork	Yes	4.8	4.8
Snowshoe Creek	Yes	1.6	1.6
Corral Basin Creek	Yes	2.7	0.0
Bosenberg Creek	Yes	2.6	0.0
Lake Creek	Yes	5.0	5.0
McCoy Creek	No	1.8	0.0
Summit Creek	Yes	3.0	0.0
Crooked Creek	Yes	0.0	0.0
Total		**27.3**	**17.2**

Spawning Habitat

There are about 14 miles of bull trout spawning habitat in the subpopulation area. Primary spawning areas for the upper Malheur subpopulation are located in Meadow Fork, Big, Snowshoe, and Lake Creeks. Highest numbers of suspected bull trout redds are found in Meadow Fork. A bull trout was observed on a redd in upper Summit Creek in 2000.

Table 83. Miles of suspected bull trout spawning habitat in the Upper Malheur subpopulation area

Stream Name	Bull Trout Spawning Habitat (Miles)
Big Creek	3.7
Lake Creek	4.5
Meadow Fork	3.4
Snowshoe Creek	1.8
Summit Creek	0.8
Total	**14.2**

Subadult Rearing Habitat

There is little information currently available on areas used by subadults for rearing during summer months in the upper Malheur River and tributaries. However based upon general life history information, it is assumed that rearing habitat for fluvial subadult bull trout is present downstream of juvenile rearing areas and may extend down to at least the Forest boundary. Winter and spring use of Crooked and Summit creeks by subadults is possible. A bull trout 200mm in length, most likely a subadult, was captured in Crooked Creek in August of 1998 (L. Schwabe, Burns Paiute Tribe, pers. com.). In 2004, one radio-tagged subadult reared throughout the summer in the East Fork of Lake Creek and one in Big Creek below Forest System Road 16.

Adult Winter Holding Habitat

Winter holding habitat for fluvial adults is present in the upper Malheur River downstream of the confluence of Lake and Big creeks to at least the Forest boundary. Spring use of Crooked Creek by adult bull trout has been documented. A bull trout 356mm in length was captured in Crooked Creek in May of 1995. Winter and spring use of Summit Creek by adults is also possible.

Migration Habitat

The Malheur River serves as a migration corridor for the subpopulation. Seasonal thermal barriers occur at the lower ends of tributaries and on the Malheur River (Bowers et al. 1993). An apparent thermal barrier exists in Lake Creek downstream of national forest lands in Logan Valley that restricts the movement of fluvial adults into spawning areas on Lake Creek. This thermal barrier has probably resulted in the isolation of the local population of Lake Creek from the rest of the subpopulation.

Redband Trout

Redband trout occur in the following streams within the project area Crooked Creek, Lake Creek, Big Creek, Bosenberg Creek and Summit Creek. Redband trout are sensitive to changes in water quality and habitat. Adult redband trout are generally associated with pool habitats, although various life stages require a wide array of habitats for rearing, hiding, feeding, and resting. Pool habitat functions as important refugia during low water periods. An increase in sediment lowers spawning success and reduces the quantity and quality of pool and interstitial habitat. Other important habitat features include healthy riparian vegetation, undercut banks and large woody debris.

Spawning occurs during the spring, generally from March to June. Redds tend to be located where velocity, depth and bottom configuration induce water flow through the stream substrate, generally in gravels at the tailout area of pools. Water temperatures influence emergence of fry, which is typically from June through July.

Redband trout are present in all fish bearing streams in the analysis area. Highest densities are found in Crooked Creek. Lower numbers are found in Lake Creek and McCoy Creek where brook trout are the dominant salmonid.

The project area has approximately 45 stream miles of occupied redband habitat. Comparatively, the Malheur National Forest contains approximately 840 miles of redband trout habitat (Malheur Forest GIS data). The miles of occupied redband trout habitat by allotment, unit and 6th field HUC are displayed below (Table 84).

Table 84. Miles of occupied redband trout habitat within the allotment boundaries in the project area for Summit Logan

Allotment	Unit	HUC	Miles	Percentage
Lake Creek	Bosenberg	Bosenberg Creek, Upper Big Creek	12.6	69
	McCoy Creek	Lake Creek Upper Big Creek	5.8	32
		Total	**18.4**	**41**
Logan Valley	Big Field	Lake Creek	0.2	3
	Corral Holding	Bosenberg Creek	0.2	3
	East Lake Creek	Bosenberg Creek Upper Big Creek	0.3	6
	Lower Field	Bosenberg Creek	0.2	3.
	North Big Creek	Bosenberg Creek Upper Big Creek	1.8	35
	South Big Creek	Bosenberg Creek Upper Big Creek	0.9	18
	West Bosenberg	Upper Big Creek	0.3	6
	West Lake Creek	Lake Creek	1.3	25
		Total	**5.2**	**11.3**
McCoy Creek	Cow Camp	Lake Creek	0.6	32
	North Fork	Upper Big Creek	0.4	24
	Starvation	Lake Creek	0.8	45
		Total	**1.8**	**4.0**
Summit Prairie	Crane Rock	Summit Creek	1.3	6
	Little Logan	Summit Creek	5.0	25
	North Summit	Summit Creek	1.0	5
	Sagehen	Summit Creek	6.4	32
	South Summit	Summit Creek	0.01	0.05
	Summit Rock	Summit Creek	5.9	30
	West Summit	Summit Creek	0.4	2
		Total	**20.0**	**44.0**
		Grand Total	**45.4**	

Redband trout require the same habitat characteristics as bull trout with the exception that bull trout are relatively limited by their requirement for cold stream temperatures. Therefore the analysis of bull trout critical habitat and water quality along with the actions proposed would have the same effects on redband trout habitat within the project area.

Summary by Allotment

All Allotments

Appendix A Table 102 shows the departure from desired conditions and the existing condition for various stream reaches based on vegetative potential and stream channel potential. The recovery timeline for these departures is represented in appendix A Table 103 based on vegetation and channel characteristics documented to not be in balance by the proper functioning condition surveys (Elmore 2007), Pacfish/Infish Biological Opinion Effectiveness Monitoring dataset, Multiple Indicator Monitoring sites (Burton and Cowley 2010), Carex Working Group Report (Carex Working Group 2012). Specific indicators related to vegetation, channel characteristics and bull trout critical habitat were selected for determining recovery or improvement. These indicators were chosen based on their repeatability and relationship to other indicators for bull trout critical habitat, as well as ongoing monitoring in these areas, and their demonstrated responses to changes in management such as livestock grazing. The following descriptions of vegetation, channel characteristics, water temperature and bull trout critical habitat describe the existing condition by unit (pasture) for streams within the various allotments. A more detailed description as well as the desired condition for stream reaches within the specific units can be found in appendix A Table 102.

Lake Creek Allotment

Table 85 lists the major streams located within the Lake Creek Allotment.

Table 85. Streams within the Lake Creek Allotment

Streams within Allotment	Stream Length in Miles
Bosenberg Creek	4.4 (unoccupied Bull Trout habitat)
Corral Basin Creek	3.6
Meadow Fork Big Creek	0.5
Big Creek	2.3
Lake Creek	1.8
McCoy Creek	1.6
Total	**14.2**

About 14.2 miles (41 percent) of the 35 miles of bull trout critical habitat within the project area lies within the Lake Creek Allotment. It is split about 60:40 percent between the Bosenberg and McCoy units, respectively. Approximately 9.6 miles (67 percent) of the bull trout critical habitat within the Lake Creek Allotment is currently unoccupied and 4.7 miles (33 percent) is occupied.

Appendix A Table 102 shows the departure from desired condition and existing condition for stream reaches within the Lake Creek allotment based on vegetative potential and stream channel potential. The recovery timeline for these departures is represented in appendix A Table 103.

Bosenberg Creek subwatershed risk ratings were developed during the Malheur National Forest Roads Analysis (USDA Forest Service 2004). Findings from the report include:

- The road density risk was high for road maintenance level (maintenance level) 1-5 and 1-2
- The risk rating for total road density within 200 feet of perennial and intermittent streams was extreme for both maintenance level 1-5 and 1-2

- The overall watershed risk from the road network was rated high

Vegetation

The potential vegetation for the riparian plant community is dominated with a conifer overstory with alder, willow and mesic graminoids in open areas (IDT Review 2012). This vegetative community is dominated by the landform of the valley bottoms and by soil texture.

Channel Characteristics

Rosgen B channel types are dominant in the Lake Creek allotment also due to the landforms. The gradient of these streams is between 2 and 4 percent slope and there is little floodplain development in these types of streams. Rosgen C channel types develop on the downstream extent of the allotment. Gravel substrate dominates channel beds. Recent wildfires in the headwaters have introduced large sediment sources that the channel is transporting downstream in pulses. Post-fir organic ash and debris have been deposited on the streambanks and floodplains downstream of the burnt areas. These stream banks are extremely sensitive to disturbance and are vulnerable to over-widening through streambank trampling.

Water temperatures across Lake Creek allotment likely are compliant with the INFISH criteria for adult holding temperatures (59º F), but not INFISH spawning and rearing (48º F) or the TMDL standard (53.6ºF). Water temperatures for streams within the Lake Creek allotment are displayed in Table 86.

Water temperatures for Lake Creek, Big Creek, and Summit Creek are summarized in Table 86.

Table 86. Water temperatures for Lake Creek, Big Creek, and Summit Creek

Stream	Site	Allotment	Unit	Elevation	Years	7DADM[a] (F)	TMDL[b] 7DADM Standard (F)	INFISH	
								Spawning/ Rearing (F)	Adult Holding (F)
Lake Creek	Lake 1	Lake Creek	McCoy	5,520	1996-2002, 2004-2007, 2011	59.3	53.6	48	59
	Lake 2	Logan Valley	W. Lake Creek	5,520	2011	58.2			
	Lake 3	Private	--	5,060	1996-2000, 2003-2005, 2007	75.6			
	Lake 4	Private	--	5,060	1993-1995, 1999-2001, 2006	73.2			
	Lake 5	McCoy Creek	Cow Camp	5,020	2006, 2008-2011	75.0			
Big Creek	Big 1	Lake Creek	McCoy	5,280	2000-2007, 2010-2011	56.8	53.6	48	59
	Big 2	Logan Valley	W. Bosenberg	5,082	1996-2001, 2003-2006, 2009-2011	63.8			
Summit Creek	Summit 1	Summit Prairie	Summit Rock	5,735	1999, 2001, 2003-2004, 2006-2007, 2009-2011	54.8	53.6	48	59
	Summit 2	Summit Prairie	Summit Rock	5,283	1996-2011, 2003-2006, 2009-2011	66.9			
	Summit 3	Summit Prairie	Little Logan	5,190	2004-2007, 2009-2010	72.8			
	Summit 4	Summit Prairie	Little Logan	5,160	2010	72.8			
	Summit 5	Summit Prairie	Sagehen	5,078	2010	72.5			
	Summit 6	Summit Prairie	Sagehen	4,950	2003-2010	76.8			
	Summit 7	Private	--	4,820	2003-2004, 2007-2008	78.7			

a – 7DADM = seven day average daily maximum stream temperature

b – TMDL = total maximum daily load

Bull Trout Critical Habitat

Lake Creek allotment is a stronghold for bull trout survival in the Upper Malheur Drainage. Much of the spawning and rearing takes place in the allotment. Meadow Fork of Big Creek had the highest density of redds until the wildfires introduced large amounts of sediment and have reworked the system.

A fish barrier is present on Bosenberg Creek, inhibiting fish connectivity to cooler water upstream. Region 6 (R6) stream survey data suggests bankfull width/depth and large woody debris are meeting standards, whereas pool quantity did not.

Logan Valley Allotment

Table 87 lists the major streams within the allotment.

Table 87. Streams within the Logan Valley Allotment

Streams within Allotment	Stream Length in Miles
Big Creek	1.8
Bosenberg Creek	0.2
Lake Creek	0.9
Total	**2.9**

The Logan Valley Allotment contains about three miles or 9 percent of the 35 miles of bull trout critical habitat in the project area. Of this, 2.7 miles (92 percent) of bull trout critical habitat is occupied within the Allotment and 0.2 miles (8 percent) is unoccupied. Big Field, East Bosenberg, Flat Field and Front Field do not have aquatic habitat or riparian resources identified. A large fen occurs in the Big Field unit. Please see the Botany Section for a discussion on these resources.

Appendix A Table 102 shows the departure from desired condition and existing condition for stream reaches within the Logan Valley allotment based on vegetative potential and stream channel potential. The recovery timeline for these departures is represented in appendix A Table 103.

Big Creek subwatershed risk ratings were developed during the Malheur National Forest Roads Analysis (USDA Forest Service 2004). Findings from the report include:

- The road density risk was moderate for road maintenance level (maintenance level) 1-5 and 1-2
- The risk rating for total road density within 200 feet of perennial and intermittent streams was moderate for both maintenance level1-5 and 1-2
- The overall watershed risk from the road network was rated moderate

Lake Creek subwatershed risk ratings were developed during the Malheur National Forest Roads Analysis (USDA Forest Service 2004). Findings from the report include:

- The road density risk was high for road maintenance level 1-5 and moderate for maintenance level 1-2
- The risk rating for total road density within 200 feet of perennial and intermittent streams was high for both maintenance level 1-5 and 1-2
- The overall watershed risk from the road network was rated moderate

Big Creek

Vegetation

Three reaches along Big Creek (1.8 miles) was rated as in proper functioning condition in 2007. It transitions from a conifer with alder and mesic graminiods upstream to a willow/sedge-rush controlled system near the 16 road. The ecological status of the designated monitoring area on Big Creek Reach 3 was mid seral. The distribution of stabilizing plant communities along Big Creek Reaches 1 and 2 were near desired condition (appendix A, Table 102).

Channel Characteristics

Big Creek has a Rosgen Da5/6 channel type and is a glacial outwash, multiple threaded and highly sinuous stream. The stream became braided because of the excessive sediment loads due to historic glacial activities. At the designated monitoring area in Reach 3, bank stability is at the long-term desired condition and meets the Amendment 29 numeric standard. The channel stability throughout Big Creek is largely controlled by the large woody debris that falls into the stream.

Temperature

Big 2 in the West Bosenberg unit is the only water temperature monitoring site that occurs in the Big Creek portion of the Logan Valley Allotment. Big 1 is in the McCoy Creek unit of Lake Creek allotment. They are approximately 2.3 miles away from each other. The seven day average daily maximum stream temperature was 56.8°F at Big 1 and 63.8°F at Big 2. Big Creek heats up approximately 7°F between sites Big 1 and 2. Without a monitoring site in the unit it is difficult to determine if the water temperatures met standards. It is likely that water temperatures in the South Big Creek unit met INFISH standards for adult holding (59° F), but may exceed INFISH standards for spawning and rearing (48°F) or the TMDL standard (53.6° F).

Bull Trout Critical Habitat

Bull trout likely use Big Creek for rearing and spawning habitat. 1.8 miles are occupied bull trout critical habitat listed for spawning and rearing.

Bosenberg Creek

Vegetation

Bosenberg Creek flows through Corral Holding and Lower Field units that are separated by private land. Corral Holding has approximately 0.1 miles of the north end of the unit contained in a riparian pasture on the back side of the corral. This section of stream is a sedge/rush with some willow plant community in very good condition and likely at a proper functioning condition rating. Willows appeared in multiple age class heights and at an appropriate density of individuals. Approximately 0.02 miles at the bottom of the reach are outside of the corral area and appear to be grazed annually with private lands. This area would likely be rated functional at risk with an unknown trend. The area lacks adequate vegetative cover and the channel looks over-widened with the bankfull width/depth not in balance with its landform setting. Lower Field unit is a sedge/rush plant community that is developing into developed community types.

Channel Characteristics

Bosenberg Creek has a Rosgen E channel type with channel stability controlled by herbaceous plants with a very narrow channel width and is highly sinuous. Abundant undercut banks and quality pools were observed throughout these two units. However, there are indicators of isolated spots that were historically over-widened and slow to recover.

Temperature

No monitoring sites were available on Bosenberg Creek.

Bull Trout Critical Habitat

0.24 miles are unoccupied bull trout critical habitat listed for spawning and rearing.

Lake Creek

Vegetation

The proper functioning condition assessment (Elmore 2007) identified Lake Creek as a conifer overstory with alder, willow and mesic graminiods in the open areas while the lower end of the reach has little or no conifer overstory. The ecological status was monitored at the multiple indicator monitoring designated monitoring area as early seral with alder (19 percent) / Kentucky bluegrass (8 percent) plant community (USDA Forest Service 2011). The young age class of willow and alder hardwoods is low. The effective shade averaged 39 percent and did not meet the desired condition of 60-80 percent in mixed shrub and conifer plant communities (Carex Working Group 2012). Two PIBO and designated monitoring areas occur in the Lake Creek portion of the Logan Valley allotment. A decrease in woody cover along the stream bank was the only statistical change observed associated with vegetative attributes. The wetland rating across the floodplain slightly improved at PIBO site 1884.

Channel Characteristics

Lake Creek has a Rosgen F4/C4 complex of channel types. The potential channel type that could exist is an E4/C4. This reach has legacy disturbances that over-widened the channel form. The poor channel shape has resulted in issues in sediment transport through the reach and has decreased the likelihood of a typical flood from reaching its floodplain. This yields excessive energy that may make the channel more unstable. Stream bank stability (55 percent, USDA Forest Service 2011) was not meeting the 90 percent desired condition using the multiple indicator monitoring protocol, but did meet the desired conditions with 95 percent using PIBO in 2006 and 2011. The multiple indicator monitoring value is probably more representative since the sampling interval is closer.

Pacfish/Infish Biological Opinion (PIBO) channel characteristics data from site 1884 indicate numbers of pools per mile have increased by two fold, and bank angle and percent undercut banks have improved. Residual pool depth has significantly decreased and bankfull width/depth has decreased.

PIBO site 2037 has less data collected in 2006 to compare 2011 data for trend interpretation. Percent stable banks has remained static and is meeting Forest Standards. Bank angle has significantly improved and percent undercut banks have improved.

Temperature

One water temperature monitoring site (Lake 2) occurs in the West Lake Creek unit and two monitoring sites occur on two channels of Lake Creek (Lake 3 and 4), approximately one mile downstream from Lake 2, below the 16 road. Lake 3 is the east channel and Lake 4 is the west channel. Lake 2 is near the most upstream extent of the unit. The seven day average daily maximum stream temperature at Lake 2 was 58.2°F, at Lake 3 it was 75.6°F and at Lake 4 it was 73.2°F. Lake Creek heats up approximately 17.4°F between sites Lake 2 and 3 and heats up by 15°F from sites Lake 2 and 4. Site 1 met the 59°F INFISH standard for adult holding, but exceeded the 53.6°F TMDL standards and 48˚F INFISH standard for spawning and rearing. The temperature difference from sites Lake 2 to 3 and 4 is because of the irrigation withdrawals that occur on private land.

Bull Trout Critical Habitat

Currently one mile of Lake Creek is occupied, spawning and rearing bull trout critical habitat within the West Lake Creek Unit.

McCoy Allotment

Table 88 lists the major streams within the McCoy Allotment.

Table 88. Streams within the McCoy Allotment

Streams within Allotment	Stream Length in Miles
Big Creek	0.8
Lake Creek	0.8
Crooked Creek	0.2
Total	**1.8**

The McCoy Allotment contains 1 mile (3 percent) of the 35 miles of bull trout critical habitat within the project area. Lake Creek, Ridge, Dry, and Government Flat do not have aquatic habitat or riparian resources identified. 0.02 miles of Big Creek flow through the North Fork unit and have been excluded to livestock by an electric fence. This reach is likely at proper functioning condition, but was not assessed.

Appendix A, Table 102 shows the departure from desired conditions and the existing condition for stream reaches within the McCoy Creek allotment based on vegetative potential and stream channel potential. The recovery timeline for these departures is represented in appendix A, Table 103. See the Logan Valley allotment description for information on roads.

See the Logan Valley allotment description for information on roads.

Big Creek

Vegetation

This reach is dominated by herbaceous vegetation. An electric fence has been placed along the corridor of the riparian area for the past few years. No proper functioning condition assessment was done on this reach. It is likely this reach is in a proper functioning condition

Channel Characteristics

The channel is presently a C/E channel with the assumption that it is moving toward an E type channel.

Temperature

There are no temperature monitoring sites on Big Creek within the North Fork Unit.

Bull Trout Critical Habitat

Currently 0.02 miles of Big Creek are occupied, spawning and rearing bull trout critical habitat within the Cow Camp unit.

Lake Creek

Lake Creek has two reaches that flow through two pastures that are not adjacent.

Vegetation

Lake Creek has a vegetative potential of sedge, rush, grass, and willows (Elmore 2007). Proper functioning condition surveys identified an abundant cover of stabilizing plants along the streambanks of this reach. A recent change in livestock management has resulted in numerous increases in number and vigor of willow species present on reach 1.

Channel Characteristics

Lake Creek reach 2 has a Rosgen E channel type and reach 1 a Rosgen C channel type that has channel stability controlled by vegetative attributes and is sensitive to livestock grazing. The beaver activity in reach 2 has created channel complexity that helps retain water and sediment and provide fish habitat faster than any other manner. The reach is a series of dams with a low gradient, meandering channel between the dams. Reach 1 has narrowed dramatically and is meeting Forest Plan standards for undercut banks.

Temperature

One water temperature monitoring site (Lake 5) occurs in the Cow Camp unit and one just upstream of the unit on the east channel (Lake 3). The seven day average daily maximum stream temperature was 75.6°F at Lake 3 and 75.0°F at Lake 5. Lake Creek stays relatively constant as it flows through Lake Creek reach 2. Site 5 exceeds INFISH standard and TMDL standards.

Bull Trout Critical Habitat

A Region Six (R6) stream survey was conducted on reach 1 of Lake Creek within the Starvation unit in 1999. Lake Creek reach 1 did not meet the INFISH and Forest Plan amendment 29 criteria for average bankfull width/depth of 19.23. It met INFISH and Forest Plan amendment 29 standards for stream bank stability with 91 percent. Lake Creek reach 1 measured 85 percent undercut banks and is meeting Forest Plan Standards.

Currently 0.72 miles of Lake Creek are occupied, spawning and rearing bull trout critical habitat within the Cow Camp and Starvation units.

Crooked Creek

Vegetation

Crooked Creek has a sedge/rush with some willows (Elmore 2007).

Channel Characteristics

Crooked Creek was rated functioning at risk with a downward trend (Elmore 2007). This reach was an intermittent Rosgen E4/5 channel type. The potential is a perennial E5 channel type. The bankfull width/depth was not in balance and the riparian area is shrinking from eroding stream banks. The stream energy is excessive and has downcut below the rooting depths of vegetation present. This is considered high risk for additional downcutting and system unraveling (Elmore 2007).

Bull Trout Critical Habitat

R6 stream survey was conducted on reach 1 of Crooked Creek within the McCoy Creek allotment in 1999. Reach 1 did not meet INFISH and Amendment 29 standards for average bankfull width:depth, pool quantity, and large woody debris. Crooked Creek reach 1 did meet INFISH and Amendment 29 standards for stream bank stability.

Currently 0.21 miles of Crooked Creek are unoccupied foraging and migratory bull trout critical habitat.

Summit Prairie Allotment

Summit Creek is the only stream within the Summit Prairie Allotment that has bull trout critical habitat. All bull trout critical habitat within the Summit Prairie allotment is considered unoccupied. 14.5 miles (49 percent) of bull trout critical habitat is within the Summit Prairie allotment of the total 35 miles in the project area. Crane Rock unit is the only unit that does not have bull trout critical habitat resources. The South Summit Unit contains approximately 20 feet of stream access and did not have issues identified during proper functioning condition inventories. It is utilized as a livestock watering access point. No management options are present other than to provide access to water. Therefore, the South Summit Unit will not be analyzed in the proceeding sections. Summit Creek is also the only allotment in the project area that is entirely contained in a single subwatershed.

Appendix A Table 102 shows the departure from desired conditions and the existing condition for stream reaches within the Summit Prairie allotment based on vegetative potential and stream channel potential. The recovery timeline for these departures is represented in appendix A Table 103. Summit Creek subwatershed risk ratings were developed during the Malheur National Forest Roads Analysis (USDA Forest Service 2004). Findings from the report include:

Summit Creek subwatershed risk ratings were developed during the Malheur National Forest Roads Analysis (USDA Forest Service 2004). Findings from the report include:

- The road density risk was high for road maintenance level (maintenance level) 1-5 and 1-2.
- The risk rating for total road density within 200 feet of perennial and intermittent streams was extreme for both maintenance level1-5 and 1-2.
- The overall watershed risk from the road network was rated high.

Note: A ¼ mile long buck and pole riparian exclosure will be built in the Little Logan Unit as a reference for comparing the vegetative, channel characteristics and complexity indicators.

Table 89. Properly functioning stream reaches on Summit Creek with unit, rating and miles

Reach	Unit	Rating	Miles
Summit Creek 1	Sagehen	FAR NA	0.3
Summit Creek 2		FAR DN	2.4
Summit Creek 2 (exclosure)		PFC	0.2
Summit Creek 3		PFC	0.7
Summit Creek 4		FAR UP	1.1
Summit Creek 5	Little Logan	FAR UP	5.0
Summit Creek 6	Summit Rock	PFC	2.0
Summit Creek 7	North Summit	PFC	1.0
Summit Creek 8	Summit Rock	PFC	1.7
West Fork Summit Reach 1	West Summit	FAR DN	0.4
West Fork Summit Reach 2	Summit Rock	FAR DN	0.8

PFC – Proper Functioning Condition: Functioning as desired.

FAR NA – Functional – At Risk: In a functional condition but has an existing soil, water or vegetative attribute making them susceptible to degradation.

FAR UP – Functional – At Risk – Upward trend: In a functional condition but has an existing soil, water or vegetative attribute making them susceptible to degradation, but is trending upward.

FAR DN (down) – Functional – At Risk – Downward trend: In a functional condition but has an existing soil, water or vegetative attribute making them susceptible to degradation, but is trending downward.

Riparian exclosures would serve as a reference for determining rates of recovery and movement towards desired conditions within appendix A Table 102 and appendix A Table 103. When livestock are managed appropriately recovery rates should approximate those within areas where no livestock use is occurring. If not adaptive management strategies would be implemented.

Table 90. Vegetative type on Summit Creek with habitat type and reach

Habitat Type	Probable Historic Vegetation	Reaches
Constrained rocky reaches	Alder-dominated thickets along stream	Reaches 1, 3
Broad Valleys with Mesic Terraces	Extensive willow-dominated thickets along stream in mosaics with grasslands, aspen groves and cottonwood groves	Reaches 2,4,5,7
Wetlands with Lateral or Hypothetic Flows	Sedge meadows (often with willows or alders along creek banks)	Reach 6
Headwater Reaches	Conifer-dominated with scattered alders and shrubs along stream	Reach 8

Summit Creek

Vegetation

Four major habitat types indicate four likely riparian vegetative communities along Summit Creek as you transition from the top of the watershed downward.

Reaches 1 and 3 are constrained, rocky reaches where alder species are dense. The existing conditions for shrub density and stabilizing plant species are very similar to desired conditions (appendix A, Table 102).

Reaches 2, 4, 5 and 7 are broad valleys where willow cover would be extensive. Currently, these reaches have plant cover that is dominated by sedges, rushes, mesic grasses and forbs. The herbaceous plant community has been narrowing the channel's form and developing into sedge/rush plant communities. Reaches 4 and 7 are closer to their desired stabilizing plant cover than Reaches 2 and 5. Sites for new willow establishment may become limited as the sedge/rush plant community continues to improve. Localized areas where scour and aggradation occurs will be likely areas for willow germination. However, the willow density levels in these reaches compared to the reference levels suggest there is a large departure. The willow species are present, but are being maintained in a 0-3 foot height category and are not able to be expressed into a height class that is above ungulate browse lines (approximately 4.5 feet for deer, 5 feet for cattle and 7 feet for elk). The lack of shrubs decreases the effective shade that can help keep the water temperatures cool. The multiple indicator monitoring site on Reach 2 showed a decrease in woody browse use leading to an increase in the number of seedlings and young woody plants from 2004 to 2010. An exclosure occurs on Reach 2 that has abundant age and height classes of different willow species and has beaver activity.

Reach 6 occurs where a groundwater upwelling or spring emerge into the bottom of the floodplain. This reach is dominated by sedge meadows because of the abundance of soil moisture. The existing stabilizing plant species and effective shade are very similar to the desired levels (appendix A Table 102). The effective shade is largely provided by the channel form and the herbaceous floodplain vegetation.

Reach 8 occurs in the most upstream extent of Summit Creek and is a headwaters reach. The overstory is dominated by conifer species with alders scattered throughout the reach. The existing stabilizing plant species and effective shade are very similar to the desired levels (appendix A Table 102).

West Fork of Summit Creek Reaches 1 and 2 have potential vegetative communities of sedge/rush/grass with some alder. The existing vegetative community is a Kentucky bluegrass community with isolated sedges and rushes. Reach 2 has a conifer overstory near the upstream most extent of the reach.

Channel Characteristics

Reaches 1 and 3 are Rosgen B channel types largely because the landforms produce constrained, rocky reaches. Reach 3 has pockets of Rosgen C channel types scattered amongst the B because of localized areas where the valley bottom is wider. Rosgen B channel types are commonly inherently stable to livestock effects because the streambed is armored with cobbles and gravels.

Summit Creek Reaches 2, 4, 5, 6, 7 and West Fork Summit Creek Reaches 1 and 2 are broad valleys that are low gradient and commonly have highly meandering channels across the valley bottom. All the reaches are currently in a Rosgen C channel type with a potential of a Rosgen E channel type in all but Reach 4. Being departed to a Rosgen C channel type is typical in livestock grazing areas because of hoof action and the loss of vegetative cover to dissipate the stream energy and the channel is over-widened as a result. Rosgen E channel types have increased bank storage of water and a tighter channel form to maintain water temperatures and not accelerate heating losses. Vertical stability issues in the form of headcuts were observed in West Fork Summit Creek Reaches 1 and 2. The multiple indicator monitoring designated monitoring area on Reach 2 has statistically improved for bank stability from 2004 to 2010. Reach 5 has two PIBO designated monitoring areas that have measured a statistically significant change in the bankfull width/depth or channel form between 2001, 2006 and 2011, suggesting sufficient vegetation is catching sediment and the banks are building.

Reach 8 has a Rosgen B channel type similar to Reaches 1 and 3. However, it is a first order stream and does not receive the streamflows or sediment supply Reaches 1 and 3 does. Energy is largely dissipated in Reach 8 through large rock, down wood and step pool sequences.

Temperature

Water temperatures are coldest in Reach 8 where they emerge from groundwater and heat up as you progress towards the Malheur River. Site 1 is towards the top of Reach 8 with an average seven day average daily maximum stream temperature of 54.8°F at Summit 1 heating up to 78.1°F at Summit 2 and cooling down to 66.9°F at Summit 3. Summit Creek heats up approximately 23°F between sites Summit 1 and 2 and cools down by 11°F from sites Summit 2 and 3. Reach 6 has numerous springs that drain into the floodplain that cool the water considerably before flowing through Summit 3. Summit Creek heats up approximately 6°F between sites Summit 3 and 4 and stays relatively continuous through sites Summit 4 and 5 in the Little Logan unit. The average seven day average daily max was 72.5°F at Summit 5 and 78.7°F at Summit 7, heating up approximately 6°F. Site 1 is the only site to meet the INFISH standard for adult holding. All sites did not meet the INFISH spawning and rearing or TMDL standard.

Bull Trout Critical Habitat

Currently 14.5 miles of Summit Creek are unoccupied, spawning and rearing bull trout critical habitat within the Summit Prairie allotment.

Currently suitable water temperatures for spawning and rearing within Summit Creek are located within the headwaters Reaches 8 and above. Within reach 5 there are some spring and groundwater upwelling.

Reaches 1 and 2 are located within a ponderosa pine/lodgepole pine/alder system. They are considered constrained rocky reaches where large wood plays an important role in forming pools and maintaining bull trout habitat. These reaches are the lowest in the Summit Creek system and are the closest in

proximity to the Malheur River. Primary utilization of these reaches by bull trout would be as migratory corridors, and possibly over wintering habitat.

Reaches 3, 4 and 5 are primarily in a meadow system that lacks adequate vegetation for shade (riparian hardwoods) and undercut bank formations which would be the primary cover for bull trout within these reaches with limited input of lodgepole pine. Additionally, channel incision and widening within these reaches and some straightening has occurred which also has reduced the streams capability for forming pools, undercut banks, and deposition (bank building). The potential channel characteristics for the reaches suggest sinuosity and the ability of the stream to access its floodplain are critical elements for recovery of this system. These factors have reduced the potential for Summit Creek in these reaches to provide juvenile rearing, spawning, and migratory habitat.

Reaches 5 and 6 would primarily be used for migratory behavior by transitory bull trout currently because of the existing warm stream temperatures. However with improvement in existing condition cold influxes within reaches 5 and 6 may provide adequate rearing habitat. The components of quality migratory habitat include quality pools that are refugia for migrating fish and the absence of thermal barriers related to water temperature. A potential culvert barrier for adults and juvenile bull trout exists within reach 8 of Summit Creek which may limit access to cold water thermal refugia for juvenile bull trout.

Environmental Consequences

The following table (Table 91) displays those threatened, endangered and sensitive species that have critical habitat or may occupy or have the potential to occupy habitat within the project or action area. Two aquatic species are present or are potentially present in the project are. These included threatened bull trout and Columbia spotted frog. Redband trout is considered a sensitive species within the Oregon Closed Basin of the Malheur National Forest so this species will only be analyzed as a management indicator species.

Those species identified in Table 91, as well as the management indicator species redband trout, are carried forward in the analysis of all proposed alternatives that determine the impacts from the alternatives to these species, especially in relation to the amended Forest Plan. Due to the similarity of aquatic habitat requirements for the bull trout, redband trout, and Columbia spotted frog, the effects analysis for these species are combined for each alternative.

Other threatened, endangered, sensitive and management indicator species considered but not carried forward in the analysis include: Mid-Columbia River steelhead, westslope cutthroat, western ridged mussel and shortface lanx, appendix A. Populations of threatened Mid-Columbia River steelhead or sensitive westslope cutthroat are not found within the Upper Malheur Subbasin. Anadromy stops at the Hells Canyon Complex. These two species are Forest Plan management indicator species.

Habitat for sensitive western ridged mussel is not known to occur in the project area. This species is found mainly in low to mid-elevation watersheds (Nedeau et al. 2009). The shortface lanx is a species that tends to occupy large streams that are relatively fast-moving, unpolluted, cold and well-oxygenated (Neitzel and Frest 1990). Potential habitat for the shortface lanx was not found in the project area. Mid-Columbia River steelhead, Westslope cutthroat, Western ridged mussel, and shortface lanx were not found during 2010 stream surveys. In August and September of 2012, mussel surveys were conducted on selected reaches of the Upper John Day River, North Fork Malheur, Little Malheur, and Upper Malheur Rivers on Forest lands within the Prairie City Ranger District. The western ridged mussel and shortface lanx were not found in selected reaches within the project area during the 2012 surveys (C. Kranich pers. comm.). Reaches were sampled within Summit Creek in the Summit Creek Allotment, Lake Creek in the

McCoy Creek Allotment, Big Creek in the Logan Valley Allotment, and Lake Creek in the Lake Creek Allotment.

Table 91. Threatened, endangered and sensitive aquatic species

Aquatic Species	Status[a]	Effects Determination[b, c, d]			
		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Columbia River Bull Trout *Salvelinus confluentus*	T (MIS)	NLAA/BE	LAA	NLAA/BE	NLAA/BE
Columbia River Bull Trout Designated Critical Habitat	D	NLAA/BE	LAA	NLAA/BE	NLAA/BE
Columbia spotted frog *Rana luteiventris*	S	NI	MIIH	MIIH/BI	MIIH/BI

a - Status
- T Federally Threatened
- S Sensitive species for Regional Forester's list
- D Designated Critical Habitat
- MIS Management Indicator Species

b - Effects Determination (threatened and endangered)
- NLAA May Effect, Not Likely to Adversely Affect
- LAA May Effect, Like to Adversely Affect
- BE Beneficial Effect

c – Designated Critical Habitat
- NE No Effect
- NLAA May Effect, Not Likely to Adversely Affect
- LAA May Effect, Like to Adversely Affect

d - Sensitive Species
- NI No Impact
- MIIH May Impact Individuals or Habitat but Will Not Likely Contribute to a Trent Toward Federally Listing or Cause a Loss of Viability to the Population or Species
- BI Beneficial Impact

The Mid-Columbia River spring Chinook was also considered but not carried forward in the analysis because anadromy stops at the Hells Canyon Complex. Due to the dams spring Chinook can no longer navigate the system.

Alternative 1 - No Grazing

Direct and Indirect Effects

Under the no action alternative, grazing would not be authorized within the Summit Prairie, Logan Valley, and McCoy allotments and the permit cancelled. Direct effects related to livestock grazing would not occur under this alternative resulting in improvements in riparian vegetation, channel characteristics, bull trout critical habitat, and water temperatures within the three allotments following removal of livestock two years after the permit cancellation. Recovery objectives (appendix A, Table 102) and desired condition (appendix A, Table 102) would likely be achieved within the time frames prescribed for many of the reaches (appendix A, Table 103) if the existing condition is related to livestock grazing. The rate of recovery within this alternative would have the greatest extent of all alternatives for recovery. Riparian areas that have concentrated wildlife use would have limited riparian hardwood recovery and thus would have a slower recovery than areas where wildlife exclosures are proposed. Improvement in riparian

hardwood condition may be slower than that of areas where exclosures are proposed because of the effects related to fencing limiting wildlife use.

Grazing would continue as permitted under the current permit for two years following notification of cancellation of the permit. The effects from another two years of grazing under the current permitted use are summarized in chapter 2 alternatives considered but eliminated from detailed study (Current Management). Reaches of Summit Creek are not expected to improve at a rate sufficient for the desired conditions in appendix A, Table 102 under the existing management and therefore the existing condition within this area is expected to remain the same for those two years.

Cumulative Effects

The area considered for cumulative effects includes all of the Big Creek, Lake Creek, Summit Creek, Bosenberg Creek – Malheur River Subwatersheds (to the confluence of Bosenberg and the Malheur River) in the Headwaters Malheur River Watershed. All activities in appendix C of the FEIS have been considered for their cumulative impacts on riparian habitat and aquatic dependent species. This upstream extent for the cumulative effects geographic area was selected because activities that occur upstream of the project area up to the drainage divide may be transported by runoff into the project area. The downstream extent was selected because most materials flowing out of the project area should deposit before leaving the subwatershed. The cumulative effect for past actions has been described in the existing condition for this analysis area. The following discussion focuses on those past, ongoing and foreseeable activities that may contribute impacts to riparian condition and aquatic species.

The subwatersheds that contain the Logan Valley, Lake Creek, McCoy Creek and Summit Creek allotments vary in condition depending on the land management designation and the primary activities that have occurred within those spaces. The upper portions of Lake Creek and Big Creek are in wilderness areas with little human caused effects. Riparian vegetation and aquatic habitat conditions are properly functioning in these areas to the extent of natural variability (without human influence). The mid to lower portions of these subwatersheds have been affected by a variety of human-caused impacts, but mostly grazing, timber harvest, and road development. Private land occurs in about the mid portion of all the subwatersheds. Livestock grazing and agriculture are the primary uses of those private lands.

The No Action alternative would not add any cumulative effects to the existing riparian vegetation, channel characteristics and complexity, water temperature and bull trout critical habitat in the project area. The current livestock grazing activities on the Logan Valley, Lake Creek, McCoy Creek and Summit Prairie allotments would not occur and areas where current grazing management impact fish and their habitat would stop. Grazing access points that result in bank trampling and streamside vegetation removal would no longer occur and these areas would improve, leading to improved aquatic and riparian habitat conditions. Because no direct or indirect effects would occur, there would be no cumulative effects. The No action alternative would result in the greatest extent of recovery of all alternatives when considered cumulatively for riparian areas whose existing condition is primarily attributable to livestock grazing. The rate of recovery for no livestock grazing including exclosures would be similar to those areas with the appropriate livestock management.

Table 92. Alternative 1 summary of expected recovery for proper functioning condition ratings by unit based on the actions proposed

Allotment	Unit	Miles	PFC in 5 years	PFC in 10 years	Desired Condition in 10 years
Lake Creek	Bosenberg	8.6	>PFC[a]	>>PFC[b]	Y
	McCoy Creek	5.7	>PFC	>>PFC	Y
Logan Valley	Corral Holding	0.1	PFC	>>PFC	Y
	East Lake Creek	0.3	>PFC	>>PFC	Y
	Lower Field	0.1	PFC	>PFC	Y
	North Big Creek	0.7	>PFC	>>PFC	Y
	South Big Creek	0.6	>PFC	>>PFC	Y
	West Bosenberg	0.1	PFC	>>PFC	Y
	West Lake Creek	1.0	PFC	>PFC	Y
McCoy Creek	Cow Camp	0.5	>PFC	>>PFC	Y
	North Fork	0.02	PFC	>>PFC	Y
	Starvation	0.3	>PFC	>>PFC	Y
	Starvation	0.2	PFC	>PFC	Y
Summit Prairie	Little Logan	5.0	PFC	>PFC	Y
	North Summit	1.0	>PFC	>>PFC	Y
	Sagehen	2.8	N[c]	PFC	N
		1.1	PFC	>PFC	Y
		0.9	>PFC	>>PFC	Y
	South Summit	0.04	PFC	PFC	N
	Summit Rock	0.81	N	PFC	N
		3.7	>PFC	>>PFC	Y
		1.0	>PFC	>>PFC	Y
	West Summit	0.4	N	PFC	N

a – > : Shows improvements in bull trout critical habitat indicators moving toward PFC
b – >> : Shows continued improvements in bull trout critical habitat indicators near or beyond PFC
c - N: Indicates not at PFC or Desired Condition within defined time period

Table 92 lists the expected proper functioning condition rating by miles for each stream reach within each allotment and unit based on the existing condition, the potential for recovery towards or achievement of desired conditions (appendix A, Table 102) and the relevant actions proposed in alternative 1.

Effects Determination

Columbia River Basin Bull Trout (T): May Affect, Not Likely to Adversely Affect (NLAA) in the short term. Beneficial Impact (BE) in the long-term.

Bull Trout Designated Critical Habitat (D): May Affect, Not Likely to Adversely Affect (NLAA) in the short term. Beneficial Impact (BE) in the long-term.

Columbia Spotted Frog (S): No Impact.

Columbia spotted frog and redband trout require the same habitat characteristics as bull trout with the exception that bull trout are relatively limited by their requirement for cold stream temperatures. Therefore the analysis of bull trout critical habitat and water quality along with the actions proposed would have the same effects on Columbia spotted frog and redband trout habitat within the project area.

Rationale

Habitat for bull trout in the aquatic analysis area is currently in a degraded state. High water temperatures, riparian hardwood suppression, reduction in herbaceous plant vigor and altered stream channels have reduced the habitat capability of streams in the aquatic analysis area to support bull trout.

Removing livestock grazing within the project area on areas currently in a degraded state (functional-at risk) would facilitate the recovery of riparian vegetation and thus improvement in channel characteristics and complexity. Shading as a result of improvements in riparian hardwood and herbaceous plant vigor, as well as an increase in undercut banks, would result in a reduction in stream temperatures benefitting bull trout and bull trout critical habitat in the long term. Impacts related to roads, irrigation, and past timber harvest activities would continue to impact recovery in the project area but not cumulatively with livestock grazing.

Management Indicator Species

Bull trout and redband trout are management indicator species chosen to indicate effects of activities on populations of non-anadromous riparian species. This alternative will improve conditions for bull trout and redband trout in the long term. Therefore, alternative 1 of the Summit Logan Valley Grazing Authorization will not contribute to a negative trend in viability for bull trout or redband on the Malheur National Forest.

Direct and Indirect Effects Common to Action Alternatives

Livestock Grazing – All Allotments

There are three primary ways in which livestock grazing may affect riparian vegetation, channel characteristics, bull trout critical habitat, and water quality. The three ways include browse utilization, hoof shearing/compaction, and riparian herbaceous plant utilization. An increase in any of these three factors and its effect on riparian vegetation and channel characteristics are synthesized below. Likewise a decrease in any of these factors would have the opposite effect. The intensity, duration, season of use, and periods of rest associated with these effects vary by alternative as well as the standards (endpoint indicators) for specific units in each of the alternatives (appendix E). Additionally, the effects of increasing any of the three values are also dependent on the existing condition of the riparian area and its resiliency to these effects and other disturbances. For example, these general effects would be lessened annually or not measureable if a site is at greater than proper functioning condition and the existing condition is very close to the desired condition. If a reach is below proper functioning condition and there is large departure from desired condition, then the annual effects will be exacerbated. This is because the vegetative and channel attributes are not resilient enough to provide channel stability. The general effects of the primary actions related to livestock grazing and their effects on riparian hardwoods, channel characteristics, and herbaceous plants in riparian areas are listed below.

Stubble height:

Six inches (typically 4-8 inches based on season of use and similarity to desired conditions); stubble height has been widely used as an annual monitoring indicator for adaptive management to evaluate

livestock vegetation use in riparian areas and provides information useful in determining the degree to which livestock grazing is influencing the achievement of desired conditions (streams dominated by herbaceous hydrophytic vegetation). Stubble height has been identified as being related to the physiological health and vigor of individual plants/communities as well as the ability of vegetation to protect streambanks and filter sediment during overbank flows, although by itself it is generally not sufficient to establish a relationship between grazing and riparian vegetative conditions. Research is limited, but the literature generally suggests 4-6 inches of residual stubble height allows for improved riparian grazing management and provides for adequate riparian protection. Clary and Leininger (2000) conducted studies on stubble height and its ability to improve riparian habitats and to capture and stabilize sediment. They concluded that stubble heights of 4-6 inches appear to stabilize the greatest amount of sediment. Boyd and Svejcar (2004) found similar results, reporting adequate regrowth occurred on most sites tested in Oregon when 4-6 inch stubble height remained. Clary (1999) states that by maintaining stubble heights of 4-5.5 inches allowed for streambank recovery. It is acknowledged; however, that in some instances 3 inches may provide adequate riparian protection while in other instances 6 to 8 inches may be required to limit streambank trampling or to reduce willow browsing. Grazing use indicator values are intended to vary by site depending on similarity to desired conditions, resiliency of the site being monitored, and the timing, duration and intensity of livestock use (University of Idaho Stubble Height Review Team Report 2004, Clary and Leininger 2000, Clary et al. 1996, Hall and Bryant 1995, Clary and Webster 1989). This annual use indicator should be used in combination with long-term monitoring of vegetation and stream channel attributes

Bank alteration:

Twenty percent (10-30 percent depending on measurement method used and on resiliency of site); like stubble height, streambank alteration is another annual or short-term indicator used to evaluate the potential effects of livestock grazing in riparian areas, primarily any potential effects to long-term streambank stability and channel shape. It is used as a tool to assess the intensity of grazing along streambanks and to determine when such intensity may be appropriate or deemed too excessive. It can also prove useful in determining the cause-and-effect relationships between livestock grazing and stream channel conditions and whether management changes are needed for the following year. Streams are naturally dynamic and have the ability to repair a certain amount of annual disturbance each year (the amount is variable based upon stream gradient, substrate composition, streambank materials, vegetation type and abundance, channel geometry, flow regime, etc.). The literature is not extensive but generally suggests 10-30 percent streambank alteration is consistent with providing adequate riparian protection, and is intended to vary by site depending on similarity to desired conditions, resiliency of the site being monitored, and the timing, duration and intensity of livestock use (Burton et al. 2011, Heitke et al. 2008, Bengeyfield 2006, Cowley 2002, Bengeyfield and Svoboda 1989). Bengeyfield (2006) found that when streambank alteration measured 15-20 percent, width to depth ratios showed an improving trend. He also noted that the vegetation improvements kept pace with the physical changes. This annual use indicator should be used in combination with long-term monitoring of streambank stability and channel geometry. In addition, it is worth noting that research is continuing to be conducted on the various ways that can be used to monitor for and measure actual streambank alteration (including multiple indicator monitoring, which the District is presently using) to account for accuracy of results, reduction of variability among observers, and the resources necessary to carry out such measures.

Mean incidence of use on woody species:

Forty percent (30-50 percent based on season of use and similarity to desired conditions); Woody vegetation is an important component of many stream/riparian ecosystems as they provide a strong root system, filter sediments, and provide stream shade and habitat diversity. Woody species browse is a short-term indicator of grazing utilization of woody species. Studies have shown that it is quite difficult to

accurately measure utilization of many riparian woody species, but that a general estimate of overall browsing of woody plants is important for determining the success of various grazing management prescriptions (detailed rule sets for describing classes of woody species use help with consistency). Overall, there is generally a reduction in seed production of woody plants that receive more than 55 percent utilization, and when heavy and severe utilization levels are sustained over time overall plant health, including size and root strength, is reduced. Although the literature is not extensive, it generally suggests light to moderate allowable use on woody species (~30-50 percent) in order to maintain or improve woody plant communities; and is intended to vary by site depending on similarity to desired conditions, resiliency of the site being monitored, and the timing, duration and intensity of livestock use (Winward 2000, Utilization Studies and Residual Measurements – USDI Bureau of Land Management 1996, PACFISH Enclosure B – Recommended Livestock Grazing Guidelines 1995). It has also been suggested that a preference change, from grasses and sedges to shrubs, be used as a trigger to manage livestock in order to protect sprouts and young woody species (Hall and Bryant 1995). This annual use indicator should be used in combination with long-term monitoring indicators of woody species age class and greenline composition to help determine the health of woody plant communities. The overall health of these plants can be a substantial factor influencing streambank stability, aquatic habitat, as well as water quality. Furthermore, this information can assist managers in determining whether management actions are making progress towards desired objectives or if adjustments are needed.

The following bulleted items depict the effects of livestock grazing on vegetation and channel characteristics when not managed appropriately or when the existing condition is functioning at risk with a large departure from desired conditions and lack resiliency to grazing impacts. Riparian areas that are closer to desired condition may not demonstrate these responses when managed appropriately and sufficient resiliency is present (minimum of proper functioning condition) therefore effects may not be measurable annually.

General effects from an increase in browse utilization

- decrease in riparian hardwood height and density
- decrease in percent effective shade
- increase of existing water temperature
- decrease in terrestrial insect input
- decrease of wetted floodplain

General effects from an increase in stream bank hoof shearing/compaction

- decrease in undercut banks
- increase in bankfull width to depth ratio
- decrease in residual pool depth and quality pools
- decrease in channel complexity/decrease in greenline to greenline width
- increase in sediment and unstable banks
- contraction of wetted floodplain

General effects from an increase in riparian plant utilization (ava)

- decrease in terrestrial insect input
- decrease in hydric plant vigor
- contraction of wetted floodplain

- decrease in stable banks

Relationship of the Effects of Livestock Grazing on the Indicators and Bull Trout Critical Habitat

Effects to bull trout from livestock grazing can be in the form of direct impacts to individual fish or indirectly through habitat disturbance. Direct disturbance includes trampling on bull trout redds, resulting in injury or death to incubating embryos or alevin; disturbing holding or spawning adults, forcing them to alter their behavior and seek cover; or disturbing rearing juveniles, forcing them to alter their behavior and seek cover. Bull trout critical habitat designated as occupied within the project area would have livestock removed prior to August 15th to prevent direct impacts to spawning adult bull trout and bull trout redds.

Grazing can have a number of detrimental effects on riparian and aquatic habitat which includes reduction of herbaceous plant cover and litter, disturbing and compacting soils, reducing water infiltration rates, and increasing soil erosion (Belsky et al. 1999). When riparian habitat is negatively affected, the survival and growth of listed fish species, sensitive species, and water quality may also be negatively affected.

Riparian Vegetation

Shrub Development

Livestock grazing can result in reduced recruitment of riparian shrubs (density), and a reduction in height classes as well as age classes. Willows require at least two years of leader growth before being able to set seed. When leaders are hedged each year, recruitment does not occur. A large portion of riparian woody browse occurs on riparian shrubs less than five feet tall that are accessible to livestock and wildlife. Livestock grazing of riparian shrubs in the fall often extenuates the use of woody riparian plants. Shrub height can directly affect shade which impacts water temperature. Also shrubs are an important source for terrestrial insects which are a source of food for bull trout and other fish species (Saunders and Fausch 2007). Terrestrial invertebrate prey that come directly from riparian vegetation have been shown to account for 50-85 percent of trout diets during summer months (Utz et al. 2007) and provide about 50 percent of their annual food budget (Kawaguchi and Nakano 2001; Baxter et al. 2005; Sweka and Hartman 2008). Browse and herbaceous utilization levels that limit the amount of detrital matter into streams may also impact aquatic invertebrates that are dependent on detrital matter (Saunders 2006, Saunders and Fausch 2007). Riparian shrub stems provide roughness and resistance to high flows. Their root system creates a matrix with herbaceous plants and increases bank stability and holding the channel's shape in a stable form.

Stabilizing plant cover

Livestock grazing can alter ecological status rating or maintain an early seral state. Hydric species such as sedges and rushes are often preferred by livestock. These hydric species contribute to a higher green line stability rating and wetland indicator rating. They also often are the first green vegetation immediately adjacent to the stream or the greenline. Hydric species also include the first colonizers of eroded banks and depositional areas facilitating a reduction in greenline to greenline width followed by channel narrowing. Early, mid, and late seral stages differ in their resilience to impacts from grazing and their ability to repair damage from one year to the next. Riparian areas that are in an early seral or mid seral state are susceptible to yearly high flow events and five year flow events which may result in a reset of improving riparian condition. These types of riparian areas are usually rated below proper functioning condition. Streams with adequate stabilizing plant cover build banks through deposition of sediment during high flows.

Shade

Livestock grazing can impact shade through a reduction in height of herbaceous cover, decrease in bankfull width/depth and decreases in height and density of riparian shrubs. They can also reduce hydric vegetation heights by reducing plant vigor. Reduced plant vigor can affect the channel's shape and stability. Riparian shrubs adjacent to the channel can provide microclimate effects that can provide cooler day time temperatures (Anderson et al. 2007; Chen et al. 1999). Overhanging sedges and rushes provide shade to the stream and hiding cover for fish. In meadow systems with meandering, low gradient stream channels, herbaceous vegetation may be the only shade-providing plants.

Channel Characteristics

The streams that are discussed are largely alluvial. They develop and function through continual adjustments from high flows and sediment loads coming in. Livestock grazing can result in changes in hydrology and channel complexity by direct bank alteration and a reduction in stabilizing bank cover and riparian hardwood shrub density. Bank stability decreases with a reduction in stabilizing bank cover and a reduction in riparian plant vigor. Reductions in riparian hardwood density can also decrease bank stability. Channels can become over-widened and susceptible to erosional process resulting in channel incision when these vegetative components are reduced. Depositional processes can be accelerated facilitating pool filling thus reducing residual pool depth and the number of quality pools. Floodplain connectivity is reduced when channel incision or over-widening occurs. The effects are manifested in the indicators of bankfull width to depth, average bankfull width, and Rosgen channel type.

Water temperature and Aquatic Species

Water temperature is related to several of the indicators discussed above. Livestock grazing can impact shade by reducing overhead cover in the form of riparian hardwood shrub height and densities thus increasing solar heating. Floodplain connectivity is related to channel type, geomorphology, and riparian vegetation. Hyphoreic exchange (cold ground water) is related to floodplain connectivity, so a reduction in riparian vegetation function, maintenance of an over-widened stream channel from livestock bank alteration, and reduction in bank stability also affects cold groundwater influence within a stream reach. Pool depth and the number of quality pools also interact with stream temperature acting to mediate stream temperatures during the summer and winter months (Ebersole et al. 2001). Mediation of winter temperatures by deep pools was found to be important for bull trout over wintering (Jakober 1995). Winter movement by bull trout was found to be more extensive in mid elevation streams where frequent freezing and thawing led to variable surface ice cover and frequent super cooling (Jakober et al. 1998). Excessive fine sediment can result in filling of pools within a reach. Current climate model predictions for the Pacific Northwest suggest less snowpack followed by more rain on snow events. This suggests more freezing/thawing events in mid elevation streams similar to streams in the project area.

Bull trout critical habitat relates to the indicators discussed above in several ways. The primary elements are stream temperature, shade, pool quality, and suitable spawning substrate. All of which vary in importance based on life history and stage-migratory, spawning, rearing. These elements are often not found within the same locale therefore migratory behavior or the ability to move between the distinct habitats based on life stage is critical for continuation of the population and its ability to endure natural or anthropogenic disturbances. Temperature may act as a thermal barrier to this type of behavior for bull trout.

Vegetative and Geomorphic Effects from Fencing Riparian Areas

There will be significant improvements in stream channel morphology as the exclosed stream reaches become narrower, deeper, and have more pool area. Increased vegetation and reduced bare ground in response to fencing is an important factor associated with stream channel geomorphic adjustments.

Establishing vegetation cover will take five years or more to be effective, with geomorphic adjustments taking longer. In Eastern Oregon, geomorphology response generally occur within 14 years, although older exclosures showed no geomorphic response after 28 years even though riparian vegetation was well established and abundant (Magilligan and McDowell 1997).Other variables such as channel constraint, stream power, and sediment supply also influence the ability of a stream channel to respond to fencing treatment. Generally, the longer the exclosure fences are in place, the greater the channel adjustment to desired conditions (Kaufman et al. 2002; Magilligan and McDowell 1997).

Logan Valley Allotment

Big Creek Field Unit

The direct and indirect effects of constructing a riparian pasture fence around the fen area may result in minimal ground disturbance from initial fence construction. Implementing the design criteria will minimize any effects to riparian areas and Columbia spotted frog by avoiding impacts to vegetation and creating wheel tracks in wet meadows or riparian areas, timing project implementation when sites and access are dry and rehabilitating after implementation to remove visible wheel tracks. The short term effects of fence construction are expected to result in long term beneficial effects for the Columbia spotted frog within the Big Creek Field unit.

Corral Holding Unit

Direct effects related to hoof shearing, browse utilization, and stubble height would be maintained on Bosenberg Creek within the Corral Holding unit. The indirect effects of livestock grazing on the riparian vegetation, channel characteristics, water temperature and bull trout critical habitat would be maintenance of the existing condition for the small section downstream of the fenced out riparian area. Inside the fenced area, minimal grazing would occur and there would be an improvement in condition. This exclosed section is approximately 0.1 miles. The woody browse would further increase the density and height classes of riparian shrubs across the entire reach. The bank alteration reduction would facilitate movement towards of improvements in the bankfull width/depth, undercut banks and shade values. Thus, it benefits bull trout critical habitat. Bull trout critical habitat within the riparian pastures would be moving towards desired condition within 10 years. This reach would likely maintain proper functioning condition and potentially move towards desired conditions in five years.

Flat Field Unit

The direct effects of the unit boundary changes and fence removal and conversion would be no livestock use on Big Creek in the Flat Field unit. The indirect effect of no livestock grazing would benefit riparian resources, channel characteristics, water temperature and critical habitat. The ground disturbing impacts removal of 0.3 miles would not be measurable. Any effects from conversion of 0.3 miles electric fence to permanent let down would be minimized through following design criteria. Excluding livestock grazing from 0.13 miles of critical habitat on Big Creek in the Flat Field unit would move it towards a rating of proper functioning condition or beyond.

Lower Field Unit

Direct effects related to hoof shearing, browse utilization, and stubble height would be maintained on Bosenberg Creek within the Lower Field unit. The indirect effects of livestock grazing on the riparian vegetation, channel characteristics, water temperature and bull trout critical habitat would have a continued improvement. Bosenberg Creek is on the far east corner of the unit and an irrigated meadow produces abundant vegetation and provides livestock water through the grazing season. The permittee actively salts in the northwest corner and these management strategies likely are successful for providing recovery for Bosenberg Creek. Sedge and rush plant communities would continue to develop dense root

masses and narrow the channel. Improvements in vegetative attributes would improve the bankfull width/depth, undercut banks and shade values in the reach. Thus, it benefits bull trout critical habitat. Bull trout critical habitat within the riparian pastures would be moving towards desired condition within 10 years. This reach would likely attain proper functioning condition in 5 years.

West Bosenberg Riparian Pasture

Direct effects related to authorizing the grazing system would result in a reduction in hoof shearing of streambanks, reduction in woody browse use, and an increase in hydric plant vigor within Big Creek. This site did not have any data collected on it other than field observations, but was in good condition likely rated at proper functioning condition. A photo point would be monitored in this 14 acre unit to ensure there's an increase in shrubs and wetland obligate plant communities. The adaptive management strategy is additional rest if sufficient movement towards or achievement of desired conditions (appendix A, Table 102) has not occurred following the 3-5 years of rest.

The indirect effects of reducing livestock effects would likely result in an increase in shrub density, height and vigor, and an increase in shade. It would also maintain potential channel type (Da5/6) by reducing bankfull width to depth. Bull trout critical habitat within the riparian pastures would likely move towards desired condition (appendix A, Table 102 and Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools. As a result of the increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade, cooler water temperatures are expected. Effects related to changes in water temperature as a result of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years. Resting for 3-5 years would facilitate movements towards or achievement of recovery objectives appendix A Table 102. The use levels identified in appendix E for the West Bosenberg unit, resting 3 years out of 10, monitoring (review of riparian condition 5 years out of recovery trajectory) as well as the adaptive management strategy (additional rest) would ensure movement towards desired conditions following re-initiation of livestock grazing.

The 0.13 miles reach is identified at proper functioning condition in 2012 and is expected to improve beyond a rating of proper functioning condition within the next 10 years based on the management actions within the West Bosenberg Riparian pasture. Any improvement beyond a rating of proper functioning condition is directly related to improvements in bull trout critical habitat. Annual use levels would facilitate maintenance of or improvement beyond a rating of proper functioning condition within the West Bosenberg Riparian pasture. The application of the adaptive management strategy (additional rest) for the West Bosenberg riparian if sufficient progress towards or achievement of desired conditions (appendix A, Table 102) has not been made following 3-5 years of rest would benefit this reach. This would ensure that movement towards desired vegetative and channel characteristics are continued.

McCoy Allotment

Cow Camp Riparian Exclosure

Livestock grazing would be excluded from Lake Creek Reach 2 because of the Lake Creek Fence and Water-Gap and the Lake Creek Willow Gallery Fence. These two fence projects are discussed in chapter 1. Direct effects of herbivory, browsing and bank trampling would be reduced. Indirect effects of riparian and channel condition would be improved through the reduction of livestock use. Shade would be improved as the herbaceous vegetation becomes established into and decreasing the channel's width. Water temperatures would likely experience less solar radiation. As the vegetation, channel and water temperatures improve, fish habitat would also be improved. The active beaver colony would likely expand and provide increased groundwater recharge. The beaver activity would also improve channel

complexity for further improved fish habitat. Bull trout critical habitat within the riparian exclosure would be moving towards desired condition within 10 years. This reach would likely remain at proper functioning condition.

Starvation Unit

The Starvation unit (Lake Creek Reach 1 and Crooked Creek Reach 1) would be removed from the McCoy Creek allotment. This area may be added to the Dollar Basin allotment in the future. A separate environmental analysis would be required to add this area to the Dollar Basin allotment.

Cumulative Effects Common to Action Alternatives

The area considered for cumulative effects includes all of the Big Creek, Lake Creek, Summit Creek, Bosenberg Creek – Malheur River Subwatersheds (to the confluence of Bosenberg and the Malheur River) in the Headwaters Malheur River Watershed. All activities in appendix C of the EIS have been considered for their cumulative impacts on riparian habitat and aquatic dependent species. These cumulative effects geographical area upstream extent was selected because activities that occur upstream of the project area up to the drainage divide may be transported by runoff into the project area. The downstream extent was selected because most materials flowing out of the project area should deposit before leaving the subwatershed. The cumulative effect for past actions has been described in detail in the existing condition for this analysis area. The following discussion focuses on those past, ongoing and foreseeable activities that may contribute impacts to riparian condition and aquatic species.

The subwatersheds that contain the Logan Valley, Lake Creek, McCoy Creek and Summit Creek allotments vary in condition depending on the land management designation. The upper portions of Lake Creek and Big Creek are in wilderness areas with little human caused effects. Riparian vegetation and aquatic habitat conditions are properly functioning in these areas. The mid to lower portions of these subwatersheds have been affected by a variety of human-caused impacts, but mostly grazing, timber harvest, and road development. Private land occurs in about the mid portion of all the subwatersheds. Livestock grazing and agriculture are the primary uses of those private lands.

Past Activities

Past activities such as legacy livestock grazing and dispersed camping in riparian areas have influenced riparian plant communities. Past activities such as timber harvest, road construction, wildland fire, and dispersed camping in riparian areas have influenced channel characteristics and complexity. Past actions relevant to water temperature and aquatic habitat resources are water withdrawals for irrigation, timber harvest, road construction, wildland fire livestock grazing and stocking of nonnative fish.

Livestock grazing (prior to adoption of the Forest Plan in 1990) likely influenced riparian vegetation in the greatest extent and magnitude of all past actions. Legacy livestock grazing has affected plant vigor, potential area of wetland obligate communities, density and height classes of riparian shrubs that have strongly influenced effective shade and thus water temperatures. These changes have affected the recruitment and maintenance of the riparian vegetative attributes. Dispersed camping from recreation uses in the project area had minor effects on aquatic and riparian function. There are a few trails that cross streams resulting in localized sediment delivery and a few dispersed recreation sites that have disturbed riparian vegetation. Legacy livestock grazing has resulted in direct effects to fish species when they accessed occupied streams and may have trampled redds, resulting in altering normal behaviors and mortalities. It has also resulted in channels with wider bankfull widths that increase solar radiation. Legacy effects from browsing on stunted riparian shrubs have decreased the amount of effective shade available.

Forty timber sales have occurred within the project area since 1972 (40 years). These included multiple harvest prescriptions see appendix C. Past timber harvest likely resulted in compacted upland soils, leading to increased runoff and sediment yield. This can change the patterns of runoff from large areas in watersheds by changing vegetation characteristics. INFISH standards and riparian habitat conservation area buffers have been applied for timber management since 1995. INFISH limited silvicultural practices to those that are needed to acquire desired vegetation characteristics where needed to attain riparian management objectives, and that avoid adverse effects on inland native fish. Ongoing and foreseeable timber harvests are required to meet the Forest Plan as amendment by Amendment 29 and INFISH.

Past timber harvesting required an extensive road network throughout most of the project areas. Roads are impervious and have changed runoff flow paths and processes. Roads adjacent to the stream likely constrain floodplain processes. Constrained roads may have additional stream energy that may erode streambanks and reduce bank stability and over widen the bankfull width/depth ratio. Ditch relief culverts in moderately steep roads adjacent to the stream are likely connected to the stream, yielding sediment into the water course directly. Roads tend to concentrate runoff, resulting in higher peak flows than would occur without roads. Fine sediments from road surfaces also enter stream channels at road crossings, increasing turbidity, substrate embeddedness and substrate composition. The vast majority of road crossings at streams are culverts. Poorly designed culverts can be barriers to juvenile or adult fish passage. Since the 1990s, road impacts have been reduced due to past project activities which have included road closure and decommissioning. Approximately 8.0 miles of road in riparian habitat conservation areas were closed or decommissioned in the last decade allowing some roads to re-vegetate and stabilize.

Past fires have occurred within the last 30 years in the wilderness and headwater portions of Big Creek, Summit Creek, and Bosenberg subwatersheds (Upper Malheur watershed) as well as stand replacement fires in Upper Big Creek and Lake Creek subwatersheds (Appendix C Cumulative Activities Considered). These fires resulted in large sediment plumes into lower downstream sections of stream, reduction in overstory and shade and likely warmer stream temperatures than prior to the fires. Recovery of the riparian hardwoods and herbaceous component has occurred in these area and the systems are primarily controlled by downed large woody debris as a result of the fires. However, recruitment of large woody debris would be delayed due to past fires, conifers have yet to reach a height where they provide the shade once present, and streambanks have formed, but are composed of erodible organic matter which is highly susceptible to impacts from livestock hoof action. The effects of removal of the conifer overstory from fire can be expected to recover within 90 years post fire. Recruitment of new large woody debris may take even longer depending on natural disturbances such as windfalls or bug kills. Thus these streams would be limited in large woody debris for the foreseeable future. These wildfires in the Summit Prairie Allotment have affected riparian habitat conservation area categories 2 and 4 within the Summit Rock and Little Logan units.

Water withdrawals for irrigation occur on private lands in the Lake Creek subwatershed. Past, ongoing and foreseeable water withdrawals would continue and is managed by the State of Oregon. Water temperatures heat up on Lake Creek from site 2 to 3 and 4 increase by 17 and 15 degrees, respectively. This water flows through a series of irrigation ditches that warms the water before releasing it back into the creek. Two head gates with fish screens have been installed within the last 15 years.

High Lake above the project area has been stocked with non-native brook trout that now occur in some streams. Brook trout are known to compete with native trout for habitat and can interbreed resulting in less fit offspring. Brook trout (*Salvelinus fontinalis*) were introduced to the Malheur Basin in the early 1900s. The distribution of brook trout overlaps all areas occupied by bull trout in Lake Creek and most areas in Big Creek and its tributaries (Buckman et al. 1992). Hybridization and competitive displacement

is possible due to the presence of brook trout. Hybridization between bull trout and brook trout in the subbasin has been documented (Buckman et al. 1992; L. Schwabe, Burns Paiute Tribe, personal communication). Brook trout are also a threat to bull trout because of their highly aggressive nature. Improvements in riparian vegetation, channel characteristics, water temperatures may improve the competitiveness of bull trout within the Malheur basin especially for those populations that exhibit migratory behavior and may grow to a larger size than local brook trout.

Ongoing Activities

Ongoing actions related to improvements in livestock management and riparian conditions are listed in appendix C. Ongoing actions in the project area that are expected to improve the condition of riparian and aquatic resources include the following. The 0.3 mile West Fork Summit Creek fence and water gap would temporarily exclude livestock in the West Summit Recovery Unit on West Fork Summit Reach 1 until the condition improves. A 0.25 mile buck and pole exclosure and enlargement of willow cages to 20 foot diameter would improve willow height classes and densities in Summit Creek Reach 5 in the Little Logan unit. A 1 mile reconstruction of the Lake Creek unit division fence would improve management of livestock. A 0.2 mile fence and water gap that would provide better livestock management on Big Creek in the West Bosenberg Riparian pasture. A 0.2 mile fence that would exclude livestock from Lake Creek Reach 2, but would provide a 20 foot water gap in the Cow Camp unit. A 2.1 mile fence would fence off Lake Creek Reach 3 into the West Lake Creek Riparian pasture. Development of water sources in the Sagehen unit should improve the distribution of livestock amongst the unit and would decrease riparian vegetation disturbances except in localized areas. West Fork Summit Creek reach 2 would have parallel tree felling that should likely allow expression of vegetation and streambanks to heal where livestock do not have access to because of a tree acting as a physical barrier. All of these management actions should allow better management control of livestock grazing to improve the trend towards the management objectives and desired conditions.

These actions were considered cumulatively in each alternative based on the existing condition (proper functioning condition rating), identified issues and the proposed grazing management for each alternative. Determinations were made as the whether the actions facilitated movement towards or achievement of recovery objectives and desired condition. These ongoing actions are expected to expedite recovery to desired conditions in coordination with the proposed actions in each alternative and benefit bull trout critical habitat thru improved livestock management and distribution within these units.

These ongoing actions are common to all alternatives and the effects from these actions have been analyzed previously in other NEPA documents. This document considered the effects of these actions cumulatively in conjunctions with proposed actions in each of the alternatives within the Summit Logan Valley Grazing Authorization FEIS. Cumulatively these actions would have a net benefit to livestock management, riparian condition, bull trout critical habitat, and water quality within the project area.

Foreseeable Activities

Riparian vegetation utilization from proposed activities would not likely add measurably to a downward trend in the existing condition of the streams in the project area because of the development of site specific use table standards, minimum rest requirements, adaptive management strategy, and changes in infrastructure to more effectively manage livestock and development of water sources. Proper functioning condition reaches that were identified as functioning at risk with a downward trend in 2007 had their use standards adjusted going into the 2008 grazing season. Changes in grazing management in response to present or ongoing activities would allow riparian vegetation to improve vigor in reaches that have issues.

Since past livestock grazing has had an effect on the existing condition of riparian vegetation, it also has an effect on the channel characteristics and complexity, water quality and aquatic dependent species. Of

primary interest is the bankfull width/depth ratio is typically higher for streams where there is a departure in the existing condition from the desired. As a result, sediment transport is negatively influenced and residual pool depths and quality pools typically are not in their desired ranges.

Ongoing and foreseeable timber, road densities, fuels and recreational activities within these subwatersheds are expected to meet INFISH riparian management objectives and Forest Plan standards and guidelines regarding riparian habitat conservation areas and aquatic dependent species. These objectives and standards are designed to allow recovery of aquatic habitat and riparian vegetation towards desired conditions. Since impacts to aquatic habitat from the proposed actions are limited to negligible or not measureable decreases in overall riparian condition, wetland obligate plant communities, channel characteristics, water quality and aquatic habitat. It is unlikely that retarding of riparian condition and its relationships to aquatic dependent habitat would result in cumulative effects from timber, fuels and recreational management activities.

The Malheur National Forest is currently in the process of analyzing changes in travel management. It is foreseeable that cross country travel would be prohibited across 1,337,770 acres on the Malheur National Forest where it is not already prohibited with the exception of cross country travel from designated open routes for the sole purpose of dispersed camping when resource damage caused by motor vehicle use can be avoided. The distance that cross country travel would be allowed from open routes to existing dispersed camp sites would vary by alternative considered in the travel management analysis. Existing dispersed sites in a riparian area would also have a setback distance from the stream where motorized access would be restricted. Foreseeable changes in travel management would have a beneficial cumulative impact to riparian areas in the long term. It is expected that there would be a long-term reduction in fine sediment production in the project area as roads are decommissioned and re-vegetated; and cross country travel and dispersed camping that are causing resource damage is prohibited. Closing roads would result in a decrease in erosion of road surfaces.

Foreseeable activities of riparian hardwood planting restoration along 1.2 miles of Lake Creek and 2.5 miles of Big Creek. These actions should improve the density of riparian shrubs towards desired conditions in these areas.

Continual livestock utilization of riparian shrubs and herbaceous plants and bank alteration would have some level of cumulative effects with present dispersed recreation activities, water withdrawals and livestock grazing both on private and public lands. The level of these cumulative effects with present dispersed recreation activities are not likely to reach a point where measureable affects would occur. However, water withdrawals and livestock grazing on private lands within the middle of public lands may be influencing water temperatures flowing onto the public lands. It is likely that the Cow Camp unit may not achieve water quality standards despite Lake Creek being excluded from livestock use because of the water withdrawals on private land. Reach 6 of Summit Creek in the Summit Rock unit and Reach 5 in the Little Logan show signs of water temperature increases because of water that flows through the private lands sections. Utilization standards and adaptive management identified in the Cow Camp, Summit Rock and Little Logan units would ensure riparian and channel characteristics are on an upward trend towards desired condition on National Forest System Lands.

The use of utilization standards, off-site water sources, placement of salt, active range riding, riparian exclusion fences, minimum rest requirements, and the adaptive management strategy would restrict the time cattle spend in stream and riparian areas and allow recovery towards riparian objectives. These components of the allotment management plans would prevent measurable cumulative effects at the stream reach or larger spatial scales.

No detrimental change in aquatic habitat conditions from the proposed grazing regime intensity and duration is expected on the Lake Creek, Logan Valley, McCoy Creek and Summit Prairie Allotments. The cumulative effects are within the scope of anticipated effects to aquatic resources determined in the Malheur Forest Plan EIS.

When past, present and foreseeable activities are considered together, rates of riparian recovery within the project area would differ because of the existing condition and rates of recovery for riparian areas within the project area. While aquatic habitat is expected to improve simply based on livestock management the presence of invasive brook trout may limit the recovery of bull trout within the project area due to competition. Riparian vegetation is expected to improve to some extent in all alternatives however channel characteristics from legacy impacts related to timber harvest or road construction may impede recovery to some degree unrelated to livestock management.

Alternative 2 - Proposed Action

Direct and Indirect Effects

Lake Creek Allotment

McCoy Creek and Corral Basin Units

The direct and indirect effects of authorizing the McCoy Creek and Corral Basin units as a vacant allotment would be no grazing on 6.4 miles of critical habitat streams. This would facilitate continual improvement and likely improve beyond a minimum rating of proper functioning condition and achieve desired conditions for vegetative and channel characteristics within the next 10 years. Riparian hardwood densities and heights would continue to increase production of shade. Stabilizing hydric plant species would continue to increase in vigor and expand. Bankfull width/depth would continue to narrow creating undercut banks and deeper pools. Stream temperatures would likely cool as a result of the improvements listed above. These areas are a current stronghold for bull trout in the Upper Malheur River. These areas would continue to provide productive habitat.

McCoy Creek Unit

The direct and indirect effects of removing 407 acres from McCoy Creek unit and creating 2.5 miles of new fence would not affect riparian and aquatic resources. The portions of these units with riparian resources and critical habitat were vacant and the authorization from this analysis would keep it pending future analysis. The design criteria would minimize ground disturbing effects of compaction and trampling or removal of vegetation to water quality and critical habitat and would only apply to the 2.5 miles of fence.

Logan Valley Allotment

Big Creek Riparian Pasture

Direct effects related to hoof shearing, browse utilization, and stubble height would be maintained at current levels to Big Creek reaches 1, 2 and 3 within the Big Creek Riparian pasture with the exception that 3 years out of 10 would not have the current levels.

Indirect effects from authorizing livestock grazing in conjunction with the use levels and improvement projects in the unit would slightly improve the shrubs and the channel characteristics, maintain the effective shade values and improve the herbaceous plant vigor within the Big Creek Riparian pasture.

Riparian shrub densities and height may be slightly increased with proposed management. Annual browse utilization standards of 30-50 percent with season long rest 3 years out of 10 should allow shrubs

currently less than three feet to be expressed to a height above the reach of livestock in 10 years. Shrubs that have not been grazed for 2 years are more likely to develop seed and establish the increased density of shrubs. These newly established shrubs are more likely to be browsed by wildlife and livestock than the shrubs that have been expressed above browse line or are mature.

Plant vigor and the greenline stability rating would likely be improved under this management. The condition of the herbaceous plant communities is currently in an adequate condition for proper functioning condition and would likely improve from the required 3 years out of 10 years rest. This condition was assessed with a 4 inch stubble height and since the herbaceous plant community is not the largest portion, it is not the driver for stream bank stability. The shrub development/recruitment in conjunction with large woody debris provides long term channel stability.

The presence of hoof shearing from livestock use would be maintained at current levels for 7 of 10 grazing seasons within the Big Creek Riparian pasture. The upstream extent of this unit has an abundant amount of large wood that has fallen across the channel and provides protection to the streambanks and channel stability. Conifers have also encroached up to the streambanks in other places making it difficult for livestock to access the creek. The lower extent is more open from a conifer overstory and has more of a developed riparian hardwood plant community. Braided channels exist across the floodplain that inherently increase the streambank trampling that occurs as livestock cross Big Creek. Maintaining current use levels on shrubs may maintain to slightly improve increases in shrubs and height classes and may slightly improve stability on the channel and the bankfull width/depth ratio. The channel may narrow as a result of increases in new shrub root masses. It would not likely cause a change in residual pool depth and improved pool quality in the 10 years (appendix A, Table 103).

Maintaining or slightly improving the riparian shrubs and channel characteristics would not measurably increase effective shade values in the Big Creek Riparian pasture within 10 years (appendix A, Table 103). These reaches represent all 1.7 miles of all life stages for bull trout critical habitat. Since the condition of the residual pool depth, pool quality and bankfull width/depth would not likely improve; spawning and rearing habitat would likely be maintained in their current condition.

The creation of the Big Creek Riparian pasture may result 1.7 miles of critical habitat moving towards desired vegetation conditions, but not towards the desired channel characteristics within 10 years for reaches 1, 2 and 3 of Big Creek. Development of seed sources in the 0-3 foot height classes of shrubs may not likely occur due to the need of having consecutive years of no browse. The adaptive management strategy of additional rest or scheduled rest may allow continual movement towards or achievement of desired vegetative conditions identified in appendix A, Table 102. The ground disturbing impacts from removal of 1.2 miles of fencing would not be measurable.

Deardorff Unit

The direct effects of removing 395 acres from a portion of the Horse Unit and a portion of the McCoy Creek unit of the Lake allotment would not affect riparian and aquatic dependent species because there is no critical habitat within the proposed Deardorff unit. The indirect effect of adding this unit would benefit livestock management strategies by developing deferment and rest options that provide more frequent rest periods in other units in the allotment with riparian resources. The ground disturbing impacts of removal of 0.5 miles would not be measurable. Any effects from fence construction of 2.5 miles would be minimized through following design criteria.

West Lake Creek Riparian Pasture

The direct effects from authorizing livestock grazing in the West Lake Creek Riparian pastures in the Logan Valley allotment would result in a reduction in hoof shearing of streambanks, reduction in woody browse use, and an increase in hydric plant vigor within a functioning at risk stream reach.

The indirect effects of reducing hoof shearing, riparian hardwood browse utilization and increasing hydric plant vigor include an increase in shrub density, height and vigor, and an increase in shade. It would also facilitate movement towards or achievement of the potential channel type (F4/C4 towards E4) by reducing bankfull width to depth. Bull trout critical habitat within the riparian pasture would likely move towards desired condition (appendix A Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools within Lake Creek reach 3. A result of the increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade is cooler water temperatures. Effects related to changes in improvement of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years. Resting for 3-5 years would facilitate movements towards or achievement of recovery objectives and desired condition. The adaptive management strategy of additional rest if it is determined that sufficient recovery has not been achieved following rest of 3-5 years would also facilitate recovery of reach 3 within Lake Creek. Reach 3 of Lake Creek was rated as functional at risk trending down and in an early seral state. Riparian areas in a mid to late seral state are more resilient to the impacts of livestock grazing. Existing annual use levels are not sufficient to improve riparian condition within this reach however recovery of the riparian area to a mid/late seral stage (with 3-5 or more years of rest) prior to the resumption of grazing may be adequate to not retard the attainment of desired conditions. The adaptive management strategy of additional rest if movement towards desired condition is not sufficient would facilitate recovery within the West Lake Creek Riparian pasture.

These levels would not retard movement towards proper functioning condition and desired conditions for vegetation. The channel characteristics would likely move towards desired condition, but at a slower rate because of the current condition. The adaptive management strategy of additional rest within the West Lake Creek Riparian pasture would ensure that sufficient resiliency has been achieved within the riparian area to maintain an upward trend in recovery towards desired condition.

Summit Prairie Allotment

Bosenberg Unit

The direct effects from authorizing livestock grazing in the Bosenberg Unit in the Summit Prairie Allotment would result in an increase in hoof shearing (bank alteration) of streambanks related to livestock grazing, increase in woody browse use (browse utilization), and maintenance of herbaceous plant vigor (stubble height). There are approximately 4.4 miles of bull trout critical habitat within the Bosenberg Unit that are not currently being grazed and would have grazing reinitiated.

The indirect effects from incorporation of the Bosenberg Unit and rest for 3 out of 10 years would alleviate the effects of hoof shearing of streambanks, woody browse use, and increase hydric plant vigor within reaches 1,2,3,4 and 5 of Summit Creek (Little Logan and Sagehen Units). The Bosenberg Unit is currently vacant and contains bull trout critical habitat. The addition of the Bosenberg Unit and resumption of grazing would introduce impacts from livestock grazing into areas that have not been grazed for twenty- two years and are recovering from the effects of fire. Required riding would maintain control of the livestock in the Unit and may minimize the time livestock spend near riparian areas. The establishment of a representative designated monitoring area and critical designated monitoring area within sensitive riparian areas in Bosenberg Creek may ensure excess bank trampling and shearing does

not occur that is beyond the natural rate of recovery and facilitates a continual upward improvement in riparian condition within Bosenberg Creek.

Indirect effects from an increase in browse utilization (riparian hardwood) within Bosenberg Unit and implementation of 3 years rest out of 10 for the Sagehen and Little Logan Units.

Additional browse utilization would increase within the Bosenberg Unit to levels beyond that of wildlife use. Annual use levels for browse would be sufficient to facilitate movement towards or maintenance of desired riparian management objectives within Bosenberg Creek. Scheduled rest of 3 years out of 10 would facilitate continual movement towards or maintenance of riparian management objectives within Bosenberg Creek and the Sagehen and Little Logan Units.

Riparian hardwood densities and height would increase slightly. The percent shade would slightly increase as hardwood heights and densities increase. The increase in shade may result in cooler water temperatures, increase in terrestrial insect input and an increase in the wetted floodplain.

Indirect effects from an increase in riparian plant utilization (stubble height) within the Bosenberg Unit and scheduled rest of 3 years out of 10 may affect riparian plant vigor and but is expected to continue to increase at a rate slower than that of alternative 1 where the Bosenberg Unit remains vacant. Riparian plant vigor is expected to increase within the Sagehen and Little Logan Units in the Summit Prairie Allotment as a result of the rest for 3 years out of 10 but not to the extent as that of alternative 1 where Sagehen and Little Logan Units become vacant. Annual use level would alleviate some of the effects of livestock use of forage within the riparian areas but not to the extent as that of No livestock grazing in alternative 1.

Indirect effects from an increase in streambank hoof shearing (bank alteration) within the Bosenberg Unit and decrease in hoof shearing within the Sagehen and Little Logan Units in the Summit Prairie Allotment. The presence of hoof shearing from livestock use would increase within the Bosenberg Unit but decrease within the Sagehen and Little Logan Units in the Summit Prairie Allotment due to initiation of rest for 3 years out of 10. Because of the establishment of a reference designated monitoring area and critical designated monitoring area as well as initial bank alteration levels of 10 percent and 15 percent within the Bosenberg Unit the formation of undercut banks, decrease in bankfull width, increase in residual pool depth, and decrease in greenline to greenline width, decrease in sediment that has occurred under vacancy is expected to continue to improve and move towards riparian management objects and desired conditions identified in appendix A Table 102.

Five off site water sources and two water gaps are proposed in alternative 2. Of the five off site water source developments, three would be stock ponds in the northeast portion of the unit, a headwater spring would be developed to a trough 300 feet away from Bosenberg Creek and a water withdrawal site would pump water from the creek to a trough approximately 100 feet away from the stream. The water gaps would be developed near the 1648 road and Bosenberg Creek. The effects related to the livestock developments proposed above for incorporation of the Bosenberg unit are analyzed below.

Three stock ponds would be constructed in the far northeastern portion of the unit. These stock ponds are in the uplands, a considerable distance from critical habitat streams. The direct and indirect effects of constructing 3 stock ponds include ground disturbance from heavy machinery and impacts to upland vegetation and soil compaction. Water would be stored in the ponds later into the grazing season and may improve the distribution of livestock in the unit. This may result in less time livestock spend in riparian areas.

Forest System road 1648 parallels Bosenberg Creek in several areas. The hill side slope from Forest Road 1648 in relatively steep into Bosenberg Creek. The direct and indirect effects from construction of water gaps along 1648 would result in additional sediment input into Bosenberg creek from the existing road and removal of existing shade. The stream banks along Bosenberg Creek are relatively soft and composed of organic matter deposited following fire. The locations for the water gaps are adjacent to road crossings, on already disturbed sites and where access for livestock is ideal. Design criteria within the Aquatic Restoration Biological Opinion (US Fish and Wildlife Service 2013) would be adhered to for construction of water gaps and would minimize the effects listed above. Utilizing concentrated water points would minimize the ground disturbance from livestock accessing the stream to water in other portions of the reach.

The headwater spring proposed for development is within a highly sensitive area on a hill side because of the steep gradient. The dominant vegetation is hydric plant species. Soil composition is primarily organic and saturated. The spring has not fully recovered from the effects of past land management actions and the fire. Areas adjacent to the spring appear to have sloughed downhill. The direct and indirect effects of development of the spring would likely result in additional damage to the soils and vegetation surrounding the outlet of the spring. Movement of groundwater into a trough exposed to solar radiation may result in increased water temperatures on water returns to Bosenberg Creek. Bosenberg creek is one of a few creeks within the Upper Malheur watershed that likely meets bull trout temperature criteria (mostly groundwater inputs). Implementing design criteria for the development of the spring outflow would minimize the effects listed above. The trough would have a float that would minimize the amount of water withdrawn from the spring outlet. The spring would be fenced off and would reduce grazing effects to the spring. Wetland obligate vegetation would expand and cold water storage functions from the spring would be maximized.

A water withdrawal location approximately a half mile from the junction of the Forest System road 1648 and 1649 to a trough located approximately 100 feet away. The direct and indirect effects from the removal of water from Bosenberg creek would likely result in less cold water reaching occupied bull trout CH within the lower portions of Bosenberg Creek and Big Creek. Implementing design criteria for the development of the spring outflow would minimize the effects listed above. The trough would have a float that would minimize the amount of water withdrawn from the spring outlet.

The direct and indirect effects of constructing 7 miles of fence within the Bosenberg unit may result in minimal ground disturbance from initial fence construction. Implementing the design criteria would minimize any effects to riparian areas, the viability of bull trout, redband trout or Columbia spotted frog within the project area. The short term effects of fence construction are expected to result in long term beneficial effects for bull trout critical habitat within the Sagehen and Little Logan units in the Summit Prairie allotment.

The re-initiation of livestock grazing within the Bosenberg Unit with a scheduled rest of 3 years out of 10, establishment of two designated monitoring areas, reduction in bank alteration levels, adaptive management strategy of additional rest, and a rider would facilitate continual movement towards desired conditions identified within (appendix A, Table 103), but at a slower rate than that of alternative 1 where no livestock grazing disturbance occurs. Riparian vegetation within the Bosenberg Unit would continue to recover from the historical effects of fire, grazing and road related impacts but not likely achieve desired condition within 10 years (appendix A, Table 103) as a result of the slow recovery observed from the effects of fire from 22 years ago. Bull trout critical habitat within the Bosenberg Unit would likely not achieve desired condition for channel characteristics within the scheduled time frame (appendix A, Table 103 10 years). Resumption of grazing within the Bosenberg Unit would not retard movements towards or achievement of desired condition but would result in a slower rate of recovery than that of alternatives 1

within the Bosenberg Unit where no livestock use occurs. The Bosenberg Unit would likely be rated as proper functioning condition or functional at risk trending up. Fish habitat criteria related to bull trout critical habitat are often achieved beyond a minimum rating of proper functioning condition for which the channel characteristics identified in appendix A, Table 103 are applicable. Bosenberg Creek is one of the few streams within the project area that contains water temperatures suitable for all life stages of bull trout. The adaptive management strategy of scheduled rest or additional rest if sufficient movement towards or maintenance of desired conditions is not achieved within the desired time frames (appendix A, Table 103) would ensure that a resilient riparian area develops along Bosenberg Creek and riparian management objectives are not retarded to a degree to prevent eventual attainment of desired condition and INFISH criteria.

Little Logan Unit

The direct effects from authorizing livestock grazing in the Little Logan unit in the Summit Prairie allotment would result in a slight decrease in hoof shearing (bank alteration) of streambanks, a continued improvement in herbaceous plant vigor from leaving more residual stubble height, and maintaining current riparian hardwoods height classes and densities.

The presence of hoof shearing from livestock use would be slightly reduced than current levels for the next 10 grazing seasons within the Little Logan unit because season long rest would occur for 3 out of 10 years. The indirect effects of reducing hoof shearing for the Little Logan unit include continued maintenance of meeting standards for streambank stability. However, the channel is still recovering from legacy grazing affects. Herbaceous plant communities expanding towards the channel are transitioning from single plants to a dense plant community. This is indicative of a wide channel narrowing and capturing soil from runoff events and building banks. This zone of streambank is very tender to livestock effects from hoof shearing and hoof shearing may severe roots. PIBO data found the bankfull width/depth ratio and bank angles have been on an upward trend and improving.

Riparian shrub densities and height classes would be maintained in their current condition. The current condition for the density of riparian shrubs is 4 percent of desired or 8 stems with 200 stems per unit area desired. Annual browse utilization standards of 30-50 percent with season long rest 3 years out of 10 would likely maintain the uncaged riparian shrubs stunted at 2 feet. Utilization values were approximately 98 percent for the shrubs that were uncaged and available for livestock browse. This indicates that the vigor of these shrubs is very low and growth rates of 1.2 feet per year may not occur until the vigor is improved. Shrubs that have not been grazed for 2 years are more likely to develop seed and establish the increased density of shrubs. These newly established shrubs are more likely to be browsed by wildlife and livestock than the shrubs that have been expressed above browse line, are caged or are mature.

Plant vigor and the greenline stability rating would likely continue to be improved under this management. The condition of the herbaceous plant communities is currently on an upward trend and would likely improve from the scheduled rest. This condition was assessed with a 4 inch stubble height.

Maintaining the riparian shrubs and improving the channel characteristics would not measurably increase effective shade values in the Little Logan unit within 10 years (appendix A, Table 103). These reaches represent 5 miles of all life stages for bull trout critical habitat. Since the condition of the residual pool depth, pool quality and bankfull width/depth would likely improve; spawning and rearing habitat would likely be slightly improved in their current condition.

Authorization of livestock grazing in the Little Logan unit may result in 5 miles of critical habitat moving towards proper functioning condition in both 5 and 10 years, maintaining the vegetation existing conditions, and move it towards the desired channel characteristics within 10 years. Bull trout critical

habitat within the riparian pastures would likely move towards, but not likely achieve desired vegetation condition within 10 years (appendix A, Table 103). This is because Reach 5 was identified as a broad valley habitat type that requires a major component of multiple aged riparian shrubs to stabilize streambanks, provide shade and cover to fish, and creates a micro climate that reduces water temperatures through moderating air temperatures adjacent to the creek. If rest occurs only after exceedances of the previous grazing season, the vegetative and channel characteristics may retard or at a minimum maintain the current condition. Development of seed sources in the 0-3 foot height classes of shrubs may not likely occur due to the need of having consecutive years of no browse. The adaptive management strategy of additional rest or scheduled rest may allow continual movement towards or achievement of desired vegetative conditions identified in appendix A Table 102. The ground disturbing impacts from removal of 0.7 miles of fencing would not affect shade or add measureable sediment contributions to surface waters or degrade aquatic habitat.

The creation of 0.25 mile exclosure on reach 5 of Summit Creek within the Summit Prairie allotment would remove the effects of hoof shearing of streambanks, woody browse use, and an increase in hydric plant vigor within reach 5 (Little Logan unit) of Summit Creek. Movement towards or achievement of desired condition is expected to be at the same rate as the No action alternative following removal of livestock. The construction of the exclosure fence may deter wildlife use within Summit Creek reach 5 and therefore recovery would be at a slightly faster rate than that of the alternative 1 (No Action). Reach 5 of Summit Creek was identified as having the greatest potential for willow recovery of all reaches within Summit Creek (Carex Working Group 2012).

The indirect effects of reducing hoof shearing, riparian hardwood browse utilization, and increasing hydric plant vigor include an increase in shrub density, height and vigor, resulting in an increase in shade within reach 5 of Summit Creek. It would also facilitate movement towards or achievement of the potential channel type (C4 to E4/5) by reducing bankfull width to depth. Bull trout critical habitat within the exclosure would likely be moving towards or achieve desired condition (appendix A Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the numbers of quality pools within the exclosure on Summit Creek reach 5. A result of the increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade would be cooler water temperatures. Effects related to changes in water temperature as a result of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years. Removal of grazing within the newly constructed exclosure would facilitate movements towards/or achievement of desired condition at a rate similar to alternative 1 (No Action). Summit Creek reach 5 was rated as functional at risk in 2007 with poor plant vigor and less than desirable bank cover of stabilizing plants. Fish habitat related to bull trout critical habitat and water quality criteria (temperature) are often achieved beyond a minimum rating of proper functioning condition. Removal of grazing would facilitate/expedite movement towards or achievement of desired condition within the exclosure on Reach 5 of Summit Creek.

North Summit Unit

Direct effects related to authorizing the grazing system would result in maintenance in existing levels of hoof shearing on streambanks, maintenance in woody browse use, and a slight improvement in hydric plant vigor within Reach 7 of Summit Creek. This site was rated at proper functioning condition in 2007 with woody shrub use was identified as an issue. The Carex Working Group identified a deficiency in shrub density and particularly height classes. None of the shrubs present were greater than 3 feet tall. A designated monitoring area exists on Reach 7 to aid in comparing condition in 5 years with the developed management objectives. The adaptive management strategy would change allowable use if sufficient movement towards or achievement of desired conditions (appendix A, Table 102).

The indirect effects of maintaining livestock effects would likely result in a maintenance of the existing conditions. The streambank stability is within the standard error of meeting the long term desired condition and would likely continue to meet the standards. The bankfull/width depth was observed to be not in balance during the proper functioning condition assessments. Bankfull width/depth may slightly improve because the herbaceous plant community is approximately 84 percent of desired. However, shrubs are not above the browsing line and may not be developing the seeds to increase the density towards desired conditions. Bull trout critical habitat within the riparian pastures would likely move slightly towards desired condition (appendix A, Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools. As a result of the increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, and increase in shade is cooler water temperatures. Effects related to changes in water temperature as a result of vegetative changes would likely be slightly improved within 10 years. The use levels identified in appendix E for the North Summit unit, monitoring and the adaptive management strategy (change allowable use) would ensure movement towards desired conditions.

The 0.97 miles reach is identified at proper functioning condition in 2007 and is expected to improve beyond a rating of proper functioning condition within the next 10 years based on the management actions within the North Summit unit. Any improvement beyond a rating of proper functioning condition is directly related to improvements in bull trout critical habitat. It is likely that the current annual use levels would facilitate limited improvement beyond a rating of proper functioning condition within the North Summit unit. This slight improvement is due to the herbaceous plant community alone that is currently in a good condition. This herbaceous community would likely tighten the channel characteristics slowly over time. However, it is not likely that the riparian shrubs would reach the desired condition within the time frame identified in appendix A, Table 103. The adaptive management strategy of changing allowable use for the North Summit unit if sufficient progress towards or achievement of desired conditions (appendix A, Table 102) has not been made would benefit the riparian shrubs in this reach. This would ensure that movement towards desired is not impeded by land management actions.

Sagehen Unit

The direct effects from authorizing livestock grazing in the Sagehen unit in the Summit Prairie allotment would result in a slight decrease in hoof shearing (bank alteration) of streambanks, a continued improvement in herbaceous plant vigor from leaving more residual stubble height, and maintenance in the current riparian hardwoods height classes and densities in reach 2 and slightly improve reach 4. There are approximately 4.7 miles of bull trout critical habitat within the Sagehen unit and represents 22 percent of the bull trout critical habitat found in the Summit Creek Subwatershed. Proper functioning condition assessments stratified 4 reaches in Sagehen unit and found 33 percent of Sagehen to be at a proper functioning condition rating and 67 percent to be functioning at risk.

The presence of hoof shearing from livestock use would be slightly reduced than current levels for the next 10 grazing seasons within the Sagehen unit because season long rest would occur for 3 out of 10 years. The indirect effects of reducing hoof shearing for the Sagehen unit include a slight improvement for streambank stability, primarily in Reaches 2 and 4. These specific reaches also have channel form still recovering from legacy grazing effects. These areas are prioritized because Reaches 1 and 3 are constrained rocky reaches that are relatively resistant to hoof action. Herbaceous plant communities expanding towards the channel are transitioning from single plants to a dense plant community. This is indicative of a wide channel narrowing and capturing soil from runoff events and building banks. This zone of streambank is very tender to livestock effects from hoof shearing and hoof shearing may severe roots.

The herbaceous component in Sagehen would likely be continually improved in plant vigor and expansion of plant communities. The 3 years out of 10 years rest would provide a full growing season for plants to expand and improve.

Riparian shrub densities and height classes would be maintained in their current condition for Reach 2 with a slight improvement in Reach 4. The current condition for riparian shrubs is near desired in Reaches 1 and 3. These are constrained, rocky reaches that are dominated with alders. The current condition of riparian shrubs for Reaches 2 and 4 are well below the desired levels. Riparian shrubs in Reaches 2 and 4 both have 23 percent of desired or approximately 45 stems with 200 stems per unit area. Annual browse utilization standards of 30-50 percent with season long rest 3 years out of 10 would likely maintain the uncaged riparian shrubs stunted at 2 feet. Utilization values were approximately 98 percent for the shrubs that were uncaged and available for livestock browse. This indicates that the vigor of these shrubs is very low and growth rates of 1.2 feet per year may not occur until the vigor is improved. Shrubs that have not been grazed for 2 years are more likely to develop seed and establish the increased density of shrubs. These newly established shrubs are more likely to be browsed by wildlife and livestock than the shrubs that have been expressed above browse line, are caged or are mature.

Maintaining the riparian shrubs and improving the channel characteristics would not measurably increase effective shade values in the Sagehen unit within 10 years (appendix A, Table 103). These reaches represent 4.7 miles of all life stages for bull trout critical habitat. Since the condition of the residual pool depth, pool quality and bankfull width/depth would likely slightly improve; spawning and rearing habitat would likely be slightly improved in their current condition for Reaches 2 and 4. Reaches 1 and 3 are in a good condition and would improve.

Authorization of livestock grazing in the Sagehen unit would result in movement towards proper functioning condition, maintaining the vegetation existing conditions, and moving it towards the desired channel characteristics. Bull trout critical habitat on Reaches 1, 3 and 4 would likely achieve proper functioning condition in both 5 and 10 years. Reach 2 would likely move towards functional at risk trending up in both 5 and 10 years, but not likely to achieve proper functioning condition because of the channel and riparian shrub existing conditions. Reaches 1, 3, and 4 would likely move towards the desired vegetation condition within 10 years (appendix A, Table 103). Reach 4 is adjacent to the road and would allow more efficient management of livestock. Reach 2 would likely maintain its existing vegetation condition because of the deficiency in riparian shrub, height classes and channel characteristics. Reaches 1, 3 and 4 would likely move towards desired channel characteristics. Reach 2 would likely move towards desired channel characteristics, but at a slow rate. If rest occurs only after exceedances of the previous grazing season, the vegetative and channel characteristics may retard or at a minimum maintain the current condition. Development of seed sources in the 0-3 foot height classes of shrubs may not likely occur due to the need of having consecutive years of no browse. The adaptive management strategy of additional rest or scheduled rest may allow continual movement towards or achievement of desired vegetative conditions identified in appendix A, Table 102.

Summit Rock Unit

The Summit Rock unit was rated as proper functioning condition in 2007 for reaches 6 and 8 for a total of 3.5miles. Livestock grazing would occur annually with no season of rest. Annual use levels would include the endpoint indicators of 4 inch stubble height, 30-50 percent browse, and 20 percent bank alteration. The adaptive management strategy would include changes in annual use levels (appendix E). Reach 6 is expected to improve slightly beyond proper functioning condition or maintain a rating of proper functioning condition. Annual use levels are sufficient to continue a slight improvement in herbaceous vigor. Bank stability would improve as a result of the improvement in herbaceous plant and woody plants. Bank alteration levels are sufficient to maintain the existing condition with a possible increase in bank

stability due to improvements in vegetation. Reach 6 is likely to maintain a rating of proper functioning condition and not achieve desired conditions within 10 years. Proper functioning condition is a minimum and does not equate to quality fish habitat until a rating beyond proper functioning condition is achieved.

Reach 8 is expected to maintain at proper functioning condition with limited improvement in herbaceous vigor, browse utilization, and bank alteration within the lower portion of reach identified in 2007. Without rest, sufficient improvement in riparian hardwoods and herbaceous plant vigor is unlikely to occur in reach 8 under the current proposed levels of use to achieve desired condition in 10 years.

Reach 2 of West Fork Summit Creek had channel incision in the reach. The same annual use levels apply to reach 2 of West Fork Summit Creek. Improvements in channel characteristics are unlikely to occur without an improvement in riparian vegetation. Stream reaches that are functional at risk trending down are highly susceptible to impacts from livestock grazing and improvements in herbaceous, hardwood cover are easily set back in this condition (resiliency).

West Fork Summit Recovery Unit

The creation of 0.85 mile temporary exclosure on West Fork Summit Creek within the Summit Prairie allotment would remove the effects of hoof shearing of streambanks, woody browse use, and an increase in hydric plant vigor within reach 1 of West Fork Summit Creek. Movement towards or achievement of desired condition is expected to be at the same rate as the No action alternative. The construction of the exclosure fence may limit wildlife use within Reach 2 and therefore recovery would be at a slightly faster rate than that of the alternative 1 (No Action).

The indirect effects of reducing hoof shearing, riparian hardwood browse utilization, and increasing hydric plant vigor for the 0.85 mile temporary exclosure would likely result in an increase in herbaceous plant communities, resulting in an increase in shade and improvement in channel morphology within reach 1 of West Fork Summit Creek. It would also facilitate movement towards or maintenance of the potential channel type by reducing bankfull width to depth. Bull trout critical habitat within the riparian pastures would likely achieve desired condition (appendix A, Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools within West Fork Summit Creek Reach 1. A result of the increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade is cooler water temperatures. Effects related to changes in water temperature as a result of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years. Removal of grazing within the newly constructed temporary exclosure would facilitate movements towards/or achievement of desired condition at a similar rate to alternative 1 (No Action) for the first 5 years. However, following the immediate rest, movement towards desired conditions would likely be at a slower rate than alternative 1. West Fork Summit Creek reach 1 was rated as functional at risk trending down in 2007 with several headcuts and channel incision. Fish habitat related to bull trout critical habitat and water quality criteria (temperature) are often achieved beyond a minimum rating of proper functioning condition. Minimum rest requirements of 3-5 years followed by additional rest if sufficient movement towards desired condition has not been achieved would facilitate movement towards desired condition within Reach 1 of West Fork Summit Creek by increasing the resiliency of the riparian vegetation and facilitating advancement in seral state.

Cumulative Effects

When cumulative effects common to alternatives 2, 3, and 4 are considered with the proposed actions from alternative 2, the result is the fourth fastest rate of recovery or movement towards a proper functioning condition and the desired condition for riparian areas and bull trout critical habitat within the project area. The rate of recovery is because of the fundamental livestock management strategy for

alternative 2 that largely includes deferment and 3 years out of 10 years rest for improvement. The cumulative effects are within the scope of anticipated effects to aquatic resources determined in the Malheur Forest Plan EIS.

Table 93. Alternative 2 summary of expected recovery for proper functioning condition (PFC) ratings by unit based on the actions proposed

Allotment	Unit	Miles	PFC in 5 Years	PFC in 10 Years	Desired Condition in 10 Years
Lake Creek	Corral Basin	3.59	>PFC	>>PFC	Y
	McCoy Creek	6.35	>PFC	>>PFC	Y
Logan Valley	Big Creek Riparian Pasture	1.67	>PFC	>PFC	Y
	Corral Holding	0.12	PFC	>>PFC	Y
	Flat Field	0.02	>PFC	>>PFC	Y
	Lower Field	0.12	PFC	>PFC	Y
	West Bosenberg Riparian Pasture	0.13	>PFC	>>PFC	Y
	West Lake Creek Riparian Pasture	0.95	N	PFC	N
McCoy Creek	Lake Creek Willow Exclosure	0.51	>PFC	>>PFC	Y
Summit Prairie	Bosenberg	4.36	PFC	PFC	N
	Little Logan	5.03	PFC	PFC	N
	North Summit	0.97	PFC	PFC	N
	Sagehen	2.43	N	N	N
		0.32	N	N	N
		1.10	PFC	PFC	N
		0.89	PFC	PFC	N
	South Summit	0.04	Water gap		
	Summit Rock	0.83	N	N	N
		3.71	>PFC	>PFC	Y
		1.00	>PFC	>PFC	Y
	West Summit Recovery Unit	0.39	N	PFC	N

Effects Determination

Columbia River Basin Bull Trout (T): Likely to Adversely Affect (LAA) in the short term.

Bull Trout Designated Critical Habitat (D): Likely to Adversely Affect (LAA) in the short term.

Columbia Spotted Frog (S): May Impact Individuals or Habitat but Will Not Likely Contribute to a Trend Toward Federally Listing or Cause a Loss of Viability to the Population or Species.

Columbia spotted frog and redband trout require the same habitat characteristics as bull trout with the exception that bull trout are relatively limited by their requirement for cold stream temperatures. Therefore the analysis of bull trout critical habitat and water quality along with the actions proposed would have the same effects on Columbia spotted frog and redband trout habitat within the project area.

Rationale

Habitat for bull trout in the aquatic analysis area is currently in a degraded state. High water temperatures, riparian hardwood suppression and altered stream channels have reduced the habitat capability of streams in the aquatic analysis area to support bull trout. Riparian areas within the project area are deficient in riparian hardwoods. Some recovery has occurred from past activities related to livestock grazing and timber harvest and natural disturbances such as fire. However many of the stream reaches are early seral with sensitive stream banks and or have not achieved a rating of proper functioning condition which is the minimum required to withstand flood events. Many of the areas have not achieved a state of resiliency and are susceptible to degradation from livestock. The addition of approximately 4.4 miles of bull trout critical habitat within the Bosenberg Unit that is currently vacant and development of cold water spring sources within the Unit would result in adverse effects to bull trout critical habitat due to the early seral state of the riparian area within the Unit that is currently recovering from wildfires in 1990 (Snowshoe, Corral Basin, and Sheep) and 2002 High Roberts wildfire. The streambanks are composed of soft organic material that is easily sheared and compacted from hoof action. While measures such as a full time rider, adaptive management strategy of additional rest, establishment of two designated monitoring areas, bank alteration standards of 10 percent and 15 percent would alleviate the possible impacts the sensitivity of the riparian area to disturbance and likelihood that cattle would prefer to congregate within the riparian area based on forage availability carries a high degree of uncertainty whether these measures will be effective. Forage production within this Unit is primarily in the riparian area with the uplands dominated by ceanothus and young ponderosa pine.

Management Indicator Species

Bull trout and redband trout are management indicator species chosen to indicate effects of activities on populations of non-anadromous riparian species.

Bull trout occupy approximately 34.5[10] miles of habitat within the project area. The Malheur National Forest contains approximately 203 miles of bull trout critical habitat, 108 miles of which are in the Malheur River population (Malheur Forest GIS data). Of the 34.5 miles of habitat within the project area, 24.6 miles will experience grazing activities while 9.9 miles will not be grazed. The project will impact 12.1 percent of the suitable habitat across the forest and 22.8 percent of the suitable habitat within the Malheur River population. This project impacts suitable habitat across the Forest, therefore, the overall direct, indirect, and cumulative effects will result in a negative trend of habitat (increase in disturbance). Alternative 2 of the Summit Logan Valley Grazing Authorization Project is likely to impact viability of bull trout within the Malheur River population.

Redband trout occupy approximately 45.39 miles of habitat within the project area. The Malheur National Forest contains approximately 840 miles of redband trout habitat (Malheur Forest GIS data). Of the 45.39 miles of habitat within the project area, 34.42 miles will experience grazing activities while 9.9 miles will not be grazed. Because this project impacts less than 4.1 percent of suitable habitat across the Forest, the overall direct, indirect, and cumulative effects will result in a small negative trend of habitat (increase in disturbance). The loss of habitat (increase in disturbance) will be insignificant at the scale of the Forest. Alternative 2 of the Summit Logan Valley Grazing Authorization Project is consistent with the Forest Plan, and thus continued viability of redband trout is expected on the Malheur National Forest.

[10] 34.5 total miles of critical habitat in the project area includes West Fork Summit Creek in the Summit Prairie Allotment. West Fork Summit Creek is not designated critical habitat by the USFWS, however for this analysis, it was considered critical habitat because reports of bull trout observations, suitable habitat, and absence of barriers suggest that historically bull trout utilized the stream.

Alternative 3

Direct and Indirect Effects

Lake Creek Allotment

McCoy Creek and Bosenberg Units

The Bosenberg unit would not be added within this alternative resulting in no impacts from livestock grazing related to bull trout critical habitat and water quality. Construction of approximately 7 miles of new fence subdividing the Bosenberg unit would not occur. Water gaps at the two locations where National Forest System road 1648 crosses Bosenberg Creek and an unnamed tributary of Big Creek would not occur. Three stock ponds in the uplands, a spring development with approximately 300-400 feet of piping to a trough and an in-stream water withdrawal piped 100 feet to a trough would not occur. The effects from these actions analyzed in alternative 2 would not occur. These actions would occur in alternative 2 and would not occur in alternatives 1 and 3. Bosenberg creek would continue to recover from past disturbances related to fire and historic land management practices and likely achieve recovery objectives within 10 years (appendix A, Table 102 and Table 103).

The southwest corner of the McCoy Creek unit (407 acres) would not be removed from the Lake Creek allotment. This action is unique from alternatives 1 and 2.

Logan Valley Allotment

Big Creek Riparian Pasture

Direct effects related to hoof shearing, browse utilization, and stubble height would be decreased on Big Creek reaches 1, 2 and 3 within the Big Creek Riparian pasture. This decrease is because the annual use levels are reduced to allow more expression in riparian vegetation.

The direct and indirect effects of livestock grazing on the riparian vegetation, channel characteristics, water temperature and bull trout critical habitat would be similar to alternative 2, with the exception of the annual use levels would be reduced, there would be no season long rest periods and the adaptive management strategies are different. The annual use levels for stubble height would be reduced from 4 to 7 inches, woody browse from 30-50 to 30 percent use and bank alteration from 20-15 percent. The stubble height increase would improve plant vigor. The woody browse would further increase the density and height classes of riparian shrubs across the entire reach. The bank alteration reduction would facilitate movement towards of improvements in the bankfull width/depth, undercut banks and shade values. Thus, it benefits bull trout critical habitat. Decreasing the intensity of grazing through reducing annual livestock use effects would likely improve riparian shrubs more than 3 years out of 10 season long rest. Bull trout critical habitat within the riparian pastures would be moving towards desired condition within 10 years (appendix A, Table 103). The adaptive management strategy of a change in allowable use levels would allow continual movement towards or achievement of desired vegetative and channel characteristic conditions identified in appendix A, Table 102. Allowing shrubs to attain a height greater than 5 feet and reducing the utilization of shrubs less than 5 feet would allow movement towards a late seral stage. Riparian areas that have a balance of early, mid and late seral stages are more resistant to impacts from livestock and are more resilient being able to recover from livestock impacts within one year depending on the magnitude of disturbance.

West Lake Creek Riparian Pasture

Direct effects related to hoof shearing, browse utilization, and stubble height would be decreased on Lake Creek reaches 1, 2 and 3 within the West Lake Creek Riparian pasture. This decrease is because the annual use levels are reduced to allow more expression in riparian vegetation.

The direct and indirect effects of livestock grazing on the riparian vegetation, channel characteristics, water temperature and bull trout critical habitat would be similar to alternative 2, with the exception of the annual use levels would be reduced. The annual use levels for stubble height would be reduced from 6 to 7 inches, woody browse from 30-50 to 30 percent use and bank alteration from 20 to 15 percent. The stubble height increase would improve plant vigor. The woody browse would further increase the density and height classes of riparian shrubs across the entire reach. The bank alteration reduction would facilitate movement towards of improvements in the bankfull width/depth, undercut banks and shade values. Thus, it benefits bull trout critical habitat. Decreasing the intensity of grazing through reducing annual livestock use effects would likely improve riparian shrubs in combination with 3 years out of 10 season long rest. Bull trout critical habitat within the riparian pastures would be moving towards desired condition within 10 years (appendix A, Table 103). The adaptive management strategy of developing additional rest would allow continual movement towards or achievement of desired vegetative and channel characteristic conditions identified in appendix A, Table 102. This reach would likely attain proper functioning condition in 5 years. The rate of recovery for alternative 3 would be greater for the West Lake Creek Riparian pasture than alternative 2.

Summit Prairie Allotment

Little Logan Unit

The direct effects from authorizing livestock grazing with the creation of the two new riparian pastures in the Little Logan unit in the Summit Prairie allotment would result in a decrease in hoof shearing (bank alteration) of streambanks, a continued improvement in herbaceous plant vigor from leaving more residual stubble height, and improve current riparian hardwoods height classes and densities (browse utilization). There are approximately 5 miles of bull trout critical habitat within the Little Logan unit and represents 35 percent of the bull trout critical habitat found in the Summit Creek Subwatershed.

The effects of hoof shearing from livestock use would be removed for 3-5 years and only resume once sufficient progress towards desired condition has been made towards desired conditions. Once grazing is resumed streambanks would have developed sufficient root systems to recover from bank alterations.

The indirect effects of removing (3-5 years) and reducing (15 percent) bank alteration hoof shearing for the Little Logan unit include continual achievement of standards for streambank stability. The channel is still recovering from legacy grazing affects but would likely meet desired conditions (appendix A Table 103). Herbaceous plant communities would likely expand towards the channel area transitioning from single plants to a dense plant community. This is indicative of a wide channel narrowing and capturing soil from runoff events and building banks. PIBO data found the bankfull width/depth ratio and bank angles have been on an upward trend and improving. Removing the effects of hoof shearing for 3-5 years would expedite this process facilitating development of undercut banks.

Riparian shrub densities and height classes would be improved from their current condition. The current condition for the density of riparian shrubs is 4 percent of desired or 8 stems with 200 stems per unit area desired. Annual browse utilization standards of 30 percent with season long rest 3 years out of 10 once desired conditions have been achieved would likely result in a release of riparian shrubs currently stunted at 2 feet. Utilization values were approximately 98 percent for the shrubs that were uncaged and available for livestock browse. This indicates that the vigor of these shrubs is very low and growth rates of 1.2 feet

per year would likely occur once the vigor has improved. Shrubs that have not been grazed for 2 years are more likely to develop seed and establish the increased density of shrubs. These newly established shrubs are more likely to be browsed by wildlife and livestock than the shrubs that have been expressed above browse line, are caged or are mature.

Plant vigor and the greenline stability rating would likely continue to improve under this management. The condition of the herbaceous plant communities is currently on an upward trend and would likely improve from the minimum rest requirements and scheduled rest. This condition was assessed with a 4 inch stubble height.

Improving the riparian shrubs and channel characteristics would measurably increase effective shade values in the Upper and Lower Riparian pasture within 10 years (appendix A, Table 103). These reaches represent 5 miles of all life stages for bull trout critical habitat. Since the condition of the residual pool depth, pool quality and bankfull width/depth would likely improve; spawning and rearing habitat would likely be slightly improved in their current condition. Quality fish habitat related to bull trout is often achieved beyond a rating of proper functioning condition. Reach 5 within the Upper and Lower Little Logan riparian pastures would like improve beyond a rating of proper functioning condition within 5 years.

The creation of the upper and lower Little Logan riparian pastures in the Summit Prairie allotment in alternative 3 would likely result in an increase in shrub density, height and vigor, and an increase in shade. It would also facilitate movement towards or achievement of the potential channel type (C towards E) by reducing bankfull width to depth. Bull trout critical habitat within the riparian pastures would likely move towards or achieve desired condition (appendix A, Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools within Summit Creek reach 5. A result of the increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade is cooler water temperatures. Effects related to changes in water temperature as a result of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years. Resting for 3-5 years would facilitate movements towards or achievement of recovery objectives and desired condition and a faster rate than that of alternative 2. The more restrictive use levels identified in appendix E for alternative 3 and monitoring (review of riparian condition 5 years out of recovery trajectory) would ensure movement towards recovery objectives following re-initiation of livestock grazing within the upper and lower little Logan riparian pastures. The adaptive management strategy of additional rest within the Upper and Lower Little Logan riparian pasture would ensure that adequate recovery has been achieved to facilitate continual movement towards desired conditions identified in appendix A, Table 102 and Table 103 and ensure sufficient resiliency has been achieved to resume livestock grazing.

North Summit Riparian Pasture

Direct effects related to authorizing the grazing system would result in decrease in existing levels of hoof shearing on streambanks, reductions in woody browse use, and an improvement hydric plant vigor within Reach 7 of Summit Creek. This site was rated at proper functioning condition in 2007 with woody shrub use was identified as an issue. The Carex Working Group identified a deficiency in shrub density and particularly height classes. None of the shrubs present were greater than 3 feet tall. A designated monitoring area exists on Reach 7 to aid in comparing condition in 5 years with the developed management objectives. The adaptive management strategy would change allowable use if sufficient movement towards or achievement of desired conditions (appendix A, Table 102).

The direct and indirect effects of constructing 0.8 miles of fence along the boundary of the North Summit Riparian pasture may result in minimal ground disturbance from initial fence construction. Implementing

the design criteria would minimize any effects to riparian areas, the viability of bull trout, redband trout or Columbia spotted frog within the project area. The short term effects of fence construction are expected to result in long term beneficial effects for bull trout critical habitat within the North Summit Riparian pasture.

The indirect effects related to authorizing livestock grazing and creating the North Summit Riparian pasture within the Summit Prairie allotment in alternative 3 would likely result in an increase in shrub density, height and vigor, and an increase in shade. The streambank stability would continue to meet standards and improve. The bankfull/width depth was observed to be not in balance during the proper functioning condition assessments. Bankfull width/depth would improve from the expansion of herbaceous and riparian shrub plant communities. Bull trout critical habitat within the riparian pasture would likely move towards desired condition (appendix A, Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools within Summit Creek reach 7. Attributes related to quality fish habitat are often achieved beyond a riparian rating of proper functioning condition. The effects of an increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade is cooler water temperatures. Effects related to changes in water temperature as a result of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years. Resting for 3-5 years would facilitate movements towards or achievement of recovery objectives and desired condition and a faster rate than that of alternative 2. The more restrictive use levels identified in appendix E for alternative 3 and monitoring (review of riparian condition 5 years out of recovery trajectory) would ensure movement towards recovery objectives following re-initiation of livestock grazing within the North Summit riparian pasture. The adaptive management strategy of additional rest within the North Summit riparian pasture would ensure that adequate recovery has been achieved to facilitate continual movement towards desired conditions identified in appendix A, Table 102 and Table 103. The annual use levels for the North Summit riparian pasture would be similar to alternative 2, with the reduction of woody browse to 30 percent from 30-50 percent. This would likely improve the riparian shrubs across the unit with the greatest magnitude. The changes in annual use for stubble height, browse, and bank alteration for the West Fork Summit Creek within the Summit Rock Unit and reach 6 of Summit Creek (appendix E) would facilitate movement towards or achievement of desired conditions outside of the North Summit Riparian pasture.

The 0.97 miles reach is identified at proper functioning condition in 2007 and is expected to improve beyond a rating of proper functioning condition within the next 10 years based on the management actions within the North Summit unit. Any improvement beyond a rating of proper functioning condition is directly related to improvements in bull trout critical habitat. The 3-5 years of immediate rest, scheduled rest and allowable use levels would improve both the herbaceous plant community and the riparian shrubs. The vegetative and channel characteristic desired condition would likely be met (appendix A, Table 102 and Table 103). The adaptive management strategy for the North Summit unit if sufficient progress towards or achievement of desired conditions (appendix A, Table 102) has not been made would benefit the riparian shrubs in this reach. This would ensure that movement towards desired is not impeded by land management actions.

Sagehen Unit

The creation of the Sagehen riparian pasture within the Summit Prairie allotment with minimum rest requirements of 3-5 years and implementation of the use levels within appendix E once it is determined that recovery objectives have been achieved or are moving toward desired conditions would result in a reduction in hoof shearing of streambanks, reduction in woody browse use, and an increase in hydric plant vigor within Reach 2 of Summit Creek for the Sagehen riparian pastures.

The creation of the Sagehen riparian exclosure would have the same effect as that of the Sagehen riparian pasture with the exception that livestock grazing would not be reinitiated within the exclosure and recovery rates are expected to be slightly faster than that of the Sagehen riparian pasture towards desired condition.

The direct and indirect effects from the creation of the Sagehen riparian pasture within the Sagehen Unit of the Summit Prairie allotment in alternative three would likely result in an increase in shrub density, height and vigor, and an increase in shade. It would also facilitate maintenance of the potential channel type (C towards E) by reducing bankfull width to depth. Bull trout critical habitat within the riparian pasture would likely move towards desired condition (appendix A, Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools within Summit Creek reach 2. Attributes related to quality fish habitat are often achieved beyond a riparian rating of proper functioning condition. The effects of an increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade is cooler water temperatures. Effects related to changes in water temperature as a result of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years. Resting for 3-5 years would facilitate movements towards or achievement of recovery objectives and desired condition and a faster rate than that of alternative 2 where no rest from livestock is proposed within Reach 2 of Summit Creek. The more restrictive use levels identified in appendix E for alternative 3 and monitoring (review of riparian condition 5 years out of recovery trajectory) would ensure movement towards recovery objectives following re-initiation of livestock grazing within the North Summit riparian pasture. The adaptive management strategy of addition rest if sufficient progress towards or achievement of desired conditions appendix A, Table 102 has not been made following 3-5 years of rest would facilitate recovery towards a more resilient riparian area within the riparian pasture.

Creation of the Sagehen riparian exclosure would have the same effects as the Sagehen riparian pasture with the exception that the rate of recovery within the exclosure is expected be faster than that of the riparian pasture due to the absence of livestock grazing (after 3-5 years of rest) and limited wildlife use.

The additional adaptive management strategy for riparian areas outside of the Sagehen Riparian pasture and Sagehen Riparian exclosure for changes in allowable use levels would facilitate recovery and movement towards desired riparian condition outside of the riparian pastures not proposed for 3-5 years of rest.

Summit Rock Unit

Reach 6 is expected to improve beyond proper functioning condition. Annual use levels for stubble height increase from an endpoint indicator of 4 inches to 6 inches that would likely result in an improvement in herbaceous vigor. Bank stability would improve as a result of the improvement in herbaceous plant and woody plants. Bank alteration levels are sufficient to maintain the existing condition with a likely increase in bank stability due to improvements in vegetation. Reach 6 is likely to improve beyond a rating of proper functioning condition and achieve desired conditions within 10 years (appendix A, Table 102). Proper functioning condition is a minimum and does not equate to quality fish habitat until a rating beyond proper functioning condition is achieved.

Reach 8 is expected at a minimum to be maintained at proper functioning condition or improve beyond proper functioning condition due to improvement in herbaceous vigor from a reduction in stubble height, browse utilization, and bank alteration within the lower portion of reach identified in 2007. Without rest, improvement in riparian hardwoods would be limited but herbaceous plant vigor is likely to increase in

Reach 8 under the current proposed levels of use and achieve a rating of greater than proper functioning condition in 10 years.

Reach 2 of West Fork Summit Creek would have higher endpoint indicator for stubble height and lower value for bank alteration. These indicators would likely increase herbaceous riparian vigor within reach 2 and allow healing of destabilized stream banks. A portion of reach 2 is primarily herbaceous and development of riparian herbaceous vigor in this reach would result in improvements in bank stability and channel characteristic but at a slower rate than if rested entirely from livestock grazing for a period of time.

Table 94. Alternative 3 summary of expected recovery for proper functioning condition (PFC) ratings by unit based on the actions proposed

Allotment	Unit	Miles	PFC in 5 Years	PFC in 10 Years	Desired Condition in 10 Years
Lake Creek	Bosenberg	8.64	>PFC	>>PFC	Y
	McCoy Creek	5.66	>PFC	>>PFC	Y
Logan Valley	Big Creek Riparian Pasture	1.67	>PFC	>>PFC	Y
	Corral Holding	0.12	PFC	>>PFC	Y
	Flat Field	0.02	PFC	>>PFC	Y
	Lower Field	0.12	PFC	>PFC	Y
	West Bosenberg Riparian Pasture	0.13	PFC	>>PFC	Y
	West Lake Creek Riparian Pasture	0.95	PFC	>PFC	Y
McCoy Creek	Lake Creek Willow Exclosure	0.51	>PFC	>>PFC	Y
Summit Prairie	Little Logan	0.09	PFC	PFC	N
	Lower Little Logan Riparian Pasture	4.11	PFC	>>PFC	Y
	North Summit Riparian Pasture	0.97	>PFC	>>PFC	Y
	Sagehen	0.04	N	N	N
		0.32	N	PFC	N
		1.10	PFC	PFC	N
		0.89	>PFC	>>PFC	Y
	Sagehen Riparian Exclosure	0.76	>PFC	>PFC	Y
	Sagehen Riparian Pasture	1.62	PFC	>PFC	Y
	South Summit	0.04	Water gap		
	Summit Rock	0.83	N	PFC	N
		3.71	>PFC	>>PFC	Y
		1.00	>PFC	>>PFC	Y
	Upper Little Logan Riparian Pasture	0.83	PFC	>>PFC	Y
	West Summit Recovery Unit	0.39	PFC	>PFC	Y

Cumulative Effects

When cumulative effects common to alternatives 2, 3, and 4 are considered with the proposed actions from alternative 3, the result is the second fastest rate of recovery or movement towards a proper functioning condition and the desired condition for riparian areas and bull trout critical habitat within the

project area. The rate of recovery is because of the fundamental livestock management strategy for alternative 3 that largely includes creation of riparian pastures with minimum rest requirements of 3-5 years on 11 miles of bull trout critical habitat, adaptive management of additional rest and more conservative allowable use levels. The cumulative effects are within the scope of anticipated effects to aquatic resources determined in the Malheur Forest Plan EIS.

Effects Determination

Columbia River Basin Bull Trout (T): May Affect, Not Likely to Adversely Affect (NLAA) in the short term. Beneficial Impact (BI) in the long-term.

Bull Trout Designated Critical Habitat (D): May Affect, Not Likely to Adversely Affect (NLAA) in the short term. Beneficial Impact (BI) in the long-term.

Columbia Spotted Frog (S): May Impact Individuals or Habitat but Will Not Likely Contribute to a Trend Toward Federally Listing or Cause a Loss of Viability to the Population or Species. Beneficial Impact.

Rationale

- Habitat for bull trout in the aquatic analysis area is currently in a degraded state. High water temperatures, riparian hardwood suppression, reduced herbaceous plant vigor and altered stream channels have reduced the habitat capability of streams in the aquatic analysis area to support bull trout. The determination that alternative 3 may affect bull trout and bull trout critical habitat but is not likely to adversely affect them in the short-term is based on the Lake Creek Allotment remaining ungrazed.
- No miles of occupied bull trout habitat would be grazed during spawning season. Livestock would be removed from riparian areas prior to August 15.
- Several riparian pastures will be created on 9.37 miles of bull trout critical habitat on stream reaches identified with high water temperatures, riparian hardwood suppression, reduced herbaceous plant vigor and altered stream channels. The pastures will immediately be rested for 3-5 years, with an adaptive management strategy of additional rest prior to resumption of grazing if objectives are not met. After resumption of grazing the pastures will be rested 3 years out of 10.
- Changes in annual use levels for stubble height, woody browse, and bank alteration would allow more expression in riparian vegetation. The change in stubble height will improve plant vigor. The woody browse will increase the density and height classes of riparian shrubs. The change in bank alteration use will facilitate movement of a narrower channel.

Cumulatively all the above management actions will allow movement towards improvements in channel bankfull width/depth, undercut banks, and shade values therefore improving bull trout critical habitat conditions in the project area.

Columbia spotted frog and redband trout require the same habitat characteristics as bull trout with the exception that bull trout are relatively limited by their requirement for cold stream temperatures. Therefore the analysis of bull trout critical habitat and water quality along with the actions proposed would have the same effects on Columbia spotted frog and redband trout habitat within the project area.

Management Indicator Species

Bull trout and redband trout are management indicator species chosen to indicate effects of activities on populations of non-anadromous riparian species.

Bull trout occupy approximately 34.5 miles of habitat within the project area. The Malheur National Forest contains approximately 203 miles of bull trout critical habitat, 108 miles of which are in the

Malheur River population (Malheur Forest GIS data). Of the 34.5 miles of habitat within the project area, 19.4 miles will experience grazing varied activities while 15.1 miles will not be grazed. Because this project will impact 9.6 percent of the suitable habitat across the Forest and 18 percent of the suitable habitat within the Malheur River population, the overall direct, indirect, and cumulative effects will result in a small negative trend of habitat (increase in disturbance) until design criteria are implemented. Of the 34.5 miles of critical habitat in the project area, 33.3 miles is expected to achieve proper functioning condition in 5 years, 34.4 miles is expected to achieve proper functioning condition in 10 years, and 32.1 miles is expected to achieve desired vegetation and channel conditions in 10 years. Achievements are from adjusting the combinations of grazing systems, allowable grazing use levels, pasture rest, pasture configurations, livestock numbers and grazing season, and allotment boundary changes. In the long-term, the loss of habitat (increase in disturbance) will be insignificant at the scale of the Forest. Alternative 3 of the Summit Logan Valley Grazing Authorization Project is consistent with the Forest Plan, and thus continued viability of bull trout is expected on the Malheur National Forest.

Redband trout occupy approximately 45.39 miles of habitat within the project area. The Malheur National Forest contains approximately 840 miles of redband trout habitat (Malheur Forest GIS data). Of the 45.39 miles of habitat within the project area, 26.29 miles will experience grazing activities while 18.29 miles will not be grazed. Because this project impacts less than 3.1 percent of suitable habitat across the Forest, the overall direct, indirect, and cumulative effects will result in a small negative trend of habitat (increase in disturbance). The loss of habitat (increase in disturbance) will be insignificant at the scale of the Forest. Alternative 3 of the Summit Logan Valley Grazing Authorization Project is consistent with the Forest Plan, and thus continued viability of redband trout is expected on the Malheur National Forest.

Alternative 4

Direct and Indirect Effects

Lake Creek Allotment

The effects to these areas remaining vacant were discussed alternative 2 (for portions other than Bosenberg Creek) and alternative 3 (including Bosenberg Creek).

The southwest corner of the McCoy Creek allotment (407 acres) would be removed from the Lake Creek allotment. This would require the construction of 2.5 miles of new fencing. This area may be added to the Dollar Basin allotment in the future. A separate environmental analysis would be required to add this area to the Dollar Basin allotment. The effects to this action are similar to alternative 2 and are discussed there. This is unique to alternatives 2 and 4.

Logan Valley Allotment

Big Creek Riparian Pasture

Direct effects related to hoof shearing, browse utilization, and stubble height would be decreased on Big Creek Reaches 1, 2 and 3 within the Big Creek Riparian pasture. This decrease is because the annual use levels are reduced and schedule rest would allow more expression in riparian vegetation.

The direct and indirect positive effects of livestock grazing on the riparian vegetation, channel characteristics, water temperature and bull trout critical habitat would be from a combination of actions between alternative 2 and 3, with the exception of the annual use levels and season long rest periods. Decreasing the intensity of grazing through reducing annual livestock use effects would likely improve riparian shrubs in concert with scheduled 3 years out of 10 season long rest. Bull trout critical habitat within the riparian pastures would be moving towards desired condition within 10 years (appendix A,

Table 103). The adaptive management strategy of scheduled rest or develop additional rest would allow continual movement towards or achievement of desired vegetative and channel characteristic conditions identified in appendix A, Table 102. The rate of recovery for this unit would result in the second fastest movement towards desired conditions, behind alternative 1.

West Lake Creek Riparian Pasture

Direct and indirect effects for the West Lake Creek unit are the same as alternative 3.

Summit Prairie Allotment

Little Logan Unit

The direct effects from authorizing livestock grazing with the creation of riparian exclosures and cages approximately 10 percent of the total length in the Little Logan unit would result in a decrease in hoof shearing (bank alteration) of streambanks, a continued improvement in herbaceous plant vigor from leaving more residual stubble height, and improve current riparian hardwoods height classes and lessor for shrub stem densities (browse utilization). There are approximately 5 miles of bull trout critical habitat within the Little Logan unit and represents 35 percent of the bull trout critical habitat found in the Summit Creek Subwatershed.

The effects of hoof shearing from livestock use would be partially reduced for the next 10 grazing seasons because of reduced allowable use standards. The change from 20 percent bank alteration to 15 percent may not influence the condition of the streambanks because it is already consistent with the standards. The larger issue is the riparian shrubs for the Little Logan unit. The range rider may influence the number of days the livestock spend out of riparian areas and in the uplands. This would improve the duration of time the livestock can spend in the Little Logan unit before the use standards are met.

Riparian height classes would be improved from their current condition and a slight improvement would occur in riparian densities where they become established in riparian exclosures. Recovery of height classes and densities of riparian shrubs outside of the riparian exclosures would be slightly improved. The current condition for the density of riparian shrubs is 4 percent of desired or 8 stems with 200 stems per unit area desired. Building riparian exclosures and cages around stunted riparian shrubs would likely result in a release of riparian shrub height classes. Utilization values were approximately 97 percent for the shrubs that were uncaged and available for livestock browse. This indicates that the vigor of these shrubs is very low and growth rates of 1.2 feet per year would likely occur once the vigor has improved. Shrubs that have not been grazed for 2 years are more likely to develop seed and establish the increased density of shrubs. These newly established shrubs are more likely to be browsed by wildlife and livestock than the shrubs that have been expressed above browse line, are caged or are mature.

Plant vigor and the greenline stability rating would likely continue to improve under a 7 inch stubble height. The condition of the herbaceous plant communities is currently on an upward trend and would likely continue to improve with the change in allowable use.

Slight improvement in the riparian shrubs and improve the channel characteristics would measurably increase effective shade values if the riparian exclosures and cages are placed adjacent to the southwest side of the streambank in the Little Logan unit within 10 years (appendix A, Table 103). These reaches represent 5 miles of all life stages for bull trout critical habitat. Since the condition of the residual pool depth, pool quality and bankfull width/depth would likely improve; spawning and rearing habitat would likely be slightly improved in their current condition. Quality fish habitat related to bull trout is often achieved beyond a rating of proper functioning condition. Reach 5 within the Upper and Lower Little

Logan riparian pastures would likely improve beyond a rating of proper functioning condition within 10 years.

It would also facilitate movement towards or achievement of the potential channel type (C towards E) by reducing bankfull width to depth. Bull trout critical habitat within the riparian pasture would likely move towards desired condition (appendix A, Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools within Summit Creek reaches 1, 2, 3, 4, and 5. Attributes related to quality fish habitat and the primary constituent elements for bull trout critical habitat are often achieved beyond a riparian rating of proper functioning condition. The effects of an increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade is cooler water temperatures. Effects related to changes in water temperature as a result of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years. This would facilitate movement towards or achievement of recovery objectives and desired condition at a faster rate than that of alternatives 2, and the same rate as alternative 1 within the exclosures but to a greater lesser extent than alternative 3. The adaptive management strategy of enlarging exclosures if sufficient movement towards or achievement of desired condition has not been met within 5 years for areas outside the exclosures. The direct and indirect effects of constructing additional exclosures in the Little Logan unit may result in minimal ground disturbance from initial fence construction. Implementing the design criteria will minimize any effects to riparian areas, the viability of bull trout, redband trout or Columbia spotted Frog within the project area by avoiding impacts to vegetation and creating wheel tracks in wet meadows or riparian areas, timing project implementation when sites and access are dry, and rehabilitating after implementation to remove visible wheel tracks. The short term effects of fence construction are expected to result in long term beneficial effects for bull trout critical habitat within the Little Logan unit.

Prairie Riparian Pasture

Direct effects related to authorizing the grazing system would result in maintenance in existing levels of hoof shearing on streambanks, a slight reduction in woody browse use, and an improvement in the hydric plant vigor within Reach 7 of Summit Creek and West Fork Summit Reaches 1 and 2. West Fork Summit Reach 1 would not have any direct effects for immediate 3-5 years or until management objectives have been met. Allowable use levels in this alternative would be a general reduction from alternative 2, with an increase in the height for stubble height from 4 inches (alternative 2) to 6 inches for the Prairie Riparian pasture. The woody browse value is also more conservative than alternative 2, changing from 30-50 percent to 30 percent use. Bank alteration values are the same across all alternatives. The effects for Summit Reach 7 are the same as discussed in the North Summit unit in alternative 2, because of the use levels and no minimum rest requirements. This analysis would only discuss direct and indirect effects occurring in the West Fork Summit Reaches 1 and 2.

The indirect effects of livestock effects for West Fork Summit Reach 1 would be an improvement in vigor and expansion of wetland obligate plant communities, improved stream bank stability and ultimately better fish habitat. Bull trout critical habitat within the riparian pastures would likely achieve desired condition (appendix A, Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools within West Fork Summit Creek Reach 1. A result of the increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade is cooler water temperatures. The vertical stability issues from active headcutting may impede improvement until they are addressed through active restoration. Effects related to changes in water temperature as a result of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years.

The indirect effects of livestock effects for West Fork Summit Reach 2 would result in an improvement to the herbaceous plant community and channel characteristics, but maintenance of the existing riparian shrub conditions for West Fork Summit Reach 2. The riparian shrub conditions are critical for the resource values present in these areas. For example, beaver complexes were evident in the proper functioning condition assessments for these reaches, however, it is not likely that this alternative would provide the dietary conditions needed to support beaver populations or bull trout overwintering habitat. The vertical stability issues from active headcutting may impede improvement until they are addressed through active restoration. West Fork Summit Reaches 1 and 2 were found to be functioning at risk with a downward trend. Reaches rated functioning at risk are not stable or resilient to impacts from frequent flooding or other land management actions but a minimum rest requirement of 3-5 years would facilitate recovery.

West Fork Summit Reaches 1 and 2 are connected to bull trout critical habitat, but are not on the critical habitat list. It has potential for bull trout and field observations have observed bull trout individuals likely foraging. These two reaches were evaluated as if they are bull trout critical habitat.

West Fork Summit Reach 1 would likely move towards desired condition (appendix A, Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools. As a result of the increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, and increase in shade is cooler water temperatures are expected. Effects related to changes in water temperature as a result of vegetative and channel changes would likely be expected within 10 years. This reach may not likely achieve proper functioning condition in 5 years; however, it would likely meet in 10 years. The use levels identified in appendix E for the Prairie Riparian pasture and monitoring (review of riparian condition 3-5 years out of recovery trajectory) as well as the adaptive management strategy (change allowable use) would ensure movement towards desired conditions. West Fork Summit Creek Reach 1 would be incorporated into the Prairie riparian pasture and have the same use levels as the Prairie Riparian pasture once grazing is resumed. The temporary fence for the West Summit Recovery unit (Reach 1) would be removed only after sufficient recovery has been achieved for resilient riparian area that is resistant to the impacts of livestock grazing.

West Fork Summit Reach 2 would likely move towards desired condition (appendix A, Table 102 and Table 103 within 5-10 years). An improvement in existing vegetative cover for riparian hardwood and herbaceous ground cover would occur, to a greater extant then that of alternative 3 because of the 3-5 years minimum rest, adaptive management strategy of additional rest, and use levels that are the same as alternative 3 once grazing is resumed. Residual pool depth, undercut banks, and the number of quality pools are expected to improve under the management proposed in alternative 4. As a result of the improvement in residual pool depth, quality pools, bankfull width to depth, and shade change in water temperatures are expected for West Fork Summit Creek Reach 2. The use levels identified in appendix E for the Prairie Riparian pasture would be applied to Reach 2 of West Fork Summit Creek rated as functional at risk trending down. Annual use levels for riparian hardwoods and bank alteration criteria along with minimum rest requirement are sufficient to achieve a rating beyond proper functioning condition within 10 years and acquire adequate resiliency to support livestock grazing and continually improve riparian condition within the West Fork Summit Creek Reach 2.

The direct and indirect effects of constructing 0.8 miles of fence along the boundary of the North Summit Riparian pasture may result in minimal ground disturbance from initial fence construction. Implementing the design criteria would minimize any effects to riparian areas, the viability of bull trout, redband trout or Columbia spotted Frog within the project area by avoiding impacts to vegetation and creating wheel tracks in wet meadows or riparian areas, timing project implementation when sites and access are dry, and rehabilitating after implementation to remove visible wheel tracks. The short term effects of fence

construction are expected to result in long term beneficial effects for bull trout critical habitat within the North Summit Riparian pasture.

Reaches are expected to improve beyond a rating of proper functioning condition within the next 10 years based on the management actions within the Prairie Riparian pasture. Any improvement beyond a rating of proper functioning condition is directly related to improvements in bull trout critical habitat. It is likely that the current annual use levels would facilitate improvement beyond a rating of proper functioning condition. This improvement is due to the herbaceous plant community alone that is currently in a good condition for Reach 7. This herbaceous community would likely improve the channel characteristics slowly over time. However, it is not likely that the riparian shrubs would reach the desired condition within the time frame identified in appendix A, Table 103. West Fork Reach 2 needs more ground cover and an increase in riparian shrub density and height class diversity. The adaptive management strategy for the Prairie Riparian pasture if sufficient progress towards or achievement of desired conditions (appendix A, Table 102) has not been made would benefit the riparian shrubs in this reach. This would ensure that movement towards desired is not impeded by land management actions.

Sagehen Unit

Livestock grazing management would be authorized and consist of deferment. Small exclosures and cages would be constructed along approximately 10 percent of the total length of the Sagehen Unit. Annual use levels for the Sagehen Unit would allow 7 inch stubble height, 30 percent woody browse use and 15 percent bank alteration. Active livestock herding would be required full time while livestock are in the Sagehen Unit. The adaptive management strategy includes expansion in the area and number of riparian exclosures and/or changing use levels.

The direct effects from authorizing livestock grazing with the creation of riparian exclosures and cages approximately 10 percent of the total length in the Sagehen Unit would result in a decrease in hoof shearing (bank alteration) of streambanks, a continued improvement in herbaceous plant vigor from leaving more residual stubble height, and improve current riparian hardwoods height classes and lessor for shrub stem densities (browse utilization). There are approximately 4.74 miles of bull trout critical habitat within the Sagehen Unit and represents 33 percent of the bull trout critical habitat found in the Summit Creek Subwatershed.

The effects of hoof shearing from livestock use would be partially reduced for the next 10 grazing seasons because of reduced allowable use standards. The change from 20 percent bank alteration to 15 percent may influence the bankfull width/depth on all reaches within the unit especially the functioning at risk reach (Reach 2). The larger issue is the riparian shrubs for the Sagehen Unit (Reaches 2 and 4). The range rider may influence the number of days the livestock spend out of riparian areas and in the uplands. This will improve the duration of time the livestock can spend in the Sagehen Unit before the use standards are met.

Riparian height classes would be improved from their current condition and a slight improvement would occur in riparian densities where they become established in riparian exclosures. Recovery of height classes and densities of riparian shrubs outside of the riparian exclosures would be slightly improved. The current condition of the representative reaches 2 and 4 for the density of riparian shrubs are 41 percent and 25 percent of desired or 81 stems and 49 stems with 200 stems per unit area desired. Building riparian exclosures and cages around stunted riparian shrubs would likely result in a release of riparian shrub height classes. Utilization values for reaches 2 and 4 were approximately 78 percent and 90 percent for the shrubs that were uncaged and available for livestock browse. This indicates that the vigor of these shrubs is very low and growth rates of 1.2 feet (Carex Working Group 2012) per year would likely occur once the vigor has improved. Shrubs that have not been grazed for 2 years are more likely to develop seed

and establish the increased density of shrubs. These newly established shrubs are more likely to be browsed by wildlife and livestock than the shrubs that have been expressed above browse line, are caged or are mature.

Plant vigor and the greenline stability rating will likely continue to improve under a 7 inch stubble height. The condition of the herbaceous plant communities is currently on an upward trend and will likely continue to improve with the change in allowable use.

Slight improvement in the riparian shrubs and improved channel characteristics will measurably increase effective shade values if the riparian exclosures and cages are placed adjacent to the southwest side of the streambank in the Sagehen Unit within 10 years (appendix A, Table 103). These reaches represent 4.74 miles of all life stages for bull trout critical habitat. Since the condition of the residual pool depth, pool quality and bankfull width/depth will likely improve; spawning and rearing habitat will likely be slightly improved in their current condition. Quality fish habitat related to bull trout is often achieved beyond a rating of PFC. Reach 3 within the Sagehen Unit will likely improve beyond a rating of proper functioning condition within 10 years.

It would also facilitate movement towards or achievement of the potential channel type (C towards E) by reducing the bankfull width to depth. Bull trout critical habitat within the riparian pasture would likely move towards desired condition (appendix A Table 103 within 10 years) by increasing residual pool depth, undercut banks, and the number of quality pools within Summit Creek reaches 1, 2, and 4. Reach 3 will likely attain desired condition within 10 years. Attributes related to quality fish habitat and the primary constituent elements for bull trout critical habitat are often achieved beyond a riparian rating of proper functioning condition. The effects of an increase in residual pool depth, number of quality pools, decrease in bankfull width to depth, increase in riparian hardwood density and height, and increase in shade is cooler water temperatures. Effects related to changes in water temperature as a result of vegetative changes would be expected within 5 years and effects related to channel characteristics and water temperature are expected within 10 years. This would facilitate movement towards or achievement of recovery objectives and desired condition at a faster rate than that of alternatives 2, and the same rate as alternative 1 within the exclosures but to a greater lesser extent than alternative 3. The adaptive management strategy of enlarging exclosures if sufficient movement towards or achievement of desired condition has not been met within 5 years for areas outside the exclosures. The direct and indirect effects of constructing additional exclosures in the Sagehen unit may result in minimal ground disturbance from initial fence construction. Implementing the design criteria will minimize any effects to riparian areas, the viability of bull trout, redband trout or Columbia spotted frog within the project area by avoiding impacts to vegetation and creating wheel tracks in wet meadows or riparian areas, timing project implementation when sites and access are dry, and rehabilitating after implementation to remove visible wheel tracks. The short term effects of fence construction are expected to result in long term beneficial effects for bull trout critical habitat within the Sagehen unit.

Summit Rock Unit

In alternative 4, the West Fork Summit Creek reaches 1 and 2 would be incorporated into the Prairie riparian pasture. Reaches 6 and 8 would remain within the Summit rock unit. The Summit Rock unit was rated as proper functioning condition in 2007 for reaches 6 and 8 for a total of 3.5 miles. Livestock grazing would occur annually with no season of rest. Annual use levels would include the endpoint indicators of 6 inch stubble height, 30-50 percent browse, and 15 percent bank alteration. The adaptive management strategy would include changes in annual use levels (appendix E).

Reach 6 is expected to improve slightly beyond proper functioning condition or maintain a rating of proper functioning condition. Annual use endpoint indicators are sufficient to facilitate an improvement in

herbaceous vigor. Bank stability would improve as a result of the improvement in herbaceous plant and woody plants. Bank alteration levels are 15 percent which is less than alternative 2. Reach 6 is likely at a minimum to maintain a rating of proper functioning condition or improve beyond proper functioning condition and achieve desired conditions within 10 years (appendix A, Table 102 and Table 103). Proper functioning condition is a minimum and does not equate to quality fish habitat until a rating beyond proper functioning condition is achieved.

Reach 8 is expected to at a minimum maintain a rating of proper functioning condition or improve beyond proper functioning condition because of the improvement in herbaceous vigor, browse utilization, and bank alteration within the lower portion of reach identified in 2007. Without rest improvement in riparian hardwoods is unlikely to occur. Improvement in herbaceous plant vigor is likely to occur in reach 8 under the current proposed levels of use. Thus, a rating of greater than proper functioning condition is likely to occur in 10 years.

Table 95. Alternative 4 summary of expected recovery for proper functioning condition (PFC) ratings by unit based on the actions proposed

Allotment	Unit	Miles	PFC in 5 Years	PFC in 10 Years	Desired Condition in 10 Years
Lake Creek	Bosenberg	7.95	>PFC	>>PFC	Y
	McCoy Creek	6.35	>PFC	>>PFC	Y
Logan Valley	Big Creek Riparian Pasture	1.67	>PFC	>>PFC	Y
	Corral Holding	0.12	PFC	>>PFC	Y
	Flat Field	0.02	PFC	>>PFC	Y
	Lower Field	0.12	PFC	>PFC	Y
	West Bosenberg Riparian Pasture	0.13	PFC	>>PFC	Y
	West Lake Creek Riparian Pasture	0.95	PFC	>PFC	Y
McCoy Creek	Lake Creek Willow Exclosure	0.51	PFC	>>PFC	Y
Summit Prairie	Little Logan	5.03	PFC	PFC	N
	Prairie Riparian Pasture	0.73	PFC	>PFC	Y
		0.97	>PFC	>>PFC	Y
	Sagehen	2.43	N	PFC	N
		0.32	N	PFC	N
		1.10	PFC	PFC	N
		0.89	>PFC	>>PFC	Y
	South Summit	0.04	Water gap		
	Summit Rock	0.08	N	PFC	N
		0.01	PFC	PFC	N
		3.71	>PFC	>>PFC	Y
		1.00	>PFC	>PFC	Y
	West Summit Recovery Unit	0.39	PFC	>PFC	Y

Cumulative Effects

When cumulative effects common to alternatives 2, 3, and 4 are considered with the proposed actions from alternative 4, the result is the third fastest rate of recovery or movement towards a proper functioning condition and the desired condition for riparian areas and bull trout critical habitat within the project area. The rate of recovery is because of the fundamental livestock management strategy for alternative 4 that largely includes range riders, creation of riparian exclosures and units, adaptive management of enlargement of riparian exclosures and changes in allowable use levels with starting allowable use levels similar to alternative 3. The cumulative effects are within the scope of anticipated effects to aquatic resources determined in the Malheur Forest Plan EIS.

Effects Determination

Columbia River Basin Bull Trout (T): May Affect, Not Likely to Adversely Affect (NLAA) in the short term. Beneficial Impact (BI) in the long-term.

Bull Trout Designated Critical Habitat (D): May Affect, Not Likely to Adversely Affect (NLAA) in the short term. Beneficial Impact (BE) in the long-term.

Columbia Spotted Frog (S): May Impact Individuals or Habitat but Will Not Likely Contribute to a Trend Toward Federally Listing or Cause a Loss of Viability to the Population or Species. Beneficial Impact

Rationale

- Habitat for bull trout in the aquatic analysis area is currently in a degraded state. High water temperatures, riparian hardwood suppression, reduced herbaceous plant vigor and altered stream channels have reduced the habitat capability of streams in the aquatic analysis area to support bull trout. The determination that alternative 4 may affect bull trout and bull trout critical habitat but is not likely to adversely affect them in the short-term is based on the Lake Creek Allotment remaining ungrazed.
- No miles of occupied bull trout habitat would be grazed during spawning season. Livestock would be removed from riparian areas prior to August 15.
- Riparian pastures on 4.45 miles of bull trout critical habitat on stream reaches identified with high water temperatures, riparian hardwood suppression, reduced herbaceous plant vigor and/or altered stream channels would receive varying degrees of rest. The Big Creek Riparian Pasture would be rested 3 years out of 10 with an adaptive management strategy of additional rest. Prairie Riparian Pasture, West Bosenberg Riparian Pasture, and West Lake Creek Riparian Pasture will immediately be rested 3-5 years with an adaptive management strategy of additional rest prior to resumption of grazing if objectives are not met. After resumption of grazing the pastures will be rested 3 years out of 10.
- Changes in annual use levels for stubble height, woody browse, and bank alteration would allow more expression in riparian vegetation. The change in stubble height will improve plant vigor. The woody browse will increase the density and height classes of riparian shrubs. The change in bank alteration use will facilitate movement of a narrower channel.
- Daily riding by permittee would occur to move livestock away from Summit Creek within the Little Logan and Sagehen Units to utilize more of the upland forage and to extend the duration in these units before achieving use levels. Construction of cages and small exclosure (20x50 feet) would also occur with exclosures totaling approximately 10 percent of the riparian length within reaches 1, 2, 3, 4, and 5 of Summit Creek. If desired conditions are not being met, adaptive management would allow for construction of exclosures around a higher percentage of Summit Creek.

- Of the 34.5 miles of critical habitat in the project area, 31.7 miles is expected to achieve proper functioning condition in 5 years, 34.5 miles is expected to achieve proper functioning condition in 10 years, and 25.5 miles is expected to achieve desired vegetation and channel conditions in 10 years.

Cumulatively all the above management actions will allow movement towards improvements in channel bankfull width/depth, undercut banks, and shade values therefore improving bull trout critical habitat conditions in the project area.

The effects of alternative 4 are the same as alternative 3 with the exception that changes in allowable use levels and a full time rider are the primary drivers as to whether recovery objectives are met within the Summit Prairie Allotment and not rest as proposed in alternative 3. Enlargement of small exclosures in the Sagehen and Little Logan Units to cover a larger percentage of Summit Creek are the adaptive management strategy in alternative 4 for the Summit Prairie Allotment.

Columbia spotted frog and redband trout require the same habitat characteristics as bull trout with the exception that bull trout are relatively limited by their requirement for cold stream temperatures. Therefore the analysis of bull trout critical habitat and water quality along with the actions proposed would have the same effects on Columbia spotted frog and redband habitat within the project area.

Management Indicator Species

Bull trout and redband trout are Management Indicator Species chosen to indicate effects of activities on populations of non-anadromous riparian species.

Bull trout occupy approximately 34.5 miles of habitat within the project area. The Malheur National Forest contains approximately 203 miles of bull trout critical habitat, 108 miles of which are in the Malheur River population (Malheur Forest GIS data). Of the 34.5 miles of habitat within the project area, 20.2 miles will experience grazing varied activities while 14.3 miles will not be grazed. Because this project will impact 10 percent of the suitable habitat across the Forest and 18.7 percent of the suitable habitat within the Malheur River population, the overall direct, indirect, and cumulative effects will result in a small negative trend of habitat (increase in disturbance) until design criteria are implemented. Of the 34.5 miles of critical habitat in the project area, 31.7 miles is expected to achieve proper functioning condition in 5 years, 34.5 miles is expected to achieve proper functioning condition in 10 years, and 25.5 miles is expected to achieve desired vegetation and channel conditions in 10 years. Achievements are from adjusting the combinations of grazing systems, allowable grazing use levels, pasture rest, pasture configurations, livestock numbers and grazing season, allotment boundary changes, and range riders. In the long-term, the loss of habitat (increase in disturbance) will be insignificant at the scale of the Forest. Alternative 4 of the Summit Logan Valley Grazing Authorization Project is consistent with the Forest Plan, and thus continued viability of bull trout is expected on the Malheur National Forest.

Redband trout occupy approximately 45.39 miles of habitat within the project area. The Malheur National Forest contains approximately 840 miles of redband trout habitat (Malheur Forest GIS data). Of the 45.39 miles of habitat within the project area, 26.29 miles will experience grazing activities while 18.29 miles will not be grazed. Because this project impacts less than 3.1 percent of suitable habitat across the Forest, the overall direct, indirect, and cumulative effects will result in a small negative trend of habitat (increase in disturbance). The loss of habitat (increase in disturbance) will be insignificant at the scale of the Forest. Alternative 4 of the Summit Logan Valley Grazing Authorization Project is consistent with the Forest Plan, and thus continued viability of redband trout is expected on the Malheur National Forest.

Consistency with Direction and Regulations

Wetlands (Executive Order 11990)

Executive Order 11990 says that Federal agencies shall avoid management practices that would adversely affect wetlands. Wetlands that occur in the project area would be maintained or expanded in spatial extent with improved functionality. Focusing on riparian vegetation and channel condition, it would allow increased water storage in the floodplains and is consistent with the Executive Order protecting Wetlands. Establishing allowable use levels and the adaptive management actions would prevent adverse effects.

Endangered Species Act

The Endangered Species Act requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the US Fish and Wildlife Service if a proposed activity may affect the population or habitat of a listed species. Preparation of a biological assessment for initiation of formal Endangered Species Act section 7 consultation with the US Fish and Wildlife Service is expected to occur prior to signing a Record of Decision. Federally listed fish species and their proposed or designated critical habitat in the project area subject to consultation include bull trout and their critical habitat. The Malheur National Forest expects to receive a Letter of Concurrence from the US Fish and Wildlife Service regarding effects to bull trout and proposed critical habitat. The completed biological assessment and consultations can be found in the project file.

Floodplains (Executive Order 11988)

Executive Order 11988 says that Federal agencies shall avoid adverse effects to floodplains or minimize potential harm. Floodplains several to a hundreds of feet wide occur in the project area. The floodplains are primarily contained within riparian habitat conservation areas. Management actions would be authorized that manage the amount of streambank alteration and herbivory, defer and/or rest livestock use that would minimize avoid adverse effects to the floodplains, and thus be consistent with Executive Order 11988.

Consistency with the Forest Plan

All alternatives are consistent with management area 3A standards, Amendment 29, and INFISH. Modifications for shade and their respective stream reaches are proposed for Amendment 29 numeric values as shown in Table 50. The proposed values for shade would be changed from the Amendment 29 values to the values identified in the TMDL or data collected by the Carex Working Group. The proposed shade values by reach are considered to be more site specific and realistic than the value present in Amendment 29. They take into consideration more factors that have localized effects on stream shade.

Clean Water Act

The Clean Water Act requires that the Forest Service manage for the attainment of water quality criteria that provides for the most restrictive beneficial use present on a reach of a stream. The most restrictive beneficial use that is present in the project area is bull trout spawning and rearing. Many of the streams present in the project area were identified as water quality limiting for water temperature with supporting data collected continuously at multiple locations. Big Creek, Lake Creek and Summit Creek were identified with 303(d) listings that were followed with the development of a TMDL. The Forest Service is responsible for developing a Water Quality Recovery Plan that would demonstrate monitoring, management changes based on monitoring and provide for a reporting process to Oregon Department of Environmental Quality every 5 years. The desired condition table (appendix A, Table 102) identifies the desired vegetative communities and used the effective shade curves or empirically collected reference

data to identify what the desired effective shade values should be achieved per reach. The monitoring plan (see chapter 2), management objectives (appendix A, Table 103) and adaptive management suite (appendix A, Table 104) developed for the Summit Logan Project would provide the management framework to ensure that the livestock effects to the project area are not adverse and that these streams are continuing on an upward trend towards their desired condition. The allowable use levels (appendix E) and the flexibility to adjust these levels would provide for the recovery of the wetland obligate vegetation attributes and channel morphology.

Irreversible and Irretrievable Commitments

The project as described would not result in any irreversible or irretrievable effects to the aquatic resource.

Recreation

Introduction

This analysis describes the environmental consequences of the proposed action and various alternatives on recreation resources within the project area.

Regulatory Framework

Malheur National Forest Management Plan

The National Forest System lands encompassed within the Summit Logan Valley Grazing Authorization Project Area have been inventoried using the Recreation Opportunity Spectrum (ROS) system to determine what recreation opportunities and settings are available to visitors. The project area falls within the Roaded Natural, Roaded Modified, Semi-Primitive Non-Motorized and Semi-Primitive Motorized classes of the ROS. Management direction for recreation as outlined in the Forest Plan is to continue to maintain existing ROS settings. The Forest Plan Management areas in the Summit Logan Valley Grazing Authorization Project area are discussed below in relation to the ROS class.

- **General Forest (MA-1):** Manage dispersed recreation for roaded modified conditions.
- **Rangeland (MA-2):** Manage for dispersed recreation ranging from semi-primitive to roaded modified.
- **Developed Recreation Sites (MA-12):** Manage for developed recreation opportunities, providing interpretation and enhancement of cultural and natural resources. This Management Area includes Murray, Huddleston Trailhead/Snopark, Logan Valley Interpretive Site and Big Creek Campgrounds, encompassing approximately 8 acres. Prohibit grazing.
- **Administrative Sites (MA-19):** Provide and maintain sites for facilities necessary for the administration of Malheur National Forest lands. This Management Area includes Lake Creek Organization Camp, encompasses approximately 27 acres. Graze livestock where capable with administrative functions.
- **Wild and Scenic River (MA-22):** Commercial livestock grazing is permitted under approved management plans which have analyzed compatibility of livestock grazing with other resource values. Design range improvements to be compatible with the visual objectives.

Analysis Methods

The analysis area analyzed for recreation impacts includes the Summit Logan Valley Grazing Authorization project area.

The Malheur National Forest uses ROS classes to develop management direction for recreation on the forest. This analysis uses the ROS classes assigned during Forest Plan development as the basis of this assessment.

The source of the recreation information is the Forest GIS data base that was compiled from the recreation inventory information and field visits to the project area.

Affected Environment

In 2006 the Malheur National Forest developed a Forest niche, which is a statement of the Forests unique role and contribution to recreation offerings in the Pacific Northwest Region. Forest niche conforms to direction established by the Forest Plan to prepare a facilities master plan and helps focus the broader agency mission to deliver specific experiences and benefits on a particular unit.

The fundamental basis for identifying the unit niche is to determine and analyze the demand/supply ratio for unit recreation sites and the market for the use of those sites. The purpose of the niche is to help identify what makes each Forest special and allow us to narrow our focus to the most appropriate recreation opportunities so that we can provide quality recreation. Our identified niche is:

> **A Traditional Way of Life**
>
> A dispersed recreation destination where local communities share traditions and heritage with new generations and with visitors. Recreation visitors enjoy the freedom to hunt, drive, camp, and hike in a wild place and enjoy the beauty and diversity of forest ecosystems away from major population centers.

Recreational use in the Summit Logan Valley Grazing Authorization Project area is oriented toward enjoyment of the area's natural and historic resources. People visit the project area to view wildlife and birds, to see the spectacular wildflower displays in the spring, to visit the Strawberry Mountain Wilderness to just enjoy the solitude. Other visitors enjoy hunting opportunities in the mountains surrounding the valley, camping in the foothills, horseback riding, hiking, and various other outdoor activities.

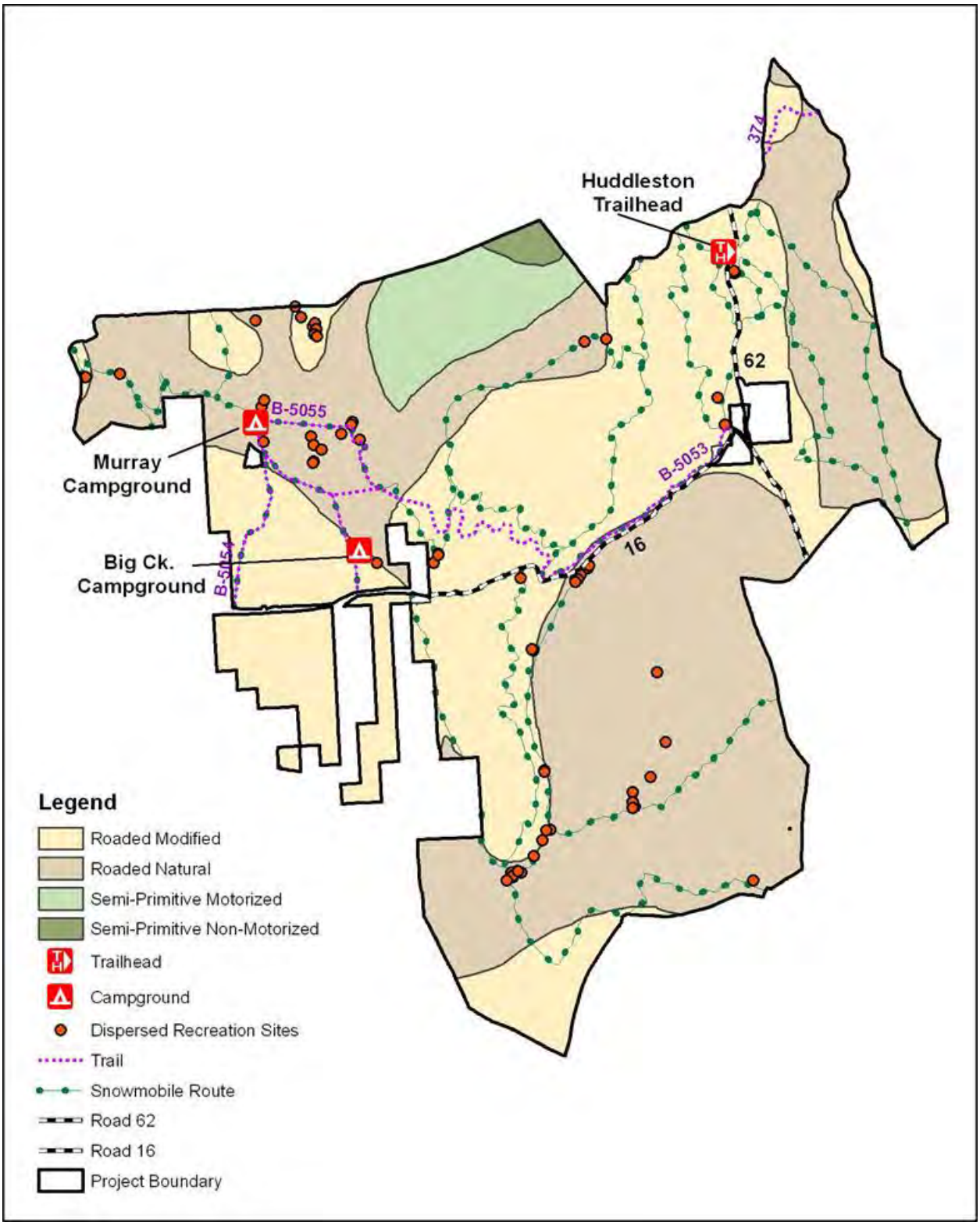

Figure 32. Recreation opportunities in the project area

Dispersed Recreation: In addition to dispersed recreation opportunities described above, there are 76 established dispersed campsites that occur in both General Forest and Rangeland within the project area. These campsites offer recreationists a more primitive camping experience than developed campgrounds do. These dispersed sites receive low to moderate use which is spread out over a six-month period from late May until mid-November. Use is highest during the fall hunting season for both deer and elk. Hunter use of dispersed sites varies depending on the number of hunting tags for a unit and the number of "new" hunters in the area. Use of off highway vehicles (OHV) is often associated with dispersed camping.

Developed Recreation Sites: total about eight acres within the project area including: Murray and Big Creek Campgrounds, Huddleston Trailhead/Sno-park, and Logan Valley Interpretive Site. A majority of the recreational use of the project area is concentrated around these developed sites. Seasonal use varies depending on such things as weather, wildflower bloom, and availability of upland birds and big game, with the highest visitation between May and December. The lowest visitation occurs during the winter months, when the temperatures drop and access is limited.

Administrative Sites: The project area includes Lake Creek Organization Camp which encompasses approximately 27 acres. This camp is privately-operated under a Special Use Permit on National Forest lands. A majority of the recreational use of the Summit Logan Valley Grazing Authorization Project area is concentrated around Murray and Big Creek campgrounds, Lake Creek Organization Camp and Huddleston Trailhead and Snopark. Seasonal use varies based on the wildflower bloom in a given year, weather, and the availability of upland birds and big game. The highest visitation occurs from May through December. The lowest visitation occurs during the winter months, when the temperatures drop and access is limited, nevertheless the grazing allotments are not active past mid-October.

Lake Creek Allotment

Developed Recreation Sites

Murray Campground

Murray Campground is a fee-based campground located in the southwestern portion of the Lake Creek Allotment on Forest Service Road 1600 924. Amenities include a vault toilet and six developed campsites with fire rings and picnic tables. The campsites can facilitate vehicles with trailers, but has limited space for motor homes.

The campground is in close proximity to Lake Creek, Meadow Fork, and Big Creek trailheads and one of the major roads to the high elevation trailheads (*Road's End High Lake Overlook*) accessing the Strawberry Mountain Wilderness. The proximity to Logan Valley and the Wilderness make this a popular campground during weekends and hunting seasons. The site is used consistently throughout the summer recreation season, but use is highest during big game hunting seasons.

As a developed recreation facility, livestock are prohibited within the campground but the campground is not fenced. Even though the Lake Creek Allotment is not currently active, occasionally livestock from nearby active allotments have occasionally entered the campground over the last several years. They are probably crossing allotment boundaries in locations where they are either going through or around boundary fences.

Dispersed Sites

There are 30 known dispersed campsites scattered throughout the Lake Creek Allotment. Eight campsites are located in Bosenberg, two in Horse Pasture and 20 in McCoy Creek. They are generally located in flat areas off main transportation systems and often in riparian areas, near springs or creeks where water

can be accessed. Varying degrees of vegetation and riparian zone damage occur as a result of vehicles, sanitation practices and removal of vegetation for fires and other purposes.

These dispersed campsites are characterized by primitive structures such as self-made toilets, meat poles, rock fire rings, and log benches built by campers. Use of Off Highway Vehicle (OHV) use is often associated with dispersed camping. Use of these sites varies throughout the year, with the majority of sites showing heaviest use during the fall hunting season and no use during the winter.

Snowmobile Trail

There are approximately 16 miles of Forest Service snowmobile system trails developed on Forest Roads within the allotment. Use of these routes during the winter recreational season is generally Decemeber 15th through April 15th (though timing varies with snow conditions).

Bike Trail

Bike trails B-5053, B05045, B-5055 follows on Forest Roads and on Forest Trail 385 for six miles. This is a shared route. These trails have low use during the spring, summer, and fall seasons.

Special Use Permit

A horse group consisting of 100 horses, horse trailers, catering trucks and showers has been issued a Special Use Permit, on a year-by-year basis, to use the Horse Pasture unit for a week-long event. Riders use the nearby trail system for day rides and bring in weed-free hay for their horses.

Logan Valley Allotment

Administrative Sites

Lake Creek Organization Camp

Located on Forest Service Road 1600924. (T16S, R34E, and Section 3). Lake Creek is a private business located on Forest Service land. The permitted area is 27 acres and is operated under a Special Use permit. The fences have been replaced within the last 3 years and are in good shape all the way around the camp. Livestock, including horses, are not allowed within Lake Creek Organization Camp.

Developed Recreation Sites

Big Creek Campground

Big Creek Campground is located on Forest Service Road 1600 815 along Big Creek and is the most popular campground in this area. The fee-campground has 15 camp sites with fire rings, picnic tables, and two vault toilets. All 15 campsites are within the Big Creek Riparian Habitat Conservation Area (RHCA) and outside of the active flood plain, with a buck-n-pole barrier fence along Big Creek.

The campground is enclosed by a barbed wire fence to keep livestock out, although they occasionally wander into the campground when fence maintenance is needed.

Logan Valley Interpretive Site

Logan Valley is located on Forest Service Road 16 (T.16.,R331/2E.,Section 14). Logan Valley is a popular site to view wildlife, flowers and Strawberry Mountain in the background. It is a pullout with parking for 3 vehicles.

Dispersed Sites

The one known dispersed campsite located in the South Big Creek pasture shows little evidence of water quality impacts. Dispersed campsites are characterized by primitive structures such as self-made toilets, meat poles, rock fire ring, and log benches built by campers. Campsites are concentrated primarily in flat areas off main transportation systems where water can be accessed. Many are near springs or creeks. Varied degrees of vegetation and riparian zone damage occur throughout the watershed due to vehicles, sanitation practices, and removal of vegetation for various purposes. Use of Off Highway Vehicle Use (OHV) is often associated with dispersed camping. Recreation use is mostly distributed throughout archery, deer and elk seasons and the allotment is not used during the winter season.

Snowmobile Trail

There are approximately five miles of Forest Service snowmobile system trails developed on Forest Roads within the allotment. Use of these routes during the winter recreational season is generally Decemeber 15th through April 15th (though timing varies with snow conditions) when the allotment is not in use.

Bike Trail

Bike trails B-5053 and B-5054 follows on Forest Roads for 5 miles. This is a shared route. These trails have low use during the spring, summer, and fall seasons and are inaccessible during the winter.

McCoy Creek Allotment

Dispersed Sites

There are no known dispersed campsites, bike or snowmobile trails in the allotment. Cows are permitted according to Forest Plan Standards and will not be addressed in the effects section.

Summit Prairie Allotment

Dispersed Sites

There are 38 known dispersed campsites scattered throughout the Summit Prairie Allotment. Ten campsites are located in Crane Rock, 13 in Little Logan, ten in Sagehen, and four in Summit Rock pastures.

As described under Lake Creek Allotment, above, these dispersed campsites generally occur off main roads near water sources and are characterized by self-made amenities and OHV use. The heaviest use occurs during hunting season in the fall.

Huddleston Trailhead/Sno-park

Huddleston Trailhead/Snopark is adjacent to County Road 62 and is within the Wilderness Loop Visual Corridor a sensitivity Level 1. Huddleston is a multi-purpose trailhead and sno-park in the winter and a trailhead in the other seasons. The site is not fenced immediately around the site. Livestock are entering the site.

Snowmobile Trail

There are approximately 54 miles of Forest Service snowmobile system trails developed on Forest Roads within the allotment. Use of these routes during the winter recreational season is generally Decemeber 15th through April 15th (though timing varies with snow conditions) when the allotment is not active.

Bike Trail

Bike trail B-5053 follows on Forest Road and on Forest Trail 374 for 10 miles. This is a shared route. These trails have low use during the spring, summer, and fall seasons and are inaccessible during the winter season.

Environmental Consequences

Alternative 1 – No Grazing

Direct and Indirect Effects

Under the No Action alternative, all grazing would be cancelled and within two years to no livestock grazing would occur in the planning area.

Recreational visits within the Lake Creek, Logan Valley, McCoy Creek and Summit Prairie allotments would remain at or near current levels. Within two years of implementing Alternative 1, there would be far less livestock/recreationist interactions, improving the recreation experience for many people. Occasionally, a cow from nearby allotments could go around or through allotment boundary fences into the project area, but that would be a rare occurrence.

There would be no change in the recreation opportunity spectrum. Existing fences and structures would likely remain on the landscape serving as barriers to travel in some areas and having similar visual impacts to current conditions.

An indirect effect of eliminating grazing would be growth of vegetation that had previously been grazed thus somewhat altering the baseline visual character of the landscape.

Cumulative Effects

Direct and indirect effects are very minimal with the No Action Alternative. It is likely that cumulative impacts would not be discernible from the current condition.

Alternative 2, 3 and 4

Direct and Indirect Effects

Lake Creek Allotment

Developed Recreation Sites

Murray Campground

Under both Alternatives 2 and 4 livestock, from a nearby allotment, that periodically enter the campground by going around or through an allotment boundary fences would no longer be able to access the campground because of new fence construction. Fencing would result in fewer livestock impacts to recreationists in the campground, thus reducing visitor complaints regarding the presence of livestock and their associated smells and nuisances.

No fence construction would occur in Alternative 3 to block livestock, from a nearby allotment, that periodically enter the campground. Livestock presence in the campground would result in user conflicts and occasional visitor complaints similar to the current condition.

Dispersed Sites

No change is anticipated in the diversity of camping styles or use patterns in this area. No change in the availability of dispersed camping at the existing 30 dispersed campsite is expected for the typical use in spring, summer and fall.

Snowmobile Trails

Since snowmobile activities occur when the allotment is inactive, under all of the action alternatives, there would be no change in snowmobile access in this area. Approximately 16 miles of existing designated snowmobile routes would remain with a mix of groomed and un-groomed conditions.

Bike Trail

In Alternatives 2 and 4 up to six miles of bike trail tread could be affected by cattle use in the vicinity of the bike trail. Cattle use could widen trails from the existing standard, break down edges of trails where there is benched construction, kick out constructed water bars adding to runoff from the trail, and result in "new" trails where cattle leave existing bike trail treads. The cattle could also knock down constructed trail markers and rub or knock down sign posts. Livestock use of the bike trails also increases the chances that recreational users would experience vegetation that was trampled by livestock and dusty areas along and adjacent to trails where livestock salting areas are located.

Under Alternative 3, recreationalists would not encounter livestock, except accidental encounters, on approximately six miles of bike trail tread. There would be no anticipated impacts to the bike trail.

Other Recreational Activities

Under Alternatives 2 and 4, about 2.5 miles of fencing construction is proposed. The fence may temporarily hinder direct access to the fenced-off steam by recreationists, until alternative routes, either around or over the fence, are found. OHV travel may also be hindered by the newly constructed fences. The removal of the 1.5 miles of fence would allow recreationalist to move more freely across the landscape that had previously been fenced, easily facilitating cross-country travel.

Alternative 3 would have no effect on other recreational activities in this area. There are no improvements or structures proposed.

Logan Valley Allotment

Administrative Sites

Lake Creek Organizational Camp

There would be no physical impacts to the Lake Creek Organizational Camp from any of the action alternatives. There is a fence surrounding the Lake Creek Organizational Camp limiting impacts of livestock grazing activities. The fence is in good condition and has excluded livestock from entering the camp. There would be minimal impacts, such as cattle still being seen or heard in the vicinity, of the Lake Creek Organizational Camp from either of the action alternatives.

Developed Recreation Sites

Big Creek Campground

There would be no impacts to Big Creek Campground under any of the action alternatives. A fence would be constructed around the campground and would exclude livestock from the campground, except when fence maintenance was needed. However, the presence of livestock outside of the campground and their associated smells and sounds would continue which may cause an occasional visitor.

Logan Valley Interpretive Site

Under all of action alternative there would be no change in the Logan Valley Interpretive site use patterns.

Dispersed Sites

No change is anticipated in the diversity of camping styles or use patterns in this area. No change in the availability of dispersed camping at the existing dispersed campsite is expected for the typical use in spring, summer and fall and no, or extremely minor, dispersed camping use occurs during the winter.

Snowmobile Trail

Under all of the action alternatives the allotments are inactive during the snowmobile season and there would be no change in snowmobile access in this area. Approximately five miles of existing designated snowmobile routes would remain with a mix of groomed and un-groomed conditions.

Bike Trail

Under all of the action alternatives approximately 5 miles of bike trail tread would continue to be affected by livestock grazing. Effects to bike trails would be similar to those described above for the Logan Valley Allotment.

Special Uses

Alternative 2 would move the Horse pasture from Lake Creek allotment to Logan Valley allotment. This would result in converting the vacant pasture into an actively grazed pasture. This could have a negative impact on the horse group that uses the Horse Pasture for a recreation event under a Special Use Permit on a year-to-year basis. If cows are pastured during the time of the event, the group may not be able to use the area at the same capacity as they have in the past.

Alternatives 3 and 4 would have no impact to the horse group's event held in the Horse Pasture.

Other Recreational Activities

The construction of a riparian fencing in all of the action alternatives may temporarily hinder recreationalist ability to have directly access the fenced-off stream until an alternative route, either around or over the fence, is found. Other fence construction may also impact OHV travel, restricting travel routes. The removal of fences would allow recreationalist to move freely across the landscape, easily facilitating cross-country travel in the previously fenced areas.

Adaptive management strategies proposed for this allotment would further impact recreationalist by creating barriers to movement with fencing.

McCoy Creek Allotment

There are no identified recreational use sites in this allotment, so no recreational impacts are anticipated. Adaptive management strategies proposed for this allotment would not impact recreational resources.

Summit Prairie Allotment

Dispersed Sites

Under all of the action alternatives there is no change is anticipated in the diversity of camping styles or use patterns in this area. No change in the availability of dispersed camping at the existing 38 dispersed campsite is expected for the typical use in spring, summer and fall.

Snowmobile Trail

Under all of the action alternatives, there would be no change in snowmobile access in this area. Approximately 54 miles of existing designated snowmobile routes would remain with a mix of groomed and un-groomed conditions.

Bike Trail

Under all of the action alternatives approximately 10 miles of bike trail tread would be continue to be affected by livestock grazing. Effects to bike trails would be similar to those described above for the Logan Valley Allotment.

Huddleston Trailhead/Sno-Park

There would be limited impacts to Huddleston Trailhead/Sno-Park under any of the action alternatives. The sno-park is not fenced in; allowing cow's access to this recreational site. The presence of livestock their associated smells, sounds, and nuisances near, in, and around this area could cause occasional visitor complaints.

Other Recreational Activities

The construction of the riparian fencing in Alternatives 3 and 4 may hinder recreationalist ability to have direct access to the fenced-off streams. Alternative routes may be made either around or over the fence.

Other fence construction proposed in all action alternatives could increase the difficulty for recreationalist to travel cross-county. Other fence construction may also impact OHV travel, restricting travel routes. However, in other areas fence removal proposed all action alternatives, would allow recreationalist to move more freely across the landscape, more easily facilitating cross-country travel.

The construction of the three upland ponds for livestock water in Alternative 2 most likely would not have an effect on the recreating public. The development of a spring may be used by the public while recreating.

The construction of the loading ramp with an attached catch pen adjacent to Forest Service Road 1647 in all of the action alternatives would not have an effect on the recreating public.

Adaptive management strategies proposed for this allotment would not further impact recreationists.

Effects Common to All Alternatives

The Summit Logan Valley Grazing Authorization Project Area lies within the East Beulah, Malheur and Murderer's Creek Big Game Management Units. The area is popular during general big game bow seasons and controlled big game hunts. Seasons are in late summer and fall. Livestock are removed from the allotment pastures in mid-October, and hence are not present during portions of deer season and all of elk rifle season. It is anticipated that Oregon Department of Fish and Wildlife would continue to offer hunting opportunities in this area as part of their management of big game and upland birds. General bow-hunting, black powder and controlled hunts would have similar seasons and numbers of tags. Bow-hunter numbers have increased in recent years and this trend may continue. Hunting in the Summit Logan Valley Grazing Authorization project area is managed and regulated by the Oregon Department of Fish and Wildlife. Nothing in the Summit Logan Valley Grazing Authorization affects the jurisdiction of the State of Oregon with respect to wildlife management. Proposed fencing projects involve both removal and construction of fences. These fences could have minor impacts on some hunters' ability to move about the landscape in the areas of fence construction.

Cumulative Effects

All past, ongoing, and reasonably foreseeable future activities in appendix C have been considered for their cumulative effects on recreation. Direct and indirect effects on recreation activities in the project area are minor. These impacts in combination with past and reasonably foreseeable actions would have no measurable impact on recreation within the project area.

Consistency with Forest Plan Direction and Regulations

The project is consistent with the Malheur National Forest Plan, as amended. Proposed activities in each of these alternatives are allowed and meet the direction contained in the Forest Plan relative to Recreation Opportunity Spectrum. The area is consistent with the roaded modified and roaded natural ROS classes under which the area is to be managed.

The proposed activities would move towards meeting recreation settings and continued grazing would in part fit the "Niche" character as identified in the Malheur Recreation Strategy.

Irreversible and Irretrievable Commitment of Resources

The action alternatives would not create any impacts that are anticipated to cause irreversible or irretrievable damage to recreation resources.

Visual Quality

Introduction

This is a summary of the Visual Quality Report that evaluates the potential effects of livestock grazing on the visual quality within the Summit Logan Valley Grazing Authorization Project. The full specialist report is in the project record and is available for review by request.

Regulatory Framework

Malheur Forest Plan

MA 14 Visual Corridors

Approximately 40,265 acres (60 percent) of the project area are identified in the Forest Plan (USDA Forest Service 1990) as Management Area 14 – Visual Corridor (Forest Plan, pg. IV-108).

Road 16, also called the Wilderness Loop, is designated as a Sensitivity Level I Corridor (Figure 33). Visual corridors consist of the visible and potentially visible landscapes along major travel routes where the traveling public has a high-to-medium sensitivity to the scenery. The goal is to manage corridor viewsheds with primary consideration to their scenic quality and the growth of large diameter trees. Visual quality objectives of retention, partial retention and modification would be applied while providing for other uses and resources.

Standards

- Permit livestock grazing in accordance with forest-wide standards (#7, Forest Plan, pg. IV-108).
- Design both structural and non-structural improvements to meet visual quality objective in Sensitivity Level 1 corridors to result in a natural appearing visual condition (#8, Forest Plan, pg. IV-109).

Wild and Scenic River[11] (MA-22)

Approximately 15 acres (less than one percent) of the project is identified in the Forest Plan as Management Areas 22 – Wild and Scenic River (Forest Plan, pg. IV-135).

The goal is to protect, enhance and maintain the natural beauty, character, outstanding remarkable values and water quality. Preserve the free flowing condition of this wild and scenic river and its' corridor for the use and enjoyment of present and future generations.

Standards

- Commercial livestock grazing is permitted under approved management plans which have analyzed compatibility of livestock grazing with other resource values. Design range improvements to be compatible with the visual objectives.

Several USDA handbooks have been developed to establish a framework for management of visual resources, including, but not limited to:

- National Forest Landscape Management Volume 2, Chapter 1 the Visual Management System (Agriculture Handbook 462, USDA Forest Service 1974) and
- Landscape Aesthetics, a Handbook for Scenery Management (Agriculture Handbook 701, USDA Forest Service 1995).

The handbooks apply current National Forest Scenery Management methodology in conjunction with existing Forest Plan direction. This includes scenery sustainability concepts described in SMS Handbook Appendix J-Recommended SMS Refinements. It relies on field studies and photography from inventoried sensitive viewpoints and other views of the project area, as well as coordination with project interdisciplinary team members, and consideration of public preferences for scenic quality. Cumulative scenic quality was within the geographic scope of roadways and other viewpoints within and adjacent to the project.

The two rating elements used to measure the effects to scenery resources are scenic integrity and scenic stability. These two elements evaluate the intensity and duration of effects as well as the degree to which the alternatives would affect the stability of scenery attributes over the long term.

Scenic Integrity is the degree to which the scenery is free from visible disturbances that detract from the natural and socially valued appearance, including disturbances due to human activities or extreme natural events inconsistent with the historic range of variability.

Scenic Stability is the degree to which the valued landscape character and its scenery attributes can be sustained through time and ecological progression. Vegetation is usually a dominant scenery attribute and the landscape element most vulnerable to change and potential loss.

[11] The Forest Plan was amended by the Wild and Scenic Plan Decision for the Malheur River.

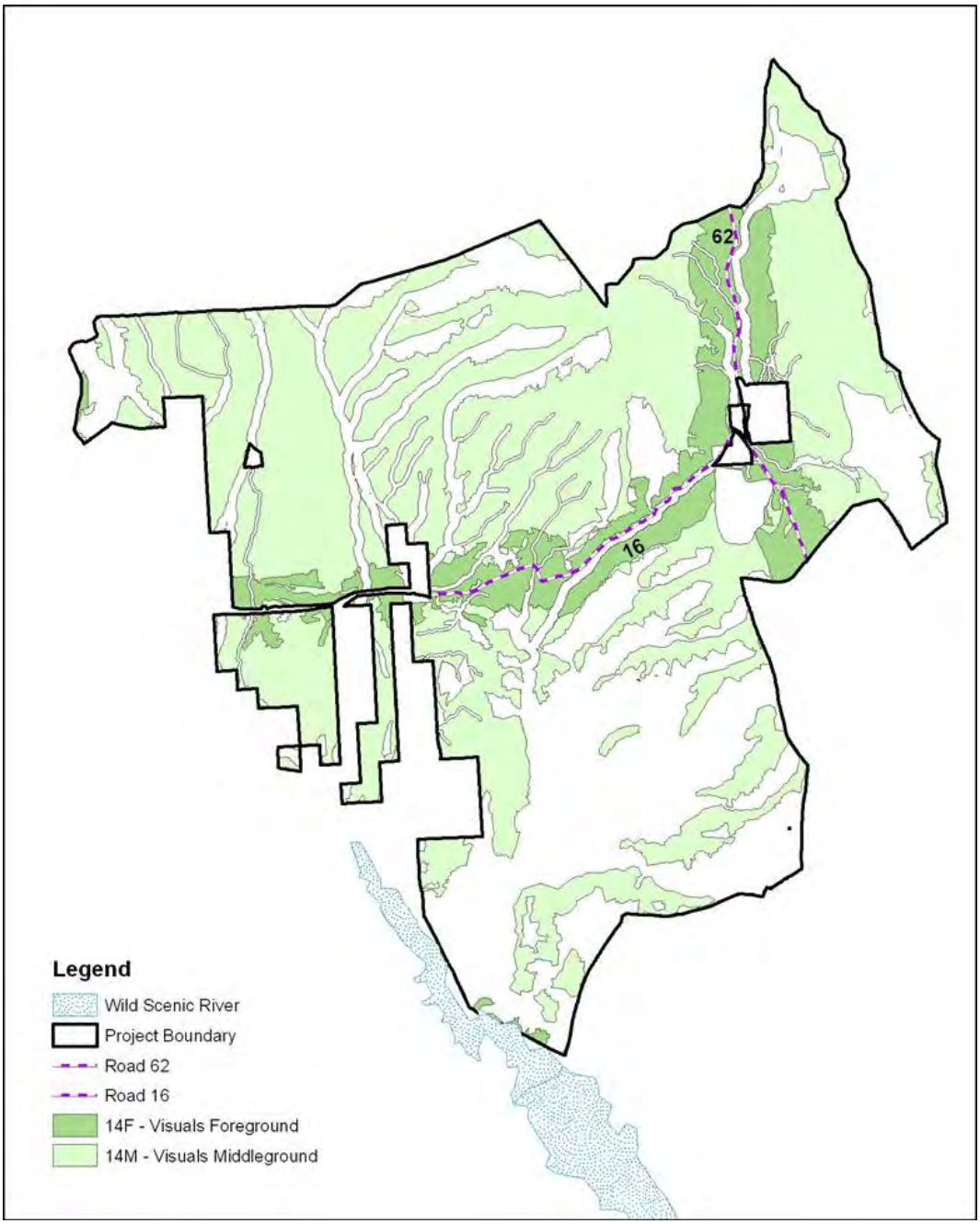

Figure 33. Visually sensitive areas within the project area

Analysis Methods

This section addresses the effects to Visual Quality of the Summit Logan Valley Grazing Authorization proposals. Management activities such as structural and non-structural improvements can affect quality scenic integrity; the amount of human-caused deviation by changing the pre-dominant form, color, line, or texture in a given viewing area. The existing landscape character is the naturalness of the landscape and is the overall visual impression of the physical appearance of the landscape that gives it an identity and "sense of place." The degree of visibility of these activities depends on the combination of certain

elements to the viewer's such as: slope and aspect of the land; surrounding landscape; and frequency and duration of view

A new scenery element has been developed for use within the USFS Scenery Management System (SMS) Scenic Stability (applied in this analysis according to procedures described in the 9/20/06 Draft Appendix J of the SMS Handbook #701).

For the Summit Logan Valley Grazing Authorization area, the existing Scenic Stability analysis focuses on the single major scenery attribute of vegetation, addressing its ecosystem conditions identified by field observation.

Scenic Stability Level Definitions

- Very High Stability**:** All dominant scenery and minor scenery attributes of the valued scenic character are present and are likely to be sustained.
- High Stability: All dominant scenery attributes of the valued scenic character are present and are likely to be sustained. However, there may be scenery attribute conditions and ecosystem stressors that present a low risk to the sustainability of the dominant scenery attributes.
- Moderate Stability: Most dominant scenery attributes of the valued scenic character are present and are likely to be sustained. A few may have been lost or are in serious decline.
- Low Stability: Some dominant scenery attributes of the valued scenic character are present and are likely to be sustained. Known scenery attribute conditions and ecosystem stressors may seriously threaten or have already eliminated the others.
- Very Low Stability: Most dominant scenery attributes of the valued scenic character are seriously threatened or absent due to their conditions and ecosystem stressors and are not likely to be sustained. The few that remain may be moderately threatened but are likely to be sustained.

These factors have been incorporated into the analysis of effects. Effects to Visual Quality are measured in terms of whether the alternatives meet the visual quality level outlined in the Forest Plan.

The mapped boundaries of the visual foreground and middleground areas were computer generated using a "seen area" modeling program from selected viewpoints along County Road 62 and Forest Road 16.

Field visits were made to visual corridors to determine visual quality objectives based on Forest Plan direction.

Affected Environment

Wilderness Loop Visual Corridor (County Road 62 and Forest Road 16)

Foreground and Middleground

The Wilderness Loop Visual Corridor is the only visual corridor located within the Summit Logan Valley Grazing Authorization project area. There are 3,912 acres within the visual foreground and 20,366 acres within the visual middleground.

Existing Scenic Stability

The project area encompasses a dramatic, expansive landscape that is relatively undeveloped. The scenic qualities of most landscape settings in Logan Valley are defined by striking natural features such as the vast open vistas across the floor valley, backed by stark mountain ridges. Structures from historic and present-day ranching operations are integral parts of a pastoral landscape on the valley floor. Seasonal

landscape elements include dramatic spring wildflower blooms in both Logan Valley and Summit Prairie. Another important component of the scenic stability of Logan Valley is the Strawberry Mountain Wilderness in the background. There are outstanding opportunities for viewing the mountain and the interpretive overlook of the valley for wildlife sightings.

Existing Scenic Integrity

Scenic Integrity is measured on the Malheur National Forest through Visual Quality Objective levels defined by the USFS Visual Management System. Levels and descriptions (as perceived by the public) are described in Table 96.

Table 96. Scenic integrity

Visual Quality Objectives	Scenic Integrity as people perceive it
Preservation	Unaltered, visually complete or intact
Retention	Unnoticeably altered
Partial Retention	Slightly altered
Modification	Moderately altered
Maximum Modification	Heavily altered
Unacceptable Modification	Unacceptably altered

The existing scenic integrity meets the visual quality objective of the Forest Plan. Within the project area there are large areas of natural appearing landscapes. Overall, from foreground, middleground and background views there is little evidence of human activities. There are existing wire fences, water troughs, springs, and livestock within the planning area. The existing condition meets the Forest Plan objective of “retention and partial retention” within the foreground, middleground and background area.

In the project area, the valley and the surrounding mountains represent a landscape with very high scenic integrity and quality. Although scenic, the Wilderness Loop along County Road 62 side of the project area is more typical of landscapes in other parts of the forest.

- **Level of viewer sensitivity to landscape changes**: The highest viewer sensitivity occurs in the foreground at popular public use areas such as scenic overlooks, recreation sites, and trail and road corridors. The project is within the Wilderness Loop Corridor rated a Sensitivity Level I. The remaining area is outside of the viewshed corridor.
- **Distance of an area from points, or corridors, of high viewer sensitivity in the middleground and background**: Even minor landscape changes are very evident when viewed in the foreground zone, but these changes become less evident with distance. The lack of natural topographic and vegetative screening makes the Summit Logan valley floor especially sensitive to any developments with the remainder of the area moderately sensitive because of additional screening and/or further distances from popular use areas.
- **Foreground**: The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities and uses can be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture in the predominant natural features of the characteristic landscape.
- **Middleground**: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape can be moderate. Management

activities and uses may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements of the predominant natural features of the landscape.

Environmental Consequences

Alternative 1 - No Grazing

Direct and Indirect Effects

Removal of cattle from allotments would have no direct effects of scenic resources. Indirectly, there would be a change in vegetative growth as a result of removing livestock from these allotments. This could cause minor alterations of the existing scenic character in foreground areas.

Cumulative Effects

There are no anticipated cumulative impacts to scenic stability or integrity as a result of removing livestock grazing from these allotments. Alternative 2, 3 and 4

Direct and Indirect Effects for All Action Alternatives

Wilderness Loop Visual Corridor (County Road 62 and National Forest System Road 16)

Foreground and Middleground

Improvements and structures proposed for the various range allotments would vary by alternative. These improvements/structures could have minor impacts to visual quality in foreground areas where they may be seen from the viewpoints (roads 16 and County Road 62). It is not expected that they would exceed visual quality objectives outlined in the Forest Plan. It is unlikely that structures and improvements would be noticeable from middleground areas. Therefore scenic quality within the project area is not expected to diminish under any of the action alternatives.

Adaptive management strategies would also vary based on the alternatives however all of the adaptive management strategies that are proposed would have no effect on the visual quality of the foreground and middleground of the various range allotments.

Malheur River Wild and Scenic River Corridor

There are no improvements and/or structures proposed within the 15 acres of the project area that is located within the Malheur River Wild and Scenic River Corridor. There would be no effect on the outstandingly remarkable value of unique scenic character within the Malheur River Wild and Scenic River Corridor. The outstandingly remarkable value would continue to be protected; preserving the free flowing conditions of the river.

Cumulative Effects for All Action Alternatives

Effects from the proposed improvements and structure in combination with the past, ongoing, and reasonably foreseeable future activities (as listed in Appendix C) are considered when analyzing the cumulative effects of the action alternatives.

In 2011, three Decision Memos were signed authorizing projects within the project area that would enhance livestock management by implementing numerous improvements and structures. These projects combined with the structures and improvements proposed in the Action Alternatives would have an additive but minimal impact on the visual quality in the project area.

Consistency with Forest Plan Direction and Regulations

The project is consistent with the Malheur National Forest Plan, as amended.

Irreversible and Irretrievable Commitments

Action alternatives are not expected to create any impacts that would cause irreversible damage to the scenic integrity.

Heritage

Introduction

The purpose of this report is to analyze the effects of livestock activities proposed within the Summit Logan Valley Grazing Authorization Project area on cultural resources. Cultural resources are fragile and irreplaceable resources that chronicle the history of people utilizing the forested environment.

Regulatory Framework

The legal framework that mandates the Forest to consider the effects of its actions on cultural resources is wide-ranging. In this case, Section 106 of the National Historic Preservation Act of 1966 (amended in 1976, 1980, and 1992) is the foremost legislation that governs the treatment of cultural resources during project planning and implementation. Implementing regulations that clarify and expand upon the National Historic Preservation Act include 36 CFR 800 (Protection of Historic Properties), 36 CFR 63 (Determination of Eligibility to the National Register of Historic Places), and 36 CFR 296 (Protection of Archaeological Resources). The Pacific Northwest Region (R6) of the Forest Service, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Office, signed a programmatic agreement regarding the management of cultural resources on National Forest system lands in 2004. The 2004 programmatic agreement outlines specific procedures for the identification, evaluation, and protection of cultural resources during activities or projects sponsored by the Forest Service. It also establishes the process that the State Historic Preservation Office utilizes to review Forest Service undertakings for National Historic Preservation Act compliance. The Grazing Allotment Review Strategy for Section 106 Compliance, which implements the Regional Forester policy letter of May 19, 2006, “Grazing Permit Reauthorization and National Historic Preservation Act” (Goodman 2006), is the region’s policy for performing heritage reviews of grazing permit reauthorizations. This policy has also been approved by Oregon State Historic Preservation Office.

The National Environmental Policy Act of 1970 is also a cultural resource management directive as it calls for agencies to analyze the effects of their actions on sociocultural elements of the environment. Laws such as the National Forest Management Act (NFMA) of 1976, the Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and Executive Order 13007 (Indian Sacred Sites) also guide Forest Service decision-making as it relates to Heritage. The American Indian Religious Freedom Act of 1978 requires that federal agencies consider the impacts of their projects on the free exercise of traditional Indian religions.

The Malheur Forest Plan (1990), as amended, tiers to the previously mentioned laws and corresponding Forest Service manual direction as it sets forth resource management goals, objectives, and standards. Forest-wide management standards that are pertinent for this cultural resource effects analysis include:

- Conduct a professionally supervised cultural resource survey on National Forest lands to identify cultural resource properties. Use sound survey strategies and the Malheur National Forest Cultural Resource Inventory Survey Design (Thomas 1991).

- Evaluate the significance of sites by applying the criteria for eligibility to the National Register of Historic Places.
- Consider the effects of all Forest Service undertakings on cultural resources. Coordinate the formulation and evaluation of alternatives with the State cultural resource plan, the State Historic Preservation Office and State Archaeologist, other State and Federal agencies, and with traditional and religious leaders of Native American Indian groups and tribes with historic ties to the project planning area.

Consultation with Others

Many of the previously described laws, regulations, and directives instruct the Forest Service to consult with American Indian tribes, the state, and other interested parties on cultural resource management issues. This consultation has been conducted through the NEPA process and under the terms of existing agreements with American Indian Tribes. To date, there have been no concerns raised during scoping regarding the effects of grazing activities on cultural resources. Documentation of compliance with the National Historic Preservation Act is currently being prepared for referral to the Oregon State Historic Preservation Office in accordance with the 2004 programmatic agreement, and consultation with that agency would be completed prior to the publication of the Summit Logan Valley Grazing Authorization Project Final Environmental Analysis.

Tribal consultation on a government-to-government basis is ongoing with the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of Warm Springs Reservation. At this point in the consultation process no concerns regarding the effects of the Summit Logan Valley Grazing Authorization Project proposal on cultural resources have been identified.

Analysis Methods

The Summit Logan Valley Grazing Authorization Planning Area includes all National Forest system lands administered by the Prairie City Ranger District that are within the designated boundary established for this project. The cultural resources effects analysis, including cumulative effects, would focus on cultural properties identified within the project area. The proposed action does not have potential to have indirect effects (i.e., visual, auditory, atmospheric) on cultural resources that are distant from the project activities.

Affected Environment

Cultural resource identification efforts in the vicinity of the Summit Logan Valley Grazing Authorization project area have focused on three primary types of resources: prehistoric archaeological sites, historic archaeological sites, and places that support resources of contemporary tribal interest. Cultural resource identification efforts that have been conducted in the four allotments of this project include pedestrian cultural resource inventories, literature reviews, and consultation with American Indian tribes and other stakeholders that are historically associated with the area. In accordance with the Grazing Allotment Review Strategy for Section 106 Compliance, which implements the Regional Forester policy letter of May 19, 2006, “Grazing Permit Reauthorization and National Historic Preservation Act” (Goodman 2006), 94 sites of a total 129 sites within the grazing allotments were identified to be monitored; 67 were visited.

Archaeological resources are places where human activities have deposited physical remains or measurably altered the earth in some manner. Archaeological sites may be prehistoric or historic and are considered valuable if they have yielded, or may be likely to yield, scientific or scholarly information important in prehistory or history. Complete site avoidance is the preferred form of treatment for archaeological resources that have the ability, or may have the ability, to yield scientific data (Keyser et

al. 1988). Because of the nature of grazing activities, archaeological resources cannot always be avoided. If grazing conflicts with cultural resources are identified, the adverse effects would be mitigated or eliminated by amending grazing practices authorized in the permit (Goodman 2006).

The most frequently encountered archaeological resources in the Summit Logan Grazing Authorization project area are scatters of lithic remains that are distributed in variable densities and are related to occupations of hunter-gatherers that span over 8,000 years. The prehistoric lithic scatters are largely related to hunting and tool finishing. However, several sites are associated with natural obsidian sources within the area. Another dominant artifact observed in the project area is the hopper mortar; over 180 hopper mortar bases have been found in the project area, most of which were found in situ (David 2004). Hopper mortars and pestles are stone tools that were used to process root crops, plant products, dried meat and fish, and other resources including insects.

Historic archaeological resources may include foundations or structural ruins, or features such as privy pits and trash dumps. Sites with historic archaeological components in the project area are believed to be associated with Depression era livestock grazing, the Hines Logging Railroad, early homesteading, agriculture, and early Forest Service administrative activities. Portions of corrals, burnt-out log troughs, historic ditches predating 1928, historic telephone lines and associated artifacts (ceramic insulators, telephone lines), railroad beds and associated artifacts from the Hines logging railroad activities, and cabins, including a snow survey cabin located at John Day Summit, have been recorded throughout the project area. Civilian Conservation Corps (CCC)-era buildings are located at the Lake Creek Organizational Camp which was an early Forest Service ranger station.

The National Environmental Policy Act and other authorities require that federal agencies consider the impact of their actions on cultural uses of the natural environment such as those practiced by preset-day communities of American Indians. Resources of contemporary tribal interest may include traditional cultural properties (Parker and King 1998), areas important for the practice of Indian religion, Indian sacred sites on federal lands, and areas that support cultural uses of the natural environment (i.e., subsistence use of plants or animals). Ethnographic sources have identified portions of the Summit Logan Grazing project area as important for traditional American Indian land-uses (Couture 1978).

Historic Land Use

The project area lies near the boundary between two cultural areas. The ethnographic record (Whiting 1950) indicates that members of the Hu'nipwi'tika (lomatium eaters) band of the Northern Paiute Indians were the primary inhabitants of the project area, and that two other Paiute bands visited and utilized the areas for subsistence activities. Ethnographic and historic accounts indicate that Sahaptin speaking people from the Columbia Plateau also made frequent forays into the region. Parties affiliated with Tenino (Warm Springs), Nez Perce, Cayuse, and Umatilla periodically visited the project area to gather roots, hunt game, engage in trade, acquire information, and to solidify social ties throughout the ethnographic present (Suphan 1974).

With the headwaters of the Malheur River at the southern end of the planning area, the area became one of the major fishing sites for the Burns Paiute. "It represented the scene of a prominent annual economic and social event centered on the salmon" (Couture 1996:36). The area was also rich with camas, biscuit root, chokecherries, and grasshoppers, which they processed with hopper mortars and stored for winter use.

For a brief period (1873 to 1882), the Malheur Indian Reservation encompassed a major portion of the project area. In 1873 the Federal Government set aside the reservation comprising of nearly two million acres, extending north to Strawberry Mountain, east and west from Castle Rock to the Silvies River, and

south to Malheur Lake. It is conceivable that some Paiute continued to use project areas during this time, but documentation for this is conspicuously lacking. By the end of the 1940s Indian use of the project area was primarily limited to a few families hunting and gathering traditional cultural plants as delicacies instead of staples.

Following the decline of eastern Oregon gold rush in the late 19th century, the principal land use in the southern Blue Mountains was livestock grazing. By the late 1860s large herds of cattle, sheep and horses were grazing these prairies with no limit being placed on the numbers of livestock. By 1912, more than 2,000 to 4,500 cattle, 6,000 to 8,000 sheep, and 500 to 1,000 horses grazed in the planning area and surrounding vicinity (Mosgrove 1980). Until the early 1900s livestock on the Forest was not managed and high stocking levels, stock driveways, and lack of management resulted in degraded upland and riparian conditions.

Grazing practices that started in the 1860s altered the native grasslands in and around the project areas, displacing prairie vegetation with annual grasses for livestock forage. For heavily overgrazed areas in the project area, non-native grass species were introduced, such as the reseeding project in the project area that began in the 1930s. And as early as 1915, historic irrigation ditches were being built in the project area by water rights holders with spreader ditches being plowed in the valley through the 1950s. The footprint of the ditches is still visible and some are still in use.

In the 1870s the Dalles Military Road was opened connecting Boise to the Dalles by way of Canyon City to service the miners and early settlers. A portion of the military road runs through the Summit Prairie allotment. Sheep camps and stock driveways were constructed within the planning area to support the administration of grazing.

Commercial logging began on the Forest in the early 1920s when the Malheur put up for sale 890 million board feet of timber. The Hines Logging Railroad was constructed from the mill in Seneca to Crane Prairie in the eastern portion of the project area to transport the timber. The Bear Creek to Summit Prairie section of the railroad system was used to haul timber from the project area between the late 1930s to early 1960s. Temporary spurs were constructed along creeks and drainage areas in the project area.

Other historic uses of the project area involved the administration of Forest Service lands and fire suppression. A fire lookout was in place by 1920 at Crane Point and the Lake Creek Ranger Station was constructed prior to 1909. An historic phone line was constructed between 1909 and 1915 to allow communication between the lookouts and Ranger stations in the project area. This telephone system was a critical part of the Forest fire suppression system until 1949.

Environmental Consequences

Alternative 1 - No Grazing

Direct and Indirect Effects

The No Action alternative would have no direct or indirect effect on cultural resources. Alternative 1 would virtually eliminate the likelihood of livestock disturbance and damage to cultural resources, however, as a consequence of no grazing; fuel loads from an increased amount of available forage could increase the risk of archaeological sites and their overall physical integrity being affected by wild fires.

Tribal uses would have beneficial consequences under this alternative. The No Action alternative would be beneficial to riparian vegetation and therefore beneficial to tribal uses. This alternative would not prevent the continuation of traditional practices.

Alternative 2 (Proposed Action), 3 and 4

Direct and Indirect Effects

Livestock activity in areas where cattle tend to congregate (water sources) with a high likelihood of containing buried cultural deposits, such as springs, seeps, and terraces, could expose and cause damage to cultural materials. Since the grazing alternatives would not change the intensity of grazing, would continue to disperse livestock across the allotments, and would manage use according to the allotment management plans, no additional impacts to sites within the project area are expected.

Two allotments, Logan Valley and Summit Prairie, would gain acreage with all three alternatives, but not livestock numbers. Lake Creek Allotment would remain vacant, and McCoy Creek Allotment would decrease in size with 23 acres being excluded in a riparian protection exclosure in all alternatives.

Any site-specific range developments identified, such as developing upland ponds, constructing fences and the loading ramp/catch pen and construction of a spring development would be mitigated per stipulation III A. of the 2004 programmatic agreement.

New fence construction (electric, barbed-wire, or buck and pole in Lake Creek Allotment (alternatives 2 and 4) and Summit Prairie Allotment (alternatives 2, 3 and 4) are being proposed along with the construction of small willow (buck and pole or wire) exclosures and cages under alternative 4 in the Summit Prairie Allotment. The conversion of 0.3 miles of electric fence to a permanent let-down fence is also being proposed in the Logan Valley Allotment under alternatives 2, 3 and 4. Fence removal in the Logan Valley, McCoy Creek and Summit Prairie Allotments is proposed under alternatives 2, 3, and 4. These activities would have no or minimal effects to heritage resources.

Under all alternatives, permit renewal provides for continued monitoring of grazing practices, archaeological review of proposed range projects, and inspections of known or newly identified cultural properties in the allotment. The results of this work would trigger adjustments in management practices (as appropriate) to ensure that cultural resources are considered. In the event that cultural properties could not be avoided or protected, appropriate mitigation measures would be undertaken through consultation with the State Historic Preservation Office for the affected cultural resource property. Vegetation that has been completely utilized by livestock is an indicator of the surface condition and integrity of archaeological sites. Where the basal condition of the grasses is intact and protecting the soil integrity, cultural materials are not as likely to be disturbed.

Specific direction concerning continued management of existing developments or activities where known cultural sites occur and are monitored would be addressed in annual operating plans.

Although these alternatives would not prevent continuation of traditional practices, impacts to tribal traditional use areas would continue at existing levels if the alternatives did not contain the adaptive management options. Livestock would continue to have direct impacts to riparian plants such as chokecherry, willow and red-osier dogwood that are used by local tribes. Other plants such as camas, biscuit-root, bitterroot, onion, current, lomatium, yarrow, sagebrush and juniper would not be impacted directly by livestock grazing.

Under the three action alternatives, proposed improvements and adaptive management strategies have been proposed that would benefit cultural plants, both upland and riparian. These adaptive management strategies include scheduling rest or additional rest within riparian pastures and recovery units, changing the allowable use levels, and installing fences to protect sensitive areas (i.e. fen area and streams). The effects of implementing the proposed improvement options/adaptive management strategies to cultural resources and tribal traditional use areas for the gathering of cultural plants (i.e. construction of fences)

would be minimal because these site specific projects would be mitigated through requirements of the 2004 Programmatic Agreement with Oregon State Historic Preservation Office.

Cumulative Effects for All Alternatives

Past and future forest management projects have the potential to impact cultural resources within the project area. These projects can cause surface disturbance that affect the integrity of historical structures and prehistoric sites. Implementation of the design criteria with all three action alternatives should prevent, or at least reduce, impacts that are currently affecting archaeological sites within the allotments. However, the cumulative effects of natural elements, logging, road building, grazing, surface collecting and/or illegal digging, and natural fuels reduction projects could still be reflected in these sites.

Typical vegetation management activities, such as timber harvest, thinning, fuels management, and vegetation reduction, as well as other activities, such as fence repair, culvert replacement and stock water enhancement, would occur over the next ten years. Prior to implementation of any of these projects a cultural resource survey and report would have to be completed and would meet the requirements for the Section 106 consultation process. All projects are designed to avoid adverse effects to cultural and historic properties. Also, potential impacts that cultural properties might incur from foreseeable future actions, such as pre-commercial thinning and hazard tree removal would be mitigated per stipulation III A. of the 2004 Programmatic Agreement.

Under the No Grazing alternative, grazing would not contribute to the cumulative effects to cultural resources taking place in the project area. It is possible that additional effects from wild fire could occur when cattle do not annually reduce fine fuels, but if this contributed to a return to historic fire regimes it may actually reduce the long term effects on sites.

Impacts to tribal traditional use areas would be cumulative with past and future management of the vegetation. Future fuels/vegetation projects would have beneficial impacts to tribal use of the area because the proposed activities are usually designed to have beneficial impacts to vegetation in the long term.

Consistency with Forest Plan Direction and Regulations

Heritage and Tribal interests are regulated by federal laws that direct and guide the Forest Service in identifying, evaluating and protecting heritage resources. All of the alternatives would comply with federal laws. The Malheur National Forest Plan tiers to these laws, therefore the proposed action alternatives would meet Forest Plan standards. With the completion of the Heritage inventory under the terms of the 2004 programmatic agreement with Oregon State Historic Preservation Office, the Grazing Allotment Review Strategy for Section 106 Compliance, which implements the Regional Forester policy letter of May 19, 2006, “Grazing Permit Reauthorization and National Historic Preservation Act” (Goodman 2006), and by providing the interdisciplinary team with appropriate input as per NEPA, all relevant laws and regulations have been met.

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments of resources that may result from the alternatives with respect to cultural resources. Ground disturbing management activities within each allotment would avoid all cultural properties that are eligible and potentially eligible (unevaluated) to the National Register of Historic Places.

Social and Economics

Introduction

This is a summary of the Social and Economic report that provides an overview of the current social and economic conditions found in the assessment area to provide the context of the effects analysis that addresses the purpose and need and the issues discussed in chapter 1. The full social and economic report can be found in the project record and is available for review upon request.

Regulatory Framework

The Malheur Forest Plan includes forest-wide management goals to:

- Contribute to the social/economic health of communities, which are significantly affected by national forest management (IV-3, #42).
- Provide an economic return to the public.
- Forest Service policy sets a minimum level of financial analysis for project planning (FSH 1909.17).
- Contribute to the economic and social well-being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood (FSM 2202.1(4)).

The Code of Federal Regulations (CFR) is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government. Minimum specific management requirements are identified in 36 CFR 219.27, to accomplish goals and objectives for the National Forest System.

The National Environmental Policy Act requires integrated use of the natural and social sciences in all planning and decision-making that affects the human environment. The human environment includes the natural and physical environment, and the relationship of people to the environment (40 CFR 1508.14).

Title 40, Code of Federal Regulations for NEPA (40CFR 1502.23) addresses non-commodity values, stating “For the purposes of complying with the Act, the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis, and should not be, when there are qualitative considerations.”

36 CFR 219.3 – National Forest System Land and Management Planning

Executive Order 12898 (February 11, 1994) on Environmental Justice directs federal agencies to identify and address agency programs that may have a disproportionately high and adverse environmental effects on minority populations, low-income populations, or Indian tribes. The order directs federal agencies to focus attention on the human health and environment effects to ethnic minorities (American Indians, Hispanics, African Americans, and Asian and Pacific-Islander Americans), disabled people, and low-income groups.

Analysis Methods

The economic analysis focuses on two key indicators of change by alternative: 1) Forage Available for Livestock, 2) Costs of Improvements.

Affected Environment

Changes in levels of grazing use associated with the Summit Logan Valley Grazing Authorization Project Management Plan may affect the major social and economic characteristics of the surrounding geographic

area. The affected area or impact zone for the Malheur National Forest consists of Grant, Harney and Baker counties in Oregon. Agriculture (particularly forage resource products), manufacturing (particularly wood products), and retail trade are important sourcesof employment and income in this region. Grant County, for example, has a low level of economic diversity, a high dependence on federal timber and forage, and a low resiliency for change. Reliance on timber and forage from federal lands is moderate to high in counties in the impact zone (Kohrman 2003). The rate of conversion from wildland range to other uses has been less than 1 percent total between 1986 and 2001 (USDA Forest Service & ODF 2004).

Many communities are closely tied to the forest in both work activities and recreation. The local communities within an hour or two drive that are anticipated to be directly or indirectly affected by the proposed action, alternatives, and their associated economics include: Prairie City (population 1,080), Burns/Hines (4,565), Dayville (140), John Day/Canyon City (2,740), Long Creek (260), Mount Vernon (650), Monument (150), Seneca (230), Sumpter (175), and Unity (145). Larger towns and cities two or more hours away from John Day include: Baker City (10,160), LaGrande (12,795), Ontario (10,680), Bend (52,029), and Pendleton (16,915). The nearest metropolitan areas are the Tri-Cities area of Kennewick, Pasco, and Richland in Washington State, and Boise, Idaho. Most of the permittees live in the listed local communities.

Ranching has played a defining role in the establishment of the western United States. Many public land permittees consider the ranching way of life vital to maintaining traditional values and their cultural heritage. This unique lifestyle had endured and evolved throughout generations. Commitment to remaining in the local communities is very strong (USDA Forest Service RMRS-GTR-113. 2003).

Nationally, regionally, and locally, the social values and demands are changing on the national forests. A recent national survey has shown there is wide support for management of public lands to provide a diversity of uses, including grazing (Shields et al. 2002). However, the same study shows the importance to manage forest and grasslands to provide different types of recreational opportunities, including preserving the ability to have a “wilderness experience”. The Draft Current Management Situation Report for the Blue Mountains orest Plan revision also discusses changing social values (USDA Forest Service Revision Team 2004). There is also a growing dichotomy between rural and urban Oregon (Kaylor 2003).

Economics

Financial institutions and the Internal Revenue Service have recognized the economic value of federal grazing permits and long-term permittees have been able to capitalize this permit as part of total ranch value for loans and property sales. However, the Forest Service does not recognize the permit as having additive financial value to an individual’s property because there is no guarantee that the permit would remain with current permittee in perpetuity and that the sale of the property would automatically give the permit to the new owner. Therefore the Forest Service recognizes grazing permits as a privilege and not a right.

A grazing program on portions of the Malheur National Forest has been around since the establishment of the forest as part of the Blue Mountain Forest Reserve in 1906 and as a separate unit in 1908 (Mosgrove 1980). The cattle ranching business has been an economic mainstay in Grant County along with the forest products industry and government jobs.

Recent Forest Service range management practices, policies and procedures require more active involvement by the permittees in the form of planning participation, multiple resource management, monitoring active livestock management and cost-share of rangeland improvement projects. A special report published in 1992 by the Oregon State University Extension Service concluded that: “changes in

federal grazing policies and regulations may have led to relative asset devaluation in the federal land dependent sector of the western livestock industry in Eastern Oregon" (Obermiller 1992).

The same study found that although grazing fees on private land are considerably higher than Forest Service land, overall grazing costs are much higher on Forest Service land. The increased expense associated with grazing on public land was attributed to: the cost of taking animals on and off of federal land, livestock management, maintenance of range improvements and higher death loss (Obermiller 1992).

The economics of the grazing program has evolved over time. Currently, stock animals, mainly cattle, spend the winter and early spring months on lower elevation private lands where they can be fed stored hay. In Grant County, the land is usually located along the John Day River and its tributaries. Most of these lands are in the ownership of the permittees. The animals are moved to higher elevation private lands and public lands as these lands become range ready in the spring. It is necessary for the cattle to be moved off their winter pastures so these private lands can be irrigated for hay production then stored for the upcoming winter.

This system of moving cattle to other pastures in the spring through fall maximizes the use of prime agricultural lands for hay production. The longer cattle are kept off these lands, the greater the opportunity to produce two or more hay crops. The more herbage produced, the more cattle can be held over the winter, and the rancher/permittee is better able to time the selling of their stock to take advantage of market prices. Through history the beef market has been very volatile, with great highs and lows in the domestic market.

In the current livestock management systems, most calving is done early. Most of the calves are born between October and February. This allows the calves to be born near ranches where they can be watched and the birth assisted when necessary by the ranchers thus reducing mortality rates. The calves develop to a size by mid-spring to where they can be safely moved to new pasturage and are large enough to be protected from most predators.

Lands within the planning area generally became ready for livestock use in mid-May or early June depending on the weather, aspect, and amount of snow pack. The cattle remain until late summer or until the end of October depending on when use criteria (triggers) are met or when the permitted grazing season ends. Annual adjustments in the timing, intensity or duration of livestock grazing may be necessary if resource conditions are not trending towards or achieving objectives. Flexibility is needed to address resource concerns. Thus, herd numbers may change up or down, and pastures may be rested in the following year. Wildfires and prescribed fires may cause portions of allotments to be rested for a period of time. Therefore, when mitigating for ecological concerns, there are both direct and indirect economic impacts to the permittees and the local economies. Economic impacts would have a social impact to rural life styles.

If either the Bureau of Land Management or the Forest Service were to reduce their role in this grazing system, the permittee would need to find other private or public lands to hold their cattle while forage is being grown, or they would need to reduce their total livestock numbers. Buying and shipping forage from outside sources is not considered economical because of the costs. In many cases, reductions in total livestock numbers would also make some family-owned businesses uneconomical.

Economic strains intensify as operational costs increase without associated increases in the prices received for livestock products. The average 300 cow/calf operation in the western United States typically yields a two percent investment return. This return is often too low to support a ranching family. Under

these conditions, many family members must seek employment outside of the ranch to make ends meet (Knight et al. 2002).

Employment

Cattle production and forest products provide a portion of the core employment for Grant and Harney counties. Most of the ranches are family run businesses and not corporate owned. In 2006 13 percent of the total employment in Grant County was in farm and agricultural services. Local government, retail trade, and services employ the most people in Grant and Harney counties (Kohrman 2003).

Ranchers in Baker, Grant and Harney counties, with federal permits in the analysis area, are highly dependent on forage from federally managed lands, compared to other counties in the region. The value of cattle reared on forage from federally managed lands represents more than 10 percent of total agricultural sales in Baker, Grant and Harney counties (Haynes and Horne 1997). Shifts in permitted use of federal grazing allotments change the availability of this forage source. The impact these shifts have on the local economy varies according to the adjustments that local ranchers have to make within their ranching operation.

Recreation-based industries, while prevalent elsewhere in the region, have not been a major contributor to the local economies. Recent efforts indicate that the volume of business is only enough to supplement income, rather than provide a primary source of income (Kohrman 2003). The exception is hunting season, which typically draws larger numbers of people into the area. Stores that sell sporting goods benefit during this period. Recreation-based employment is seasonal and service-oriented, with wages at the lower end of the pay scale (Kohrman 2003). Economic activity based on recreation may have limited growth potential for communities in the area (Kline 2001). Seasonal limitations, the dispersed nature of recreation within the counties, along with a general lack of large, water-based recreational opportunities, does not create the concentrated numbers of recreationists and readily-identifiable recreation destinations necessary to support many recreation industries (Kohrman 2003). Recreation based industry had a small increase in Grant County between 1990 and 2000 (The Wilderness Society 2004).

Historically, government employment and expenditures has provided a degree of stability in rural communities (Kohrman 2003). With reduced Forest Service budgets and work force, and a switch to management emphasis that produces generally lower amounts and value of commodity products, federal workforce and program expenditures has not buffered economic downturns as in the past (Oregon Department of Employment 2001). This situation, combined with fluctuations in the other base industries, has had a significant effect on the economy (Kohrman 2003).

The communities surrounding the Summit Logan Valley Grazing Authorization Project area have a disproportionately high unemployment compared with the Oregon State average of 9.6 percent. Unemployment in Baker County for January 2012 was 12.8 percent, Grant County – 17.5 percent, and Harney County – 15.9 percent. (From Northwest Area Foundation (NAF) Website/ http://www.indicators.nwaf.org)

Average Wages

Average annual pay per job provides an indication of the wage contribution of jobs in the analysis area. Average income for the affected counties is below the national and state averages: United States $45,000, Oregon $43,500, Baker County $31,700, Grant County $32,500, Harney County $31,700. (Northwest Area Foundation Website) Wages in Grant and Harney counties are lower, primarily due to lower wage rates per hour and a larger number of part-time jobs, compared to the state as a whole (Kohrman 2003).

Environmental Consequences

Alternative 1 - No Grazing

Direct and Indirect Effects

Economics

Alternative 1 would eliminate authorized livestock use within the planning area, thus possibly affecting the economic viability of the associated permittees' operations (magnitude) depending on the minimum number of AUMs necessary for the permittees to remain in business.

Eliminating cattle from the allotments could affect the economic viability of the livestock operations for the permittees due to the cumulative costs associated with securing additional range or buying supplemental feed to accommodate herd sizes consistent with current permitted numbers, fencing and establishing water on the additional range, increased trucking costs, and labor costs associated with moving cattle. The intensity of the effects would depend upon the available options for the permittee; access and availability of private land, availability of forage and the costs associated with those options. Additionally, the intensity of the effects would also depend of the size of their total operations, debt structure, business goals and objectives and the market for cattle.

Alternative 1 would prohibit approximately 680 cow/calf pair from the current AUMS (3,945). The three term grazing permits associated with this allotment would be cancelled. Permittees may choose to graze the displaced livestock on their own properties if there was a large enough land base or they may have to find an alternative source for pasture lands. In Grant, Harney and Baker Counties, available pasture for grazing is limited to dispersed blocks of pasture at approximately $10 to $20 per head month with availability depending on the season. Based on the lack of the summer rangeland and the overall shortage within the zone of influence (Grant, Harney and Baker Counties), operational costs would dramatically increase for the permittees. Costs associated with transportation and travel would increase operational costs.

The permittee may attempt to maintain their current livestock herds even if they lose their permit to graze livestock within the planning area. This may result in adverse environmental effects on adjacent privately owned lands. Or the permittee may choose to reduce the heard size which may adversely affect the permittee operations.

If selected, alternative 1 would result in abandonment of all infrastructures in place. The investments made to date into internal pasture fences, allotment boundary fences, spring developments and other structures owned by the government would be lost. If subsequent decision is made to retain any of these improvements, funding would need to be secured for their maintenance or adjacent permittees would be reassigned maintenance responsibility. Assigning maintenance responsibility to adjacent permittee would in turn increase their operational costs.

However, alternative 1 would eliminate all permittee costs associated with the allotment. In addition, a fair market appraisal of improvements may be necessary to determine appropriate compensation for investments made on the allotments by the current permittees. The magnitude of the direct effects of this alternative is considered to be the three ranching operations currently holding permits for the allotments under consideration and the Government.

No grazing fees would be collected from domestic livestock grazing in the project area under alternative 1, therefore the Malheur National Forest would not receive this portion of the grazing fees collected

annually, for on the ground range improvements (range betterment funds). Neither would they be needed. These funds would not be available to assist the local economy by purchase of materials for construction of improvements locally or hire local seasonal workers to complete projects on the Forest.

Employment

Grazing reductions (AUMs) could affect employment and income in several ways: (1) direct effects attributable to employment associated with the ranches, (2) indirect effects attributable to industries that supply materials, equipment, and services to the ranches, and (3) induced effects attributable to personal spending by the ranch owners, employees, families, and related industries (direct, indirect, and induced effects as defined above constitute the magnitude or area of the effect). A reduction of this magnitude in the number of authorized Animal Unit Months (AUMs) would be expected to affect the associated ranches' capacity as these grazing permits may provide for 50 to 100 percent of the ranches' summer forage.

Selection of this alternative would have an adverse effect upon the permittees and their employees. All these livestock operations are family businesses, with the exception of one. As many as 6 families (permit holders and employees) would potentially be affected by this alternative. This translates to the alternative affecting approximately 18 people. Permit holders would struggle to find comparable grazing opportunities within the proximity to their home ranches, due to the high demand and high cost for grazing lands in Grant, Harney and Baker counties.

Average Wages

This alternative would have no impact on the average wages for zone of influence.

Cumulative Effects

If alternative 1, No Grazing, were selected there would be a cumulative economic and social effect. As the Malheur National Forest and other national forests in the Pacific Northwest Region (Oregon and Washington) prepare more allotment management plans, it is anticipated the overall amount of cattle utilizing National Forest System lands may be reduced. As family ranching becomes less profitable, the number of people employed in and enjoying this life-style would decline locally, regionally, and nationally, potentially creating a social minority group.

Forest Service Chief Dale Bosworth, in a 2003 speech (USDA Forest Service, 2003), stated his concern with ending grazing (a proposal most similar to Alternative 1) on public lands: "…Without the access to seasonal grazing on national forest or other federal lands, the viability of many ranching operations in the West would be seriously in doubt. An end result would be the selling off of many of the privately-owned base ranch properties adjacent to public lands. What typically happens next is the land is subdividied into ranchettes and valuable open space and wildlife habitat is lost…"

As agricultural lands are lost to development, communities bear higher costs. Privately owned and managed agricultural land generates more in local tax revenues than it costs in services. Carefully examining local budgets in cost of community services (COCS) studies shows that nationwide farm, forest and open lands more than pay for the municipal services they require, while taxes on residential uses consistently fail to cover costs (Freegood, AFT, 2002).

Alternative 2 - Proposed Action

All cost estimates were derived from personal conversations and past experience with Gary Delaney, Jason Kerberg, Shannon Britt, Cindy Kranich, and Bubba Lindley.

Direct and Indirect Effects

Lake Creek Allotment

- Lake Creek Allotment boundary fence change requires 2.5 miles of fence construction at $27,000.00 per mile for a total of $67,500.00.
- Total cost for structural improvements on this allotment under this alternative is $67,500

Logan Valley Allotment

- Removal of 2.3 miles of fence (@ $3,000/mile) $6,900.
- Construction 2.5 miles of fence (@ $27,000/mile) per mile for total $67,500
- Total cost for structural improvements on this allotment under this alternative is $74,400.

McCoy Creek Allotment

- Removal of 1 mile of fence at $3,000.
- Total cost for this allotment under this alternative is $3,000.

Summit Prairie Allotment

- Removal of .7 miles of fence at $2,100.
- Construction 7 miles of fence (to include Bosenberg) at $27,000 per mile for a total of $189,000.
- Upland water sources (springs and troughs) 4 at $7,000 each for a total of $28,000.
- 1 catchpen and loading ramp @ $5,000.

Total cost for structural improvements on this allotment under this alternative is $224,100.

The total cost associated with structural improvements with the implementation of alternative 2 would be $593,100.

Routine maintenance and deferred replacement costs are not factored into this analysis and should be considered as common to the action alternatives, however annual maintenance costs would increase with the addition of structural improvements. Implementation costs associated with structural improvements and livestock management are increasing. Operational costs are increasing. Depending on the year, permittees may need to increase their active livestock management efforts and distribution techniques in order to meet utilization standards.

The Malheur National Forest would continue to receive one quarter of the grazing fees collected annually, for on the ground range improvements. Materials for construction of improvements would be purchased locally and local seasonal workers are hired to complete projects on the Forest, assisting the local economy.

This alternative meets Forest Plan goals and objectives to contribute to the social and economic health of communities which are significantly affected by National Forest management.

Alternative 3

Direct and Indirect Effects

Lake Creek Allotment

The entire allotment would remain vacant with no authorized grazing and no change in the allotment boundary. There would be no new costs associated with this alternative.

Logan Valley Allotment

- Removal of 1.5 miles of fence at $3,000.00 per mile for a total of $4,500.00.
- Construction of .3 miles of fence $8,100.
- Total cost for this allotment and this alternative is $12,600.

McCoy Creek Allotment

- Removal of 1 mile of fence at $3,000.
- Total cost for this allotment and this alternative is $3,000.

Summit Prairie Allotment

- Creation of riparian pastures in the existing Little Logan Pasture would require 7.3 miles of fence (@ $27,000/miles) for a total of $197,100.
- Removal of .7 miles of fence to absorb a portion of Logan Valley Allotment (@ $3,000/ mile) for a total of $2,100.
- Creation of an exclosure and riparian pasture in existing Sagehen Pasture would require 4 miles of fence, a cost of $108,000.00.
- Creation of riparian pasture in North Summit would require construction of .8 miles of fence for $21,600.
- 1 catchpen and loading ramp for $5,000.

Total cost for this allotment and this alternative is $333,800.

The total cost associated with structural improvements with the implementation of alternative 3 would be $349,400.

Implementation costs associated with the construction of structural improvements for more intense livestock management are increasing. Operational costs (livestock management) may see a decrease if the improvements alone are effective in their purpose.

Routine maintenance and deferred replacement costs are not factored into this analysis and should be considered as common to the action alternative, however annual maintenance costs would increase with the addition of structural improvements.

The Malheur National Forest would continue to receive one quarter of the grazing fees collected annually, for on the ground range improvements. Materials for construction of improvements would be purchased locally and local seasonal workers are hired to complete projects on the Forest, assisting the local economy.

This alternative meets Forest Plan goals and objectives to contribute to the social and economic health of communities which are considerably affected by National Forest management.

Alternative 4

Direct and Indirect Effects

Lake Creek Allotment

- Lake Creek allotment boundary fence change requires 2.5 miles of fence construction at $27,000 per mile for a total of $67,500.

Logan Valley Allotment

- Removal of 1.5 miles of fence at $3,000 per mile for a total of $4,500.
- Construction of 2.8 miles of fence for $75,600.
- Total cost for this allotment and this alternative is $80,100

McCoy Creek Allotment

- Removal of 1 mile of fence at $3,000.
- Total cost for this allotment and this alternative is $3,000.

Summit Prairie Allotment

- New Prairie Riparian fence construction for 3.1 miles for $83,700.
- Removal of .7 miles of fence at $3,000 per mile for a total of $2,100.
- 1 catchpen and loading ramp for $5,000.
- Construction of combination buck & pole and wire cages along portions (10 percent) of Summit Creek (1.2 mi @27,000 x 2) $64,800.

Total cost for this allotment under this alternative is $155,600

The total cost associated with structural improvements with the implementation of alternative 4 would be $306,200

Routine maintenance and deferred replacement costs are not factored into this analysis and should be considered as common to the action alternatives, however annual maintenance costs would increase with the addition of structural improvements. Implementation costs associated with the construction of structural improvements for more efficient livestock management are increasing. Operational costs would increase with daily riding requirement.

The Malheur National Forest would continue to receive one quarter of the grazing fees collected annually, for on the ground range improvements. Materials for construction of improvements would be purchased locally and local seasonal workers are hired to complete projects on the Forest, assisting the local economy.

This alternative meets Forest Plan goals and objectives to contribute to the social and economic health of communities which are significantly affected by National Forest management.

Cumulative Effects for Alternatives 2-4

Recent Forest Service range management practices, policies and procedures require more active involvement by the permittees in the form of planning participation, multiple resource management, monitoring, active livestock management and cost-share of rangeland improvement projects. A special report published in 1992 by the Oregon State University Extension Service concluded that: “changes in federal grazing policies and regulations may have led to relative asset devaluation in the federal land dependent sector of the western livestock industry in Eastern Oregon” (Obermiller 1992).

All the action alternatives would add to the permittee cost of doing business, including implementation and operational. Fences and other improvements from the 2011 signed Decision Memo’s (see chapter 1 for further detail) would further contribute to costs. Cumulatively this could affect the viability of the permittees’ operations.

These alternatives could have some minimal cumulative effects on social and economic resources. It is difficult to project what the cumulative effects would be since it is unknown how the permittees would adjust to the new requirements.

Consistency with Direction and Regulations

Executive Order 12898 on environmental justice requires federal agencies to identify and address any disproportionately high and adverse human health or environmental effects on minority and low-income populations.

The population of the area is predominately white (96 percent Grant County, 92 percent Harney County). The region is sparsely populated, and contains low populations of minorities (4 percent of the Grant County population, 8 percent of Harney County). The largest component in this group is Native American. The primary American Indian tribes involved are the Burns Paiute, Umatilla, and Warm Springs. The Warm Springs has purchased lands adjacent the Summit Logan Valley Grazing Authorization Project area. Virtually the entire Summit Logan Valley Grazing Authorization Project area falls within the ceded lands of the Confederated Tribes of the Warm Springs. Under the terms of the Treaty of 1855, the Confederated Tribes reserve the rights to hunt, fish, gather plant crops, and pasture livestock within these ceded lands. These reserved treaty rights are important in the maintenance of traditional economic strategies (Treaty with the Tribes of Middle Oregon).

Poverty rates provide some indication of the percentage of the population in surrounding communities with low-incomes. Poverty rates for both Grant and Harney counties are 16 percent and 14 percent respectively. The Oregon statewide average rate of persons living below poverty is 13 percent (Northwest Area Foundation http://www.indicators.nwaf.org/ShowOneRegion.asp?IndicatorID=14&FIPS=41023).

Data regarding minorities or people with disabilities employed in the region in the timber, mining, ranching, road construction, forestry services, and recreation sectors is unavailable. Some firms contracted by the Forest Service for reforestation work have traditionally hired Hispanic workers that comprise a migratory workforce in the area. Asian and Pacific Islanders uses of the area include commercial mushroom harvesting and developed camping associated with this activity. Some contracts are reserved for award to minority businesses under the USDA Office of Small and Disadvantaged Business Utilization and the Small Business Administration, although overall contract amounts to these groups has declined since 1998 (Kohrman 2003).

Irreversible and Irretrievable Commitments

Selection of any alternative is not anticipated to result in adverse or disproportionate effect upon, nor displacement of minorities, or increases in taxes that would constitute an economic hardship. There would be no negative effects on public health.

Wildlife

Introduction

This is a summary of the biological evaluation and wildlife specialist report that evaluates the potential effects of livestock grazing on wildlife species and their associated habitat within the Summit Logan Valley Grazing Authorization Project. The full biological evaluation and wildlife specialist report are on file in the project record and are available for review by request.

Regulatory Framework

National Forest Management Act (NFMA)

NFMA requires the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native wildlife species and conserve all listed threatened or endangered species populations (36CFR219.19).

Endangered Species Act (ESA)

The Endangered Species Act requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystem upon which they depend. Forests are required to consult with US Fish and Wildlife Service if a proposed activity may affect the population or habitat of listed species.

Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act established an international framework for the protection and conversation of migratory birds. This Act makes it illegal, unless permitted by regulations to "pursue, hunt, take, capture, purchase, deliver for shipment, ship, cause to be carried by any mean whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird…".

Malheur Forest Plan

The principle policy document relevant to wildlife management on the Forest is the amended 1990 Malheur National Forest Land and Resource Management Plan, referred to as the Forest Plan for the remainder of this section. The Forest Plan provides standards and guidelines for management of wildlife species and habitats. Standards and guidelines are presented at the Forest level (Forest Plan, pp. IV-26 to IV-33) or Management Area level (Forest Plan pp. IV-50, IV-53, IV-56 to IV-57, IV-105 to IV-107, and IV-108).

Additional management direction is provided for conservation of migratory landbirds. This direction is consolidated in the Forest Service Landbird Strategic Plan and further developed through the Partners in Flight Program. The Oregon-Washington Partners in Flight Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman 2000) identifies priority bird species and habitats for the Blue Mountains in Oregon.

Analysis Methods

Effects on wildlife species and habitat were assessed for the Summit Logan Valley Grazing Authorization Project area, focusing on implementation of actions described within each alternative, as well as effects of adaptive management. Some wildlife habitats require a detailed analysis and discussion to determine potential effects on a particular species. Other habitats may either not be impacted or are impacted at a level which does not influence the species or their occurrence.

Effects were analyzed within the context of the project area (40,279 acres), unless otherwise noted. For Management Indicator Species (MIS) primary cavity excavators the effects boundary was expanded to include adjacent subwatersheds in order to discuss nearby post-fire habitat. For wide-ranging carnivores such as the gray wolf and wolverine, the effects boundary was expanded to include discussion of remote habitat such as the Strawberry Mountain and Monument Rock Wilderness areas, the Vinegar Hill-Indian Rock Scenic Area and several roadless areas on the Forest. Cumulative effects were analyzed with respect to past, ongoing and foreseeable future activities listed in appendix C.

Species presence/absence determinations were based on habitat presence, review of recorded wildlife sightings in District and Forest wildlife databases, the National Resources Information System (NRIS)

Wildlife database, non-Forest Service databases, Oregon Department of Fish and Wildlife (ODFW) reports, as well as notes, maps, and summary reports of wildlife observations made during field reconnaissance for several smaller projects in the area in 2011, with some follow-up visits early spring 2012.

The Regional Forester's Sensitive Species List, December 2011, was used to identify the threatened, endangered and sensitive wildlife species discussed in this document. Conservation status, trends, and source habitats for these and other species were obtained from the Oregon Biodiversity Information Center "Rare, Threatened and Endangered Species of Oregon" (October 2010), NatureServe Explorer (accessed 2012), US Fish and Wildlife Service Birds of Conservation Concern (2008), and viability assessments for the Blue Mountain Forest Plan Revision (USDA Forest Service, draft 2011).

Elk management objectives and estimated population levels were obtained from Oregon Department of Fish and Wildlife offices in Hines and John Day, Oregon.

Old growth habitat was determined using the Forest's old growth GIS map layer, and management activity layers. Existing vegetation and aspen habitat was determined using the Forest's existing vegetation and hardwood GIS map layer.

Landbirds, including neotropical migratory birds, were analyzed based on priority habitats identified in the Oregon-Washington Chapter of Partners in Flight, Northern Rocky Mountains Bird Conservation Plan (Altman 2000). Species lists of birds seen or heard in Logan Valley were obtained from District records as well as local birding groups (Grant County Bird Club).

The duration of effects on the wildlife resource is described according to the following terms and definitions:

- Immediate – Approximately one growing season or several months or less
- Short-term – 0 to 5 years
- Mid-term – 5 to 25 years
- Long-term – 25+ years

Rather than addressing all wildlife species, the Forest Plan focuses on three categories of wildlife: threatened, endangered, and sensitive species, management indicator species, and featured species. In addition, interest has been raised for landbirds including neotropical migratory birds. Categories and wildlife species are summarized below:

- *Threatened, Endangered and Sensitive Species*: This analysis uses the December 2011 Regional Forester's Sensitive Species List.
- *Management Indicator Species*: Rocky Mountain elk represent a big game species. American (pine) marten, pileated woodpecker, and northern three-toed woodpecker represent old growth habitats. Primary cavity excavators (most woodpeckers) represent dead wood habitat. Effects to management indicator species are discussed in the big game habitat, old growth forest, and primary cavity excavator sections respectively.
- *Featured Species*: The featured species associated with the project area are northern goshawk, blue grouse, osprey, and pronghorn antelope. Effects are discussed in the featured species section. Upland sandpiper and sage grouse are both sensitive and featured species, and are addressed in the threatened, endangered and sensitive species section. In addition, due to their influence on riparian habitat, beaver will also be discussed.

- *Landbirds including Neotropical Migratory Birds*: These species and associated habitats are discussed in the landbirds including neotropical migratory birds section.

Threatened, Endangered and Sensitive Wildlife Species

Table 97 describes the threatened, endangered and sensitive wildlife species that have suitable habitat within or near the project area. There is no suitable habitat present for American peregrine falcon (*Falco peregrinus anatum*), pygmy rabbit (*Brachylagus idahoensis*), Wallowa rosy finch (*Leucosticte tephrocotis wallowa*), tricolored blackbird (*Agelaius tricolor*), or bufflehead (*Bucephala albeola*). These species will not be discussed.

There is no designated or proposed critical habitat for Canada lynx in the affected subwatersheds. Based on the National Lynx Survey, the Malheur National Forest falls under the designation of "Unoccupied Mapped Lynx Habitat" (US Fish and Wildlife Service Memo, 2006). Consequently, there is No Effect (NE) to Canada lynx. The Lynx Conservation Assessment and Strategy applies to occupied lynx habitat. Compliance with section 7 (a) (2) of the Endangered Species Act is not required for lynx on national forests determined to be unoccupied by lynx (US Fish and Wildlife Service 2006). Consequently, there is No Effect (NE) to Canada Lynx.

Table 97. Threatened, endangered and sensitive wildlife species summary

Terrestrial Species	Status	Species Occurrence	Effects Determination[a, b]			
			Alternative 1	Alternative 2	Alternative 3	Alternative 4
Canada Lynx *Lynx canadensis*	T	HN/N	NE	NE	NE	NE
Gray Wolf *Canis lupus* East of Hwy 395, Rocky Mtn. DPS[c]	S	HD/S	NI	NI	NI	NI
Bald Eagle *Hailaeetus leucocephalus*	S	HD/S	NI	NI	NI	NI
American Peregrine Falcon *Falco perigrinus anatum*	S	HN/N	NI	NI	NI	NI
California Wolverine *Gulo gulo luteus*	S, C	HD/S	NI	NI	NI	NI
Pygmy Rabbit *Brachylagus idahoensis*	S	HN/N	NI	NI	NI	NI
Greater Sage-Grouse *Centrocercus urophasianus phaios*	S, C	HD/D	NI	MIIH	MIIH	MIIH
Silver-bordered Fritillary *Boloria selene*	S	HD/S	NI	MIIH	MIIH	MIIH
Wallowa Rosy Finch *Leucosticte tephrocotis wallowa*	S	HN/N	NI	NI	NI	NI
Bobolink *Dolichonyx oryzivorus*	S	HD/S	NI	MIIH	MIIH	MIIH
Grasshopper Sparrow *Ammodramus savannarum*	S	HD/S	NI	MIIH	MIIH	MIIH
Upland Sandpiper *Bartramia longicauda*	S	HD/D	NI	NI	NI	NI

Terrestrial Species	Status	Species Occurrence	Effects Determination[a, b]			
			Alternative 1	Alternative 2	Alternative 3	Alternative 4
Tricolored Blackbird *Agelaius tricolor*	S	HN/N	NI	NI	NI	NI
Bufflehead *Bucephala albeola*	S	HN/N	NI	NI	NI	NI
Lewis's Woodpecker *Melanerpes lewis*	S	HD/D	NI	MIIH	MIIH	MIIH
White-headed Woodpecker *Picoides albolarvatus*	S	HD/D	NI	MIIH	MIIH	MIIH
Townsend's Big-Eared Bat *Corynorhinus townsendii*	S	HD/S	NI	MIIH	MIIH	MIIH
Pallid Bat *Antrozous pallidus*	S	HD/S	NI	MIIH	MIIH	MIIH
Fringed Myotis *Myotis thysanodes*	S	HD/S	NI	MIIH	MIIH	MIIH
Johnson's Hairstreak *Callophrys johnsoni*	S	HD/S	NI	NI	NI	NI
Columbia Clubtail *Gomphus lynnae*	S	HD/S	NI	MIIH	MIIH	MIIH
Columbia Spotted Frog *Rana luteiventris*	S	HD/D	See Aquatic Section	MIIH	MIIH	MIIH

a - See Environmental Consequences section for further discussion on effects determination for threatened, endangered and sensitive wildlife species.

b - **Status**

T Federally Threatened

S Sensitive species for Regional Forester's list

C Candidate species under the Endangered Species Act

Occurrence

HD Habitat Documented or suspected within project area or near enough to be impacted by project activities

HN Habitat Not within the project area or affected by its activities

D Species Documented in general vicinity of project activities

S Species Suspected in general vicinity of project activities

N Species Not documented and not suspected in general vicinity of project activities

Effects Determination

Threatened and Endangered Species

NE No Effect

Sensitive Species

NI No Impact

MIIH May Impact Individuals or Habitat but Will Not Likely Contribute to a Trend Toward Federally Listing or Cause a Loss of Viability to the Population or Species

BI Beneficial Impact

c – DPS = distinct population segment

Affected Environment and Environmental Consequences Threatened, Endangered and Sensitive Species

Alternative 1 - No Grazing

All Threatened, Endangered and Sensitive Species

Direct, Indirect and Cumulative Effects

Under the No Action alternative, there would be no management activities, no grazing would occur on any of the allotments. Impact to upland and riparian forage and shrubs from domestic livestock would be eliminated. Lack of competition for forage from cattle could be beneficial for big game species. Because there would be no direct or indirect effects from management activities to threatened, endangered and sensitive wildlife species or their habitat, there would be no additive cumulative effects.

Determination

Due to the nature of the No Action alternative, there would be No Impact (NI), to threatened, endangered or sensitive wildlife species or their habitat.

Alternatives 2, 3 and 4

Gray Wolf (Sensitive Species)

Gray wolves are highly adaptable, wide-ranging carnivores that utilize a variety of habitats. They prefer remote areas where sufficient prey resources and low levels of human activity are present. High road densities and corresponding human activity may deter use of an area by wolves (Thurber et al. 1994). The Strawberry Mountain and Monument Rock Wilderness areas, Vinegar Hill-Indian Rock Scenic Area, and several roadless areas on the Forest would best meet these remote and relatively disturbance free requirements preferred by gray wolves.

The availability of prey is the most important habitat indicator for this species; survival of the young and population growth depends on the availability of food during the rearing season (Jordan et al. 1967 in Verts and Carraway 1998). In Oregon, gray wolves feed extensively upon large ungulates, including Rocky Mountain elk and mule deer. Seasonally, rodents, such as voles, field mice, and ground squirrels are also important prey sources. The location and distribution of prey often directly influences daily and seasonal movements of gray wolves.

The greatest threat to individual gray wolves and packs is human-caused mortality and disturbance.

The Northern Rocky Mountain gray wolf was listed as endangered on June 4, 1973, and a recovery plan was released in 1987. The United States Fish and Wildlife Service established a distinct population segment of the gray wolf (*Canis lupus*) in the Northern Rocky Mountains of the United States, which encompasses the eastern one-third of Washington and Oregon, a small part of north-central Utah, and all of Montana, Idaho and Wyoming.

Wolves in the eastern third of Oregon are part of the Northern Rocky Mountain distinct population segment, which was delisted as of May 5, 2011. Because this population is no longer on the federal Endangered Species List (Federal Register Vol. 76, No. 87, May 5, 2011), the Regional Forester has designated it a regional sensitive species.

Wolves throughout Oregon remain protected by the state Endangered Species Act (Oregon Endangered Species Act). Wolves west of Hwy 395 (outside of the Northern Rocky Mountain distinct population

segment) also remain protected by the federal Endangered Species Act. The U.S. Fish and Wildlife Service is the lead management agency for wolves that occur west of these state highways.

Historically, wolves occupied all habitats of the Malheur National Forest (Wisdom et al. 2000). In 1999, a radio-collared wolf from Idaho was confirmed near the Middle Fork John Day River, on the Malheur National Forest. This animal was recaptured and returned to Idaho. In 2008, Oregon's first wolf pack was documented on the Umatilla National Forest. As of February, 2013, Oregon's wolf count is 46 wolves, including six packs (all breeding pairs). The six Oregon packs are, in order: Imnaha, Wenaha, Walla Walla, Snake, Umatilla, and Minam. http://www.dfw.state.or.us/wolves/wolf_program_updates.asp

Two unconfirmed sightings of single animals in the Logan Valley and along Summit Creek are recorded for the Prairie City Ranger District. Two radio-collared individuals made their way south through Grant County in 2011. While individual wolves or tracks of large canids have been sighted, there are currently no known packs or denning pairs documented for the Malheur National Forest.

Direct and Indirect Effects – Gray Wolf

Wolves are limited by prey availability and are threatened by negative interactions with humans. Generally, land management activities are compatible with wolf protection and recovery, especially actions that maintain ungulate populations. Elk populations on the Malheur National Forest are stable; within the project area, elk populations are at or slightly above management objectives set by Oregon Department of Fish and Wildlife (Oregon Department of Fish and Wildlife 2010).

Due to the project's proximity to Forest System road 16, Lake Creek Youth Camp, Big Creek and Murray Campgrounds, Burns Paiute Tribe work center, as well as winter snowmobile and cross-country ski activities, it is unlikely that wolves would use the project area for home range, denning, or rendezvous sites. The area is easily accessed and regularly used by local residents, recreationists, and hunters during spring, summer, and fall months; and to a lesser extent during winter months. The project area may be used by animals as dispersal habitat.

Communication with US Fish and Wildlife Service indicates that because of the variety and range of habitat used by gray wolves, "they (US Fish and Wildlife Service) do not consider any of our forest management activities to have any negative impacts on wolves" (Reames, forest biologist, personal communication 2012, 2013). If and when a dens site and reproducing animals are documents, US Fish and Wildlife Service would require a buffer around such sites.

Distribution of large game may shift, depending on areas used by cattle in any given year. However, prey species such as elk are not limiting, and are not expected to decline as a result of the alternatives proposed. Actions including adaptive management strategies aimed at improving riparian conditions would benefit big game in the long run.

Determination – Gray Wolf

No wolf populations currently occupy the Malheur National Forest. No denning or rendezvous sites have been identified on the Malheur National Forest. There is an abundance of prey available for gray wolves on the Forest. Prey distribution may be influenced, depending on the alternative chosen for implementation, however, big game populations are not expected to decline. Wolves would be able to avoid any activities occurring within the allotments.

Consequently, there would be **No Impact (NI)** to gray wolves or their habitat as a result of the proposed actions.

Cumulative Effects – Gray Wolf

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on gray wolves.

Vehicle traffic, hunting, firewood cutting, camping and snowmobiling are expected to continue. Snowmobile routes are used during the winter months. Consequently human disturbance in parts of the area continues year round, limiting the area's capacity to provide remote and undisturbed habitat preferred by gray wolves.

Currently off-road vehicle travel is allowed; off-highway vehicle use has the potential to disturb wildlife and reduce security for elk and deer, prey species of gray wolves, as well as dispersing gray wolves.

The Malheur National Forest is in the process of analyzing changes in its travel management plan. It is foreseeable that cross country travel would be prohibited on the Malheur National Forest (where it is not already prohibited), with the exception of accessing dispersed camping sites from open roads. Foreseeable changes in travel management would have a beneficial cumulative impact to big game (wolf prey species) in the long term, providing increased security and reducing disturbance. Open road densities would still likely limit the area as remote wolf habitat.

Fire suppression, beginning in the 1950s, eliminated or reduced most fires occurring within the drier forest types, and allowed for ingrowth of more shade tolerant conifer species. Overstocking in some stands has shaded out forage and shrub species. However, commercial and precommercial thinning activities have also occurred in the area, reducing overstocked stands. Thinning for meadow restoration (ongoing) and recent prescribed burning in the Merit Project area have potential to improve meadow habitat, and improve understory forage.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect prey populations that gray wolves depend on, or gray wolves themselves.

Bald Eagle (Sensitive Species)

In Oregon, bald eagles generally nest near coastlines, rivers, large lakes or streams that support an adequate food supply. Nest trees are mature or old-growth trees, with a large and open branch structure that can support a nest that may ultimately weigh in excess of 1,000 pounds (US Fish and Wildlife Service 2007). Fish and waterfowl make up the majority of their diet. During the winter, bald eagles feed on carrion and crippled or dead waterfowl (Csuti et al. 1997). They shelter at winter roost sites, utilizing large trees with open branching patterns in the crown. The birds show a preference for the largest trees or snags in roosting areas (US Fish and Wildlife Service 1986).

The bald eagle is managed under the Pacific States Bald Eagle Recovery Plan (US Fish and Wildlife Service 1986). Bald eagles were removed from the threatened and endangered species list on August 8, 2007. However, they are still protected, particularly during nesting, by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Major threats to bald eagles continue to be environmental contaminants (especially lead shot or bullet fragments), excessive disturbance by humans, and illegal shooting (NatureServe 2010).

The district records incidental sightings of bald eagles within the project area. No known roosts or nests are documented at this time. Best habitat for roosting and nesting occurs in vicinity of the Malheur River. An adult bald eagle was observed in the Malheur River Corridor south of the project area in 2012.

Direct and Indirect Effects – Bald Eagle

Roosting or nest habitat for bald eagles would not be affected by levels of cattle grazing proposed in any of the alternatives. Should an occupied bald eagle nest be discovered during layout or construction of fences or water developments, design elements to avoid disturbance to nesting birds would be implemented. Prey species would not be negatively impacted. In the long term, actions including adaptive management strategies resulting in improvements in riparian habitat would result in beneficial impacts for fish species, prey for bald eagles.

Determination – Bald Eagle

The determination of effects for bald eagles and their habitat is **No Impact (NI)**.

Cumulative Effects – Bald Eagle

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on bald eagles and potential habitat. Past activities such as timber harvest, road construction, fire suppression, grazing, and wildfire have combined to create the current condition in the analysis area. The combined effects of the Summit Logan Valley Grazing Authorization project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations or viability of bald eagles within the project area or at the Forest level.

California Wolverine (Sensitive, Candidate Species)

The wolverine is strongly associated with remote, high elevation alpine and coniferous forest habitats. They depend on "deep persistent snow cover for successful denning, and they concentrate their year-round activities in areas that maintain deep snow cover into spring and cool temperatures throughout summer" (US Fish and Wildlife Service 2013). In addition to persistent snow pack, the presence of avalanche chutes, boulder fields, and large piles of down logs are also important habitat features associated with denning and food caching.

Wolverines are wide ranging carnivores and are known to travel long distances. These movements are based largely on the acquisition of food, primarily carrion. Home ranges may vary from approximately 40 to 350 square miles in size, depending upon abundance and distribution of prey or food sources, as well as gender and age of individuals (Banci 1994 in US Fish and Wildlife Service 2013). Although areas of high road density, human developments, and activity may be avoided, current wolverine distribution is more likely influenced by the availability of high alpine, persistent snow habitat requirements described above (McKelvey et al. 2011).

On December 14, 2010, the US Fish and Wildlife Service determined that wolverines in the contiguous United States constitute a distinct population segment and that addition to the lists of endangered and threatened wildlife and plants was warranted. At the time, listing was precluded by higher priority actions; wolverines were added to the candidate species list (NatureServe 2011). As of February 4, 2013, the US Fish and Wildlife Service has proposed to list the distinct population segment of the North American wolverine as a threatened species under the Endangered Species Act (Federal Register Vol. 78, No. 23. 2013).

Based on current information, the primary threat to wolverines within the contiguous 48 states would be habitat loss due to increasing temperatures and reduced late spring snowpack as a result of climate change (US Fish and Wildlife Service 2013). Wolverines exhibit low reproductive rates, high juvenile mortality, and are slow to reach sexual maturity (Peterson 1997, in NatureServe 2011). Indirectly, as habitat shrinks and small populations potentially become more isolated, inbreeding and loss of genetic diversity may also

threaten the North American wolverine distinct population segment (US Fish and Wildlife Service 2013). Human-caused mortality due to trapping, whether legal (Montana) or incidental (if animals are inadvertently trapped in sets designed for other species) would be detrimental, by removing additional animals from already low density populations.

Historically, wolverines have been documented on the Malheur National Forest. Winter snow track surveys for American marten and wolverine have been conducted periodically across the district. Several reliable sightings, as well as a partial carcass of a juvenile wolverine found in the Strawberry Mountain Wilderness in 1992, indicate that this species is, or has been, present on the Malheur National Forest.

Suitable snow conditions and denning habitat are located primarily within the Strawberry Mountain Wilderness, north of the Summit Logan Valley Grazing Authorization Project, in cold dry and cool moist subalpine fir-dominated habitats. In 1997, winter helicopter surveys conducted by the Oregon Department of Fish and Wildlife documented a potential den site and probable wolverine tracks in the Strawberry Mountain Wilderness and tracks were observed in the Monument Rock Wilderness. Other areas potentially providing suitable habitat include the Vinegar Hill-Indian Rock Scenic area, Dixie Butte and Dry Cabin Wildlife Emphasis Areas, and Shaketable, McClellan Mountain, and Aldrich Mountain Roadless Areas.

In southern portions of the wolverine's range, animals "remain at high elevations throughout the year, avoiding lower elevation habitats with xeric conditions" (Copeland et al. 2010). At lower elevations, habitat suitability declines due to warmer and drier biophysical environment, and human-related disturbance associated with roads, recreational use, and past timber harvest.

Although wolverines would not be expected to regularly use the project area due to environmental and human-caused factors, suitable dispersal habitat may exist as animals move between higher elevation areas (listed above) and in search of food. District records document one incidental wolverine sighting in the Lake Creek Allotment near upper reaches of Bosenberg Creek.

Currently, the US Fish and Wildlife Service considers animals in Oregon as dispersing individuals, not contributing as "source" populations (US Fish and Wildlife Service 2013).

Direct and Indirect Effects – California Wolverine

Suitable denning habitat for wolverines does not exist within the project area. Wolverine year-round use would be expected at higher elevations defined by deep persistent spring snow and cool summer temperatures (Copeland et al. 2010). This type of habitat is present in the Strawberry Mountain Wilderness. Habitat suitability for wolverine declines with the drier warmer conditions found at lower elevations. Animals may move through the project area, using it as dispersal habitat or while searching for food. The project's proximity to National Forest System road 16, Lake Creek Youth Camp, Big Creek and Murray Campgrounds, Burns Paiute Tribe work center, as well as winter snowmobile and cross-country ski activities may limit some potential use by wolverines. Given the home range of individual wolverines, animals could detour to avoid areas frequented by people or activity. In addition, "wolverines are not thought to be dependent on specific vegetation or habitat features that might be manipulated by land management activities, nor is there evidence to suggest that land management activities are a threat to the conservation of the species"(US Fish and Wildlife Service 2013).

Distribution of large game may shift, depending on areas used by cattle in any given year; however prey species such as elk are not limiting, and are not expected to decline as a result of the alternatives proposed. Use levels aimed at improving riparian conditions, would benefit big game in the long run.

Determination – California Wolverine

No denning habitat for wolverine exists within the project area (alpine to subalpine habitat comprises less than one percent of the total project acres). Animals may transit through the project area, either dispersing or in search of food. Cattle grazing would not impact such movement. Existing human activity within the project area is relatively high during the spring, summer, and fall months, possibly deterring wolverine use. Individual wolverines could detour to avoid areas frequented by people or activity. Prey species would not be a limiting factor.

Because of limited potential use of the area by wolverines, no direct, indirect, or cumulative effects are anticipated from the Summit Logan Valley Grazing Authorization Project. The determination would be **No Impact (NI)** for wolverine populations and habitat as a result of the proposed action.

Cumulative Effects – California Wolverine

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on wolverines. Vehicle traffic along roads, campers, hikers, hunters, firewood cutting, and other human activities would be the greatest deterrent for wolverine use of the area. However, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect wolverines utilizing the area as dispersal habitat.

Greater Sage-Grouse (Sensitive, Candidate Species)

Greater sage-grouse are obligate residents of sagebrush-grassland or juniper-sagebrush-grassland plant communities. Optimum habitat during nesting and brood-rearing consists of a healthy sagebrush community including species such as; *Artemesia tridentata tridentata*, *A. tridentata vaseyana, A. tridentata wyomingensis*, and *A. arbuscula*) with a strong herbaceous understory of native grasses and forbs (Hagen 2005).

Sage-grouse breed on sites called leks (strutting grounds) and the same lek areas are generally used annually. While most sage-grouse nests are found under sagebrush within four miles of the lek, dispersal distances of hens are variable and they have been recorded up to 12 miles from the lek (Hagen 2005). Habitat quality may be a factor determining dispersal of hens. Chick diets include forbs and invertebrates (Drut et al. 1994). The best brood-rearing habitat provides a wide variety of plants and resulting diversity of insects which provide important food for chicks.

Sagebrush habitat in the Summit Logan Valley Grazing Authorization Project area is fragmented and exists on slightly higher and drier ground surrounded by wetter meadows. Known dispersal patterns of greater sage-grouse hens and broods are unknown; one incidental sighting of sage-grouse has been documented in District records. The Burns Paiute Tribe has also documented incidental sightings of sage-grouse on their property south of National Forest System road 16 (Burns Paiute Tribe Biologists, personal communication 2012). There are no known or historic leks recorded for Logan Valley.

Direct and Indirect Effects – Greater Sage-Grouse

No documented leks of greater sage-grouse males, hens, or hens with broods have been recorded within the project area. Incidental sightings of sage-grouse have occurred in the fall, in the vicinity of Flat Field, within the Logan Valley allotment. This area may have some of the higher potential for sage grouse use, given its lack of conifer encroachment and open grass and sagebrush habitat.

Impacts to greater sage-grouse would depend on timing of cattle grazing, and concentration of animals. The US Fish and Wildlife Service states, “The effects of grazing on sage-grouse habitat vary widely with timing and intensity of use…Light to moderate levels of grazing can have a positive or neutral impact on

sage-grouse habitat, meaning this land use can be compatible with healthy sage-grouse habitat" (Species Fact Sheet, US Fish and Wildlife Service, accessed August 2013).

Anticipated use by sage-grouse would be from May through October, Logan Valley is covered by snow during the winter. Because of variations in dates of turn-out, not all areas of potential habitat would be impacted by cattle in a given grazing season. In the event that nesting does occur in Logan Valley, early season grazing has the highest potential for nest trampling. Grazing may also reduce forbs used by young birds, although improvements in riparian areas would provide these types of food plants, especially in late summer as upland pastures dry out.

Water developments would be placed to limit impact to native vegetation. Wildlife escape ramps are required for any trough or tank installation, to allow smaller mammals or birds using these water sources a way of escaping the trough if they fall in (see Design Elements, Chapter 2).

Monitoring for upland sandpipers in within the Big Field or Flat Field pastures would allow for concurrent monitoring of greater sage-grouse in years when either of those pastures was scheduled for early season use. If an existing or newly established lek is discovered, the timing and location of cattle turnout and trailing would be evaluated to avoid concentrations of cattle in the vicinity of the lek. Nesting may occur at variable distances from the lek. Once eggs are hatched, young sage-grouse are mobile and would more readily avoid cattle or other large ungulates.

Monitoring use levels for upland vegetation as well as riparian vegetation would be critical for determining trends in habitat improvement.

Adaptive management strategies such as reduced time in any given pasture, reduced numbers in cattle or additional fencing to exclude use would all benefit grassland habitat. The Oregon Department of Fish and Wildlife "Greater Sage Grouse Conservation Assessment and Strategy for Oregon." (Oregon Department of Fish and Wildlife, updated April 2011) provides conservation guidelines for grazing including adaptive management strategies similar to those proposed above.

Determination – Greater Sage-Grouse

Because there is potential for some direct impacts to sage-grouse habitat within the project area, the proposed alternatives **May Impact Individuals or Habitat (MIIH)**, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects – Greater Sage-Grouse

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on greater sage-grouse or their habitat.

Cumulatively, unregulated livestock grazing earlier in the century may have impacted shrub, grass, and forb composition within potential greater sage-grouse habitat in the Summit Logan Valley Grazing Authorization Project. Introduction of non-native grasses, introduction of invasive weedy species, changes to habitat due to agricultural development and conversion of sagebrush to hayfields and pastures, fire suppression and resulting succession of lodgepole pine in some areas may have also impacted greater sage-grouse habitat within the project area. Over time, and with changes in grazing management, habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in riparian and upland habitat.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of greater sage-grouse on the Forest.

Silver-bordered Fritillary (Sensitive Species)

While populations of this butterfly are widely distributed across northern and montane regions of North America, the silver-bordered fritillary tends to be localized and endemic in the Pacific Northwest. Two primary colonies occur in Oregon; one at Big Summit Prairie on the Ochoco National Forest and one in the Strawberry Mountains on the Malheur National Forest (Miller and Hammond 2007). Habitat for this species consists of open wet meadows, bogs, and marshes. Caterpillar host plants consist of violets, including pioneer violet (*Viola glabella*) and northern bog violet (*V. nephrophylla*). Adult nectar plants are composite flowers including goldenrod (*Solidago* spp.) and black-eyed Susan (*Rudbeckia* spp.). Emergence and flight of adults begins in June through July, with a second generation flight occurring late summer and fall during August through September (Miller and Hammond 2007).

The silver-bordered fritillary is dependent upon the maintenance of wet meadow habitat and its associated food plants. Downcutting of creeks and subsequent draining and drying out of meadow habitat, loss of native plant species due to overgrazing or trampling by domestic cattle, and invasion of non-native grasses and other weedy species remain the dominant threats to habitat.

Wet meadow habitat comprises approximately three percent of the project area, and occurs within Logan Valley in vicinity of the fen, as well as riparian meadows associated with all of the major drainages in the project area. The food and nectar plants required by the caterpillar and butterfly occur within the project area. No formal surveys for the butterfly were conducted in the Summit Logan Valley Grazing Authorization Project area, but potential habitat was noted.

The silver-bordered fritillary was added to the Malheur National Forest sensitive species list in 2008.

Direct and Indirect Effects - Silver-bordered Fritillary

Impacts to silver-bordered fritillary caterpillars or habitat would depend on timing of cattle grazing, and concentration of animals within pastures containing preferred meadow habitat. Grazing may impact butterfly eggs, young, or food plants. Because of variations in dates of turn-out, not all areas of potential habitat would be impacted by cattle in a given grazing season.

Monitoring use levels and assessing impact to meadow habitat and native vegetation would be critical for determining trends in habitat improvement.

Adaptive management strategies such as: reduced time in any given pasture, or reduced numbers of cattle, as well as additional fencing to exclude use would all benefit meadow habitat.

Determination - Silver-bordered Fritillary

Silver-bordered fritillary has not been documented within the project area. However, because caterpillar and butterfly food plants and meadow habitat exist within all of the allotments, there is potential for impacts to habitat from cattle utilizing vegetation. Not all habitats would be impacted concurrently throughout the project area, providing areas where food plants would persist for this butterfly and its larvae. The proposed alternatives **May Impact Individuals or Habitat (MIIH),** but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects - Silver-bordered Fritillary

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on silver-bordered fritillary or its habitat.

Unregulated livestock grazing earlier in the century impacted meadow habitat within the Summit Logan Valley Grazing Authorization Project. Over time, and with changes in grazing management, habitat has

improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in meadow habitat.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of silver-bordered fritillary on the Forest.

Bobolink (Sensitive Species)

Bobolinks summer in eastern Oregon grasslands and meadows. They are ground nesters, utilizing moist meadows composed of grasses, sedges, and forbs. Willows, cow parsnip, and fence stays are used for song perches (Marshall et al. 2003, 2006). The birds generally nest in loose colonies. Threats to bobolink populations include changes in land use that impact nesting territories, and capture of wintering birds in South America, to be sold as pets (Marshall et al. 2003, 2006).

Bobolink have been documented in vicinity of John Day and Prairie City, Oregon and in Bear Valley and Silvies Valley (Marshall et al. 2003, 2006). They are often associated with agricultural lands, and to a lesser extent wetlands and meadow habitat (Hutto, in Marzluff and Sallabanks, 1998). Although no District sightings of bobolink are documented within the Summit Logan Valley Grazing Authorization Project, potential habitat does exist in the wet meadows found in Logan Valley and Summit Prairie, and larger riparian meadows found within all of the allotments.

Direct and Indirect Effects - Bobolink

Impacts to bobolink or habitat would depend on timing of cattle grazing, and concentration of animals within pastures containing preferred meadow habitat. Early season grazing may have the greatest impact to bobolink by cattle trampling eggs, or by reducing cover through grazing and increasing the exposure of nests. Because of variations in dates of turn-out, not all areas of potential habitat would be impacted by cattle in a given grazing season.

Monitoring use levels and assessing impact to meadow habitat and native vegetation would be critical for determining trends in habitat improvement.

Adaptive management strategies such as: reduced time in any given pasture, or reduced numbers of cattle, as well as additional fencing to exclude use would all benefit meadow habitat.

Determination - Bobolink

Bobolink have not been documented within the project area. However, because meadow or grassland habitat exists within all of the allotments, there is potential for direct impacts from cattle grazing. However, not all habitat would be impacted concurrently throughout the project area, providing nesting and foraging habitat for bobolink. The proposed alternatives **May Impact Individuals or Habitat (MIIH)**, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects - Bobolink

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on bobolinks or their habitat.

Unregulated livestock grazing earlier in the century impacted meadow habitat within the Summit Logan Valley Grazing Authorization Project. Over time, and with changes in grazing management, habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in meadow habitat.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of bobolink on the Forest.

Grasshopper Sparrow (Sensitive species)

Although grasshopper sparrows occur broadly across North America, local populations are small and erratic. In Oregon, the birds are considered very local breeders and rare migrants. They occur in scattered "colonies" along the unforested northern slopes of the Blue Mountains and elsewhere (Marshall 2003, 2006). Habitat consists of drier grassland or bunchgrass prairies with scattered shrubs. A domed nest, concealed by vegetation, is built on the ground. Males sing from elevated perches, such as a flower stalk or fencepost, before diving back into the grasses (Marshall 2003, 2006).

Significant population declines have occurred in North America due to loss, degradation, and incompatible management of grassland habitat (NatureServe 2012).

Although no district sightings of grasshopper sparrow are documented within the Summit Logan Valley Grazing Authorization Project, potential habitat does exist in drier grassland and sagebrush habitat found in Logan Valley.

Direct and Indirect Effects – Grasshopper Sparrow

Impacts to grasshopper sparrow or habitat would depend on timing of cattle grazing, and concentration of animals within pastures containing preferred grassland habitat. Early season grazing may have the greatest impact to grasshopper sparrow by cattle trampling eggs, or by reducing cover through grazing and increasing the exposure of nests. Because of variations in dates of turn-out, not all areas of potential habitat would be impacted by cattle in a given grazing season.

Monitoring use levels and assessing impact to meadow habitat and native vegetation would be critical for determining trends in habitat improvement.

Adaptive management strategies such as reducing time in any given pasture, or reducing numbers of cattle, as well as additional fencing to exclude use, would all benefit grassland habitat.

Determination – Grasshopper Sparrow

Grasshopper sparrows have not been documented within the project area. However, because meadow or grassland habitat exists within all of the allotments, there is potential for direct impacts to habitat from cattle grazing. However, not all habitat would be impacted concurrently throughout the project area, providing nesting and foraging habitat for grasshopper sparrow. The proposed alternatives **May Impact Individuals or Habitat (MIIH)**, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects – Grasshopper Sparrow

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on grasshopper sparrows or their habitat.

Unregulated livestock grazing earlier in the century impacted grassland habitat within the Summit Logan Valley Grazing Authorization Project. Over time, and with changes in grazing management, habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in grassland habitat.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of grasshopper sparrow on the Forest.

Upland Sandpiper (Sensitive Species)

In the Blue Mountains, upland sandpiper habitat is composed of large flat or gently rolling expanses of grassland in mountain valleys, open uplands adjacent to small creek drainages, and wet to dry meadows (Akenson and Schommer 1992). Nesting habitat exists in native prairie, dry meadows, pastures, and domestic hayfields (Nature Serve 2012). Upland sandpipers arrive in breeding areas in late April to early May (Logan Valley), with nesting and egg lying occurring mostly in May and June. The chicks are precocial and leave the nest within a day of hatching; family groups remain together until the post-breeding migration (Nature Serve 2012).

Major threats to upland sandpipers and their breeding habitat include habitat loss or fragmentation (changes in agricultural practices, forest succession, etc.), predation, and possibly direct trampling of nests and overgrazing by livestock (Nature Serve 2012). Lodgepole succession in meadow habitat has occurred in vicinity of the historic nesting and use areas north of FS road 16. The District has conducted thinning and handpiling in select areas to restore meadow habitat in this area.

Upland sandpipers were initially documented in Logan Valley and Bear Valley in 1931 (Jewett 1931 cited in Scoville 1991). Surveys for these two areas were conducted, beginning in 1977, and occurred throughout the 1980s through 1998. Nesting pairs and individual sightings were recorded for both locations (Herman et al. 1985, 1987; Scoville 1990, 1991; Prairie City Ranger District records).

At one point, Logan Valley was the second largest concentration of upland sandpipers in the state, Bear Valley being the largest, although numbers of birds observed have been limited in both areas. The last District sighting of upland sandpipers in Logan Valley was in 1997. However, monitoring since 1998 has been sporadic. No recent sightings of upland sandpipers have been documented for Logan Valley.

This lack of consistent survey effort has made it difficult to draw conclusions regarding current occupancy by upland sandpipers, and consequently to determine effects of management activities.

Historic nest areas in both Bear Valley and Logan Valley consist of pasture or grassland areas, with scattered patches of low-growing sagebrush. This is consistent with Marshall's description: Breeding areas in [eastern] Oregon are associated with mainly dry meadows … that lie at elevations of around 5,000 feet. These meadows have some common characteristics in that they are surrounded by coniferous timber, have low areas that contain surface water during the spring, but in general are dominated by perennial grasses that appear to be sustained in part by high water tables or subsurface irrigation. Low-growing sagebrush (*Artemesia arbuscula*) typically surrounds such meadows or is mixed with the grasses (Marshall 1988).

Grazing has occurred historically as well as currently in both areas. In Bear Valley, nest areas are associated with pastures grazed by cattle, with upland sandpipers observed feeding in adjacent mowed hayfields (Tom Hunt, personal communication). Herman et al. were complimentary to land owners in Bear and Logan Valley by stating "much of the private and public land used by upland sandpipers is grazed conservatively, with the clear intention of preserving overall productivity" (Marshall 1988). Sue Burton (Prairie City Ranger District, Range Management) stated that current grazing practices in Logan Valley are consistent with this statement (Burton, personal communication 2013).

Direct and Indirect Effects – Upland Sandpiper

Impacts to upland sandpipers or habitat would depend on timing of cattle grazing, and concentration of animals within grassland or meadow habitat. Early season grazing may have the greatest impact to upland sandpipers by cattle trampling eggs, or by reducing cover through grazing and increasing the exposure of nests. "In grazed pastures cattle should optimally be restricted from nesting fields during the egg-laying and incubation periods" (NatureServe 2011). In Logan Valley, this has typically been late May, June, into mid-July (Akenson 1993). Because upland sandpipers show a degree of nest site fidelity, monitoring of the historic nesting and use areas within Big Field and Flat Field would be required for any early season (prior to August 1) grazing proposed for these two pastures (See Design Elements). To avoid impacting habitat north and south of National Forest System road 16, both of these pastures would not be grazed at the same time (See Design Elements).

In addition, monitoring use levels and assessing impact to meadow habitat and native vegetation would be critical for determining trends in habitat improvement. Monitoring requirements and 5 and 10 year Management Objectives are found in chapter 2 and appendix A (Table 103) respectively.

Adaptive management strategies such as reduced time spent in any given pasture, or reduced numbers of cattle, as well as additional fencing to exclude cattle use would all benefit meadow habitat. The adaptive strategy that includes fencing of the fen within the Big Field pasture, could impact upland sandpiper nesting habitat by concentrating cattle in vicinity of historic nest areas. Because upland sandpipers exhibit nest site fidelity, maintaining historically used areas is important. To avoid impacting these upland sandpiper nesting areas, the location of the fence would be determined by the district wildlife biologist working with the forest botanist, and range specialist.

Determination – Upland Sandpiper

No recent sightings of upland sandpiper have been documented within the project area. Because of the very low numbers of birds that may potentially be present in Logan Valley, any impact to a nest by trampling, or increased predation by crows or coyotes due to nest exposure as a result of grazing would be detrimental to the Forest population. Because young birds are precocial and mobile once hatched, later season light to moderate grazing would have minimal impacts to upland sandpipers or their young (NatureServe 2012).

Because upland sandpipers show strong site fidelity to their nesting areas (Nature Serve 2012), Design Elements requiring monitoring for the birds within known historic nesting/use areas of upland sandpipers would occur prior to any early season grazing of Big Field. If the upland sandpipers are documented during surveys, cattle turnout into these fields would be postponed until later in the season. Early season grazing of both Big Field and Flat Field at the same time would not occur, providing nesting habitat in one pasture or the other. This is consistent with management recommendations from Dechant et al. 1999, Houston et al. 2011, and NatureServe 2012.

Should monitoring of the fen indicate a need for protection via fencing, layout of any fence would be determined by consulting with the district wildlife biologist, in order to avoid concentrating cattle near historic upland sandpiper nesting areas.

Late season grazing (after August 1) of Big Field would result in **No Impact (NI)** to upland sandpipers as the birds readily move and would avoid cattle. If no upland sandpipers are documented during May and June monitoring, early season grazing of Big Field would also result in **No Impact (NI)** to upland sandpiper populations. **Monitoring would be required** for any early season turnout and grazing of Big Field (see Design Elements and Monitoring, chapter 2). If upland sandpipers are documented during these surveys, turnout would be postponed in order to allow nesting and incubation of upland sandpipers to

occur without risk of trampling or disturbance. Foraging habitat is available in several pastures within Logan Valley.

Cumulative Effects – Upland Sandpiper

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on upland sandpiper or its habitat.

Unregulated livestock grazing earlier in the century impacted grassland and meadow habitat within the Summit Logan Valley Grazing Authorization Project. Over time and with changes in grazing management, this habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in meadow habitat. Ongoing thinning and proposed future burning projects would also have the potential for restoring meadow and grassland habitat important for upland sandpipers. Design elements associated with the proposed activities within historic sandpiper use areas would require fall burning and timing for thinning operations to eliminate disturbance to breeding and nesting upland sandpipers.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of upland sandpipers.

Lewis's Woodpecker (Sensitive Species)

Lewis's woodpecker breeds from southwestern Canada and Montana, south to central California, Colorado, Arizona, and New Mexico. It winters from northern Oregon south to northern Mexico and west Texas. In Oregon, Lewis's woodpecker breeds along the east slope of the Cascades, within the Blue Mountains, and within riparian areas across eastern Oregon (Marshall et al. 2003, 2006).

Lewis's woodpecker inhabits primarily open forest and woodlands; it is distinguished from other woodpecker species by its unique flycatching behavior and distinctive plumage (Marshall et al. 2003, 2006).

This species is considered a weak excavator and seldom excavates its own nest cavity; instead it relies on cavities created by other woodpeckers (Bock 1970). Lewis's woodpeckers also use natural cavities, or will excavate their own in very soft snags (Draft Forest Plan Revision 2011). Home ranges are 2.5 to 15 acres in size (Johnson and O'Neil 2001). In burned areas, ponderosa pine snags greater than 16 inches dbh are chosen for nesting. Similar diameter cottonwood snags in riparian areas are selected (Galen 1989).

Nesting habitat consists of three distinct types in eastern Oregon: riparian areas with large cottonwoods, open canopied old forest in ponderosa pine, or burned old forest in ponderosa pine (Wisdom et al. 2000).

Woodpecker abundance is typically higher in post-fire habitat (Draft Forest Plan Revision 2011). North of the project area, the 10,022 acre Snowshoe, Corral, Basin, and Sheep fires burned in 1990; portions of these fires were salvage logged. A few remaining snags still stand, although most have fallen. The 9,917 High Robert fire burned in 2002. This fire may still provide some snag habitat for Lewis's woodpeckers.

Lacking cottonwoods in Logan Valley, aspen stands with larger diameter trees and aspen snags have been used by Lewis's woodpeckers for nest habitat. Nesting Lewis's woodpeckers have been documented in at least two aspen stands within the vicinity of the fen in Logan Valley. Five adult birds (two pairs and one single adult) were observed mid-May in and around a patch of larger aspen snags on the south perimeter of the fen in 2012.

Habitat assessments and viability outcomes for Lewis's woodpecker have been developed for the Blue Mountain Forest Plan Revision (Draft Forest Plan Revision 2011). While habitat historically was broadly distributed and in high abundance, current habitat is patchily distributed or isolated and in low abundance.

Lewis's woodpecker was added to Regional Forester's Sensitive Species list in 2008.

Direct and Indirect Effects – Lewis's Woodpecker

Within open ponderosa pine, or post fire habitat, nesting and foraging habitat for Lewis's woodpecker would not be affected by cattle grazing or associated activities.

Cattle grazing within aspen stands continues to impact recruitment of sapling and young aspen that would allow stands to persist as older mature trees die. While mature trees currently exist in many stands, over time there would be a reduced presence of large aspen trees and snags, due to this lack of replacement. Other factors impacting aspen stands include conifer encroachment and browsing by wildlife.

Determination – Lewis's Woodpecker

Cattle grazing would not impact snag habitat for Lewis's woodpeckers within conifer stands. However, cattle grazing has the potential to adversely affect the recruitment of young aspen in stands where old mature trees are dying and falling to the ground. In the mid- to long-term, a loss of aspen habitat, especially larger diameter trees and snags, may reduce nesting habitat for Lewis's woodpecker. Ongoing restoration projects including conifer removal within aspen stands, and protection for aspen in this area would lessen this impact.

Consequently, the proposed alternatives **May Impact Individuals or Habitat (MIIH)**, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects – Lewis's Woodpecker

The area considered for cumulative effects is the project area and adjacent subwatersheds to include post-fire habitat. All of the activities in appendix C have been considered for their cumulative effects on Lewis's woodpecker.

Past timber harvest, fire suppression, road construction, wildfire, and firewood cutting have all impacted the quality, quantity, and distribution of suitable snag habitat within the project area. The High Roberts Fire, which burned in 2002, just north Summit Logan Valley Grazing Authorization Project area, may currently provide nesting habitat for Lewis's woodpeckers. Prescribed underburning in the Merit Timber Sale area may also provide some post-fire habitat. Cattle grazing would not cumulatively impact existing snag habitat within green or burned conifer stands.

Large diameter aspen and snags within the project area also provide some Lewis's woodpecker nesting and foraging habitat. Conifer encroachment, along with grazing by domestic and wild ungulates, continues to degrade aspen stands and in the mid- to long-term may result in loss of habitat for Lewis's woodpecker. Larger aspen stands within the project area are more resilient, and would persist in the short- to mid-term. Without successful recruitment of sapling size replacement trees, some small stands may die out.

Ongoing and past aspen restoration projects (which include conifer removal and protection) are expected to hold a percentage of aspen stands on the landscape. Monitoring is needed to assess the continued long-term impact of grazing on aspen habitat and to implement effective management strategies to lessen these impacts (See Monitoring, chapter 2).

In the short-term, public firewood cutting is expected to continue along open roads. It is foreseeable that the Malheur Forest Access Travel Management Plan would prohibit cross country travel on the Malheur National Forest with the exception of travel from designated open roads to dispersed camp areas. It is expected that with the implementation of the Access Travel Management Plan there would be reduced access for firewood cutting and improved retention of large diameter snags.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of Lewis's woodpecker on the Forest.

White-headed Woodpecker (Sensitive species)

White-headed woodpeckers are considered a resident from the southern interior British Columbia, though central Washington, northern Idaho, east and southwest Oregon, through the Sierras to southern California. In Oregon they are found along the east slope Cascades and within the Ochoco, Blue and Warner Mountains. They are rare west of the Cascades, and are found in the Siskiyou Mountains and Umpqua River basin (Marshall et al. 2003, 2006, Wahl et al. 2005).

The white-headed woodpecker occurs mainly in open ponderosa pine or mixed conifer forests dominated by ponderosa pine (Marshall et al. 2003, 2006). This species relies heavily upon the seeds from ponderosa pine cones for its foraging needs as well as insects gleaned off ponderosa pine and mixed conifer trees. Large ponderosa pine snags, mean diameters ranging from 25 to 31 inches, are utilized for nesting (Frenzel 1995 in Marshall et al. 2003, 2006). Nest cavities are relatively low to the ground, and can fail as a result of predation from small mammals. Home range sizes are quite variable, ranging from 165 to 1,099 acres (mean of 257 acres in contiguous habitat, mean of 793 acres in fragmented habitat)(Dixon 1995).

Habitat degradation and loss of large diameter ponderosa pine stands continue to be the greatest threats to white-headed woodpeckers. Habitat for white-headed woodpeckers in Oregon and Washington is probably less than 10 percent of what existed prior to European-American settlement (Henjum et al. 1994, in Marshall et al. 2003, 2006). Historically, white-headed woodpeckers were well distributed throughout the Blue Mountains.

White-headed woodpeckers have been documented in Logan Valley at Big Creek Campground, Lake Creek Youth Camp, and south of Summit Prairie. One nest cavity was observed in a live aspen tree at Lake Creek Youth Camp (Kranich, personal observation).

White-headed woodpeckers were added to the Regional Forester's Sensitive Species List in 2008.

Direct and Indirect Effects – White-headed Woodpecker

Within open ponderosa pine, or post-fire habitat, nesting and foraging habitat for white-headed woodpeckers would not be affected by cattle grazing or associated activities. Cattle and wildlife use of shrub species in the understory of ponderosa pine may impact hiding cover and foraging habitat for small mammals, reducing potential predation of white-headed woodpecker nests.

While not considered typical, large diameter aspen snags within the project area may provide some white-headed woodpecker nesting habitat. Conifer encroachment, along with grazing by domestic and wild ungulates, continues to degrade aspen stands and in the mid- to long-term may result in some loss of habitat for white-headed woodpeckers. Larger aspen stands within the project area are more resilient, and would persist in the short- to mid-term. Without successful recruitment of sapling size replacement trees,

some small stands may die out. Ongoing aspen restoration projects have protected some aspen within the project area by fencing or slash barriers.

Determination – White-headed Woodpecker

Cattle grazing and the associated activities from all alternatives would not impact snag habitat for white-headed woodpeckers within ponderosa pine stands, or foraging habitat associated with open large ponderosa pine, or mixed conifer stands where ponderosa pine is dominant.

Cattle grazing has the potential to adversely affect the recruitment of young aspen in stands where old mature trees are dying and falling to the ground. Although not used to the extent that other woodpeckers use aspen stands, white-headed woodpeckers have been observed using aspen snags as nest sites (Kranich, personal observation). In the mid- to long-term, a loss of aspen habitat, especially larger diameter trees and snags, may reduce some potential nesting habitat for white-headed woodpeckers. Ongoing restoration projects including conifer removal and protection for aspen in this area would lessen this impact.

Consequently, the proposed alternatives **May Impact Individuals or Habitat (MIIH)**, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects – White-headed Woodpecker

The area considered for cumulative effects is the project area and adjacent subwatersheds to include post-fire habitat. All of the activities in appendix C have been considered for their cumulative effects on white-headed woodpeckers.

Past timber harvest, fire suppression, road construction, wildfire, and firewood cutting have all impacted the quality, quantity, and distribution of suitable snag habitat within the project area. The High Roberts Fire, which burned in 2002, just north Summit Logan Valley Grazing Authorization Project area, may currently provide nesting habitat for white-headed woodpeckers. Prescribed underburning in the Merit Timber Sale area may also provide some post-fire habitat. Cattle grazing would not cumulatively impact existing snag habitat within green or burned ponderosa pine stands.

Conifer encroachment, along with grazing by domestic and wild ungulates, continues to degrade aspen stands and in the mid- to long-term may result in an incidental loss of nesting habitat for white-headed woodpeckers. Larger aspen stands within the project area are more resilient, and would persist in the short- to mid-term. Without successful recruitment of sapling size replacement trees, some small stands may die out.

Ongoing and past aspen restoration projects (which include conifer removal and protection) are expected to hold a percentage of aspen stands on the landscape. Monitoring is needed to assess the continued long-term impact of grazing on aspen habitat and to implement effective management strategies to lessen these impacts (See Monitoring, chapter 2).

In the short-term, public firewood cutting is expected to continue along open roads. It is foreseeable that the Malheur Forest Access Travel Management Plan would prohibit cross country travel on the Malheur National Forest with the exception of travel from designated open roads to dispersed camp areas. It is expected that with the implementation of the Access Travel Management Plan there would be reduced access for firewood cutting and improved retention of large diameter snags.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of white-headed woodpecker on the Forest.

Townsend's Big-eared Bat (Sensitive species)

Townsend's big-eared bat occurs from south central British Columbia to northern Baja California, and from the Pacific Coast east through Montana, portions of South Dakota, Colorado, New Mexico, Oklahoma, and Texas, and into Mexico. In Oregon, these bats have been collected throughout most of the state except in parts of the Blue Mountains Province, and in the western part of the Basin and Range Province (Verts and Carraway 1998).

Roost habitat includes caves, mines, hollow trees, and man-made structures (Woodruff and Ferguson 2005). Snags and large trees may be important roosts for this species, although maternity colonies and winter hibernacula are usually associated with caves, mines, or buildings (Woodruff and Ferguson 2005). In eastern Oregon, ponderosa pine, mixed conifer forest, and riparian-wetland habitat is used by Townsend's big-eared bats. Insects are generally captured in the air, the bats forage in and around foliage at mid and upper canopy levels.

Threats include disturbance or destruction of roost sites, loss or degradation of water sources and foraging areas, and exposure to pesticides or other toxic chemicals.

Townsend's big-eared bats are documented for the Malheur National Forest. Although no bat surveys were conducted, cliff, rock crevice, large tree and snag, and foraging habitat occur within the project area.

Direct and Indirect Effects - Townsend's Big-eared Bat

No impacts to roost habitat (cliffs, rock crevices, snags, old buildings, caves) are expected from cattle grazing. However, foraging habitat and insect prey diversity and abundance may be impacted by grazing of vegetation. Impacts to vegetation would depend on location and duration of grazing. Use levels and move triggers that result in improvements to riparian vegetation would benefit diversity and abundance of insect prey species and ultimately bat species. Improvements and increases in riparian vegetation resulting in beaver re-colonization of stream reaches, and resulting beaver ponds, would also increase riparian vegetation diversity, and alter insect prey diversity and abundance (Keinath 2004). Although aspen stands would continue to exist in the short to mid-term, continued impact of ungulate grazing on aspen stands, as well as conifer shading, may result in loss of smaller stands, and reduced diversity of habitat, impacting insect prey species used by Townsend's big-eared bats.

Monitoring use levels and assessing impact to riparian vegetation as well as aspen habitat would be critical for determining trends in habitat improvement.

Adaptive management strategies such as reduced time in any given pasture, or reduced numbers of cattle, as well as additional fencing to exclude use would benefit foraging habitat. Depending on placement, barb-wire fencing in riparian areas may negatively impact individual bats if animals become impaled on wire. Stream crossings of fences in particular need to be visible to bats and birds to allow animals to avoid wires. Pond construction or spring developments may provide water sources for bats. Design elements require wildlife escape ramps placed in troughs to avoid trapping small mammals, bats and birds (See Design Elements, chapter 2). Depending on number of cattle, trampling, muddy water and manure may make ponds less palatable or useful for bats as drinking sources late season.

Determination - Townsend's Big-eared Bat

No surveys for Townsend's big-eared bat have occurred within the project area, however potential roost and foraging habitat does exist. Surveys for bat species have been conducted on Emigrant Creek Ranger District as part of the Oregon Bat Grid project. Acoustic surveys using Pettersen Bat Detectors and recording devices and mist netting for identification and determination of reproductive status, collecting genetic and bat call information, were part of the study. Acoustic surveys have also been conducted on

Blue Mountain and Prairie City Ranger Districts, associated with mine closures, bat gate installations, and vegetation and fuels reduction projects (Soda Bear and Elk 16). Improvements to riparian vegetation would benefit Townsend's big-eared bat prey species. Lack of sapling recruitment within aspen stands continues to be an adverse impact from ungulate grazing. Conifer shading and competition with aspen compounds this problem. Depending on placement, wire fencing has potential to impale bats, directly impacting individuals. Direct impacts from fences could be minimized by making fences more visible (see Design Elements, chapter 2).

Consequently, the proposed alternatives May Impact Individuals or Habitat (MIIH), but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects - Townsend's Big-eared Bat

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on Townsend's big-eared bat or their habitat.

Unregulated livestock grazing earlier in the century impacted grassland and riparian habitat within the Summit Logan Valley Grazing Authorization Project. Over time, and with changes in grazing management, habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in meadow and riparian habitat. As a result, diversity and abundance of insect prey species for Townsend's big-eared bat would be maintained, or expected to improve.

Ongoing and past aspen restoration projects (which include conifer removal and protection) are expected to hold a percentage of aspen stands on the landscape. Monitoring is needed to assess the continued long-term impact of grazing on aspen habitat and to implement effective management strategies to lessen these impacts.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of Townsend's big-eared bat on the Forest.

Pallid Bat (Sensitive species)

The pallid bat occurs from southern British Columbia through the Pacific states to northern Mexico,and east through portions of Nevada, Utah, Wyoming, Colorado, Kansas, Oklahoma, Arizona, New Mexico, and Texas. In Oregon, pallid bats occur in the drier interior valleys from Lane-Benton county line south, and throughout eastern Oregon, except for the most northeast portion of the Blue Mountains (Verts and Carraway 1998). Records are documented for Grant County (Verts and Carraway 1998). Pallid bats are documented using the John Day Fossil Beds National Monument near Goose Rock and the castle-like palisade formations near Clarno (Rodhouse, personal communication, 2012).

Habitat for pallid bats in Oregon includes drier shrub/steppe habitat and grasslands, often near rocky outcrops and water. Open ponderosa pine forest that includes cliff habitat is also used (Ferguson and Azerrad 2004, NatureServe 2012). Roosts include rock crevices, buildings, under bridges, under rock overhangs. Rock piles, hollow trees, and cavities in ponderosa pine are also used (Verts and Carraway 1998). Pallid bats forage for arthropods and insects off the ground, their diet composed of beetles, moths, crickets, scorpions, centipedes, as well as an occasional lizard or small rodent (Verts and Carraway 1998).

Although no bat surveys were conducted, rock outcrops, cliff habitat, sagebrush, juniper woodland, and grassland foraging habitat occur within the project area.

Direct and Indirect Effects – Pallid Bat

No impacts to roost habitat (cliffs, rock outcrops, rock crevices, hollow trees, old buildings) are expected from cattle grazing. However, foraging habitat and insect prey diversity and abundance may be impacted by grazing of vegetation. Impacts to vegetation would depend on location and duration of grazing. Use levels and move triggers that maintain adequate cover and diversity of plant species would provide for the prey species required by pallid bats. Monitoring use levels and assessing impact to upland vegetation would be critical for determining trends in habitat.

Adaptive management strategies such as reduced time in any given pasture, or reduced numbers of cattle, would benefit foraging habitat. Depending on placement, barb-wire fencing in vicinity of rock outcrops and potential roost areas may negatively impact individual bats if animals become impaled on wire.

Stream crossings of fences in particular need to be visible to bats and birds to allow animals to avoid wires. Pond construction or spring developments may provide water sources for bats. Design elements require wildlife escape ramps placed in troughs to avoid trapping small mammals, bats and birds (See Design Elements, chapter 2). Depending on number of cattle, trampling, muddy water, manure may make ponds less palatable or useful for bats as drinking sources late season.

Determination – Pallid Bat

No surveys for pallid bat have occurred within the project area, however roost and foraging habitat does exist. Use levels and move triggers to retain adequate upland vegetation for other wildlife would also benefit prey species that pallid bats depend on. Depending on placement, barb-wire fencing has potential to impale bats, directly impacting individuals. Direct impacts from fences could be minimized by making fences more visible (see Design Elements, chapter 2).

Consequently, the proposed alternatives **May Impact Individuals or Habitat (MIIH)**, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects – Pallid Bat

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on pallid bats or their habitat.

Unregulated livestock grazing earlier in the century impacted grassland as well as riparian habitat within the Summit Logan Valley Grazing Authorization Project. Over time, and with changes in grazing management, habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in grassland and riparian habitat. As a result, diversity and abundance of insect prey species for pallid bat would be expected to be maintained or improved.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of pallid bats on the Forest.

Fringed Myotis (Sensitive species)

Fringed myotis occurs from south central British Columbia to northern Baja California, and east through southeast Idaho and portions of Wyoming, Colorado, New Mexico, South Dakota, Texas. In Oregon, these small bats occur in the Coast Range from Jackson to Clatsop counties and in northeastern Oregon. A museum specimen is recorded from Grant County (Verts and Carraway 1998). Although their range is large, fringed myotis are rare and patchily distributed within this range (Keinath 2004).

Roost habitat includes caves, mines, cliffs, buildings, and snags. Suitable tree roosting habitat contains late successional ponderosa pine with high density clusters of snags in early to medium stages of decay (Keinath 2004). Foraging habitat includes a heterogeneous mix of conifer forest, including ponderosa pine, Douglas-fir, and shrubland/grassland, with ample water sources and an abundance of insect prey (Keinath 2004). Threats include disturbance or destruction of roost sites, loss or degradation of water sources and foraging areas, and exposure to pesticides or other toxic chemicals.

Fringed myotis are documented for the Malheur National Forest. Although no bat surveys were conducted, cliff, snag, and foraging habitat occur within the project area.

Direct and Indirect Effects – Fringed Myotis

No impacts to roost habitat (cliffs, rock crevices, snags, old buildings, caves) are expected from cattle grazing. However, foraging habitat and insect prey diversity and abundance may be impacted by grazing of vegetation. Impacts to vegetation would depend on location and duration of grazing. Use levels and move triggers that result in improvements to riparian vegetation would benefit diversity and abundance of insect prey species and ultimately bat species. Improvements and increases in riparian vegetation resulting in beaver re-colonization of stream reaches, and resulting beaver ponds, would also increase riparian vegetation diversity, and alter insect prey diversity and abundance (Keinath 2004). Although aspen stands continue to exist in the short to mid-term, continued impact of ungulate grazing on aspen stands, as well as conifer shading, may result in loss of smaller stands, and reduced diversity of habitat, impacting insect prey species.

Monitoring use levels and assessing impact to riparian vegetation as well as aspen habitat would be critical for determining trends in habitat improvement.

Adaptive management strategies such as reduced time in any given pasture, or reduced numbers of cattle, as well as additional fencing to exclude use would benefit foraging habitat. Depending on placement, barb-wire fencing in riparian areas may negatively impact individual bats if animals become impaled on wire. Stream crossings of fences in particular need to be visible to bats and birds to allow animals to avoid wires. Pond construction or spring developments may provide water sources for bats. Design elements require wildlife escape ramps placed in troughs to avoid trapping small mammals, bats and birds (see Design Elements, chapter 2). Depending on number of cattle, trampling, muddy water, manure may make ponds less palatable or useful for bats as drinking sources late season.

Determination – Fringed Myotis

No surveys for fringed myotis have occurred within the project area, however roost and foraging habitat does exist. Improvements to riparian vegetation would benefit fringed myotis prey species. Lack of sapling recruitment within aspen stands continues to be an adverse impact from ungulate grazing. Conifer shading and competition compounds this problem. Depending on placement, wire fencing has potential to impale bats, directly impacting individuals. Direct impacts from fences could be minimized by making fences more visible (see Design Elements, chapter 2).

Consequently, the proposed alternatives **May Impact Individuals or Habitat (MIIH)**, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects – Fringed Myotis

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on fringed myotis or their habitat.

Unregulated livestock grazing earlier in the century impacted grassland and riparian habitat within the Summit Logan Valley Grazing Authorization Project. Over time, and with changes in grazing management, habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in grassland and riparian habitat. As a result, diversity and abundance of insect prey species for fringed myotis would be expected to improve.

Ongoing and past aspen restoration projects (which include conifer removal and protection) are expected to hold a percentage of aspen stands on the landscape. Monitoring is needed to assess the continued long-term impact of grazing on aspen habitat and to implement effective management strategies to lessen these impacts.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of fringed myotis on the Forest.

Johnson's Hairstreak Butterfly (Sensitive species)

Johnson's hairstreak butterfly has been found from southwestern British Columbia, south through Washington, Oregon, and western Idaho to central California. Scattered sightings in Oregon occur in the Coast Range, Siskiyou Mountains, Blue Mountains, and Wallowas.

Habitat is associated with dwarf mistletoe (*Arceuthobium* spp.) found within old growth, and late successional second growth coniferous forest. Younger forests where dwarf mistletoe is present also support butterfly populations (Huff 2011).

Butterflies spend the majority of their time in the top of the forest canopy, so are infrequently seen. Larvae feed on all exposed plant parts of dwarf mistletoe, and can be found on host leaves April through October. Adults feed on nectar of flowers from numerous genera including *Actostophylos, Ceanothus, Cornus, Fragaria, Rorrippa*, and *Spraguea*, etc. In northern parts of the range, or at higher altitudes, adults fly from late May through mid-July. At lower elevations, adults fly from mid-May to early September, with peaks occurring in May and August (Pyle 2002 in Huff 2011).

Threats include loss of habitat from logging or fire, widespread use of BTK bacterium (as applied in large-scale aerial treatments to control other forest pests such as spruce budworm), and some herbicides applied to flowering plants that support adult butterflies.

The Johnson's hairstreak was added to the Malheur National Forest Sensitive Species list in 2011.

Direct and Indirect Effects – Johnson's Hairstreak Butterfly

No documented occurrences of Johnson's hairstreak have been recorded within the project area; however, suitable habitat does exist. Dwarf mistletoe supporting caterpillar larvae occurs within mixed conifer stands found within and adjacent to the allotments. Nectar plants used by adult butterflies are generally widespread and common. Many, such as ceanothus, are not usually impacted by cattle grazing.

Determination – Johnson's Hairstreak Butterfly

Because dwarf mistletoe supporting Johnson's hairstreak larvae would not be impacted by cattle grazing, and because nectar plants used by adults are common, found throughout the project area, and often not utilized by cattle, there would be **No Impact (NI)** to Johnson's hairstreak populations or habitat.

Cumulative Effects – Johnson's Hairstreak Butterfly

Cumulative effects were analyzed at the project area level and adjacent subwatersheds (post-fire habitat containing ceanothus). All of the activities listed in appendix C were considered for their cumulative effects on Johnson's hairstreak and potential habitat. Past activities such as timber harvest, road construction, fire suppression, grazing, and wildfire have combined to create the current condition in the analysis area. The combined effects of the Summit Logan Valley Grazing Authorization project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations or viability of Johnson's hairstreak butterfly within the project area or at the Forest level.

Columbia Clubtail (Sensitive species)

The Columbia clubtail is a medium sized black and yellow clubtail dragonfly. Habitat is found along sandy to rocky, slow-flowing rivers. Columbia clubtail eggs are broadcast in the water. Once hatched, clubtail larvae burrow in and overwinter in mud along the banks. Larval habitat (river) is most crucial. Adults forage mid-June through mid-August among riparian shrubs (Scheuering 2006).

Currently, only five populations of the Columbia clubtail are known within Oregon and Washington: one on the Yakima River in Benton County, Washington, one on the Owyhee River in Malheur County, Oregon, and three on the John Day River system in Grant County, Oregon. Habitats for each of these river systems vary, there is potential for this dragonfly to occur over a range of river systems, including Idaho. However, none have been found elsewhere in the region as yet (Abbott 2007, in NatureServe 2012).

Threats to this dragonfly include heavy amounts of siltation, agricultural runoff, or introduced predatory fish. The Columbia clubtail was added to the Malheur National Forest Sensitive Species list in 2011.

Direct and Indirect Effects – Columbia Clubtail

No documented occurrences of Columbia clubtail have been recorded within the project area. However, habitat suitable for Columbia clubtail may exist along the Malheur River within the Logan Valley Allotment. Impacts to this dragonfly or habitat would depend on timing of cattle grazing, and concentration of animals within pastures containing riparian habitat. Because of variations in dates of turn-out, not all areas of potential habitat would be impacted by cattle in a given grazing season.

Use levels and move triggers scheduled for all allotments within their respective riparian habitat conservation areas are designed to restore riparian vegetation and shrub habitat, improving habitat for Columbia clubtails.

Monitoring use levels and assessing impact to riparian habitat and native vegetation would be critical for determining trends in habitat improvement.

Adaptive management strategies such as reduced time in any given pasture, or reduced numbers of cattle, as well as additional fencing to exclude use would benefit riparian habitat.

Determination – Columbia Clubtail

Columbia clubtail dragonflies have not been documented within the project area. However, because potential habitat may exist along the Malheur River within the project area, there is potential for some direct impacts from cattle utilizing vegetation. Not all habitat would be impacted concurrently within the project area. The proposed alternatives **May Impact Individuals or Habitat (MIIH)**, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects – Columbia Clubtail

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on Columbia clubtail or its habitat.

Cumulatively, unregulated livestock grazing earlier in the century impacted riparian habitat within the Summit Logan Valley Grazing Authorization Project. Over time, and with changes in grazing management, riparian habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in bank stability, shrub recruitment, and herbaceous vegetation important for Columbia clubtail.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of Columbia clubtail dragonflies.

Management Indicator Species

The National Forest Management Act directs National Forests to designate management indicator species and the Forest Service Manual Direction 2621.1 defines the criteria for selection of management indicator species. Management activities on the Forest that would affect management indicator species populations and habitat, would also affect populations of other species with similar habitat needs.

The Malheur Forest Plan identifies twelve (12) management indicator species. In order to appropriately analyze potential project impacts to management indicator species, three habitat types were selected. Big game habitat, old growth habitat, and primary excavator habitat (standing dead and downed wood) are discussed.

Table 98 describes the 12 management indicator species selected for the Malheur National Forest. The table also includes associated habitat requirements and whether habitat occurs within the project area.

Table 98. Management indicator species summary (Malheur National Forest)

MIS Species	Representing	Habitat Requirements	Habitat Present in Analysis Area
Elk	Commonly hunted Big-game Species	Forested Mountains and meadows with grasses and forbs	Yes, including known calving area within Logan Valley fen and vicinity
American (Pine) Marten	Old Growth	Mature, mesic coniferous forests, with high structural diversity in the under story	Higher elevation mixed conifer stands: designated old growth stands, replacement old growth stands, late and old structure on Lake Creek and Big Creek.
Pileated Woodpecker	Old Growth, Primary Cavity Nester, Snags and Down Wood	Extensive areas of dense coniferous forests with tall closed canopy, high basal area and large diameter snags	Yes, mixed conifer stands, drainages, designated old growth stands, replacement old growth stands, late and old structure on Lake Creek and Big Creek.
Three-toed Woodpecker	Old Growth, Primary Cavity Nester, Snags and Down Wood	Higher elevation (above 4,500ft) lodgepole pine and mixed conifer forests with a lodgepole component	Yes, lodgepole pine habitat within the project area.

MIS Species	Representing	Habitat Requirements	Habitat Present in Analysis Area
Lewis's Woodpecker	Primary Cavity Nester, Snags and Down Wood	Open forests and nests in large snags in cavities created by other cavity nesters or in very soft snags	Yes, have been documented nesting in aspen within the project area.
Red-naped Sapsucker[a]	Primary Cavity Nester, Snags and Down Wood	Associated with riparian habitats consisting of a mixture of grasses shrubs and hard woods	Yes, associated with aspen stands
Williamson's Sapsucker	Primary Cavity Nester, Snags and Down Wood	Mature higher-elevation coniferous forests for nesting and feeding	Yes, associated with aspen stands, associated with larger conifer.
Downy Woodpecker	Primary Cavity Nester, Snags and Down Wood	Associated with riparian habitats consisting of a mixture of grasses shrubs and hard woods	Yes, Big Creek, Lake Creek, portions of Summit Creek provide the most suitable habitat, as well as aspen habitat in riparian areas
Hairy Woodpecker	Primary Cavity Nester, Snags and Down Wood	Habitat generalists that prefer large trees	Yes
White-headed Woodpecker	Primary Cavity Nester, Snags and Down Wood	Open ponderosa pine forests with large trees and snags in large patches	Yes, dry forest, large tree and open-canopied habitat.
Black-backed Woodpecker	Primary Cavity Nester, Snags and Down Wood	Forests with dead, insect-infested trees associated with large-scale disturbances such as fire or wind throw	Yes, lodgepole pine habitat within the project area.
Northern Flicker	Primary Cavity Nester, Snags and Down Wood	Habitat generalists that prefer large trees stands near meadows	Yes

a - Red-naped sapsuckers represent the east version of red-breasted and yellow-bellied sap suckers originally listed in the Forest Plan

Affected Environment and Environmental Consequences Management Indicator Species

Big Game Habitat (Elk)

Rocky Mountain elk were selected as a Management Indicator Species for the Malheur National Forest due to their economic and social value, and their response to changes in forest cover, forage quality, and road densities. Elk are grazers, primarily eating grasses. Lesser amounts of forbs and woody plants are also consumed. Elk are vulnerable to disturbance, displacement, and hunting pressure. High-quality habitat for elk provides effective escape and hiding cover.

Elk as well as mule deer are widely distributed across the District, Forest and the Blue Mountain Region. Both species occur throughout the Summit Logan Valley Grazing Authorization Project area. The large grassland/meadow habitat within Logan Valley and the fen area are an important calving and fawning area for elk, mule deer, and pronghorn antelope in May and June. Elk and deer use a mosaic of cover and forage habitat found within the project area.

All four allotments within the Summit Logan Valley Grazing Authorization Project are classified as summer range. Portions of the project area are utilized as migration corridors to lower elevation winter range (Jackle, Oregon Department of Fish and Wildlife, personal communication, 2012).

Big Game Populations

Big game management on the Malheur National Forest is a cooperative effort between the Forest Service and the Oregon Department of Fish and Wildlife. The Forest Service manages habitat while Oregon Department of Fish and Wildlife manages big game populations. The project area occurs within the Murderer's Creek and Malheur River Big Game Management Units.

Total elk population estimates may vary; animals are highly mobile, and may move back and forth across boundaries between hunt units (Oregon Department of Fish and Wildlife 2011). However, for both of these units, trends indicate that elk populations have remained at or slightly above management objectives for the last several years. Conversely, mule deer populations have remained below management objectives (Oregon Department of Fish and Wildlife 2011).

The Murderer's Creek Big Game Management Unit consists of approximately 1,150 square miles (736,002 acres) with a management objective of 1,700 elk. The Malheur River Big Game Management Unit consists of approximately 2,954 square miles (1,890,567 acres) with a management objective of 1,500 elk.

The Summit Logan Valley Grazing Authorization project allows summer pasture for approximately 680 cow/calf pairs (1,360 animals) within the 40,279 acre project area (Burton 2012).

Bull to cow ratios are influenced by a number of factors including numbers of hunters, length of hunting seasons, lack of hiding cover, high open road densities, and others (Schommer and Johnson 2003). As bull/cow ratios decline below 10 bulls/100 cows, breeding dynamics within a herd also change, and there can be a corresponding reduction in cow/calf ratios (Oregon Department of Fish and Wildlife 2003). Both units have met or exceeded this threshold of bull to cow ratios for most years since 2000.

Calf recruitment represents the number of sub-adult animals added to the population each year. Recruitment levels are expressed as the number of calves per 100 cows. The average number of calves needed to sustain an elk population ranges from between 20 to 40 calves per 100 cows, depending on the annual adult mortality. Both units have generally been within this range.

Although elk population estimates have been at or above management objectives, animals are not always well distributed. Within the Murderer's Creek Big Game Management Unit, current trend has been a continued movement of animals off Forest lands and onto private lands. Wildlife biologists with the Oregon Department of Fish and Wildlife attribute this poor distribution to open road densities, increased hunting pressure, cougar predation, and reduced forage.

Forage

Forage consists of woody and non-woody plants that are available to livestock or wildlife as a food source. While forage is not considered a limiting factor in summer range (all of the project area), competition between elk and cattle for forage resources may occur in both riparian and upland areas.

High value foraging areas for elk include wet meadow habitat in Logan Valley, and riparian meadows along streams. Creeks within the project area have wetland habitat comprised of sedges, willow and alder plant communities, however, many sections of these systems have downcut channels, limited riparian shrub communities, and reduced floodplains. Hardwood shrubs in some cases have been eradicated by grazing, shaded out by conifers, or a combination of both. Growing conditions for forage plants are less

favorable on some sites compared to historical conditions. This is in part a result of fire suppression, which has allowed conifers to increase in density and size, thus shading out understory grass and shrubs. Also, fire no longer acts as a rejuvenating agent, which invigorates many shrub and grass species.

Fawning/Calving Habitat

Optimum calving and fawning habitat includes a combination of thermal cover, hiding cover, and quality forage located in close proximity to water (Thomas 1979). Habitat is provided primarily within riparian areas where high quality succulent vegetation and water are readily available. Hardwood shrubs, thickets of conifer saplings and seedlings, and down logs provide security and hiding cover. Typically calving and fawning habitat is located where slopes are gentle – usually less than 15 percent – or located on bench areas within steep topography (Thomas 1979). The fen and surrounding meadow habitat in Logan Valley provide known calving and fawning habitat within the project area. Meadow habitat along Summit Creek and lower Bosenberg Creek also provide calving and fawning habitat.

Hardwood vegetation is lacking on several stream reaches and could be increased (Carex Working Group 2012). The presence of roads in riparian areas may reduce the effectiveness of calving and fawning habitat, not only because roads convert habitat to non-habitat, but also because road traffic during the spring and early summer impacts security and may disturb animals and their young.

Security

Elk in particular are vulnerable to human disturbance. Roads open to motorized traffic allow people easy access to big game habitat. Motor vehicles and associated human activities can stress big game animals, causing them to avoid use of available habitat and expend energy unnecessarily. Research has demonstrated elk avoid areas near open roads; animal showed lower use of areas within ½ mile of roads. This may lead to poor distribution of animals and use of quality habitat (Wisdom et al. 2005). Open road access reduces deer and elk escapement during hunting seasons as well as other times of the year, and facilitates legal or illegal taking of game animals. In the Summit Logan Valley Grazing Authorization Project, open road density and disturbance may influence elk distribution within portions of the allotments.

Although individual habitat component such as open road densities do not always meet standards, it appear that existing conditions support elk populations at management objectives for both Big Game Management Units. Mule deer populations remain below management objectives.

Alternative 1 - No Grazing

Big Game Habitat (Elk)

Direct, Indirect and Cumulative Effects

Under the No Action alternative, there would be no management activities, no grazing would occur on any of the allotments. Impact to upland and riparian forage and shrubs from domestic livestock would be eliminated. Lack of displacement or competition for forage from cattle, especially in meadow and riparian systems, could be beneficial for big game species. Competition between cattle and big game in and around water sources, both developed and undeveloped, would be eliminated. If interior fences are not removed, lack of maintenance of those fences could be detrimental if loose wire resulted in entrapped or injured animals.

Because there would be no direct or indirect effects from management activities to big game species or their habitat, there would be no additive cumulative effects.

Alternatives 2, 3 & 4

Big Game Habitat (Elk)

Direct and Indirect Effects

Forage

While forage is not considered a limiting factor in summer range (all of the project area), competition between elk and cattle for forage resources has the potential to occur in both riparian and upland areas. Cattle have grass-dominated diets but would consume forbs and shrubs if grass species have cured and thus provide less available protein and other nutrients by late summer. Likewise, elk, who normally avoid areas of cattle use during spring and early summer, may change this pattern and completely overlap with cattle in prime use areas late season, when upland forage species are dry and less palatable (Coe et al. 2005).

In several studies at the Starkey Experimental Station near La Grande, Oregon, it was shown that elk avoid cattle during the spring and summer. When cattle are moved into an area, elk move to higher elevations and steeper ground. Because optimum forage may exist within riparian and large wet meadows within the project area, elk may be negatively impacted by this displacement (Coe et al. 2005).

Forage and subsequent nutritional effects may have a substantial impact on individual animal performance. While fitness of elk and mule deer may not be affected during the summer, their ability to survive severe winters and reproduce may be negatively affected by poor summer nutrition (Cook et al. 2004).

Currently elk may move into the vacant Lake Creek Allotment when cattle are moved into the Summit Logan Valley Grazing Authorization project area. Patterns of distribution are not known, however, and the various configurations of use, non-use, deferred use make it difficult to predict how elk may react to each of the alternatives proposed.

Impacting a larger landbase (alternatives 2 and 4) may displace elk to higher elevations and less optimum forage; however, improving overall conditions for upland and riparian habitat within all of the allotments would benefit big game as well as cattle. Reducing the landbase for the McCoy Creek Allotment (all alternatives) would require monitoring to promptly move cattle, based on use and move triggers, to allow adequate residual forage for wildlife at the end of the grazing season.

If recovery objects are not met within the defined timeframes (see appendix A, Table 104) for any allotment, adaptive strategies may be implemented further reducing cattle numbers, or season of use, or excluding additional riparian acres from grazing resulting in beneficial impacts to habitat and ultimately big game forage.

Aspen within riparian areas may benefit from use levels and move triggers, or riparian fencing, designed to improve all riparian hardwood species. Aspen is a favorite browse species. Aspen located in upland areas, or in vicinity of the fen, continue to be negatively impacted by conifer succession, and overgrazing by both domestic and wild ungulates. Mature aspen trees continue to decline and regeneration of sapling-sized replacement trees is low to non-existent. Several of the smaller, older and more decadent unprotected sites may die out within the next few years. This has occurred on other areas of the forest (personal observation, Kranich 2012).

Aspen restoration in the Merit Timber Sale, and as part of the Logan Valley Meadow and Aspen Restoration project have positively impacted several aspen within the project area, by protecting stands

with fencing, and within the Logan Valley project, by removing competing conifers. Additional conifer removal is needed within aspen stands fenced within the Merit Timber Sale project.

Fawning/Calving Habitat

Restoration and expansion of wet meadow habitat; whether within vicinity of the fen in Logan Valley, or riparian meadows along major stream reaches; within all of the allotments would improve potential calving and fawning habitat. Displacement of elk or mule deer by cattle could negatively impact adults and their young. However, the overlap of cattle and big game during the calving/fawning season is generally the last two weeks of June and does not occur in May or early June, allowing big game to take advantage of these meadow systems during that time. Antelope fawns were seen in Logan Valley in early June 2012. The first observation of a mule deer fawn was mid-June 2012. No reports of elk fawns were obtained within the project area during this time, although animals with young were observed in adjacent subwatersheds, mid-June (Oregon Hunter Association Volunteers, personal communication 2012).

Security

Existing road densities would remain the same within the project area for all alternatives. Consequently there would be no overall impact or change in security from the existing condition. Improvement and expansion of riparian habitat may provide additional potential forage and calving/fawning areas for big game, but disturbance from vehicle traffic may limit its effective use by elk and other wildlife. Mule deer are less disturbed by roads and consequently may benefit as riparian conditions improve.

Fences, water developments

While fences are generally easily negotiated by big game species, they can negatively impact animal movement during late season snow, when poorly placed on hillsides, or when animals are panicked by predators or humans. Spooked herds of elk may tear completely through a fence rather than go over it. Antelope panicked along roadways may hit a fence multiple times before finally locating a hole to squeeze through (Kranich, personal observation). Pregnant elk or deer may not navigate fences well. Poorly placed fences mid-slope, or near the top of cut-banks have the ability to entrap animals at any time. Poorly maintained fences and loose wire also become hazards for big game animals (Paige 2008).

Fences impact non-game wildlife; bats, song birds, and flying squirrels can become impaled on barbs. Raptors, in particular owls, can fly into fences while pursuing prey species (Paige 2008). Although likely incidental, these interactions have potential to cripple or kill individual animals.

To reduce the impact of fences to big game, Design Elements are in place requiring a smooth bottom wire at least 16 inches above the ground to facilitate fawn movement, with a maximum top wire height of 42 inches, and spacing of 10 inches between the top and next lower wire to reduce the potential of back legs being caught when animals jump the fence. Properly maintained fences also minimize the possibility of animals becoming caught in loose or tangled wires. Let-down fences used in areas of heavy snow-pack benefit wildlife because they are laid flat on the ground during the non-grazing season, removing the barrier to movement by big game and non-game species. Several other modifications to fences that reduce impacts to wildlife are illustrated in “A Landowner’s Guide to Wildlife Friendly Fences: How to Build Fence with Wildlife in Mind” (Paige 2008).

Water developments in the form of troughs or stock ponds provide additional water for big game and non-game wildlife use. Elk may use these developments early spring or late season, but generally avoid them when cattle are present. Evaporation and lowered water tables of late summer, trampling, and manure make some ponds less useable by wildlife. Generally, lack of vegetation makes these ponds less attractive to amphibian species as breeding sites. However, Pacific chorus frog egg masses were seen in May 2012 in existing ponds in the Sage Hen unit. Tadpoles and young frogs can generally maneuver to avoid cattle

at stock ponds (Bull et al. 2001). However, early season turnout of livestock, when amphibian eggs are present and anchored to twigs and vegetation within 15 to 20 inches of the pond edge, may result in trampling of egg masses by cattle. No Columbia spotted frogs or egg masses were observed in any of the existing stock ponds.

Troughs are required to have wildlife escape ramps to avoid drowning small mammals and birds. Springs providing water to troughs would have sufficient flow to maintain the existing riparian vegetation on site (see Design Elements, chapter 2). Pond clean-out or resealing would need to occur late season to avoid impacting amphibian egg masses, or tadpoles.

Cumulative Effects – Big Game Habitat (Elk)

Cumulative effects were analyzed at the project area level as well as the areas encompassed by the Murderer's Creek and Malheur River Big Game Management Units. All of the activities listed in appendix C were considered for their cumulative effects on big game (elk) and potential habitat. Past activities such as timber harvest, road construction, fire suppression, grazing, and wildfire have combined to create the current condition in the analysis area.

Past historic grazing practices heavily impacted big game habitat within the Summit Logan Valley Grazing Authorization Project. Changes in livestock management have improved habitat conditions over time. Ongoing CE projects within the project area (Logan Valley Aspen and Meadow Restoration project and previous underburning within the Merit Timber sale projects) in addition to the proposed alternatives are designed to further restore existing aspen meadow and riparian habitat important for big game, and would provide sufficient forage to support both wild and domestic ungulate use within the project area.

The Malheur National Forest has analyzed changes in its travel management plan. It is foreseeable that cross country travel would be prohibited on the Malheur National Forest (where it is not already prohibited), with the exception of accessing dispersed camping sites from open roads. This may increase security for elk and allow access to forage habitat not previously utilized because of disturbance from cross-country vehicle travel.

Conclusion – Big Game Habitat (Elk)

The Murderer's Creek and Malheur River Big Game Management Units are sufficiently large to provide for existing populations of big game. Elk populations have remained stable, meeting or exceeding Oregon Department of Fish and Wildlife management objectives. Elk distribution may shift depending on various configurations of the allotments and where cattle are grazing at any given time and place within the Summit Logan Valley Grazing Authorization Project area. However, the proposed alternatives would not be expected to affect elk population numbers or viability at the Forest level.

Old Growth Habitat

The following terms for old growth are used throughout this section. These terms are defined in Wildlife definition of terms section.

- Late and Old structure (LOS) – A term used in Regional Forester's Eastside Forest Plans Amendment #2 (Interim Wildlife Standard) that refers to the structural stages where large trees are common. In this document old growth and mature forest are sometimes used as surrogate terms.
- Dedicated Old Growth (DOG) – Forest plan management area 13 which is comprised of mature trees (150 years or older) provides habitat for wildlife species dependent on mature forest conditions and provides for ecosystem diversity. These areas are equally distributed across the Forest. Wildlife species dependent on these lands include pileated woodpecker and American (pine) marten.

- Replacement Old Growth (ROG) – Part of Forest Plan management area 13. These areas serve as replacements for dedicated old growth in the case of catastrophic damage or deterioration of dedicated old growth. Replacement old growth areas are to be located within ¼ mile of the dedicated areas and are one-half the size of corresponding dedicated old growth units.

Dedicated Old Growth and Replacement Old Growth Areas

Forest Plan Management Area 13 (MA-13) provides for the management of old growth through a network of dedicated and replacement old growth areas (Forest Plan, page IV105-107). Each dedicated old growth and replacement old growth area is specifically managed for one or two management indicator species: pileated woodpecker or American (pine) marten (Forest Plan, page IV-32). Replacement old growth areas are established to counter possible catastrophic loss or deterioration of the dedicated old growth. Replacement areas may not have all the characteristics of old growth at the present time, but are to be managed to achieve those characteristics in the future so that when a dedicated old growth area no longer meets the needed habitat requirements, the replacement old growth can take its place.

In addition, Forest-wide Standard 59 (Forest Plan, page IV-31) directs Forest managers to delineate areas of old growth lodgepole pine for three-toed woodpeckers. While these old growth lodgepole areas are specifically managed for three-toed woodpeckers, they are not considered part of the MA-13 network.

The Forest Plan directs that pileated woodpecker dedicated old growth areas are to be at least 300 acres of mature and old growth habitat. Replacement old growth areas are intended to be half the size of the dedicated old growth areas, approximately 150 acres. In addition, 300 acres are managed as a pileated woodpecker feeding area; the replacement old growth and feeding area are permitted to overlap. Pileated woodpecker dedicated old growth areas were delineated Forest-wide to provide an even distribution of habitat areas, one dedicated old growth area every 12,000 acres, or approximately 5 miles apart.

The Forest Plan directs that American marten dedicated old growth areas are to be 160 acres and replacement old growth areas are to be 80 acres. American marten dedicated old growth areas were delineated every 4,000 to 5,000 acres, or approximately 3 miles apart.

To maintain an even distribution of old growth across the Forest, dedicated old growth and replacement old growth areas were designated in all biophysical environments or forest types. Attempts were made to identify some of the best habitat available, while maintaining the old growth grid system.

By providing old growth habitat for these species, it is assumed that habitat for old-growth obligate species would be provided as well. Management requirements were derived from the US Forest Service 1986 Minimum Management Requirements.

Pileated Woodpecker – Old growth Management Indicator Species

The pileated woodpecker is a wide-spread resident in forested areas of Oregon and Washington, including the Blue Mountains. It is absent from higher and lower elevations due to lack of large trees for nesting, roosting, and foraging (Marshall et al. 2003, 2006).

Pileated woodpeckers prefer mature and old growth forests with at least 60 percent canopy cover (Bull and Holthausen 1993). They also use younger forests that have scattered large dead trees (Bull and Jackson, 1995, Bull et al. 2007). This species relies heavily on snags and downed wood material for foraging, and large hollow trees for roosting (Bull 1982, Wisdom et al. 2000). Nest cavities are typically excavated in older, large broken top ponderosa pine and western larch snags (Bull 1987).

Foraging habitat is commonly found in mixed conifer and grand fir forest types. Pileated woodpeckers forage by excavating insects (mostly carpenter ants) from larger (over 20 inch) snags and down logs over 25 inches) in the summer and scaling bark of larger live trees for insects in the winter.

Home range for a breeding pair has been identified by different sources as ranging from 300 acres (Thomas 1979) to 1,000 acres (Bull and Holthausen 1993). Single birds may use larger home ranges, from 500 to 3,600 acres in size.

Although source habitat for pileated woodpeckers has increased from historic levels, large snags for nesting may still be limiting. Threats include loss of habitat and declines in densities of large snags and large hollow trees (Wisdom et al. 2000).

American Marten (Pine Marten) – Old growth Management Indicator Species

Martens prefer mature old growth forest with a well-developed multi-storied canopy. Cover and prey species largely determine American marten distribution and abundance.

Snags and downed woody material are important for winter and summer dens, resting sites, and cover for prey species. Martens show a strong avoidance of open areas, possibly for predator avoidance (Hawley and Newbry 1957). Open, dry forest types and those that lack structure near the ground are used very little (Buskirk and Powell 1994). Movement and dispersal over the landscape are maintained by providing corridors with consistent overhead cover (Ruggerio et al. 1994). Home range for a breeding pair has been identified ranging from 160 acres (Campbell 1979) to 1,400 acres (Freel 1991).

Trends in source habitat were evaluated for American marten in the Malheur Fire Learning Network area (Wales, 2009). Overall there has been a decline in forests with trees greater than or equal to 20 inch dbh and canopy closures greater than 60 percent in the higher elevation forests.

Loss of source habitat and trapping are continued threats to American marten.

American Three-Toed Woodpecker – Old growth Management Indicator Species

Source habitats for three-toed woodpeckers are old forests of lodgepole pine, grand fir-white fir, Engelmann spruce and subalpine fir. The three-toed woodpecker prefers stands where lodgepole pine is either dominant or co-dominant, and uses mostly trees 9 inches dbh and greater for both nesting and foraging (Bull 1980, Goggans 1986). They are attracted to areas with high concentrations of beetles, such as habitats created by stand replacing fires or blowdown. Home range size for three-toed woodpeckers is estimated at 130-750 acres.

Threats to three-toed woodpeckers include removal of fire-killed or insect-infested trees, altered frequency of stand-replacing fires, and decline in availability of medium to large snags infected with heart rot (Wisdom et al. 2000, NatureServe 2011).

Alternative 1 - No Grazing

Old-growth Habitat Management Indicator Species

Direct, Indirect and Cumulative Effects

Under the No Action alternative, there would be no management activities, no grazing would occur on any of the allotments. Impact to upland and riparian forage and shrubs from domestic livestock would be eliminated. Current dedicated old growth, replacement old growth, and pileated woodpecker feeding areas

would be maintained. Increased growth of riparian shrubs, herbaceous cover, and aspen stands could benefit small mammal species preyed upon by American marten.

Because there would be no direct or indirect effects to old growth habitat, and the management indicator species associated with this habitat, there would be no additive cumulative effects.

Alternatives 2, 3 & 4

Old-growth Habitat Management Indicator Species

Direct and Indirect Effects

Cattle grazing would have little to no impact to old growth habitat and associated management indicator species pileated woodpecker, American marten, and three-toed woodpecker. Because of overstory shading, existing dedicated old growth provides limited understory forage for livestock. Large or extensive down logs can impede cattle movement and access. Grazing would not alter the character of such habitat. Changes in allotment boundaries would not change dedicated old growth, replacement old growth, or pileated woodpecker feeding area acres or boundaries. Fence construction, water developments, riders would not be expected to impact these habitats.

Because proposed allowable use levels and move triggers are designed to improve riparian vegetation in the mid- to long-term, improvements in habitat for American marten prey species may occur.

Cumulative Effects

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on old growth management indicator species and habitat. Past activities such as timber harvest, road construction, fire suppression, grazing, and wildfire have combined to create the current condition in the analysis area.

There are little to no impacts expected for old growth habitat from cattle grazing within the project area. Consequently, the combined effects of the Summit Logan Valley Grazing Authorization project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations or viability of pileated woodpecker, American marten, or three-toed woodpecker.

Conclusion

The Forest's network of dedicated old growth and replacement old growth would continue to maintain habitat for pileated woodpecker, American marten and three-toed woodpeckers. No loss of viability for populations of these old growth management indicator species would be expected from implementation of the Summit Logan Valley Grazing Authorization Project.

Primary Cavity Excavators

Primary cavity excavators (most woodpeckers) depend on standing and downed wood for foraging, nesting, and roosting. These species create cavities in dead and live trees. Secondary cavity users (mountain bluebirds, wrens, chickadees, nuthatches, small owls, flying squirrels, bats, and many others) depend on and use cavities excavated by these woodpecker species for their nesting and reproductive needs. In forest environments, approximately 93 wildlife species utilize snags, and about 86 wildlife species utilize down wood for all or parts of their life cycle (Rose et al. 2001).

The Forest Plan identifies 11 primary cavity excavators as management indicator species for the availability and quality of dead and defective wood habitat: black-backed woodpecker, three-toed woodpecker, Lewis's woodpecker, white-headed woodpecker, pileated woodpecker, downy woodpecker,

hairy woodpecker, northern flicker, Williamson's sapsucker, and red-naped sapsucker (formerly listed in the Forest Plan as the red-breasted sapsucker and yellow-bellied sapsucker). Red-naped sapsuckers are used as the management indicator species for east-side forest habitats.

For details of conservation status, distribution, habitat, population trend and threats for:

- Pileated Woodpecker - see Old Growth Habitat section beginning on page 292
- Three-toed Woodpecker – see Old Growth Habitat section beginning on page 292
- White-headed Woodpecker – see Threatened, Endangered and Sensitive Wildlife Species section beginning on page 262
- Lewis's Woodpecker – see Threatened, Endangered and Sensitive Wildlife Species section beginning on page 262

Descriptions of the remaining primary cavity excavators are displayed below:

In Oregon, black-backed woodpeckers occur at high elevations west of the Cascades, and from the east slope of the Cascades through the Blue, Ochoco, and Warner Mountains (Marshall et al. 2003, 2006).

The black-backed woodpecker forages at slightly lower elevations and in a broader range of mixed conifer types compared to the three-toed woodpecker, although the two species overlap (Marshall et al. 2003, 2006). Both species are similar in size, appearance, and forage almost solely on bark beetle larvae. Both species are associated with mature and over mature stand structures.

Home ranges for black-backed woodpeckers increase as time since a fire event increases; home ranges vary from 285 acres upwards to over 1,000 acres (Dudley 2005, Dudley and Saab 2007). In green forests during beetle outbreaks, home ranges can be 178 to 810 acres in size (Goggans et al. 1988).

Suitable habitat for black-backed woodpeckers is tied to existing levels of diseased and decaying trees with heart rot for nesting and roosting, as well as decaying substrate to provide a prey base for wood-boring insects (Goggans et al. 1987). For black-backed woodpeckers, threats include removal of fire-killed or insect-infested trees, altered frequency of stand-replacing fires, and decline in availability of medium to large snags infected with heart rot (Wisdom et al. 2000, NatureServe 2011). In Oregon, the liquidation of old growth lodgepole pine due to its infestation with the mountain pine beetle may reduce or eliminate habitat for this species (NatureServe 2011).

Williamson's Sapsucker – Primary Cavity Excavators

Williamson's sapsuckers occur along the east slope of Cascades to the Rocky Mountains, from southern British Columbia south into Mexico. In Oregon Williamson's sapsucker occurs along the east slope Cascades, and in the Blue and Warner Mountains (Marshall et al. 2003, 2006, Wahl et al. 2005).

In northeastern Oregon Bull et al. (1986) described this species as occurring in mature and old-growth mixed conifer forests at 3,500 - 6,500 feet elevations. Nesting occurs in both live and dead tree species comprised mainly of ponderosa pine, western larch, Douglas-fir, and grand fir. Snags are a critical component of breeding habitat (Bull et al. 1980). On Starkey Experimental Forest 86 nest trees averaged 27 inches dbh (Bull et al. 1986). Home range for a breeding pair is approximately 2.5-15 acres (Johnson and O'Neil 2001).

Foraging consists of feeding at sapwells of ponderosa pine and Douglas-fir, and gleaning insects from the bark of trunks and limbs (Marshall et al. 2003, 2006).

Threats include reduction in late-seral forest habitat, and reduction in numbers of large snags used for nesting (Wisdom et al. 2000).

The global short term trend for Williamson's sapsuckers is listed as stable (NatureServe 2011). Breeding Bird Surveys for 1968 through 2004 for Oregon indicate a slightly declining trend, although reliability rating (yellow) is not optimal due to low numbers recorded in the counts (Sauer et.al 2008). Williamson's sapsucker has been documented within the project area.

Red-naped Sapsucker – Primary Cavity Excavators

Red-naped sapsuckers breed in the Rocky Mountains west to the crest of the cascades and the Sierras, from southern Canada to Arizona, New Mexico, and west Texas. In Oregon they are widespread east of the Cascades (Marshall et al. 2003, 2006, Wahl et al. 2005).

This species is described as inhabiting riparian habitats, especially aspen, as well as pine forests (Marshall et al. 2003, 2006). This species uses riparian willow communities for foraging (Csuti 1997). Nest trees are most commonly aspen with heart rot, but ponderosa pine was also selected (DeGraaf 1991). Less than 1 pair per 100 acres was noted in northeast Oregon (Marshall et al. 1993).

The global short term trend for red-naped sapsuckers is listed as stable. Breeding Bird Surveys for 1968 through 2004 for Oregon indicate a downward trend, although reliability rating (red) is not optimal due to low numbers recorded in the counts, as well as low sample routes (Sauer et.al 2008).

Red-naped sapsuckers were observed drumming within the fen in Logan Valley, spring 2012.

Hairy Woodpecker – Primary Cavity Excavators

This medium-sized woodpecker is a resident in forests throughout Oregon, with the exception of juniper (Marshall et al. 2003, 2006). It is more common in older forests, but readily uses burned areas and forest edges for foraging (Csuti 1997). In northeastern Oregon, nesting occurs primarily in ponderosa pine 10-20 inches dbh, mean nest tree dbh was 17 inches (Bull et al. 1986). Grand fir is not selected, but other species may be used (Bull et al. 1986). Hairy woodpeckers feed primarily in ponderosa pine stands, and will use grand fir stand types as well. Live and dead trees greater than 10 inches dbh are foraging habitat for this species.

The global short term trend for hairy woodpeckers is listed as stable (NatureServe 2011). Breeding Bird Surveys for 1968 through 2004 for Oregon indicate no significant changes in population trend, with a reliability rating of blue, indicating moderate precision, and indicating moderate abundance on routes (Sauer et.al 2008).

Observations of hairy-woodpeckers have occurred within project area.

Downy Woodpecker – Primary Cavity Excavators

Preferred habitat for this small woodpecker includes cottonwood and aspen stands and riparian areas, but they will use coniferous-deciduous and sometimes coniferous forests. Territories are 5-9 acres. Nesting occurs in trees and snags greater than 8 inches dbh at heights over 15 feet (Marshall et al. 2003, 2006). They forage by a variety of means such as pecking and flaking bark for insects, gleaning leaves, and flycatching (Csuti 1997). Potential habitat for this species is currently found in existing riparian areas and aspen stands within the planning area. Threats to habitat include riparian degradation, and loss of hardwood species to encroaching conifers.

Breeding bird surveys for 1968 through 2004 for Oregon indicate no significant changes in population trend, although reliability rating (yellow) is not optimal due to low numbers recorded in the counts (Sauer et.al 2008).

Downy woodpeckers have been documented within the project area.

Northern Flicker – Primary Cavity Excavators

Northern flickers are a common resident across both Oregon and Washington (Marshall et al. 2003, 2006). Northern flickers use a wide variety of plant communities and successional stages. They prefer open habitats, and are commonly found foraging on the ground in open woodlands, meadows, fields and regeneration harvest areas (DeGaaf et al. 1991 and Csuti 1997). Thomas et al. (1979) report this species using all forest successional stages for foraging and young forest (40-79 years) to old growth (160+ years) for reproduction. Limited reproductive use of earlier stages is due to the absence of snags that this species requires for nesting. Nesting occurs in open areas in snags with some decay. Marshall (2003) noted 71 percent of nest trees had broken tops. Average nest tree diameter was 22 inches dbh and nest hole heights averaged 49 feet.

Northern flickers have been documented in the project area.

Alternative 1 - No Grazing

Primary Cavity Excavators (Management Indicator Species)

Direct, Indirect and Cumulative Effects

Under the No Action alternative, there would be no management activities, no grazing would occur on any of the allotments. Impact to understory vegetation from domestic livestock would be eliminated. Conifer shading and wildlife use of aspen stands would continue. Impact to existing aspen stands would depend on stand vigor, and extent of conifer succession, and extent of wildlife browsing. Some species of woodpecker could be negatively impacted if aspen continued to decline.

However, since there would be no activities occurring with this alternative, there would be no direct or indirect, or cumulative effects to the primary cavity excavators or their habitat.

Alternatives 2, 3 & 4

Primary Cavity Excavators (Management Indicator Species)

Direct and Indirect Effects

Current Forest Plan direction, as amended, is to maintain snag and down log levels at 100 percent of the potential population of all woodpecker species that exist on the Forest. This means that availability of snags and down logs would not limit the numbers of woodpeckers that could live in an area.

Cattle grazing would have little to no impact to snag and down wood habitat in ponderosa pine, lodgepole pine, or mixed conifer stands. Grazing would not alter the character of such habitat. Consequently, for woodpeckers utilizing these habitats for nesting or foraging, the proposed alternatives would have little to no impact. Fence clearing and construction, or placement of water developments may impact snag or down wood habitat. Avoiding snags during layout would minimize these impacts (see Design Elements).

Use levels and move triggers designed to improve riparian shrub recruitment and growth would benefit woodpecker species dependent on that habitat (primarily downy woodpeckers, and red-naped sapsuckers).

Aspen stands found within riparian areas, or protected by proposed exclosures or riparian pastures, would also receive some measure of protection and monitoring.

However, unprotected aspen stands may continue decline. Conifer shading and competition, along with grazing pressure from cattle as well as wildlife are adversely impacting these stands. Currently aspen snags and large mature aspen exist within the project area, but as these stands continue to age, lack of replacement trees would result in a reduction and eventual loss of aspen stands in the long-term. This would directly impact downy woodpeckers, and red-naped sapsuckers, species which use aspen stands extensively for nesting and foraging. Other primary cavity excavators using aspen habitat include Lewis's and white-headed woodpeckers, Williamson's sapsucker, northern flicker, and hairy woodpecker. Secondary cavity nesters would be impacted by loss of aspen stands. Approximately 71 bird species have been recorded within these stands (Cobb 1997 *in* Swanson et al. 2010). Aspen restoration projects (Logan Valley Meadow and Aspen Restoration project, and Merit Timber sale project) have protected some aspen within the project area by removing conifers, and fencing or creating slash barriers around the stands. The Logan Valley project is ongoing. Several aspen stands have received some measure of conifer removal or protection and would maintain aspen within the project area.

Cumulative Effects

The area considered for cumulative effects is the project area and adjacent subwatersheds to include post-fire habitat. All of the activities in appendix C have been considered for their cumulative effects on primary cavity excavators.

Past timber harvest, fire suppression, road construction, wildfire, and firewood cutting have all impacted the quality, quantity, and distribution of suitable snag habitat within the project area. The High Roberts Fire, which burned in 2002, just north Summit Logan Valley Grazing Authorization Project area, may currently provide nesting habitat for several primary cavity excavators. Prescribed underburning in the Merit Timber Sale area may also provide some post-fire habitat. Cattle grazing would not add cumulatively to existing snag habitat within green or burned conifer stands.

Large diameter aspen and snags within the project area also provide nesting and foraging habitat for woodpeckers, specifically downy woodpeckers, and red-naped sapsuckers. Conifer encroachment, along with grazing by domestic and wild ungulates, continues to degrade aspen stands and in the long-term may result in loss of habitat for these species. Larger aspen stands within the project area are more resilient, and would persist in the short- to mid-term. Without successful recruitment of sapling size replacement trees, some small stands may die out. Ongoing aspen restoration projects have protected some aspen within the project area by fencing or slash barriers.

In the short-term, public firewood cutting is expected to continue along open roads. It is foreseeable that the Malheur Forest Access Travel Management Plan would prohibit cross country travel on the Malheur National Forest with the exception of travel from designated open roads to dispersed camp areas. It is expected that with the implementation of the Access Travel Management Plan there would be reduced access for firewood cutting and improved retention of large diameter snags.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of primary cavity excavators on the Forest.

Conclusion

While there may be impacts to individuals or habitat, populations of primary cavity excavators and other species associated with dead wood habitats within conifer stands would be expected to be maintained at the Forest level.

Nesting habitat associated with aspen stands (live trees as well as snags) may continue to be adversely impacted in the long term, possibly impacting individual downy woodpeckers or red-naped sapsuckers, and other woodpeckers. Retention of aspen by fencing or creating slash barriers as part of ongoing and future restoration projects would maintain a level of aspen stands within the project area.

Featured Species

Featured species are those identified in the Malheur Forest Plan as wildlife species of high public interest or demand. The Forest Plan (IV-30 and IV-31) provides direction (standards 50-55) for the protection of habitat for these species.

Table 99 lists the seven featured species currently on the Malheur National Forest. The table also includes what their habitat requirements are and whether or not their habitat occurs in or near the project area. There is no potential effect to bighorn sheep or their habitat from the proposed action. This species will not be discussed further. Sage grouse and upland sandpiper, both sensitive species, are addressed in the threatened, endangered, and sensitive wildlife species section.

In addition to featured species listed within the Malheur Forest Plan, American beaver are discussed, in response to public interest and comments generated by the proposed action.

Table 99. Featured species habitat

Featured Species	Habitat Requirements	Habitat Present In or near Analysis Area
Northern Goshawk	Mature, multi-storied ponderosa pine stands, or mixed conifer stands that are dominated by ponderosa pine	Yes, documented within or near vicinity of the project area
Blue Grouse	Clumps of mistletoe infected Douglas-fir on tops or upper slopes of ridges	Yes, upper elevations within project area
Sage Grouse	Open sagebrush plains from 4,000-9,000 ft. in elevation.	Yes, incidental observations, Logan Valley. See TES section.
Osprey	Large dead trees suitable for nesting (30”dbh greater than60’ in height) adjacent to or near large rivers or lakes	Yes, active nests documented on Big Creek in Logan Valley, and near Summit Prairie
Pronghorn Antelope	Open grasslands, with low sagebrush being an important component	Yes, animals use area in vicinity of fen as fawning area; also observed along Summit Creek
California Bighorn Sheep	Alpine-desert grasslands associated with mountains, cliffs, foot-hills, and river canyons	No, the project area does not fall with suitable habitat for Bighorn sheep
Upland Sandpiper	Large open montane meadows and grasslands	Yes, potential habitat; historically nested in project area. See TES section.
American Beaver[a]	Lower gradient perennial streams with riparian vegetation	Yes, present in several stream reaches

a - American beaver are discussed, in response to public interest and comments generated by the proposed action

Affected Environment Featured Species

Northern Goshawk

The northern goshawk uses a complex mosaic of landscape conditions to meet its life history requirements for nesting, post-fledging, and foraging (Reynolds et al. 1992). Preferred nesting areas include mature, unlogged, or lightly managed forested habitats with closed canopies (often greater than 60 percent); northerly exposures, gentle slopes, and are often close to water (Reynolds et al. 1992). Canopy closure provides security from avian predators; security from human disturbance is also a factor in nest site selection.

Post-fledging areas include the nest stand, alternate nest sites, and a surrounding area used by adults and developing young after they leave the nest, and prior to natal dispersal (Reynolds et al. 1992). Structurally complex late-successional forest provides the most suitable habitat for post-fledging areas in eastern Oregon.

Northern goshawks are accipiters, i.e. woodland hawks. Their morphology (short, rounded wings and relatively long tails) and behavior are adapted for maneuvering and hunting in moderately dense, mature forests (Beier and Drennan 1997). Small openings and forest edge are also important for the birds, providing a diversity of habitats that support northern goshawk prey animals (Reynolds et al. 1992).

Several historic nests documented in the late 1980s and early 1990s are recorded in District records. While no recent surveys have been conducted, northern goshawk have been documented within the project area.

Blue Grouse

Blue grouse prefer coniferous forests dominated by Douglas-fir, grand fir, and subalpine fir, with a mixture of deciduous trees and shrubs near edges and openings. These habitats occur at mid-elevations and in subalpine areas, usually associated with openings and rocky areas.

Young blue grouse eat insects, while adults depend on herbaceous material, particularly needles and buds of Douglas-fir and ponderosa pine during the winter. Dense coniferous thickets of small trees, stumps, and down logs are used by blue grouse for resting and escape cover. Large conifers with dense foliage are used for roosting. Blue grouse home range size is between one and five acres.

Blue grouse winter in open coniferous habitats at higher elevations than those that they inhabit in the summer. The Forest Plan standard for the protection of grouse habitat (Forest Plan IV-30, standard #50) states that projects should “Maintain grouse winter roost habitat.” Blue grouse use large mistletoe infected Douglas-fir trees, generally located within the upper 1/3 of slopes, as winter roosts.

Mixed conifer stands that include Douglas-fir are found within higher elevations within the project area. The upper reaches of Lake Creek, Big Creek and Summit Creek contain mixed conifer stands and riparian habitat that would support blue grouse.

Osprey

Osprey build nests in large old growth trees with dead tops, or in the tops of large snags, usually in vicinity of large streams, rivers or lakes with adequate fish populations.

Two known osprey nests are documented within the Summit Logan Valley Grazing Authorization Project area. These occur in vicinity of Big Creek in Logan Valley, and south and east of Summit Prairie. Both nests were occupied; incubating females were observed on nests, spring 2012.

Pronghorn Antelope

Pronghorn antelope occur primarily in grasslands and open shrub-grasslands with gently rolling topography. In Oregon, habitat includes sagebrush steppe, as well as areas occupied by widely spaced juniper or ponderosa pine. Water is essential, animals are seldom found far from available sources. Described as “dainty foragers”, pronghorns browse on shrubs and a variety of forbs. During fawning, females often isolate themselves just prior to giving birth. Young are usually born during the third week in May (Verts and Carraway 1998), although this may vary slightly by location.

Pronghorns are numerous in Logan Valley; estimated herd size may range from 40 to 50 animals (Torland, Oregon Department of Fish and Wildlife, personal communication 2012). Sightings of animals along the lower reaches of Bosenberg Creek, in meadow habitat in vicinity of Summit Creek, and using existing stockponds in the Sage Hen unit are also recorded. These sightings have been small groups of animals, up to 20 in number, as well as lone animals, likely females, during the spring fawning period. While considered a big game species, there are no specific management objectives for antelope populations (Oregon Department of Fish and Wildlife 2011). In 2012, four very young antelope fawns were recorded with a group of adults in early June, north of National Forest System road 16 near the fen in the Big Field pasture.

American Beaver

Historically, beaver once occupied riparian and wetland habitat throughout North America. Population estimates range from 60 to 400 million prior to European settlement (Baker 2003). Despite this abundance, populations were decimated during the 1700s and 1800s by fur trappers. Settlement and unregulated livestock grazing in the mid to late 1800s in these newly beaver-free riparian areas resulted in severe loss of native vegetation, resulting in accelerated erosion and severe downcutting in many areas (Baker 2003).

Beaver occupation and activity within Logan Valley and the headwaters of the Malheur River is also believed to have been high. This is supported by documentation in the historic literature for this region of the Blue Mountains, as well as through tribal oral histories of the Malheur River Basin (Wenick et al. 2002). Similar impacts of trapping and loss of habitat from high stocking rates and overgrazing by domestic livestock beginning in the 1860s reduced their numbers within the project area (Wenick et al. 2002).

Beaver exist on Lake Creek and Big Creek within Logan Valley. Freshly peeled sticks were noted at both sites, May 2012 (Kranich, personal observation). Three beaver dams were noted in the Summit Creek exclosure during plot monitoring by the Carex Working Group in 2011. Small felled conifers and fresh cuttings were noted during a visit to the exclosure during May 2012. Older beaver activity (greater than two years old) was noted along Summit Creek in reaches 3, 4, 5, and 6 (Carex Working Group 2012). District records also note occupation of various portions of Summit Creek, Bosenberg Creek, Big, and Lake Creek over the years since the mid-1990s.

Environmental Consequences – Featured Species

Alternative 1 - No Grazing

Direct, Indirect and Cumulative Effects

Under the No Action alternative, there would be no management activities, no grazing would occur on any of the allotments. Impact to upland and riparian forage and shrubs from domestic livestock would be eliminated. Depending on wildlife browse and use, the potential for riparian recovery could be faster with

this alternative. Lack of competition for forage from cattle could be beneficial for featured species such as pronghorn antelope and beaver. Re-establishment of beaver along more stream reaches within the project area could accelerate riparian recovery (see discussion below). Improvements in riparian habitat may benefit foraging for blue grouse, as well as improve the prey base of small mammals for northern goshawk, or fish abundance for osprey.

Since there would be no activities occurring with this alternative there would be no direct or indirect, or cumulative effects to featured species or their habitat.

Alternatives 2, 3 & 4

Direct and Indirect Effects

Impacts to featured species or habitat would depend on timing of cattle grazing, and concentration of animals within pastures containing riparian habitat. Because of variations in dates of turn-out, not all areas of potential habitat would be impacted by cattle in a given grazing season. Use levels and move triggers scheduled for all allotments within their respective riparian habitat conservation areas are designed to restore riparian vegetation and shrub habitat.

There would be no impacts to goshawk nesting habitat, osprey nesting habitat (snags), or blue grouse winter roosts. Impacts for these species would stem from impacts to their respective prey base or foraging areas. Improvements in riparian shrub density and age classes, as well as herbaceous cover, would improve habitat for small mammals, birds (northern goshawk prey), fisheries (osprey prey), or blue grouse foraging areas.

Cattle grazing may displace female pronghorns. Because turn-out dates would be in mid- June or later, this would not impact newly born fawns. Most antelope have had their young by June. Because these animals are mobile, they may simply move to other areas along the forest edge to avoid competition and disturbance. Pond construction or spring development may provide water sources for pronghorn. Depending on number of cattle trampling, mudding water and manure may make ponds less palatable as drinking sources late season.

Monitoring use levels and assessing impact to upland, meadow habitat, riparian habitat and native vegetation would be critical for determining trends in habitat improvement.

Adaptive management strategies such as reduced time in any given pasture, or reduced numbers of cattle, as well as additional fencing to exclude use would benefit riparian habitat.

During project operations (fence maintenance, new fence or catch-pen construction, water developments) a degree of disturbance and displacement of wildlife are likely.

Goshawks are highly sensitive to disturbance during the breeding season. Seasonal restrictions on activities occurring within ½ mile of occupied nests have been regularly used to reduce impacts to nesting birds. If a new northern goshawk nest were discovered during fence or water development layout, these timing and distance restrictions would be implemented (See Design Elements, chapter 2).

There may be some incidental loss of smaller snags during layout and construction of proposed fences, catch pen, or water developments. Any layout design should avoid impacting large snags potentially used by osprey, particularly if within 1/2 mile of the Malheur River, Summit Creek, Big Creek or Lake Creek, or in vicinity of known nests (Forest Plan #54, IV-31).

In addition, the District wildlife biologist would be contacted if new raptor nests or roost trees are discovered during project layout of fences or water developments. Appropriate buffers and timing restrictions would be implemented (See Design Elements, chapter 2).

Timing restrictions limiting motorized vehicle use in calving and fawning areas would minimize disturbance to antelope using meadow and open ponderosa pine areas within the Summit Logan Valley Grazing Authorization Project area. Fences may impact pronghorn antelope. Fence designs with minimum lower wire height and smooth bottom wire would help facilitate antelope movement (See Design Elements, chapter 2).

Beaver

Grazing management that allows for recovery of herbaceous vegetation and riparian hardwoods could increase the expansion of beaver within the project area. Even if riparian hardwoods are not fully reestablished, beaver may expand their range by using herbaceous vegetation for summer forage, and conifers and other materials for dam construction (Kranich, personal observation).

Beaver dams have the potential to raise water tables, store water for late season flow, trap sediment, reduce channel erosion, enhance and expand establishment and production of aquatic herbaceous vegetation, as well as expand willow and other riparian hardwoods at the edges or along suitable substrate within these saturated wetlands (Baker and Hill 2003, Carex Working Group 2012). Saturated soils often deter cattle and wild ungulates, providing some protection for riparian hardwoods within these sites. Even when dams deteriorate or fail, either due to flood events, or loss of beaver by predation, trapping, or movement to other areas, downstream deposition of material from behind the dams may provide sites for willow and other riparian hardwood establishment (Hall 2005, Demmer and Beschta 2008).

Increased abundance and diversity of herbaceous as well as riparian hardwood species could increase overall species richness of insect populations, as well as that of small mammal, bird, and bat species.

Once beaver become established in an area, grazing management may become more critical. Beaver cut willows at the base, which stimulates suckering and growth, while tip browsing by both wild and domestic animals can arrest growth (Kindschy 1985). Heavy browsing by ungulates, in addition to riparian hardwood use by beaver, can be detrimental for shrub recovery (Baker and Hill 2003). However, beaver currently exist on both Lake Creek and Big Creek within Logan Valley, and their activities appear to be compatible with some level of cattle grazing. Willows and other hardwoods are present in both areas.

Alder and willow within the exclosure on Summit Creek also appear to be healthy. This exclosure has existed since the 1980's and photo points have documented shrub development since the area was fenced (District Range Photo points, 1986 to 2010). Elk and deer are able to negotiate the fence to access this exclosure, the fence only restricts cattle access. Freshly cut lodgepole pine and peeled sticks from beaver activity were noted in the exclosure in May 2012 (Kranich, personal observation).

Cumulative Effects

The area considered for cumulative effects to featured species and their habitat is the project area. All of the activities in appendix C have been considered for their cumulative effects on these species. Past activities, actions, and events in the analysis area have contributed to create the existing condition in the project area.

Past historic grazing practices heavily impacted big game habitat within the Summit Logan Valley Grazing Authorization Project. Changes in livestock management have improved habitat conditions over

time. Livestock grazing is expected to continue. Livestock turned out later in the spring are not expected to conflict with antelope fawning periods. Forest plan grazing standards are established to provide sufficient forage to support both wildlife and domestic ungulates. Improvements to riparian habitat would benefit all of the above featured species, either directly; or indirectly by improving forage for their prey species. Upland water developments may provide sources of water for big game depending on season of use, number of cattle and their impacts to the water source.

Past commercial harvest and thinning, fire suppression, wildfire, and personal use firewood cutting have affected the quality and quantity of large nest tree habitat, snag habitat, and winter roost habitat. There may be some incidental loss of smaller snags during layout and construction of proposed fences, catch pen, or water developments. Design elements are in place to limit losses of larger snags.

Conclusion

Cumulatively, and with design elements in place, any impacts to featured species or their habitat from the action alternatives is expected to be minimal. Although individual animals may be disturbed, any of the above activities would not be expected to adversely impact featured species populations.

Landbirds including Neotropical Migratory Birds

Neotropical migratory birds breed in temperate North America and spend the winter primarily south of the United States-Mexico border. Of the 225 neotropical migrants that are known to occur in the western hemisphere, about 102 are known to breed in Oregon and about 82 are known to breed on the Malheur National Forest. They include a large group of species, including many raptors, cavity excavators, warblers and other songbirds, with diverse habitat needs spanning nearly all plant community types and successional stages. Long-term population data on many of these birds indicate downward population trends although not all species populations are declining (Sharp 1996, Saab and Rich 1997, Altman 2000, US Fish and Wildlife Service 2008). Habitat loss is considered the primary factor in decline of neotropical migratory birds.

In 2000, the Oregon-Washington Chapter of Partners in Flight published its Northern Rocky Mountains Bird Conservation Plan (Altman 2000, also referred to as the Bird Conservation Plan). The Bird Conservation Plan provides conservation recommendations for the various species of landbirds that occupy the Oregon and Washington portions of the Interior Columbia Basin. The Bird Conservation Plan identified the following priority habitats for landbird conservation: old-growth dry forest, old-growth moist forest, riparian woodland and shrubland, and unique habitats including alpine and subalpine forests, shrub-steppe, montane meadow and aspen habitats. The Bird Conservation Plan also identified burned old forest as a limited habitat due to fire suppression.

Table 100 lists priority habitats within the Summit Logan Valley Grazing Authorization Project area which could be affected by project implementation. The table describes habitat type, habitat features, and associated focal species. Existing condition and effects discussions will focus on changes to priority habitats rather than the individual species that use these habitats. Alpine, subalpine, mesic mixed conifer old growth and post-fire habitats are either not in the project area, or are not affected by this project. Short-term, mid-term and long-term definitions are defined at the beginning of the wildlife specialist report.

Table 100. Neotropical migratory birds – priority habitat features and associated focal landbirds species within project area

Habitat Type	Habitat Feature/Conservation Focus	Focal Species	Potential Grazing Effects
Dry Forest Old Forest	Large patches of old forest with large trees and snags	White-headed woodpecker	No impacts for conifer habitat impacts, associated with aspen habitat
	Old forest with interspersion of grassy openings and dense thickets	Flammulated Owl	Yes
	Open understory with regenerating pines	Chipping sparrow	Yes
	Patches of burned old forest	Lewis' woodpecker	No impacts to conifer habitat, impacts associated with aspen habitat
Mesic Mixed Conifer Old Forest	Large snags	Vaux's swift	No
	Overstory canopy closure	Townsend's warbler	No
	Structurally diverse; multi-layered	Varied thrush	No
	Dense shrub layer in forest openings and understory	McGillivray's warbler	Yes
	Edges and openings created by wildfire	Olive-sided flycatcher	No
Montane Meadow	Wet or dry open tracts of short grasslands	Upland sandpiper	No impacts for upland sandpiper, timing of cattle turnout will vary depending on presence of birds See Design Elements,
Shrub Steppe	Juniper, sage brush with small openings	Vesper sparrow	Yes
Riparian Shrub	Willow/alder shrub patches	Willow flycatcher	Yes
Aspen	Aspen stands	Red-naped sapsucker	Yes

Many of the avian species/habitats identified in the Northern Rocky Mountains Bird Conservation Plan are also addressed in the US Fish and Wildlife Service's Birds of Conservation Concern (US Fish and Wildlife Service 2008). BCR 10, Northern Rockies Region, encompasses the Blue Mountains. Table 101 lists species status as present or absent from the Summit Logan Valley Grazing Authorization Project area, and where each species is addressed in this report.

The following sections describe the existing conditions of priority habitats in the analysis area. Cumulative effects have been analyzed in respect to past, ongoing and foreseeable future activities listed in Appendix C. Effects for Neotropical Migratory Birds and Landbird species were analyzed within the context of the Project Area and adjacent subwatersheds.

The District has not conducted official neotropical migratory bird surveys in all habitat types within the Summit Logan Valley Grazing Authorization Project area. Informal bird surveys have been conducted by Grant County Bird Club volunteers in vicinity of the fen, and during past upland sandpiper surveys. These species lists, as well as District records were reviewed for this project. During a period from 1991 through 2012, approximately 105 bird species have been documented within Logan Valley, within the project area. This diversity of species is reflective of the diversity of habitat available in this area of the project,

including grassland, shrub-steppe, aspen, fen/wetland, riparian, and both ponderosa pine and mixed conifer forest habitat.

Table 101. BCR 10, Northern Rockies Region, USFS birds of conservation concern – 2008

Species	Presence / Absence	Present & Absent Species and Reasoning
Bald Eagle	Present	See TES section
Swainson's Hawk	Suspected	See landbird discussion
Ferruginous Hawk	Absent	Outside range of project area
Peregrine Falcon	Nesting Habitat Absent	No suitable nesting habitat in project area, one incidental sighting of bird flying over area is recorded
Upland Sandpiper	Historically Present	TES section, historically present, current status unknown
Long-Billed Curlew	Present	See landbird discussion
Yellow-Billed Cuckoo	Present	Documented infrequently in Logan Valley, see landbird discussion
Flammulated Owl	Present	See landbird discussion
Black Swift	Absent	Outside range of project area
Lewis' Woodpecker	Present	See TES section
Williamson's Sapsucker	Present	MIS - primary cavity excavator discussion, see landbird discussion
White-Headed Woodpecker	Present	See TES section
Olive-sided Flycatcher	Present	See landbird discussion
Willow Flycatcher	Suspected	See landbird discussion
Loggerhead Shrike	Suspected	See landbird discussion
Sage Thrasher	Absent	Outside range of project area
Brewer's Sparrow	Present	See landbird discussion
Sage Sparrow	Absent	Outside range of project area
McCown's Longspur	Absent	Outside range of project area
Black Rosy-Finch	Absent	Outside range of project area
Cassin's Finch	Present	See landbird discussion

In addition, the Oregon Breeding Bird Atlas (Adamus et al. 2001) includes observations for this area. Much of the data for the Breeding Bird Atlas for the Malheur National Forest was obtained from local biologists and ornithologists. Most neotropical migratory bird species that are expected in the project area were recorded within the atlas' hexagons for the area. There is a high confidence level that most species discussed in this report are currently present in the area.

Affected Environment

Dry Forest Old Growth Habitat and Dependent Species

The Conservation Strategy (Altman 2000) identifies four habitat components of the dry forest types that are important to landbirds: Large patches of old forest with large trees and snags, old forest with patches of regenerating pines, old forest with grassy openings and dense thickets of small trees, and burned habitats (see Table 100). Large-scale declines in old forest with large trees and snags have raised concern for such species as the white-headed woodpecker, flammulated owl, chipping sparrow, white-breasted

nuthatch, pygmy nuthatch, Williamson's sapsucker, and Lewis's woodpecker. Habitat loss has resulted in population declines and range retractions for these species (Altman 2000), this habitat loss is generally the result of past harvest activity and fire suppression.

Post-fire habitat for species such as the Lewis's woodpecker and white-headed woodpecker occurs north of the Project area. Recent underburning within the Merit Timber Sale area may also be providing small patches of burned forest habitat. See the threatened, endangered, and sensitive species section for discussion.

Mesic Mixed Conifer Old Forest and Dependent Species

The mesic mixed conifer habitats refer to the cooler, moister mixed conifer habitats that occur at higher elevations, wetter sites, northerly aspects, and in areas where soils are mesic and well developed. These forests are generally dominated by the true fir species (grand and white fir), with Douglas-fir, western larch, and occasional ponderosa pine scattered within these stands.

This habitat is described as structurally diverse, multi-layered with overstory canopy closure and large snags. Upper portions of Lake Creek and Big Creek within the project area are comprised of these habitat components. Alder-dominated shrub habitat within forested openings occurs. Because of dense overstory and shading, there is little available forage for cattle in the understory and generally would not be impacted by grazing animals. Exceptions to this would be shrub dominated openings where some understory vegetation was available as forage.

Montane Meadow

Montane meadow habitat suitable for upland sandpipers occurs primarily within Logan Valley and Summit Prairie within the project area. Smaller meadow habitat occurs along several drainages within the project area as well. Conservation issues include overgrazing and recreational off road vehicle use (Altman 2000). Private land interspersed with National Forest System land occurs within both areas. Livestock grazing occurs on some of these private lands. The Burns Paiute Tribe owns and manages property in Logan Valley (Wenick et al. 2002).

Upland sandpipers were documented historically within Logan Valley and Bear Valley (west of the project area). Effects to upland sandpiper are discussed in the threatened, endangered and sensitive wildlife species section. Montane meadow habitat within the project area supports a wide diversity of other landbirds. Long-billed curlews are documented nesting within Logan Valley.

Shrub-steppe Habitats

Non-forested acres, including shrub-steppe habitats of dry woodlands, shrublands and grasslands comprise approximately 11 percent of the Summit Logan Valley Grazing Authorization Project area. These shrub-steppe habitats include scab flats, meadows, and fringe areas transitioning from ponderosa pine to larger grassland openings into Logan Valley and Summit Prairie.

Small openings are also scattered throughout the forested areas, and can include both grasslands and shrublands. Shrub species include sagebrush as well as mountain mahogany and bitterbrush; these areas provide additional habitat for landbird species that use dry shrub-steppe habitats. Species that use these habitats include vesper sparrow, Brewer's sparrow, lark sparrow, and long-billed curlew.

Livestock grazing, fire suppression and road construction have impacted habitat quality. Conifer encroachment into these openings may have reduced the extent of these habitats.

Riparian Shrublands

Riparian shrub habitats are typified by the presence of hardwood shrub species, along with associated wetland herbaceous species. Water is an important component of these habitats, whether it is in the form of standing wetlands, spring and seeps, or flowing water (rivers and streams). Although these habitats generally comprise only a small portion of the landscape, they usually have a disproportionately high level of avian diversity and density when compared to surrounding upland habitats.

Within the project area, riparian woodlands and shrublands are generally associated with perennial rivers and streams such as the Malheur River, Lake Creek, McCoy Creek, Big Creek, Bosenberg Creek, Summit Creek and portions of surrounding tributaries. Intermittent streams also support riparian vegetation, as streams run at least part of the year, beyond normal run-off events.

Vegetation along streams in the project area is variable. Most streams have a patchy distribution of forest and non-forest, open vegetation types along their length. Willow and alder thickets historically dominated some stream reaches. Today, willow and alder densities and age classes are well below historic levels along some streams within the project area (Carex Working Group 2012).

As a result, riparian conditions have likely affected such landbird species as Lewis's woodpecker, red-naped sapsucker, downy woodpecker, red-eyed vireo, olive-sided flycatcher, veery, willow flycatcher, ash-throated flycatcher, tree swallow, house wren, Swainson's thrush, calliope hummingbird, song sparrow, spotted towhee, western wood pewee, warbling vireo, American redstart, orange-crowned warbler, and mountain chickadee. Landbird species that could benefit from improvements in riparian habitat include almost every bird species residing or migrating through Oregon.

Aspen

Stands of quaking aspen (*Populus tremuloides*) represent an uncommon and unique habitat type in the Blue Mountains. As one of few broadleaf deciduous trees in a landscape dominated by conifers and shrub-steppe habitat, aspen provide diverse and valuable forage, cover, and nesting habitat for a number of wildlife species, including neotropical migratory birds. Point count surveys conducted by Lynda Cobb of Grant County Bird Club (1997) detected 71 bird species in 34 aspen stands of the Malheur National Forest. In riparian areas, aspen provide shade, streambank stability, and nutrients from leaf fall into streams (Swanson et al. 2010).

Historically aspen stands within the Blue Mountains have never been as abundant as in other areas of the west. On the Malheur National Forest, most stands are small, usually averaging less than one acre (Swanson et al. 2010). This low abundance and small patch size can increase the potential loss of these stands from conifer succession and herbivory. Both wild ungulates and domestic cattle impact aspen stands; however, livestock grazing represents an adverse effect that was historically absent prior to the arrival of Europeans to this area (Swanson et al. 2010). Fire suppression resulting in competing conifers that gain ground within aspen stands compounds the problem. Some land managers believe that 50% or more of remaining aspen clones may be lost in the next 20 years if active measures are not taken (Swanson et al. 2010).

There are approximately 380 acres of aspen stands currently within the Summit Logan Valley Grazing Authorization Project (Harris, GIS 2013). Some stands have been protected by fencing, and have responded with increased sucker growth and production. Most continue to be impacted by grazing by cattle, deer, and elk, and by conifer encroachment.

Figure 34. Aspen stands within the project area. Mature trees are present, but replacement saplings and suckers are missing. Aspen snags and down aspen logs are abundant in some stands.

Although the Lake Creek allotment has been vacant, visits to several aspen stands early spring 2012 showed browsing by wildlife was still arresting aspen regeneration. Old cow manure was also observed, so some unauthorized cattle use of this allotment is occurring, impacting aspen regeneration.

Numerous wildlife species depend on and benefit from healthy aspen stands within forested landscapes. Primary species to benefit from aspen would be red-naped and Williamson's sapsuckers, northern flicker, tree swallow, house wren, northern pygmy owl, western screech owl, and mountain bluebird (Altman 2000). In addition, Lewis's woodpeckers were documented nesting within aspen stands in the Summit Logan Valley Grazing Authorization Project, 2010 and 2012.

Environmental Consequences

Alternative 1 - No Grazing

Landbird including Neotropical Migratory Bird Habitat

Direct, Indirect and Cumulative Effects

Under the No Action alternative, there would be no management activities, no grazing would occur on any of the allotments. Impact to upland and riparian forage and shrubs from domestic livestock would be eliminated.

Habitats and associated species that would benefit from no grazing include riparian shrub, steppe shrubland, montane meadow, and aspen. Habitats and associated species less impacted by the No Action alternative include dry forest old growth and mesic mixed conifer.

Because there are no direct or indirect effects to neotropical migratory birds, landbirds, or their habitat, as a result of No Action, there would be no additive cumulative effects.

Alternatives 2, 3 & 4

Landbird including Neotropical Migratory Bird Habitat

Direct and Indirect Effects

Dry Forest Old Growth Habitat and Dependent Species and Mesic Mixed Conifer Old Forest and Dependent Species

Depending on canopy cover and overstory shading, dry forest old growth and mesic mixed conifer old forest habitat may have less available forage, or less palatable forage, and consequently may be less impacted by cattle grazing. Depending on season of use, some ground nesting birds within this habitat could be impacted by trampling or loss of cover and exposure of nests. Early season grazing would have the greatest impact. Not all areas of potential habitat would be affected by cattle in a given grazing season.

Montane Meadow, Shrub Steppe Habitats

Impacts to montane meadow or shrub steppe habitats would depend on timing of cattle grazing, and concentration of livestock within these pastures. Early season grazing may have the greatest impact to ground nesting birds by cattle trampling eggs, or by reducing cover through grazing and increasing the exposure of nests. Because of variations in dates of turn-out, not all areas of potential habitat would be impacted by cattle in a given grazing season.

Monitoring use levels and assessing impact to native vegetation with these grassland, meadow, and shrub steppe habitats would be critical for determining trends in habitat improvement.

Adaptive management strategies such as reducing time in any given pasture, or reducing numbers of cattle, as well as additional fencing to exclude use would all benefit these habitats.

Primary species to benefit from montane meadow include savannah sparrow, long-billed curlew, Wilson's phalarope, Wilson's snipe (common snipe), and sandhill crane (Altman 2000). All of these species have been documented in the project area.

Primary species to benefit from shrub steppe habitat include vesper sparrow, Brewer's sparrow, lark sparrow and long-billed curlew (Altman 2000). All of these species have been documented in the project area.

Riparian Shrublands

Impacts to riparian shrublands would also depend on timing of cattle grazing, and concentration of livestock within these pastures. Use levels and move triggers designed to improve riparian conditions for fisheries would also improve these areas for neotropical migratory birds.

Early season grazing may have the greatest impact to ground nesting birds by cattle trampling eggs, or by reducing cover through grazing and increasing the exposure of nests. Because of variations in dates of turn-out, not all areas of potential habitat would be impacted by cattle in a given grazing season.

Monitoring use levels and assessing impact to native vegetation within these riparian habitats would be critical for determining trends in habitat improvement.

Adaptive management strategies such as reducing time in any given pasture, or reducing numbers of cattle, as well as additional fencing to exclude use would all benefit these habitats.

Fences, especially those in riparian areas, may impact non-game wildlife; bats, song birds, and flying squirrels can become impaled on barbs. Raptors, in particular owls, can fly into fences while pursuing prey species (Paige 2008). Although likely incidental, these interactions have potential to cripple or kill individual animals.

Properly maintained fences minimize the possibility of animals becoming caught in loose or tangled wires. Let-down fences used in areas of heavy snow-pack benefit wildlife because they are laid flat on the ground during the non-grazing season, removing the barrier. Several other modifications to fences that reduce impacts to wildlife are illustrated in "A Landowner's Guide to Wildlife Friendly Fences: How to Build Fence with Wildlife in Mind" (Paige 2008). Water developments such as troughs are required to have wildlife escape ramps installed to prevent drowning of small mammals or birds.

Aspen

Where aspen occur within riparian areas, use levels and move triggers designed to improve riparian shrub recruitment and growth may also provide a level of protection and monitoring for those stands.

However, unprotected aspen stands may continue decline. Conifer shading and competition, along with grazing pressure from cattle as well as wildlife are adversely impacting these stands. Currently aspen snags and large mature aspen exist within the project area. As these stands continue to age, lack of saplings as replacements for older trees would result in a reduction and eventual loss of aspen stands in the long-term. This would directly impact downy woodpeckers, and red-naped sapsuckers, species which use aspen stands extensively for nesting and foraging. Other primary cavity excavators using aspen habitat include Lewis's and white-headed woodpeckers, Williamson's sapsucker, northern flicker, and hairy woodpecker. Numerous secondary cavity nesters as well as small mammals and bats would be impacted by loss of aspen stands.

Aspen restoration projects (Logan Valley Meadow and Aspen Restoration project, and Merit Timber sale project) have protected some aspen within the project area by removing conifers, and fencing or creating slash barriers around the stands. The Logan Valley project is ongoing. Stands that have received some measure of conifer removal or protection would maintain aspen within the project area. Monitoring would determine if appropriate use levels by cattle are allowing aspen suckers to develop to the sapling stage (See Monitoring, chapter 2).

Direct and Indirect Effects Common to All Landbird Habitats

During project implementation (cattle off-loading, cattle grazing, fence maintenance, fence construction, water development construction) a degree of disturbance and displacement of wildlife is likely. Disturbance and displacement of wildlife depends on the season of the year and the tolerance of the species and individuals. Overall, disturbance from activities would be limited in time and place, and therefore, would not be expected to impact populations of species at the landscape level.

Cumulative Effects Common to All Landbird Habitats

Cumulative effects were analyzed at the project area level. All of the activities listed in appendix C were considered for their cumulative effects on neotropical migratory birds or their habitat.

Unregulated livestock grazing earlier in the century impacted grassland and riparian habitat within the Summit Logan Valley Grazing Authorization Project. Over time, and with changes in grazing management, habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in grassland and riparian habitat. As a result, diversity and abundance of prey species for neotropical migratory birds and landbirds would be expected to improve.

Ongoing aspen restoration (which includes conifer removal and protection) is expected to hold a percentage of aspen stands on the landscape. Monitoring is needed to assess the continued long-term impact of grazing on aspen habitat and to implement effective management strategies to lessen these impacts.

Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of neotropical migratory birds and landbirds on the Forest.

Conclusion

Overall, while there may some impacts to individuals or habitat, the proposed actions are not expected to adversely impact neotropical migratory bird species and landbird populations at the Forest level.

Consistency with Direction and Regulations

Threatened, Endangered and Sensitive Species

A Biological Evaluation (BE) and Wildlife Specialist Report has been prepared and evaluates the potential effects of livestock grazing on wildlife species and their associated habitat within the Summit Logan Valley Grazing Authorization Project. The Proposed Action is consistent with the Endangered Species Act. The proposed action would be expected to have **No Effect (NE)** to threatened Canada lynx and No Impact (NI) to the sensitive gray wolf, bald eagle, California wolverine, and Johnson's hairstreak butterfly. . Late season grazing would have **No Impact (NI)** to upland sandpipers. No early season grazing would occur in historic nest areas for upland sandpipers if birds are present.

The proposed action **May Impact Individuals or Habitat (MIIH)** of sensitive greater sage-grouse, silver-bordered fritillary, bobolink, grasshopper sparrow, Lewis's woodpecker, white-headed woodpecker, Townsend's big-eared bat, pallid bat, fringed myotis, Columbia clubtail dragonfly, and Columbia spotted frog, but would not likely contribute to a trend towards federal listing.

Old Growth Habitat (MIS)

Management Area 13 – Old Growth – The goals of this management area are to provide "suitable" habitat for old growth dependent wildlife species, ecosystem diversity, and preservation of aesthetic qualities. Within the Summit Logan Valley Grazing Authorization Project area, the acres mapped as MA-13 would stay the same.

Connectivity

For all alternatives, existing connectivity is expected to remain the same.

Summer Range Cover

For all alternatives, summer range cover is expected to remain the same.

Snags and Down Logs

For all alternatives, snags and down logs are not targeted for removal. Cattle grazing would not impact these structures. Overall snag and down log quantities are expected to stay about the same, with only incidental impacts to this habitat from clearing right-of-way for new fence construction, or water developments.

Featured Species

Goshawk

If nest sites are active, management activities would be prohibited within ½ mile of the nest sites from April 1 to September 30 to avoid disturbing goshawks during the breeding season.

Blue Grouse

For blue grouse, the action alternatives are not expected to impact winter roost habitat.

Osprey

The action alternatives include design elements to maintain osprey nest trees and snags on the landscape and minimize disturbance to nesting birds. These measures meet Forest Plan direction.

Pronghorn Antelope

Design elements including timing restrictions in fawning areas and fence designs to facilitate antelope movement, would minimize disturbance to antelope using meadow and open ponderosa pine areas within the Summit Logan Valley Grazing Authorization Project area. These measures meet Forest Plan direction.

Landbirds

The Proposed Action is consistent with the 1918 Migratory Bird Treaty Act and the Migratory Bird Executive Order 13186. The Proposed Action was designed under current Forest Service policy for landbirds. The Northern Rocky Mountains Bird Conservation Plan (Altman 2000) and the U.S. Fish and Wildlife Service's Birds of Conservation Concern (US Fish and Wildlife Service 2008) were reviewed for effects disclosure. The Proposed Action alternative was designed to protect or enhance priority habitats for landbird species, including neotropical migratory species.

Irreversible and Irretrievable Commitment of Resources

The project as described would not result in any irreversible or irretrievable effects to the wildlife resource. The project moves habitat conditions towards the historic condition. Therefore there are no irreversible or irretrievable commitments.

Climate Change

Regulatory Framework

The Forest Service Strategic Framework for Responding to Climate Change, states, "[t]he Forest Service will need to build consideration of climate change into virtually all aspects of agency operations including consideration of life cycle analysis of activities" (p. 11 under POLICY – Integrate climate change, as appropriate, into Forest Service policies, program guidance, and communications … heading). In addition, many of the recommendations included within appendix 1 of the cited document would be addressed under a greenhouse gas NEPA effects analysis for proposed actions.

Forest Service Chief's January 16, 2008 letter of direction transmitting the January 13, 2009, Climate Change Considerations in Project Level NEPA Analysis, applies general NEPA direction and regulation to the consideration of the appropriateness and degree of climate change and greenhouse gas emissions analysis for a given project. This guidance frames climate change analysis by discussing the answers to two fundamental challenges: how our management may influence climate change mainly through incremental changes to global pools of greenhouse gases and how climate change may affect our forests and grasslands.

Alternative 1 – No Grazing

Under alternative 1 (No Action), livestock grazing would no longer occur within the project area and there would be an evolution of resource conditions as biophysical processes would continue to occur. The scope and degree of effect of not grazing livestock in the project area on greenhouse gas emissions would be minor relative to the amount of lands being grazed on the Malheur Forest, Grant County, the State of Oregon as a whole, and the Western United States.

With no grazing the biophysical processes associated with the emission of greenhouse gas emissions related to livestock production tied to the project area would be altered. There would no longer be livestock authorized to graze within the project area that would be producing CH_4 as a result of enteric fermentation. The redistribution of carbon across the landscape would cease. Overall a similar or reduced level of carbon sequestration and soil carbon build up would be expected within the project area. However, since management practices which maintain or move plant associations to "good" condition appear to be consistent with maintaining the soil organic pool (Henderson, Ellert and Naeth 2004; Brown and Thorpe 2008; Sharrow 2008); improvement of vegetative conditions in riparian areas that are currently not at the desired condition (see Hydrology and Aquatics section) should increase in their efficacy as carbon sinks.

Under this alternative the "disposition" of the displaced livestock that have been grazing within the project area would ultimately determine the actual effect on greenhouse gas emissions. Unless these cattle were slaughtered or otherwise perished they would continue to produce CH_4 as a result of enteric fermentation. Many scenarios for the disposition of these displaced livestock would be expected to produce more net greenhouse gas emissions than have been produced in the past. Three scenarios where this would be expected to be the case include:

1. Livestock are raised in containment: Under this scenario (most unlikely for a cow/calf operation) livestock would be raised in a feedlot like environment. Under this scenario the production of both CH_4 and NO_2 associated with manure anaerobic decomposition would be expected to be increased dramatically while CH_4 associated with ruminant digestion would be expected to be reduced due to a higher quality of feed.
2. Livestock are moved to private rangeland: Under this scenario finding unallocated rangeland is unlikely therefore increased stocking on currently allocated rangeland would be expected. There is potential for rangeland degradation associated with increased stocking rates that would result in a reduced ability to capture and sequester carbon from the atmosphere.
3. Livestock are moved to private irrigated land: Under this scenario finding unallocated irrigated pasture is unlikely so increasing stocking on currently allocated irrigated pasture would be expected. In order to avoid degradation of the irrigated pasture it would be expected that increased inputs of fertilizer and water would be utilized. In this case the potential for the production of CH_4 and NO_2 is dramatically increased although capture and sequestration of atmospheric carbon is also increased.

Alternative 2, 3, & 4

The Effects of Grazing on Soil Carbon and Green House Gas Emissions (GHG)

"Agriculture and forestry practices may either contribute to or remove greenhouse gasses from the atmosphere. Agriculture and forestry have affected greenhouse gas levels in the atmosphere through cultivation and fertilization of soils, production of ruminant livestock, management of livestock manure, land use conversions, and fuel consumption. The primary greenhouse gas sources for agriculture are N_2O emissions from cropped and grazed soils, CH_4 emissions from ruminant livestock production and rice

cultivation, and CH_4 and N_2O emissions from managed livestock waste. The management of cropped, grazed, and forestland has helped offset greenhouse gas emissions by promoting the biological uptake of CO_2 through the incorporation of carbon into biomass, wood products, and soils. …In the U.S., agriculture accounted for close to 7 percent of total greenhouse gas emissions (7,260 Tg CO_2 eq., teragrams of carbon dioxide equivalents) in 2005 (EPA 2013). …After accounting for C sequestration related to forestry, agricultural and forested lands in the U.S. were estimated to be a net sink of 306 Tg CO_2 eq. … Livestock production is responsible for … about 22 percent (of the agricultural greenhouse gas emissions) from enteric fermentation, 10 percent from managed waste, and 18 percent from grazed lands. It should be noted that the estimates … are for emissions only, and do not account for C storage in agricultural soils and forests" (USDA Global Change Program 2008).

"Grazing lands are estimated to contain 10 to 30 percent of the world's soil organic carbon" (Schuman, Janzen and Herrick 2002). While some studies have found limited to large reductions in soil carbon and increases in CO_2 flux associated with grazing (Haferkamp and Macneil 2004, Welker et al. 2004). Studies involving modeling and remotely sensed data indicate that proper grazing can improve ecosystem production as measured by soil carbon storage (Li, Liu and Tan 2007; Steinfeld and Wassenaar 2007; Reeder et al. 2004; Schuman, Janzen and Herrick 2002). Additional studies similarly conclude that certain levels of grazing may even increase carbon sequestration (Hellquist et al. 2007; Derner, Boutton and Briske 2006; Derner et al. 2005; LeCain et al. 2002; Ganjegunte et al. 2005; Manley et al. 1995; Reeder et al. 2004; Schuman, Janzen and Herrick 2002). Complementing these findings, several studies indicate that light to moderate levels of grazing have no overall effect on total carbon sequestration (Hellquist et al. 2007; Ingram et al. 2007; Derner, Boutton and Briske 2006; Stavi et al. 2008; Owensby, Ham and Auen 2006; Shrestha and Stahl 2008; Ingram et al. 2008). In fact, intensive rotational grazing appears to be a viable option for greenhouse gas reduction and carbon sequestration credits (Bosch, Stephenson, Groover and Hutchins 2008; Stenguer, Brown and Thorpe 2008; Natural Resources Conservation Service 2006; Li, Liu and Tan 2007; Ingram et al. 2008; Conant and Paustian 2000; Stenguer, Brown and Thorpe 2008; Streater 2009; Sharrow 2008).

Initially these findings seem inconsistent with the dual observations that desertification results in a net loss of C to the atmosphere and, the rate of desertification has been estimated to be higher for grazing land than for other land uses globally (Steinfeld and Wassenaar 2007, Asner et al. 2004). However, these observations need to be considered in the context that conversion of land use from cropping to grazing increases carbon sequestration (Conant and Paustian 2000; Derner et al. 2005; Sharrow 2008; US Environmental Protection Agency 2005; Schuman, Janzen and Herrick 2002).

It can safely be asserted that there is tremendous variability in carbon storage and its response to grazing across different land types (Derner, Boutton and Briske 2006; Henderson, Ellert and Naeth 2004). The Northern Great Plains appears to have small potential as a carbon sink (Haferkamp and Macneil 2004). Alternately local research indicates that ungrazed sagebrush steppe sites were CO_2 sinks during the period they were measured (Svejcar et al.2008). Management practices which maintain or move plant associations to "good" condition appear to be consistent with maintaining the soil organic pool (Henderson, Ellert and Naeth 2004; Brown and Thorpe 2008; Sharrow 2008).

Grazing results in redistribution of carbon on the landscape (Stavi et al. 2008). It has been noted that livestock waste management represents a potential long-term soil carbon gain (Fellman et al. 2008). Free ranging livestock deposit manure across the landscape resulting in aerobic decomposition. Aerobic decomposition of manure generates considerably less methane than does decomposition associated with stockpiling strategies employed in more concentrated livestock production strategies (US Environmental Protection Agency 2005). This "in-effect" land application of manure also results in a buildup of soil

carbon that decomposes much more slowly than occurs when composting (Natural Resource Conservation Service 2007).

The Effects Relative to Green House Gas Emissions and Climate Change

Alternatives 2, 3, and 4 would authorize livestock grazing on areas ranging from 30,000 to 35,000 acres in the Logan Valley, McCoy Creek, and Summit Prairie grazing allotments on the Malheur National Forest (See FEIS Chapter 2 for specific acre by alternative). Slightly different levels of livestock grazing in riparian areas would be expected to occur within the project area with each alternative. A project of this magnitude would have such minimal effects to greenhouse gasses that its impact on global climate change would be infinitesimal. Therefore, at the global scale, the proposed action's direct and indirect contribution to greenhouse gasses and climate change would be negligible. In addition, because the direct and indirect effects would be negligible, the proposed action's contribution to cumulative effects on greenhouse gasses and climate change would also be negligible.

"[U]ncertainty about climate projections are much greater at the local and regional scales important to land managers, because uncertainties amplify as data and model output are downscaled. … changes in annual precipitation, … have higher uncertainties associated with them. … Ecological response to climate related changes is highly likely to be more difficult than climate to model accurately at local scales. … Uncertainty does not imply a complete lack of understanding of the future. Managing in the face of uncertainty will best involve a suite of approaches, including planning analyses that incorporate modeling with uncertainty, and short-term and long-term strategies that focus on enhancing ecosystem resistance and resilience, as well as actions taken that help ecosystems and resources move in synchrony with the ongoing changes that result as climates and environments vary. … Flexibility to address the inherent uncertainty about local effects of climate change could be achieved through enhancing the resiliency of forests … Efforts to address existing stressors would address current management needs, and potentially reduce the future interactions of these stressors with climate change" (U.S. Climate Change Science Program 2008).

Alternatives 2, 3, and 4 meet the Agency's mission and the described purpose and need for this project while enhancing the resilience and adaptive capacity of resources to the potential impacts of climate change (USDA 2008). Alternatives 2, 3, and 4 incorporate an adaptive management approach that provides flexibility to address inherent uncertainty associated with the local effects of climate change.

Although we know an ecosystem's sensitivity to grazing pressure and threshold for degradation changes with bioclimatic setting, resulting in lower sustainability in very dry and very humid ecosystems (Asner et al. 2004), the future bioclimatic setting within the project area is highly uncertain. It is very likely that as future average temperatures increase, snow pack will be reduced, snow melt, run-off and peak flows will occur earlier in the year. In addition, with increased atmospheric carbon, primary production is expected to increase particularly on semi-arid rangelands (Derner et al. 2005). It has been hypothesized that grazed areas resulting in a lower soil water holding capacity and lower temperature sensitivity of soil respiration might release less CO_2 to the atmosphere through soil respiration under future precipitation and temperature scenarios (Shiping Chen et al. 2008).

Other Laws, Regulations and Policies

National Historic Preservation, Treaty Rights, Executive Order 12875, Executive Order 13287 and American Antiquities Act of 1906

See Heritage under Consistency with Direction and Regulations.

Environmental Justice, Executive Order 12898

See Social and Economic Effects Section under Consistency with Direction and Regulations.

Migratory Bird Treaty Act (MBTA)

See Wildlife Effects Section under Consistency with Direction and Regulations.

Clean Water Act

See Hydrology and Aquatics effects under Consistency with Direction and Regulations.

Floodplains, Executive Order 11988

See Hydrology and Aquatics effects under Consistency with Direction and Regulations.

Wetlands (Executive Order 11990)

See Hydrology and Aquatics effects under Consistency with Direction and Regulations.

Endangered Species Act

See Wildlife, Hydrology and Aquatics, and Botany Sections.

National Forest management Act (NFMA)

The analysis and proposed activities are consistent with the direction in the Forest Plan. The Forest Plan was developed and amended per guidance from NFMA.

Multiple-Use Sustained Yield Act of 1960

The four alternatives considered in detail meet the intent of the Multiple-Use Sustained Yield Act. They ensure that recreation, fish and wildlife, water, timber resources are available for current and future generations, however only the three action alternatives ensure that grazing resources are available for both current and future generations in the project area.

Municipal Watersheds

There are no designated municipal watersheds in the Summit Logan Analysis area.

Consumers, Civil rights, Women, and Minorities

Consumers, the civil rights of individuals and groups, including minorities and women, and the rights of American Indians identified by the American Indian Religious Freedom Act of 1978 would not be adversely affected by implementation of any alternative under consideration. Indirect effects on these groups my result from job opportunities created or maintained by authorizing grazing on allotments and pastures in the projected area with alternatives 2, 3, and 4. Such employment opportunities would not be provided with implementation of alternative 1 (No Grazing).

Unavoidable Adverse Effects

There would be no unavoidable adverse effects to resources with implementation of the grazing alternatives under consideration. Implementation of alternative 1 (No Grazing) would have an adverse economic effect upon permittees and their employees.

Chapter 4. Preparation, Consultation and Distribution

List of Preparers

Name	Expertise	Years	Education
Shannon Britt	Rangeland Vegetation & Invasive Species	24 years	Bachelor of Science, Rangeland Resource Management
Joseph Rausch	Botany/Ecology	11 years	Doctor of Philosophy, Botany
Robert “Hersh” McNeil	Soil Science	22 years	Doctor of Philosophy, Forestry
Bob Hassmiller	Hydrology	5 years	Bachelor of Science, Resource Conservation
Dan Armichardy	Fisheries	6 years	Masters of Science, Biology (emphasis on Fish Migration)
Amanda Kunzman	Fisheries		
Shannon Winegar	Recreation & Visual Quality	27 years	Bachelor of Nursing
Mary Robertson	Archaeology	20 years	Masters of Science (emphasis on Archaeology)
Susan Burton	Social & Economics	30 years	Bachelor of Science, Rangeland Management
Cindy Kranich	Wildlife Biology	29 years	Bachelor of Science, Wildlife Biology
Ryan Falk	Environmental Coordinator	28 years	Bachelor of Science, Forest Management
Kristin Whisennand	Writer/Editor	20 years	Bachelor of Arts, Anthropology, Bachelor of Science, Natural Resource Management Planning
Anita Leach	Environmental Coordinator	28 years	Bachelor of Science, Forestry

Consultation and Coordination

The Forest Service consulted the following individuals, tribes, Federal, state and local agencies, and non-forest Service persons during the development of this environmental impact statement:

Tribes

Confederated Tribes of the Warm Springs Reservation
Confederated Tribes of the Umatilla Indian Reservation
Burns Paiute Tribe

Others

National Riparian Service Team
Carex Working Group

Federal, State and Local Agencies

Bureau of Land Management (BLM), John Day
Oregon State Historic Preservation Office (SHPO)
Oregon Department of Fish and Wildlife
Oregon Department of Forestry
Grant County Court

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Oregon Wild
Oregon Natural Desert Association

Draft EIS Comments

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Karen Coulter - Blue Mountains Biodiversity Project
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Boardman Chip Co. Inc.;Ed Tarnasky
Carter Patton
Cascadia Wildlands Project; John Laughlin
Center for Tribal Water Advocacy: Harold Shepard
Columbia Helicopters Inc.; Max Merlich
Columbia River Intertribal Fisheries Commission
Columbia Vista Corporation; Fred Schatz
Colvin Cattle Company
Continental Resource Solutions
D.R. Johnson Lumber; Gerald Keck
Dakom Logging Inc.; Dan Komning
Darrel Holliday Ranch, Inc.
Dash W Bar Ranch LLC
Dayville Grazing Association
Defenders of Wildlife; Rick Brown
Dunton Ranch
E & M Kimberling Ranch LLC; Michael Kimberling
Elliott Livestock Company, Inc.; Keith Elliott
Elmwood Ranches, Inc.
Emmel Borthers Ranch
Ernst Construction; Robert Ernst
G.I. Ranch Corporation
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Gant County ESD; Antony Lanni
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Juniper Group Sierra Club: Oregon Eastside Forest Committee
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Oregon Sportsmen; Marion Crow
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Pacific Legal Foundation; Emma T. Suarez
Parametrix, Inc.
Prairie Wood Products; Dan Bishop
Randy Scott Logging; Randy Scott
Rangeland Consultation Service
Rocky Mtn. Elk Foundation; Phillip H. Turrell
Rocky Bluff Ranch; Herb Peterson
Roger O. and Meredith L. Ediger Trust
S Bar S Ranches, Inc.; Don Moss
Silver Creek Ranches, LLC
Snow Mountain Ranch LLC
Southworth Brothers, Inc.; Jack Southworth
Swaggart Enterprises Inc.; Nancy Swaggart
T.G. Cattle Company LLC; Theodore & Sandra Brown
The Nature Conservancy
Three Valley Ranch LLC
Thunderbolt; Roy & Evelyn Cates
Trini-D LLC; Chris Bravos
Van Grazing Coop.; John Sword
Vaughan Ranches Inc.; Jack E Johns
Vencor; David Vernam
W. Irene Keerins/Bonham Keerins Trust
Whelan Realty and Eng. Inc.; Pat Whelan
Wilburn Ranches, Inc.; Rich Wilburn

Local Officials

Grant County Court: Judge Scott Meyers
Grant County Court; Mark Webb
Grant County Forest Commission; Dave Traylor
Grant County Forest Commission; Mike Smith
Grant County Forest Commission; Tad Houpt
Grant County Rd. Dept. Road Supervisor
Grant County Soil and Water Conservation District: Jason Kehrberg
Harney County Court: Judge Steve Grasty
Harney County Watershed Council

State Agencies

Oregon Department of Fish and Wildlife; Kevin Blakely
Oregon Department of Fish and Wildlife; Ryan Torland

Tribal Contacts

Burns Paiute Tribe: Honorable Diane Teeman
Confederated Tribes of the Umatilla Indian Reservation: Honorable Les Minthorn
Confederated Tribes of the Umatilla; Rick George
Confederated Tribes of Warm Springs: Honorable Ron Suppah
Confederated Tribes of Warm Springs: Honorable Stanley "Buck" Smith
Confederated Tribes of Warm Springs; Bobby Brunoe
Confederated Tribes of Warm Springs; Sally Bird
Confederated Tribes of Warm Springs; Scott Turo

Federal Agencies

Acquisitions and Serials Branch National Agriculture Library
Bureau of Land Management
Chief of Naval Operations (N45) Energy and Environmental Readiness Division
Deputy Director APHIS PPD/EAD
Director, NEPA Policy and Compliance, Department of Energy
Director, Planning and Review Advisory Council on Historic Preservation
Habitat Conservation Division, NOAA Fisheries Service NW Region
Northwest Power Planning Council
US Coast Guard, Commandant CG-47, Department of Homeland Security
US EPA, Region 10, EIS Review Coordinator
US Fish and Wildlife Service
USDA Forest Service, S&PF; Steve Bush
USDA Forest Service, Walla Walla Ranger District; District Ranger
Army Corps of Engineers, Northwestern Division

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Glossary

A:

Access – The mode by which activities are pursued and how well users can travel to or within the setting.

Adaptive Management – A system of management practices based on clearly identified intended outcomes and monitoring to determine if management actions are meeting those outcomes; and, if not, to facilitate management changes that will best ensure that those outcomes are met or re-evaluated. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain.

Allotment Management Plan (AMP) – A long-term operating plan for a grazing allotment on public land prepared and agreed to by the permittee and appropriate agency.

Allowable Use – (1) The degree of utilization considered desirable and attainable on various parts of a ranch or allotment considering the present nature and condition of the resource, management objectives and levels of management. (2) The amount of forage planned to be used to accelerate range improvement.

Animal-Unit-Month (AUM) – The amount of dry forage required by one animal unit for one month based on a forage allowance of 26 pounds per day. Not synonymous with animal-month. The term AUM is commonly used in three ways: (a) stocking rate, as in “X acres per AUM”, (b) forage allocations, as in “X AUMs in Allotment A”, (c) utilization, as in “X AUMs taken from Unit B.”

Available Forage – That portion of the forage production that is accessible for use by a specified kind or class of grazing animal.

Average Bankfull Width – The width at the elevation of the bank where flooding occurs.

B:

Bankfull width to depth – A ratio that divides the bankfull width by the average depth of the bankfull channel. A higher value is typically wide and shallow, whereas a lower values is narrower and deeper.

Bankfull – The elevation of the bank where flooding begins. The bankfull level is associated with the streamflow that just fills the channel to the top of its banks where water begins to overflow onto the floodplain.

Bryophyte – Species of land plants that do not have true vascular tissue (non-vascular), such as mosses, liverworts, and hornworts (compare to vascular plant).

C:

Capability – Potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current resource conditions and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices, such as silviculture or protection from fire, insects, and disease

Carrying Capacity – Also known as grazing capacity. The maximum stocking rate possible without inducing damage to vegetation or related resources. It may vary from year to year on the same areas due to fluctuating forage production.

Complete Survey – For this type of survey, the survey area is given a very close review by walking through the entire area and its perimeter more than once. Virtually all of the area is examined.

Cultural Resources – The physical remains (artifacts, ruins, burial mounds, petroglyphs, etc.) and conceptual content or context (as a setting for legendary, historic, or prehistoric events, as a sacred area of native peoples, etc.) of an area associated with human use capable of providing scientific or humanistic understanding of past human behavior, cultural adaptation and related topics through the application of

scientific or scholarly techniques of investigation, or has spiritual value for members of the affiliated culture.

D:

Dedicated Old Growth (DOG) – Forest plan management area 13 which is comprised of mature trees (150 years or older) provides habitat for wildlife species dependent on mature forest conditions and provides for ecosystem diversity. These areas are equally distributed across the Forest. Wildlife species dependent on these lands include pileated woodpecker and American (pine) marten.

Deferred Grazing – The use of deferment in grazing management of a management unit, but not in a systematic rotation including other units.

Deferred Rotation – Any grazing system, which provides for a systematic rotation of the deferment among pastures.

Designated Monitoring Area (DMA) – A relatively small portion of a pasture or management unit selected because of its location, use or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the overall riparian condition and the acceptability of current grazing management in riparian areas.

Desired Condition – (1) A portrayal of the land or resource conditions that are expected to result if goals and objectives are fully achieved. (2) A description of the landscape as it could reasonably be expected to appear at the end of the planning period if the plan goals, objectives, standards, and guidelines for that landscape are fully achieved.

Dispersed Recreation – Recreation use that occurs outside of developed sites and requires few, if any, facilities other than roads and trails. Dispersed recreation activities include hiking, backpacking, cross-country skiing, hunting, and snowmobiling, viewing scenery, and driving for pleasure.

E:

Ecological Status (seral status) – The present state of vegetation and soil protection of an ecological site in relation to the potential natural community for the site. Vegetation status is the expression of the relative degree of which the kinds, proportions, and amounts of plants in a community resemble that of the potential natural community. If classes or ratings are used, they should be described in ecological rather than utilization terms. For example, some agencies are utilizing four classes of ecological status ratings (early seral, mid-seral, late seral, potential natural community) of vegetation corresponding to 0-25%, 26-50%, 51-75% and 76-100% of the potential natural community standard. Soil status is a measure of present vegetation and litter cover relative to the amount of cover needed on the site to prevent accelerated erosion. This term is not used by all agencies.

Ecological Status Rating – The average ecological status rating of plants. The ecological status is calculated using plant successional status ratings and Winward's Riparian Capability Groups. It is further adjusted where a woody overstory component should be present but currently is not present.

Effective Shade – The percent reduction of potential daily solar radiation delivered to the water surface.

End-point Indicator – Physical features that can be measured as a group to assess cause and affect relationships and determine condition and trend. The timing of measurements is based on the objective – bank disturbance features (such as hoof prints) are best measured at the end of the grazing season, vegetation monitoring is generally conducted at the end of the growing season (or the end of the grazing season-whichever is later).

Exclosure – An area fenced to exclude animals.

Extensive Management Strategy – A Forest Plan strategy where management seeks full utilization of forage available to livestock. Cost-effective management systems and techniques, including fencing and water development, are designed and applied to obtain relatively uniform distribution and use of forage and to maintain plant vigor.

F:

Featured Species – The Malheur Forest Plan defines a featured species as a wildlife species of high public interest or demand.

Fen – A groundwater-dependent ecosystem and type of minerotrophic peatland that has a relatively constant supply of groundwater which saturates the soil and slows decomposition to the point that peat accumulates. The water table is slightly below, at, or just above the surface; there is internal groundwater seepage in these systems, but sometimes they have over-surface flow. The dominant vegetation are bryophyte, graminoid, or low shrub species.

Floodplain – The relatively flat area adjacent to a stream or lake that experiences occasional or periodic flooding.

Forage –Browse and herbage which is available and may provide food for grazing animals or be harvested for feeding.

Forage Production – The weight of forage that is produced within a designated period of time on a given area. The weight may be expressed as either green, air-dry, or oven-dry. The term may also be modified as to time of production such as annual, current years or seasonal forage production.

Foreground – A term used in visual management to describe the portions of a view between the observer and up to ¼ to ½ mile distant.

Functional At Risk (FAR) – Riparian-wetland areas that are in functional condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

G:

General Survey – For this type of survey, the survey area is given a closer review by walking through the area and its perimeter or by walking more than once through the area. Most of the area is examined.

Geomorphology – The study of landforms and the processes that form them.

Graminoid – Species of vascular plants that include grasses and grass-like plants, such as sedges, rushes, bulrushes, and spikerushes.

Grassland – Land on which the vegetation is dominated by grasses, grass-like plants, and/or forbs. Non-forest land shall be classified as grassland if herbaceous vegetation provides at least 80% of the canopy cover excluding trees. Lands not presently grassland that were originally or could become grassland through natural succession may be classified as potential natural grassland. See also: Rangeland.

Grazing Permit – Official written permission to graze a specific number, kind, and class of livestock for a specified period on a defined allotment or management area. See also: Term Permit.

Grazing Permittee – An individual or other legal entity who has been granted a term grazing permit to graze a specified number of livestock for a specific period on a range allotment.

Grazing Season – (1) On public lands, an established period for which grazing permits are issued. May be established on private land in a grazing management plan. (2) The time interval when animals are allowed to utilize a certain area.

Grazing Use -

Actual Use – Report of the actual livestock use.

Authorized Use – is the use specified on the annual Bill(s) for Collection and verified by permittee's payment of fees.

Permitted Use – is the number of animals, period of use, and location of use specified in Part 1 of the grazing permit (see also definition for authorized use).

Greenline Stability Rating – The average vegetation stability rating of plants measured during the greenline plant composition component of MIM.

Greenline to Greenline Width – The nonvegetated width of a stream channel measured from the greenline on one side of the channel perpendicular to the streamflow to the greenline on the opposite side.

Groundwater-Dependent Ecosystem (GDE) – A wetland community that is reliant on having access to groundwater to maintain its ecological structure and function. They are diverse, complex, and often have a disproportionate amount of rare, sensitive, and unusual plant species. Springs, seeps, fens, swamps, and marshes are all types of GDEs.

H:

Hyphoreic Zone – The region beneath and adjacent to a stream where mixing in shallow groundwater and surface water occurs. Fish spawning typically occurs in these regions that provide cool water.

I:

Incidental Survey – This type of survey is conducted while accomplishing other botanical, ecological, or biological work. Thus, the primary purpose of the survey is not necessarily to locate and document TES plant species, but to accomplish other goals related to plant species function and occurrence. However, TES species are often located through this method. Most of the area is examined.

Interdependent – A relationship where each member is mutually dependent on the others.

Interrelated – Relates or connects to one another.

Intuitive Survey – This type of survey is the most commonly used and most efficient method of surveying for TES plants. Potential suitable habitat is identified for each species of interest and the survey effort is focused in those areas. When conducting intuitive controlled surveys, an area somewhat larger than the identified suitable habitat is searched to validate current suitable habitat definitions.

Invasive species – Plant species that were absent in undisturbed portions of the original vegetation of a specific range site and will invade or increase following disturbance or continued heavy grazing.

Irretrievable – Applies primarily to the use of nonrenewable resources. For example, some or all of the timber production from an area is irretrievably lost during the time an area is used as a winter sports site. If the use is changed, timber production can be resumed. The production lost is irretrievable, but the action is not irreversible.

Irreversible – Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors such as soil productivity that are renewable only over long time periods. Irreversible also includes loss of future options.

L:

Landscape Character – Particular attributes, qualities, and traits of a landscape that give it an image and make it identifiable or unique.

Late and Old Structural (LOS) Forest – A term used in Regional Forester's Eastside Forest Plans Amendment #2 (Interim Wildlife Standard) that refers to the structural stages where large trees are common. In this document old growth and mature forest are sometimes used as surrogate terms.

Lentic – Pertaining to ecosystems with still or slow moving waters (as lakes, ponds, fens, marshes, or swamps).

Letdown fence – Is a three of four-stand fence that can be laid down as a unit but remains under tension. It is commonly used in mountainous areas where snow packs of four feet or more commonly loosen or break wires or pull over posts.

M:

Management Indicator Species – Species selected by the Malheur National Forest as "barometers" of species diversity, viability, and the forest ecosystem. They are monitored over time to assess how changes in forest conditions (especially from management) affect MIS populations and habitat, and thus also populations of other species with similar habitat needs.

Meadow – (1) An area of perennial herbaceous vegetation, usually grass or grass-like, (2) Openings in forests and grasslands of exceptional productivity in arid regions, usually resulting from high water content of the soil, as in streamside situations and areas having a perched water table.

Mean Residual Pool Depth – The average of all differences between the crest depth and pool max depth in the survey. This difference can be visualized by imagining that if water ceased to flow, the water left in the pool that can't flow into the next riffle is the amount of the residual pool depth.

Middleground – The visible terrain beyond the foreground where individual trees are still visible, but do not stand out distinctly from the stand. It is the zone between the foreground and the background in a landscape. The area located from ½ mile to 4 mile from the observer.

Minerotrophic – Soils and vegetation whose water supply comes mainly from streams or springs. This water has flowed over or through rocks or other minerals, often acquiring dissolved chemicals which raise the nutrient levels and reduce the acidity.

Modification – A Visual Quality Objective meaning human activity may visually dominate the characteristic landscape, but also must utilize naturally established form, line, color, and texture.

N:

Non-Use – (1) Absence of grazing use on current year's forage production. (2) Lack of exercise, temporarily, of a grazing privilege on grazing lands. (3) An authorization to refrain, temporarily, from placing livestock on public ranges without loss of preference for future consideration

Noxious Weed – A plant species that is undesirable because it conflicts, restricts, or otherwise causes problems under management objectives. Not to be confused with species declared noxious by lows concerned with plants that are weedy in cultivated crops and on range.

O:

On-Site Recreation Development – The degree and appropriateness of recreation facilities provided within the setting.

P:

Partial Retention – Management activities may be evident to the viewer but must remain visually subordinate to the surrounding landscape.

Pasture – A grazing area enclosed and separated from other areas by fencing or other barriers; the management unit for grazing land.

Peat – Organic soils that are composed of partially decayed vegetation. Peat formation occurs when decomposition is very slow due to low oxygen conditions associated with waterlogging. Peat is primarily composed of un-decomposed graminoids and bryophytes.

Peatland – Any wetland that accumulates partially decayed plant matter (peat). Peatlands are often thousands of years old, and take from hundreds to thousands of years to form. Fens and bogs are the two primary peatland types.

Pedestaling – An evidence of soil erosion, where soil has been eroded from around a piece of ground cover (such as a clump of grass, or a piece of gravel), leaving the ground cover on a pedestal of un-eroded soil.

Percent Use – Grazing use of current growth, usually expressed as a percent of the current growth (by weight) that has been removed.

Permittee – One who holds a permit to graze livestock on state, federal, or certain privately owned lands.

Phenology – The study of periodic biological phenomena that are recurrent such as flowering, seeding, etc., especially as related to climate.

Plant Vigor – Plant health.

Potential Natural Community (PNC) – The biotic community that would become established on an ecological site if all successional sequences were completed without interferences by man under the present environmental conditions. Natural disturbances are inherent in its development. The PNC may include acclimatized or naturalized non-native species.

Productivity – (1) Soil productivity: the capacity of a soil to produce plant growth, due to the soil's chemical, physical, and biological properties (such as depth, temperature, water-holding capacity and mineral, nutrient, and organic matter content). (2) Vegetative productivity: the rate of production of vegetation within a given period. (3) General: the innate capacity of an environment to support plant and animal life over time.

Proper Functioning Condition – A riparian-wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to: dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; support greater biodiversity.

R:

Range – (n.) Any land supporting vegetation suitable for grazing including rangeland, grazable woodland and shrubland. Range is not a use. (adj.) Modifies resources, products, activities, practices and phenomena pertaining to rangeland.

Rangeland – Land where the vegetation is predominantly grasses, grass-like plants, forbs, or shrubs suitable for grazing and browsing.

Range Improvement – Any structure or nonstructural improvement to facilitate management of rangelands or livestock.

Range Readiness – The defined stage of plant growth at which grazing may begin under a specific management plan without permanent damage to vegetation or soil. Usually applied to seasonal range. To be determined by Range Management Specialist with input from IDT.

Recreation Opportunity Spectrum (ROS) – A system for planning and managing recreation resources. Land delineations that identify a variety of recreation experience opportunities categorized into classes on a continuum from primitive to urban. Each class is defined in terms of the degree to which it satisfies certain recreation experience needs, based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreation use. The settings, activities, and opportunities for obtaining experiences have been arranged along a continuum or spectrum divided into seven classes: Primitive, Semi-primitive Non-motorized, Semi-primitive Motorized, Roaded Modified, Roaded Natural, Rural, and Urban.

Remoteness – The extent to which individuals perceive themselves removed from the sight and sounds of human activity.

Replacement Old Growth (ROG) – Part of Forest Plan management area 13. These areas serve as replacements for DOG in the case of catastrophic damage or deterioration of dedicated old growth. Replacement old growth areas are to be located within ¼ mile of the dedicated areas and are one-half the size of corresponding dedicated old growth units.

Resilient, resilience, resiliency – (1) The ability of a system to respond to disturbances. Resiliency is one of the properties that enable the system to persist in many different states or successional stages. (2) In human communities, refers to the ability of a community to respond to externally induced changes such as larger economic or social forces.

Retention – Provides for management activities that are not visually evident. Management activities are permitted, but the results of the activities on the natural landscape must not be evident to the average viewer.

Riparian area – Area with distinctive soil and vegetation between a stream and other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation.

Riparian Habitat Conservation Areas (RHCAs) – Portions of watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. Riparian Habitat Conservation Areas include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams, (2) providing root strength for channel stability, (3) shading for stream, and (4) protecting water quality.

Riparian Pasture – Riparian pastures are designed to protect riparian values. They may be smaller areas of rangeland containing both upland and riparian vegetation that are managed together as a unit to achieve riparian objectives, or they may be streamside pastures containing only riparian vegetation.

Riparian Species – Plant species occurring within the riparian zone. Obligate species require the environmental conditions within the riparian zone; facultative species tolerate the environmental conditions, and may occur away from the riparian zone.

Riparian Zone – The banks and adjacent areas of water bodies, watercourses, seeps and springs whose waters provide soil moisture sufficiently in excess of that otherwise available locally so as to provide a moister habitat than that of contiguous flood plains and uplands.

Roaded Natural – A natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high with evidence of other users prevalent. Motorized use is allowed.

Roaded Modified – A natural environment substantially modified, particularly by vegetation and landform alterations. There is strong evidence of roads and/or highways. Frequency of contact is low to moderate.

Rosgen Channel Types – An alpha-numeric classification system for communicating the type of stream channel that exists. Streams are grouped by entrenchment (the ease in which water flows onto the floodplain or is confined in the stream channel), the bankfull width/depth ratio, the sinuosity (or degree of meandering), water surface slope, and streambed rock size. The system goes from A-G and 1-6. A channel types are steep headwater streams. B channel types typically have water surface slopes between 2 and 4%, C channel types are lower gradient streams that typically have floodplains and point bars. D channel types drain glacially outwash areas such as Logan Valley. E channel types are extremely low gradient, have very sinuous channel patterns, don't have point bars and have vegetation creating a very narrow, deep channel dimension. F and G channel types typically have been incised and are evolving into a different channel type.

Rotation Grazing – A grazing scheme where animals are moved from one grazing unit (paddock) in the same group of grazing units to another without regard to specific graze; rest periods or levels of plant defoliation.

S:

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

Scabland – An area characterized by elevated tracts of rocky land with little or no soil and sparse vegetation of vascular plants.

Scenery Management System – Management guidelines based on the premise that land management activities (including construction of facilities) should not contrast with the existing natural appearing landscape. Within a framework of regional landscape, character types, form, line, color, and texture should be used to make activities and structures "fit" within landscapes.

Scenic Integrity – The degree of direct human-caused deviations in the landscape, such as road construction, timber harvesting, or activity debris. Scenic integrity is evaluated by measuring degree of alteration in line, form, color, and texture from the natural or natural-appearing landscape character or

form the established landscape character accepted over time by the general public. This is done by measuring changes in scale, intensity, and pattern against the attributes of that landscape character.

Seasonal Grazing – Grazing restricted to a specific season.

Season of Use – The time during which livestock grazing is permitted on a given range area, as specified in the grazing permit.

Sediment – Solid materials, both mineral and organic, in suspension or transported by water, gravity, ice, or air; may be moved and deposited away from their original position and eventually will settle out.

Semi-Primitive Motorized – A natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The opportunity exists to use motorized equipment.

Semi-Primitive, Non-Motorized – A natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. Use of local roads for recreation purposes is not allowed.

Seral – 1) Refers to the stages that plant communities go through during succession. Developmental stages have characteristic structure and plant species composition. Early seral refers to plants that are present soon after a disturbance or at the beginning of a new successional process (in riparian areas-usually shallow-rooted, weak-stemmed colonizing plants that grow quickly and filter very fine sediment-often grasses); mid seral is often a mix of early and late seral plants; late or old seral refers to plants present during a later stage of plant community succession (in riparian areas-commonly stabilizing plants such as sedges and rushes that have strong cord-like rhizomes, deep, fibrous roots, coarse leaves and strong crowns that buffer streambanks against erosion, enhance streambank strength, filter sediments, and with water build/rebuild eroded banks-Winward 2000). 2) Refers to species or communities that are eventually replaced by other species or communities within a sere.

Seral stage – The developmental phase of rangeland with characteristic structure and plant species composition (see SERAL). Seral stage is a measure of vegetative condition which varies from very early to late seral with potential natural community (PNC) being the latest seral stage. Generally, an area falls into a later seral stage if it has a high percentage of “stabilizers” (usually native, deep-rooted sedges and grasses, and in some places rocks and down wood) and a shrub component. Areas with a higher percentage of “colonizers” (usually short-lived, shallow-rooted plants that respond quickly to change, including non-native plants) and with fewer shrubs are in earlier seral stages (adopted from Winward, 2000). PACFISH (USDA Forest Service 1995) defines seral stage by percent similarity of riparian vegetation to PNC or stream condition: under 25% similarity to PNC or “poor” stream condition equals early seral, over 50% similarity to PNC or “good” or better stream condition equals late seral. In terms of riparian function, later stages provide better stability and function, but in terms of forage, mid- and early seral stages tend to provide more production.

Social Encounters – The degree of solitude or social opportunities provided.

Soil – In this document “soil” means soil outside of stream channels.

Species Composition – The proportions of various plant species in relation to the total on a given area. It may be expressed in terms of cover, density, weight, etc.

Standard 127 – Forest Plan Forest-wide Standard 127, which gives minimum ground cover by soil erodibility class.

Stock Water Development – Development of a new or improved source of stock water supply, such as well, spring, pond, together with storage and delivery system.

Suitable Range – Land which produces or has the inherent capability to produce 50 pounds or more of palatable forage per acre, can be grazed on a sustained-yield basis, and is or can be feasibly made accessible for use.

Suitability – a determination of the appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone.

T:

Term Permit – A document that authorizes grazing on public lands for a stated number of years as contrasted with an annual or temporary permit. See also: Grazing Permit.

Thinning – An operation to remove stems from a forest for the purpose of reducing fuel, maintaining stand vigor, regulating stand density/composition, or for other resource benefits. Although thinning can result in commercial products, thinning generally refers to non-commercial operations.

Threatened, Endangered and Sensitive Species – An endangered species is an animal or plant species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range. A threatened species is an animal or plant species listed under the Endangered Species Act that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. A sensitive species is an animal or plant species identified by the Forest Service Regional Forester for which species viability is a concern either a) because of significant current or predicted downward trend in population numbers or density, or b) because of significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Trend – The direction of change in ecological status or resource value rating observed over time. Trend in ecological status should be described as toward or away from the potential natural community, or as not apparent. Trend in a resource value rating for a specific use should be described as up, down or not apparent. Trends in resource value ratings for several uses on the same site at a given time may be in different directions, and there is no necessary correlation between trends in resource value ratings and trend in ecological status. Some agencies use trend only in the context of ecological status.

U:

Understory – The trees and other woody species that grow beneath the canopy of other plants. Usually refers to grasses, forbs, and low shrubs under a tree or shrub canopy.

Unsatisfactory Range Condition – Allotment does not meet criteria for satisfactory condition.

Upland – Ground elevated above the lowlands along rivers or between hills. The portion of the landscape above the valley floor or stream.

Use – Also called utilization. 1) The proportion of current year's forage production that is consumed or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole. (2) Utilization of range for a purpose such as grazing, bedding, shelter, trailing, watering, watershed, recreation, forestry, etc.

Utilization Standards – The prescribed level of grazing by livestock which will achieve specific objectives including maintenance of vegetation and soil condition. Expressed as the percent of the annual herbaceous production removed by grazing.

V:

Vascular Plant – Species of land plants that have true vascular tissue, such as flowering plants, conifers, and ferns (compare to bryophyte).

Vegetation condition rating – A rating for range vegetation from Condition and Trend (C/T) plot data that is calculated by using a model that uses four successional stages (climax, late seral, mid seral, and early seral) mainly determined by percentage of climax vegetation on site. The C/T plots on the Malheur National Forest used ratings of excellent, good, fair, and poor which correlate to climax, late seral, mid seral and early seral and can be substituted in the vocabulary if necessary. With heavy grazing and subsequent defoliation of decreases (palatable productive plants and perennial grasses associated with climax seral stages) comes retrogression to an earlier seral stage resulting in an increase of increasers (plants usually of lower productivity and/or palatability associated with early seral stages).

Vigor – Relates to the relative robustness of a plant in comparison to other individuals of the same species. It is reflected primarily by the size of a plant and its parts in relation to its age and the environment in which it is growing. Syn. plant vigor.

Visitor Impacts – The degree of impact on both the attributes of the setting and other visitors within the setting.

Visitor Management – The degree and appropriateness of how visitor actions are managed and serviced.

Visual Corridor (Viewshed) – The total landscape seen or potentially seen from all or a logical part of a travel route.

Visual Quality – The degree of apparent modification of the natural landscape.

Visual Quality Objectives (VQOs) – A desired level of management based on physical and sociological characteristics of an area. Refers to the degree of acceptable alteration of the characteristic landscape.

W:

Water Gap – 1) A specially constructed fence across drainage. The fence is easily moved by the forces of a flood, thus preventing damage to the permanent fence. (2) An opening of fences area providing access to a developed or natural water supply permitting one watering facility to serve two or more pastures.

Wetland Rating – The average wetland ranking of plants as computed using the Wetland Indicator Status of Reed (1996).

Wolf Plant (wolfiness) – 1) A plant that, though of a species generally considered palatable, is not grazed by livestock. 2) An isolated plant growing to extraordinary size, usually from lack of competition.

Woody Cover – The sum of the percent cover of woody species along the greenline.

Appendix A - Existing and Desired Conditions, Management Objectives and Adaptive Management Strategies

Table 102. Existing and desired conditions

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
Summit Creek Reach 1 • Functional At Risk (FAR), No Apparent Trend (2007) • Summit Prairie allotment • Sagehen unit	Constrained, rocky reached that are dominated by alder thickets and conifers with occasional scattered willows (Carex Working Group 2012, Elmore 2007).	Stream Shade: Ranges from 23% (Wall 2009) to 45% (Carex Working Group 2012).	Increase hardwood shade component. Shade 65% or greater (Oregon Department of Environmental Quality 2010).
		Shrub Development: The vast majority of shrubs are alders less that 6 ft. tall (average height of 3 ft.) and are moderately browsed with an average utilization of 55%; shrub density is 63 shrubs per 100 m of streambank (Carex Working Group 2012, Rausch 2012).	Increase shrub development: ≤ 30% shrub utilization (INFISH 1995); majority of shrubs > 6 ft. tall (Carex Working Group 2012); ≥ 80 shrubs per 100 m of streambank (Carex Working Group 2012, Rausch 2012).
		Undercut Banks: Undercut banks is not an appropriate measure for this reach because of the type of vegetation does not develop a root mass and the scour line width will be wider than a herbaceous site, the streambank soil texture and stream gradient attributes are also not conducive towards developing these features.	
		Stabilizing Plant Cover: Stabilizing plant cover is estimated at 60% (Elmore 2007).	Greater than 80-95% stabilizing cover (Winward 2000, Elmore 2007).
		Stable Banks: N/D	
Summit Creek Reach 2 • Functional At Risk, Downward, No Apparent Trend (Elmore 2007) • Summit Prairie allotment • Sagehen unit	Broad valleys with mesic terraces comprised of a mosaic of extensive willow thickets, alder, grasslands, and sedge wetlands in old meanders; occasional areas of sedge-dominated wetlands where lateral flows promote deep anoxic soils; also potential habitat for aspen and cottonwood groves (Carex Working Group 2012, Elmore 2007).	Stream Shade: Ranges from 6-45% with an average of 24%; shade in sedge dominated portion is 8% (Carex Working Group 2012).	Increase hardwood shade component; shade ≥ 60% (Carex Working Group 2012) or ≥ 25% native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: Alders and willows are the dominant shrubs, the majority of which are less than 3 ft. tall; all shrubs less than 6 ft. are heavily browsed with an average utilization 78%; floodplain shrub density is 81 shrubs per acre; shrub density of the > 6 ft. height class is 13 shrubs per acre (Carex Working Group 2012, Rausch 2012).	Increase shrubland development: ≤ 30% shrub utilization (INFISH 1995); majority of shrubs > 6 ft. tall (Carex Working Group 2012); ≥ 200 shrubs per acre of floodplain (Carex Working Group 2012; Rausch 2012).
		Undercut Banks: N/D	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Reach species present have a greenline stability rating of Mid (4.4), ecological status rating of Early Seral (35) and hydric plants at 49% (USDI BLM 2011).	Greater than High (8.0 to 9.5) greenline stability rating (Winward 2000).
		Stable Banks: The reach currently has 60% stable banks (USDI BLM 2011).	Greater than 90% stable banks (Amendment 29 % US Fish and Wildlife Service Properly Functioning criteria).

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
Summit Creek Reach 3 • At Proper Functioning Condition (Elmore 2007) • Summit Prairie allotment • Sagehen unit	Constrained, rocky reaches that are dominated by alder thickets, with occasional scattered willows (Carex Working Group 2012, Elmore 2007).	Stream Shade: Ranges from 43% (Wall 2009) to 98% (Carex Working Group 2012).	Increased hardwood shade component; shade ≥ 80% (Amendment 29, TMDL 2011).
		Shrub Development: Alders are the dominant shrub with some willows also present; the vast majority of shrubs are greater than 6 ft. tall and shrubs less than 6 ft. are either not browsed or lightly browsed with average utilization less than 25%; shrub density is 97 shrubs per 100 m of streambank (Carex Working Group 2012, Rausch 2012).	Maintain shrub development: continue shrub utilization ≤ 25% (INFISH 1995); maintain abundance of shrubs > 6 ft. tall (CWG 2012); maintain existing density of shrubs at ≥ 80 shrubs per 100 m of streambank (Carex Working Group 2012; Rausch 2012).
		Undercut Banks: Undercut banks is not an appropriate measure for this reach because the type of vegetation does not develop a root mass and the scour line width will be wider than a herbaceous site, the streambank soil texture and stream gradient attributes are also not conducive towards developing these features.	
		Stabilizing Plant Cover: Stabilizing plant cover is estimated at 70% (Elmore 2007).	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29, US Fish and Wildlife Service Properly Functioning criteria).
Summit Creek Reach 4 • FAR, Upward Trend (2007) • Summit Prairie allotment • Sagehen unit	Broad valleys with mesic terraces comprised of a mosaic of extensive willow thickets, aspen, alder, grasslands, and sedge wetlands in old meanders; occasional areas of sedge-dominated wetlands where lateral flows promote deep anoxic soils; there is also potential habitat for cottonwood groves (Carex Working Group 2012, Elmore 2007).	Stream Shade: Ranges from 10-57% with an average of 32% (Wall 2009, Carex Working Group 2012).	Increased hardwood shade component: shade ≥ 60% (Carex Working Group 2012) or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: The vast majority of shrubs are willows with a fairly even distribution of shrub height classes; willows under 6 ft. are moderately browsed with an average utilization of 26%; however some areas within upper portions of the reach are primarily composed of willows less than 2 ft. tall with utilization that approaches 90%; overall floodplain shrub density is 49 shrubs per acre; shrub density of the > 6 ft. height class is 5 shrubs per acre (Carex Working Group 2012, Rausch 2012).	Increase shrubland development: ≤ 30% shrub utilization (INFISH 1995); majority of shrubs > 6 ft. tall (Carex Working Group 2012); ≥ 200 shrubs per acre of floodplain (Carex Working Group 2012; Rausch 2012).
		Undercut Banks: Undercut bank is estimated to be 22% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Stabilizing plant cover is estimated at 75% (Elmore 2007).	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29 % US Fish and Wildlife Service Properly Functioning criteria).

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
Summit Creek Reach 5 • At Proper Functioning Condition (Elmore 2007) • Summit Creek allotment • Little Logan unit	Broad valleys with mesic terraces comprised of a mosaic of extensive willow thickets, aspen, grasslands, and sedge wetlands in old meanders; occasional areas of sedge-dominated wetlands where lateral flows promote deep anoxic soils; there is also potential habitat for cottonwood groves (Carex Working Group 2012, Elmore 2007).	Stream Shade: Ranges from 8-51% with an average of 23% (Wall 2009, Carex Working Group 2012).	Increase hardwood shade component; shade ≥ 60% (Carex Working Group 2012).
		Shrub Development: The vast majority of shrubs are willows; no alders are present; willows are either over 6 ft. tall and caged or less than 2 ft. tall and heavily browsed with an average utilization of 97%; floodplain shrub density is 8 shrubs per acre; shrub density of the 3-6 ft. height class is 0.3 shrubs per acre (Carex Working Group 2012, Rausch 2012).	Increase shrubland development: ≤ 30% shrub utilization (INFISH 1995); majority of shrubs > 6 ft. tall (Carex Working Group 2012); ≥ 200 shrubs per acre of floodplain (Carex Working Group 2012; Rausch 2012).
		Undercut Banks: Present undercut bank was measured at 31% (site id: 952, PIBO 2011) and 29% (site id: 954, USDA Forest Service 2011).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Stabilizing plant cover is estimated to be 55-60% (Elmore 2007).	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: The reach currently has 96% stable banks (site id: 952, PIBO 2011) and 100% stable banks (site id: 954, PIBO 2011).	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).
Summit Creek Reach 6 • At Proper Functioning Condition (Elmore 2007) • Summit Prairie allotment • Summit Rock unit	Sedge-dominated meadows and wetlands with lateral flow and deep anoxic soils, willows or alders along the stream bank (Carex Working Group 2012, Elmore 2007).	Stream Shade: Ranges from 5-32% with an average of 18% (Wall 2009, Carex Working Group 2012).	≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: The majority of the reach is composed of sedge wetlands with occasional shrubs; the majority of shrubs are less than 2 ft. tall, and all shrubs are heavily browsed with average utilization greater than 90%; shrub density is 5 shrubs per 100 meters of streambank; shrub density of the > 3 ft. height class is 0.8 shrubs per 100 meters of streambank (Carex Working Group 2012, Rausch 2012).	Increase shrub development along streambank: ≤ 30% shrub utilization (INFISH 1995); majority of shrubs > 6 ft. tall (Carex Working Group 2012); ≥ 25 shrubs per 100 m of streambank (Carex Working Group 2012; Rausch 2012)
		Undercut Banks: Undercut bank is estimated to be 10% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Stabilizing plant cover is estimated to be 77% (PFC 2007)	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29 % USFWS Properly Functioning criteria).

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
Summit Creek Reach 7 • At Proper Functioning Condition (Elmore 2007) • Summit Prairie allotment • North Summit unit	Broad valleys with mesic terraces comprised of a mosaic of extensive willow and alder thickets, aspen groves, grasslands, and sedge wetlands in old meanders; occasional areas of sedge-dominated wetlands where lateral flows promote peat formation and deep anoxic soils; there is also potential habitat for cottonwood groves (Carex Working Group 2012, Elmore 2007).	Stream Shade: Ranges from 51-84% with an average of 64% (Carex Working Group 2012).	Increase hardwood shade component; shade ≥ 80% for alder-dominated areas (Amendment 29), ≥ 60% for mixed shrub areas (Carex Working Group 2012), or ≥ 25% native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: Primarily a mixed shrub community; the majority of willows and alders are less that 3 ft. tall; Alders under 6 ft. are lightly browsed and willows under 6 ft. are heavily browsed with average utilizations of 26% and 100%, respectively; floodplain shrub density is 190 shrubs per acre; shrub density of the > 6 ft. height class is 9 shrubs per acre (Carex Work Group 2012, Rausch 2012).	Increase shrubland development: ≤ 30% shrub utilization (INFISH 1995); majority of shrubs > 6 ft. tall (Carex Work Group 2012); ≥ 200 shrubs per acre of floodplain (Carex Working Group 2012; Rausch 2012).
		Undercut Banks: N/D	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Reach species present have a greenline stability rating of High (6.7), ecological status rating of Later Seral (77) and hydric plants at 71% (DMA 2009).	Greater than High (8.0-9.5) greenline stability rating (Winward 2000).
		Stable Banks: The reach currently has 89% stable banks (DMA 2009).	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).
Summit Creek Reach 8 • At Proper Functioning Condition (Elmore 2007) • Summit Prairie allotment • Summit Rock unit	Headwater reaches dominated by conifers, alder, and aspen that also support shade-tolerant vegetation (Carex Working Group 2012, Elmore 2007).	Stream Shade: Ranges from 55-83% with an average of 70% (Carex Working Group 2012).	Increase hardwood shade component; shade ≥ 80% (Amendment 29).
		Shrub Development: The vast majority of shrubs are alders with a fairly even distribution of height classes; alders under 6 ft. are lightly browsed with an average utilization of 24%, shrub density is 35 alder per 100 m of streambank; small aspen shoots are also present in some locations (Carex Working Group 2012, Rausch 2012)	Maintain and/or increase shrub development: continue shrub utilization ≤ 25% (INFISH 1995); increase proportion of shrubs > 6 ft. tall (Carex Working Group 2012); increase alder density to ≥ 80 shrubs per 100 m of streambank (Carex Working Group 2012; Rausch 2012).
		Undercut Banks: Undercut banks is not an appropriate measure for this reach because the vegetation type does not develop root mass. The scour line width will be wider than a herbaceous site, streambank soil texture and stream gradient attributes are not conductive towards developing these features.	
		Stabilizing Plant Cover: Stabilizing plant cover is estimated to be 75% (Elmore 2007)	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
West Fork of Summit Creek Reach 1 • FAR, Downward Trend (Elmore 2007) • Summit Prairie allotment • West Summit Recovery unit	Vegetation potential is sedge/rush/grass with some alder There still are many of those plants present but Kentucky bluegrass is dominant and the site continues to dry out due to a lowering water table (Elmore 2007).	Stream Shade: N/D	≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: The reach is primarily a sedge/rush grass meadow. A small areas of alder is present at the upper end of the reach (Elmore 2007).	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: N/D	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Stabilizing plant cover is estimated to be 20% (Elmore 2007)	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29 % USFWS Properly Functioning criteria).
West Fork of Summit Creek Reach 2 • FAR, Downward Trend (2007) • Summit Prairie allotment • Summit Rock unit	Potential vegetation is sedge/rush/grass with alder. Potential vegetation in the upper end is conifer story with an alder overstory (Elmore 2007).	Stream Shade: N/D	Increase hardwood shade component; shade ≥ 80% for alder-dominated areas (Amendment 29), ≥ 60% for mixed shrub areas (Carex Working Group 2012), or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: The reach currently contains 20% seedlings and young age class shrubs (alder). Present mature age class is 80% (DMA 2008).	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: N/D	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Reach species present have a greenline stability rating of Mid (5.2), ecological status rating of Early Seral (30.5) and hydric plants at 31% (DMA 2008).	Greater than High (8.0-9.5) greenline stability rating (Winward 2000). Greater than 64-78% hydrophytic vegetation (Winward 2000).
		Stable Banks: The reach currently has 47% stable banks (DMA 2008).	Greater than 90% stable banks (Amendment 29 % USFWS Properly Functioning criteria).
Crooked Creek Reach 1 • FAR, Downward Trend (2007) • McCoy Creek allotment • Starvation unit	Vegetation potential is sedge/rush with some willows (Elmore 2007).	Stream Shade: N/D	≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010)
		Shrub Development: Some willows are present but are not a dominate part of the reach. Three willow species were noted. Woody plants are released older plants (Elmore 2007).	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be 73% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Stabilizing plant cover is estimated to be 75% (Elmore 2007).	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: The reach currently has 97% stable banks (USDA Forest Service 1999).	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
Lake Creek Reach 1 • FAR, Upward Trend (2007) • McCoy Creek allotment • Starvation unit	Vegetation is dominated by sedge/rush/grass with willows (Elmore 2007).	Stream Shade: N/D	Increase hardwood shade component; shade ≥ 60% (Carex Working Group 2012) or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: Two willow species were noted. Due to recent changes in management, willows are more prevalent and vigorous. As the reach continues to recover there will be an increase in willow cover. Diverse age-class distribution of riparian-wetland vegetation is present (Elmore 2007).	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be 85% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Stabilizing plant cover is estimated to be 60% (Elmore 2007).	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: This reach currently has 91% stable banks (DMA 2008).	Greater than 90% stable banks (Amendment 29 % USFWS Properly Functioning criteria).
Lake Creek Reach 2 • At Proper Functioning Condition (Elmore 2007) • McCoy Creek allotment • Cow Camp unit	Potential vegetation is willow, sedge/rush communities (Elmore 2007).	Stream Shade:	Increased hardwood shade component: shade ≥ 60% (Carex Working Group 2012) or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: Several willow species and mountain alder present. Diverse age-class distribution of riparian-wetland vegetation is present. Beaver colony activity present (Elmore 2007).	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be 16% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Stabilizing plant cover is estimated to be 80% (Elmore 2007).	Greater than 80-95% stabilizing cover (Winward 2000). Greater than 64-78% hydrophytic vegetation (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
Lake Creek Reach 3 • FAR, Downward Trend (2007) • Logan Valley allotment • West Lake Creek Riparian pasture	Primary potential vegetation being conifer overstory with alder, willow and mesic Graminiods in the open areas while the lower end of the reach has little or no conifer overstory (Elmore 2007).	Stream Shade: Shade average is 39% (Wall 2009).	Shade 60-80% in mixed shrub and conifer (Carex Working Group 2012) or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: The reach currently contains 15% seedlings and young age class shrubs (alder with some willows). Present mature age class is 83% (DMA 2008).	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Present undercut banks was measured at different sites along the reach. PIBO site ID 1884 was 37% and site ID 2037 was 43% (PIBO 2011).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Reach species presently have a greenline stability rating of Mid (4.4), ecological status rating of Very Early Seral (13.6) and hydric plants at 50% (DMA 2008).	Greater than High (8.0-9.5) greenline stability rating (Winward 2000).
		Stable Banks: The reach currently has 55% stable banks (DMA 2008).	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).
Lake Creek (No PFC Assessment) • Lake Creek allotment • McCoy Creek unit	Primary potential vegetation being conifer overstory alder (IDT Review 2012)	Stream Shade: Shade average is 70% (Wall 2009).	Shade 60-80% in mixed shrub (Carex Working Group 2012) or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: N/D	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be 25% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: N/D	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).
Big Creek (No PFC Assessment, s. side of FS rd 16 for 0.15 miles.) • Logan Valley allotment • West Bosenberg Riparian Pasture	Potential vegetation is willow, sedge/rush communities (IDT Review 2012)	Stream Shade: Shade average is 7% (Wall 2009).	Shade 60-80% in mixed shrub (Carex Working Group 2012) or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: N/D	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be 62% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: N/D	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
Big Creek Reach 1 • At Proper Functioning Condition (Elmore 2007) • Logan Valley allotment • South Big Creek unit	Potential vegetation is a conifer overstory with willow and alder and mesic Graminoids (Elmore 2007).	Stream Shade: Shade average is 26% (Wall 2009).	Shade 60-80% in mixed shrub and conifer (Carex Working Group 2012) or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: Several willow species present. Beaver activity on main and side channels. Several age classes for herbaceous and woody species present. Young willow is heavily browsed (PFC 2007).	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be 36% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Stabilizing plant cover is estimated to be 75% (Elmore 2007).	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).
Big Creek Reach 2 • At Proper Functioning Condition (Elmore 2007) • Logan Valley allotment • North Big Creek unit	Potential vegetation in the upper end is a conifer overstory with a mesic Graminoid understory. The lower 1/3 transitions to an alder, willow, mesic Graminoid (Elmore 2007).	Stream Shade: Shade average is 26% (Wall 2009).	Shade 60-80% in mixed shrub and conifer (Carex Working Group 2012) or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: Several willow species present. Young willows are heavily browsed, like by deer, elk and some livestock. Diverse age-class distribution of riparian-wetland vegetation is present. Willow and alder provide a bigger role in the lower part of the reach (Elmore 2007).	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be 36% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Stabilizing plant cover is estimated to be 75% (Elmore 2007).	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
Big Creek Reach 3 • At Proper Functioning Condition (Elmore 2007) • Logan Valley allotment • East Lake Creek unit	Potential vegetation is conifer with alder with mesic Graminoid (IDT Review 2012).	Stream Shade: Shade average is 26% (Wall 2009).	Shade 60-80% in mixed shrub and conifer (Carex Working Group 2012).
		Shrub Development: The reach currently contains 17% seedlings and young age class shrubs (alder). Present mature age class is 83% (DMA 2008).	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be 36% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: Reach species present have a greenline stability rating of Low (2.8), ecological status rating of Mid Serial (41) and hydric plants at 8% (DMA 2011).	Greater than High (8.0-9.5) stability rating (Winward 2000). Greater than 64-78% hydrophytic vegetation (Winward 2000).
		Stable Banks: The reach currently has 98% stable banks (DMA 2011).	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).
Big Creek (No PFC Assessment) • Lake Creek allotment • Big Creek unit (above FS rd 1648)	Potential vegetation is a conifer overstory with willow and alder and mesic Graminoids (IDT Review 2012)	Stream Shade: Shade average is 20% (Wall 2009).	Shade 60-80% in mixed shrub and conifer (Carex Working Group 2012).
		Shrub Development: N/D	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be 42% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: N/D	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: N/D	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).
Big Creek (No PFC Assessment) • Logan Valley allotment • West Bosenberg Riparian Pasture	Primary potential vegetation being conifer overstory with alder, willow and mesic Graminiods in the open areas (IDT Review 2012)	Stream Shade: Shade average is 7% (Wall 2009)	Shade 60-80% in mixed shrub (Carex Working Group 2012) or ≥ 25% for native floodplain grasses (Oregon Department of Environmental Quality 2010).
		Shrub Development: N/D	Greater than 25% sapling and young shrubs (Winward 2000, UI Stubble Height Study Results 2004).
		Undercut Banks: Undercut bank is estimated to be at 62% (Wall 2009).	Undercut banks should be greater than 75% for non-forested systems.
		Stabilizing Plant Cover: N/D	Greater than 80-95% stabilizing cover (Winward 2000).
		Stable Banks: The reach currently has 95% stable banks (USDA Forest Service 1998).	Greater than 90% stable banks (Amendment 29, USFWS Properly Functioning criteria).

Stream/Reach	Vegetation Community Potential	Existing Condition	Long-Term Desired Condition
Logan Valley Fen Complex Logan Valley allotment • Big Field unit and associated components of West Lake Creek, North Big Creek & South Big Creek units	The fen complex can be described as a broad helocrene spring system with a mosaic of peatlands (= fen), fen pools, wet and moist meadows, mesic shrublands, aspen stands, lodgepole pine swamps, and occasional mixed conifer stands. Fen and wetland systems are primarily dominated by wetland moss, graminoid, and willow species. (USDA Forest Service 2009, Rausch 2009, USDA Forest Service 2010).	Hydrologic Function: Overall, hydrologic processes are in proper functioning condition. Natural surface or subsurface flow patterns are largely unaltered and hydrologic alterations are not substantially contributing to degradation. However, some livestock trails are diverting early season flow patterns in isolated areas (USDA Forest Service 2009, Rausch 2009, USDA Forest Service 2010).	Livestock trails are not diverting flow patterns anywhere in the fen complex (Weixelman & Cooper 2007).
		Peat Development: The majority of peatlands have exposed peat ≤ 10%; however, there are specific areas where exposed peat is 40% (USDA Forest Service 2009, USDA Forest Service 2010). On average, 96% of plant species are peat forming, 91% are wetland obligates, and 3% are non-native.	Exposed peat is ≤ 10% throughout the entire fen complex (USDA Forest Service 2009, Weixelman & Cooper 2009). The proportion of peat forming species and obligate wetland species are maintained at 96% and 91% or greater, respectively. Non-native species are absent or are not expanding (FSM 2900).
		Sensitive Animals: The Columbia spotted frog occurs in three different locations (USDA Forest Service 2009, Rausch 2009); these fen pools serve as spawning, rearing and over-wintering grounds (Bull 2005, USFWS 2011). At least one other location has potential habitat, but the current condition is not suitable for occupation (USDA Forest Service 2009, USDA Forest Service 2010).	Expansion of sensitive animal populations and/or their respective habitats (FSM 2670).
		Sensitive Plants: Five sensitive plant species are documented in various locations throughout the fen complex (NRIS 2012), and unoccupied habitat exists for numerous other sensitive plants (ISSSSP 2012). Isolated areas (where exposed peat is >10%) have the potential for sensitive species habitat, but the current condition is not suitable.	Expansion of sensitive plant populations and/or their respective habitats (FSM 2670).

NOTE: All surveys only include portions of reaches located on National Forest lands. Private land pieces are not included in the summary.
N/D: Existing Condition information not available. MIM DMA has greenline stability and ecological status indicators that are ratings. The rating system for greenline stability rating is as follows: <4 is Low, 4-6 is Mid and >6 is High. The ecological status rating system is as follows: 0-15 is Very Early Seral, 16-40 is Early Seral, 41-60 is Mid Serial, 61-85 is Late Seral and 86-100 is Potential natural community.

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Table 103. Management objectives

Stream/Reach	Indicator (Measure of Table 102)	Indicator	Target Time Period	Management Objective (Measure)	Monitoring Type
Summit Creek Reach 2 • Summit Prairie allotment • Sagehen unit Note: Reaches 2 and 4 would be used as representative reaches for the Sagehen unit as a whole.	Undercut Banks, Shade and Bank Stability, Stabilizing Plant Communities	Greenling to Greenline Width	5 year	Greenline to greenline width would decrease by 25% from 12.7 to 9.5 feet.	Multiple indicator monitoring at DMA site
		Greenline Stability Rating	5 year	Increase greenline stability rating from Mid (4.4) to high (6.3).	Multiple indicator monitoring at DMA site
		Stable Banks	5 year	Increase bank stability from 60 % to 80%.	Multiple indicator monitoring at DMA site
	Shrub Development	Shrub Density and Height Class	5 year	Expand alder and willow species shrub density of the > 6 ft. height class from 13 shrubs per acre to 32 shrubs per acre of floodplain (average across the reach).	Monitoring at Carex Working Group plots
	Channel Characteristics and Aquatic Habitat	Average Bankfull Width (feet)	10 years	Decrease in average bankfull width on an upward trend towards exclosure reference condition (establish cross section in exclosure).	Channel characteristics monitoring at DMA site
		Average Bankfull Width/Depth (ratio)	10 years	Decrease in average bankfull W/D on upward trend towards exclosure reference conditions (establish cross section in exclosure).	Channel characteristics monitoring at DMA site
		Residual Pool Depth	10 year	Increase residual pool depth from 0.63 ft to an upward trend towards exclosure reference condition (establish cross section in exclosure).	Channel characteristics monitoring at DMA site
		Pool Quality (# of pools > 3.3 ft)	10 years	Increase in numbers of pools > 3.3 ft depth on upward trend towards exclosure reference condition (establish cross section in exclosure).	Channel characteristics monitoring at DMA site
	Water Temperate, Shade, Shade Development and Channel Characteristics	Shade	10 years	Increase shade at DMA towards reference condition, site potential values of 60% in hardwood areas and 25% for native floodplain grass sites (Carex Working Group 2012, TMLD 2010).	SolarPathfinder at DMA

Stream/Reach	Indicator (Measure of Table 102)	Indicator	Target Time Period	Management Objective (Measure)	Monitoring Type
Summit Creek Reach 4 • Summit Prairie allotment • Sagehen unit Note: Reaches 2 and 4 would be used as representative reaches for the Sagehen unit as a whole.	Shrub Development and Shade	Shrub Density and Height Class	5 year	Expand alder and willow species shrub density of the > 6 ft. height class from 5 shrubs per acre to 29 shrubs per acre of the floodplain (average across the reach).	Monitor at Carex Working Group plots
Summit Creek Reach 5 • Summit Prairie allotment • Little Logan unit	Undercut Banks, Shade and Bank Stability, Stabilizing Plant Communities	Greenline Wetland Rating	5 year	Increase the greenline wetland rating value by 10 percent from 73.9 to 81.3 (PIBO site id 952) and from 76 to 83.6 (PIBO site id 954).	PIBO monitoring at DMA sites
		Cross Section Vegetative Wetland Rating	5 year	Increase the cross section wetland rating value by 10 percent from 57.9 to 63.7 (PIBO site id 952) and from 62.3 to 68.5 (PIBO site id 954).	PIBO monitoring at DMA sites
	Shrub Development and Shade	Shrub Density and Height Class	5 year	Expand willow species shrub density of the 3-6 ft. height class from 0.3 shrubs per acre to 4 shrubs per acre of floodplain (average across the reach).	Monitoring at Carex Working Group plots
	Channel Characteristics and Aquatic Habitat	Average Bankfull Width (feet)	10 years	Decrease in average bankfull width on an upward trend towards exclosure reference condition (establish cross section in ¼ miles buck-n-pole exclosure).	PIBO monitoring at DMA sites. Channel characteristics monitoring at DMA site in ¼ mile new exclosure
		Average Bankfull Width/Depth (ratio)	10 years	Decrease in average bankfull W/D on upward trend towards exclosure reference conditions (establish cross section in ¼ miles buck-n-pole exclosure).	PIBO monitoring at DMA sites. Channel characteristics monitoring at DMA site in ¼ mile new exclosure
		Residual Pool Depth	10 year	Increase residual pool depth from 0.63 ft to an upward trend towards exclosure reference condition (establish cross section in ¼ miles buck-n-pole exclosure).	PIBO monitoring at DMA sites. Channel characteristics monitoring at DMA site in ¼ mile new exclosure

Stream/Reach	Indicator (Measure of Table 102)	Indicator	Target Time Period	Management Objective (Measure)	Monitoring Type
Summit Creek Reach 5 • Summit Prairie allotment Little Logan unit (cont'd)	Channel Characteristics and Aquatic Habitat (cont'd)	Pool Quality (# of pools > 3.3 ft)	10 years	Increase in numbers of pools > 3.3 ft depth on upward trend towards exclosure reference condition (establish cross section in ¼ miles buck-n-pole exclosure).	PIBO monitoring at DMA sites. Channel characteristics monitoring at DMA site in ¼ mile new exclosure
	Water Temperate, Shade, Shade Development and Channel Characteristics	Shade	10 years	Increase effective shade at DMA towards reference condition, site potential values of 60% in hardwood areas (Carex Working Group 2012).	SolarPathfinder at DMA
	Shrub Development and Water Quality	Macroinvertebrate	10 years	Increased abundance of species in the shredder function group. Decreased number of intolerant taxa and taxa richness.	PIBO monitoring at DMA sites
Summit Creek Reach 6 • Summit Prairie allotment • Summit Rock unit	Shrub Development and Shade	Shrub Density and Height Class	5 years	Expand willow species shrub density of the > 3 ft. height class from 0.8 shrubs per 100 meters of streambank to 6 shrubs per 100 meters of streambank (average across the reach).	Monitoring at Carex Working Group plots
Summit Creek Reach 7 • Summit Prairie allotment • North Summit unit	Undercut Banks, Shade and Bank Stability	Greenline to Greenline Width	5 years	Greenline to greenline width would decrease by 25% from 4 to 3 feet.	Multiple indicator monitoring at DMA site
	Shrub Development and Shade	Shrub Density and Height Class	5 years	Expand alder and willow species shrub density of the > 6 ft. height class from 9 shrubs per acre to 40 shrubs per acre of floodplain (average across the reach).	Monitoring at Carex Working Group plots
	Channel Characteristics and Aquatic Habitat	Average Bankfull Width (feet)	10 years	Decrease in average bankfull width	Channel characteristics monitoring at DMA site
		Average Bankfull Width/Depth (ratio)	10 years	Decrease in average bankfull W/D toward a Rosgen E channel type of 12 (PFC 2007).	Channel characteristics monitoring at DMA site
		Residual Pool Depth	10 year	Increase residual pool depth	Channel characteristics monitoring at DMA site
		Pool Quality (# of pools > 3.3 ft)	10 years	Increase in numbers of pools > 3.3 ft depth on upward trend towards exclosure reference condition.	Channel characteristics monitoring at DMA site
	Water temperate	Shade	10 years	Increase effective shade at DMA towards reference condition, site potential values of 60% in hardwood areas (Carex Working Group 2012).	SolarPathfinder at new DMA site

Stream/Reach	Indicator (Measure of Table 102)	Indicator	Target Time Period	Management Objective (Measure)	Monitoring Type
West Fork of Summit Creek Reach 1 • Summit Prairie allotment • West Summit Recovery Unit	Stabilizing Plant Cover	Photopoint	5 years	Expand wetland obligate plant communities.	Establish photo monitoring at DMA site
West Fork of Summit Creek Reach 2 • Summit Prairie allotment • Summit Rock unit	Undercut Banks, Shade and Bank Stability, Stabilizing Plant Communities	Greenline Stability Rating	5 years	Increase greenline stability rating from Mid (5.2) to High (6.5).	Multiple indicator monitoring at DMA site
		Stable Banks	5 years	Increase bank stability from 47% to 80%.	Multiple indicator monitoring at DMA site
	Shrub Development and Shade	Shrub Density and Height Class	5 years	Expand alder shrub density along greenline (3 to 6 foot height class) by 10%.	Multiple indicator monitoring at DMA site
Lake Creek Reach 3 • Logan Valley allotment • West Lake Creek Riparian Pasture	Undercut Banks, Shade and Bank Stability, Stabilizing Plant Communities, and Shrub Development	Greenline to Greenline Width	5 years	Greenline to greenline width would decrease by 25% from 24.8 to 18.6 feet.	Multiple indicator monitoring at DMA site
		Greenline Stability Rating	5 years	Increase greenline stability rating from Mid (4.4) to High (6.3).	Multiple indicator monitoring at DMA site
		Stable Banks	5 years	Increase bank stability from 55% to 80%.	Multiple indicator monitoring at DMA site
		Bankfull Width/Depth	5 years	Decrease the bankfull width/depth ratio at riffles by 15 percent from 23.8 to 27.4 (PIBO site id 1884) and 33.8 to 38.9 (PIBO site id 2037).	PIBO monitoring at DMA sites
	Channel Characteristics and Aquatic Habitat	Average Bankfull Width (feet)	10 years	Decrease in average bankfull width	PIBO monitoring at DMA sites
		Average Bankfull Width/Depth (ratio)	10 years	Decrease the bankfull W/D ratio at riffles by 15% (from 23.8 to 18.8) towards a Rosgen E channel type of 12 (PIBO Site ID 1884, PFC 2007).	PIBO monitoring at DMA sites
		Residual Pool Depth	10 year	Increase residual pool depth	PIBO monitoring at DMA sites
		Pool Quality (# of pools > 3.3 ft)	10 years	Increase number of pools > 3.3 ft depth	PIBO monitoring at DMA sites
	Water Temperature	Shade	10 years	Increase effective shade at DMA towards reference condition, site potential values of 80% in hardwood areas (Carex Working Group 2012).	SolarPathfinder at new DMA site
	Shrub Development and Water Quality	Macroinvertebrate	10 years	Increased abundance of species in the shredder function group. Decreased number of intolerant taxa and taxa richness.	PIBO monitoring at DMA sites

Stream/Reach	Indicator (Measure of Table 102)	Indicator	Target Time Period	Management Objective (Measure)	Monitoring Type
Big Creek (No PFC, S. side of FS rd 1600 for 0.15 miles) • Logan Valley allotment • West Bosenberg Riparian pasture	Shrub Development and Stabilizing Plant Cover	Photopoint	5 years	Increase of shrubs and wetland obligate plant communities.	Establish photo monitoring at DMA site
Big Creek Reaches 1, 2 & 3 • Logan Valley allotment • South Big Creek unit (reach 1) • North Big Creek unit (reach 2) • East Big Creek unit (reach 3)	Undercut Banks, Shade and Bank Stability, Stabilizing Pant Communities, and Shrub Development	Site Visits	5 years	Continued maintenance and improvements in riparian conditions.	Multiple indicator monitoring at DMA site
	Channel Characteristics and Aquatic Habitat	Average Bankfull Width (feet)	10 years	Decrease in average bankfull width	Channel characteristics monitoring at new DMA site
		Average Bankfull Width/Depth (ratio)	10 years	Decrease the bankfull W/D ratio at riffles	Channel characteristics monitoring at new DMA site
		Residual Pool Depth	10 year	Increase residual pool depth	Channel characteristics monitoring at new DMA site
		Pool Quality (# of pools > 3.3 ft)	10 years	Increase number of pools > 3.3 ft depth	Channel characteristics monitoring at new DMA site
	Water Temperate, Shade, Shade Development and Channel Characteristics	Shade	10 years	Increase effective shade at DMA towards reference condition, site potential values of 60% in hardwood areas and 25% for native floodplain grass site (Carex Working Group, 2012, TMDL 2010).	SolarPathfinder at new DMA site
Bosenberg Creek (No PFC Assessment) • Lake Creek allotment • Bosenberg unit (above FS rd 1648)	Undercut Banks, Shade and Bank Stability, Stabilizing Pant Communities, and Shrub Development	MIM Attributes	5 years	Establish a designated monitoring area and collect baseline information immediately. Follow up five years post implementation of boundary changes with repeat monitoring.	Establish multiple indicator monitoring at new DMA site
	Channel Characteristics and Aquatic Habitat	Average Bankfull Width (feet)	10 years	Decrease in average bankfull width	Channel characteristics monitoring at new DMA site
		Average Bankfull Width/Depth (ratio)	10 years	Decrease the bankfull W/D ratio at riffles	Channel characteristics monitoring at new DMA site
		Residual Pool Depth	10 year	Increase residual pool depth	Channel characteristics monitoring at new DMA site
		Pool Quality (# of pools > 3.3 ft)	10 years	Increase number of pools > 3.3 ft depth	Channel characteristics monitoring at new DMA site

Stream/Reach	Indicator (Measure of Table 102)	Indicator	Target Time Period	Management Objective (Measure)	Monitoring Type
Bosenberg Creek (No PFC Assessment) • Lake Creek allotment • Bosenberg unit (above FS rd 1648) (cont'd)	Water Temperate, Shade, Shade Development and Channel Characteristics	Shade	10 years	Increase effective shade at DMA towards reference condition, site potential values of 60% in hardwood areas and 25% for native floodplain grass sites (Carex Working Group 2012, TMDL 2012).	SolarPathfinder at new DMA site
Fen Area • Logan Valley allotment • Big Field unit	Hydrologic Function	Early Season Flow Diversion	5 years	Livestock trails are revegetating and are diverting less flow (Weixelman & Cooper 2007).	Fen PFC, GDE Level 2 and photopoints
	Peat Development	Exposed Peat	5 years	Exposed peat is ≤ 15% (Weixelman & Cooper 2007).	Fen PFC and GDE Level 2
		Peat Forming Species	5 years	The proportion of peat forming species is ≥ 90%.	
		Obligate Wetland Species	5 years	The proportion of obligate wetland species is ≥ 90%.	
		Non-Native Species	5 years	Non-native species are absent or are not expanding (FSM 2900).	
	Sensitive Species	Population Abundance	5 years	Sensitive species populations are maintained at current extent or are expanding (FSM 2670).	Modified GDE Level 2 and Threatened, Endangered and Sensitive Plant module of the USFS Natural Resource Information System
		Habitat Abundance	5 year	Sensitive species habitats are maintained at current extent or are expanding (FSM 2670).	Modified GDE Level 2 and photopoints

Table 104. Adaptive management strategies

Stream/Reach	Alternative 2		Alternative 3		Alternative 4	
	Proposed Action	Adaptive Strategy	Proposed Action	Adaptive Strategy	Proposed Action	Adaptive Strategy
Summit Creek Reaches 1, 2, 3 & 4 • Summit Prairie allotment • Sagehen Unit	Entire pasture would be rested 3 years out of a 10 year period (season long rest). Entire allowable use levels (see appendix E).	Scheduled rest or additional rest.	Construction of the Sagehen Riparian exclosure and Sagehen Riparian pasture along Summit Creek in Reach 2. The riparian exclosure would not be grazed. The riparian pasture would be rested for 3-5 years after the pasture fence is constructed. Grazing would resume after resource objectives have been achieved. Reach 1, 3, and 4 of Summit Creek would be grazed annually to allowable use levels (see appendix I).	Additionally rest within the riparian pasture (Reach 2) and change allowable use levels (Reaches 1, 3, and 4).	Daily riding by permittee to move livestock away from Summit Creek. Construction of cages and small exclosure (20x50 ft). Exclosures would be approximately 10% of the total riparian length.	Construct exclosures around a higher percentage of Summit Creek.
Summit Creek Reach 5 • Summit Prairie allotment • Little Logan unit	Entire pasture rested 3 years out of a 10 year period (season long rest).	Scheduled rest or additional rest.	Construction of two riparian pastures (Lower Little Logan and Upper Little Logan Riparian pastures) along Summit Creek. The riparian pastures would be rested for 3-5 years after the pasture fences are constructed. Grazing would resume after resource objectives have been achieved	Additionally rest within the riparian pasture	Daily riding by permittee to move livestock away from Summit Creek. Construction of cages and small exclosures (20x50 ft). Exclosures would be approximately 10% of the total riparian length.	Construct exclosures around a higher percentage of Summit Creek.

Stream/Reach	Alternative 2		Alternative 3		Alternative 4	
	Proposed Action	Adaptive Strategy	Proposed Action	Adaptive Strategy	Proposed Action	Adaptive Strategy
Summit Creek Reach 6 and West Fork Summit Creek Reach 2 • Summit Prairie allotment • Summit Rock unit	Entire pasture would be grazed annually to allowable use level (see appendix E).	Change allowable use levels.	Entire pasture would be grazed annually to allowable use level (see appendix E).	Change allowable use levels.	The area outside of the Prairie Riparian pasture would be grazed annually to allowable use level (see appendix E). See below for Prairie Riparian pasture proposed action.	Change allowable use levels outside of the Prairie Riparian pasture. See below for Riparian Pasture Adaptive Strategy.
Summit Creek Reach 7 • Summit Prairie allotment • North Summit unit	Entire pasture would be grazed annually to allowable use level (See appendix E).	Change allowable use levels.	Construct North Summit Riparian pasture (Summit Creek Reach 7). The riparian pasture would be rested for 3-5 years after the pasture fence is constructed. Grazing would resume after resource objectives have been achieved (see appendix E).	Additionally rest within the riparian pasture.	Construct Prairie Riparian pasture along (Summit Creek Reach 7 and West Fork of Summit Creek Reach 2). The riparian pasture would be rested for 3-5 years after the pasture fence is constructed. Grazing would resume after resource objectives have been achieved (see appendix E).	Additionally rest within the riparian pasture.
West Fork of Summit Creek Reach 1 • Summit Prairie allotment • West Summit Recovery unit	The West Summit Recovery unit (constructed in 2011) would be rested 3-5 immediate grazing season (season long rest).	Additional rest within the West Summit Recovery unit.	The West Summit Recovery unit (constructed in 2011) would be rested 3-5 immediate grazing season (season long rest).	Additional rest within the West Summit Recovery unit.	The West Summit Recovery unit (constructed in 2011) would be rested 3-5 immediate grazing season (season long rest).	Additional rest within the West Summit Recovery unit.

Stream/Reach	Alternative 2		Alternative 3		Alternative 4	
	Proposed Action	Adaptive Strategy	Proposed Action	Adaptive Strategy	Proposed Action	Adaptive Strategy
Bosenberg Creek No PFC Assessment • Lake Creek allotment • Bosenberg unit (above FS rd 1648)	Entire pasture rested 3 years out of a 10 year period (season long rest).	Scheduled rest or additional rest.	None (Bosenberg remains vacant)	None	None (Bosenberg remains vacant)	None
Lake Creek Reach 3 • Logan Valley allotment • West Lake Creek Riparian Pasture (existing authorized project to be constructed in 2012 or 2013)	Rest would occur for 3-5 years after the fence is constructed and willows are planted. Grazing would resume after willows have established.	Additional rest within the West Summit Recovery unit.	Rest would occur for 3-5 years after the fence is constructed and willows are planted. Grazing would resume after willows have established.	Additional rest within the West Summit Recovery unit	Rest would occur for 3-5 years after the fence is constructed and willows are planted. Grazing would resume after willows have established.	Additional rest within the West Summit Recovery unit
Big Creek (No PFC Assessment, located s. side of FS rd 16 for 0.15 miles) • Logan Valley allotment • West Bosenberg Riparian Pasture (existing authorized project to be constructed in 2012 or 2013)	Rest would occur for 3-5 years after the fence is constructed and willows are planted. Grazing would resume after willows have established.	Additional rest within the West Bosenberg Riparian pasture.	Rest would occur for 3-5 years after the fence is constructed and willows are planted. Grazing would resume after willows have established.	Additional rest within the West Bosenberg Riparian pasture.	Rest would occur for 3-5 years after the fence is constructed and willows are planted. Grazing would resume after willows have established.	Additional rest within the West Bosenberg Riparian pasture.

Stream/Reach	Alternative 2		Alternative 3		Alternative 4	
	Proposed Action	**Adaptive Strategy**	**Proposed Action**	**Adaptive Strategy**	**Proposed Action**	**Adaptive Strategy**
Big Creek Reach 1, 2, & 3 • Logan Valley allotment • South Big Creek unit (reach 1) • North Big Creek unit (reach 2) • East Big Creek unit (reach 3)	The South Big Creek, North Big Creek and East Big Creek units would be combined into a single unit identified as the Big Creek Riparian pasture. The entire Riparian pasture rested 3 years out of a 10 year period (season long rest).	Scheduled rest or additional rest.	The South Big Creek, North Big Creek and East Big Creek units would be combined into a single unit identified as the Big Creek Riparian pasture. The entire Riparian pasture rested 3 years out of a 10 year period (season long rest).	Scheduled rest or additional rest	The South Big Creek, North Big Creek and East Big Creek units would be combined into a single unit identified as the Big Creek Riparian pasture. The entire Riparian pasture rested 3 years out of a 10 year period (season long rest).	Scheduled rest or additional rest
Fen Area • Logan Valley allotment • Big Field Creek unit	Graze annually and monitor Fen area.	Construct riparian pasture fence around Fen area	Graze annually and monitor Fen area.	Construct riparian pasture fence around Fen area	Graze annually and monitor Fen area.	Construct riparian pasture fence around Fen area

Appendix B - Summit Logan Valley Grazing Authorization Project Maps

Figure 35. Vicinity map of the four allotments

Alternative 1 – No Grazing:

Figure 36. Alternative 1 - Lake Creek allotment

Figure 37. Alternative 1 - Logan Valley allotment

Figure 38. Alternative 1 - McCoy Creek allotment

Figure 39. Alternative 1 - Summit Prairie allotment

Alternative 2 – Proposed Action:

Figure 40. Alternative 2 - Lake Creek allotment

Figure 41. Alternative 2 - Logan Valley allotment

Figure 42. Alternative 2 - McCoy Creek allotment

Figure 43. Alternative 2 - Summit Prairie allotment

Alternative 3:

Figure 44. Alternative 3 - Lake Creek allotment

Figure 45. Alternative 3 - Logan Valley allotment

Figure 46. Alternative 3 - McCoy Creek allotment

Figure 47. Alternative 3 - Summit Prairie allotment

Alternative 4:

Figure 48. Alternative 4 - Lake Creek allotment

Figure 49. Alternative 4 - Logan Valley allotment

Figure 50. Alternative 4 - McCoy Creek allotment

Figure 51. Alternative 4 - Summit Prairie allotment

Figure 52. Bull trout critical habitat within the project area

Figure 53. Monitoring sites and stream reaches within the project area

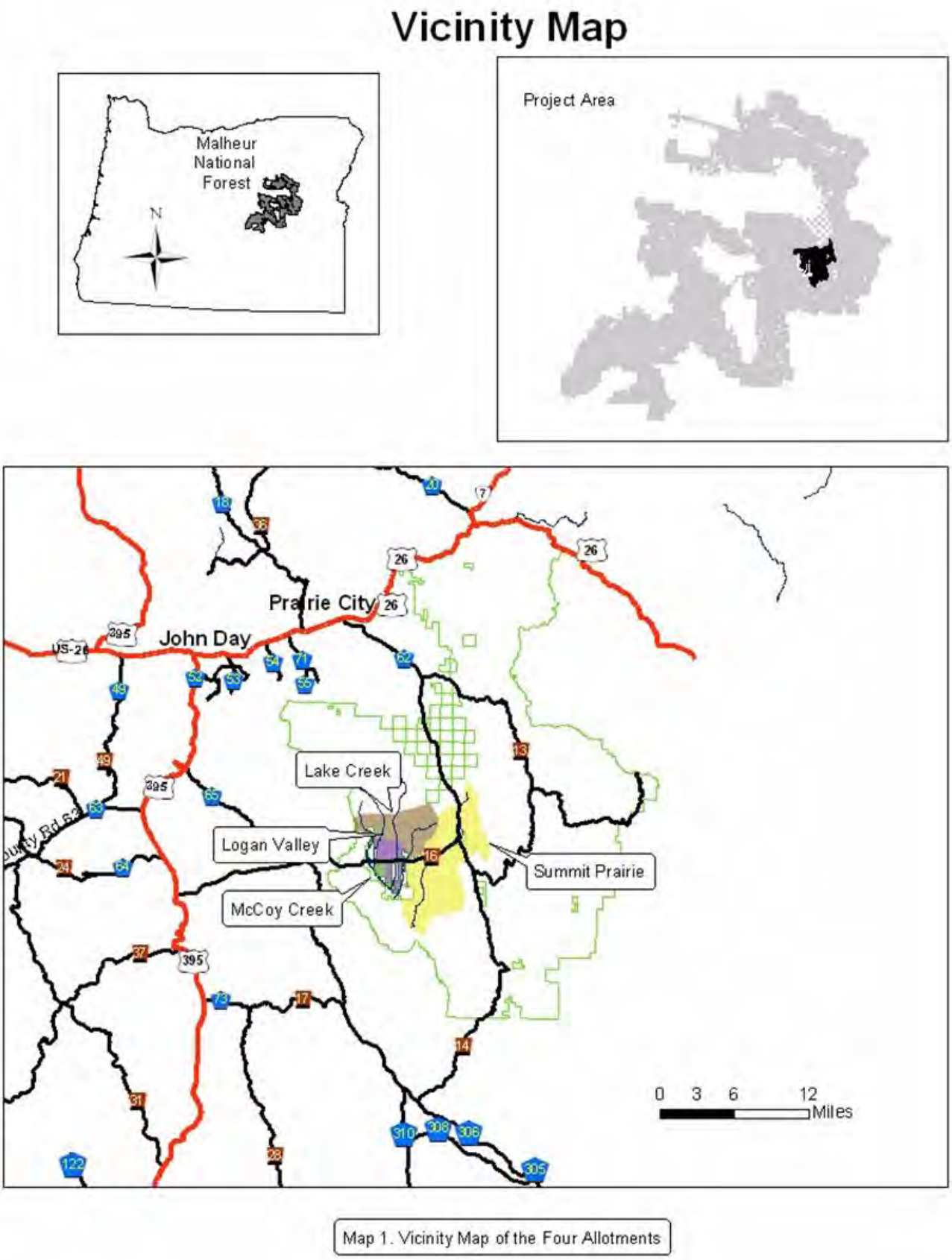

Figure 35. Vicinity map of the four allotments

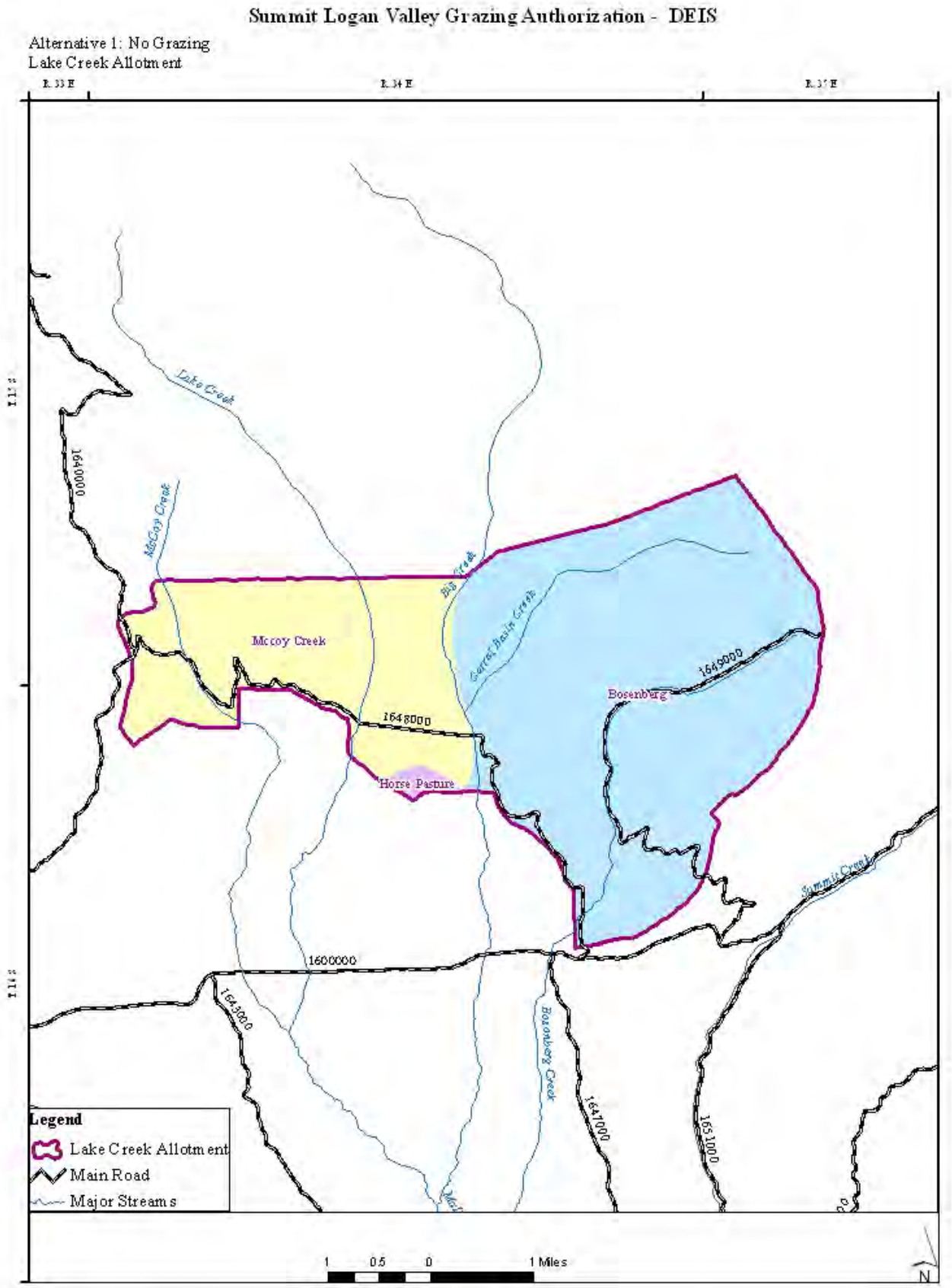

Figure 36. Alternative 1 - Lake Creek allotment

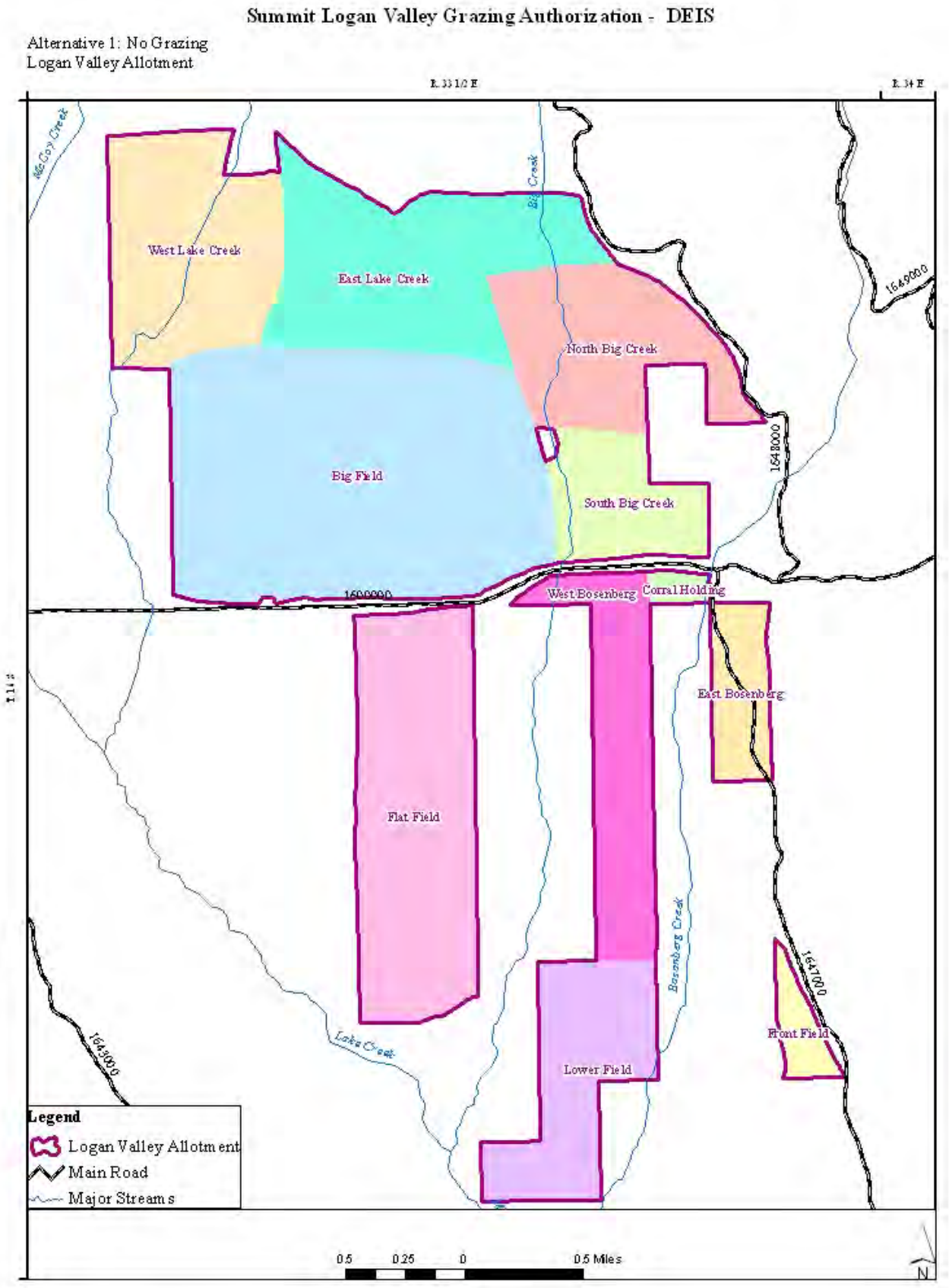

Figure 37. Alternative 1 - Logan Valley allotment

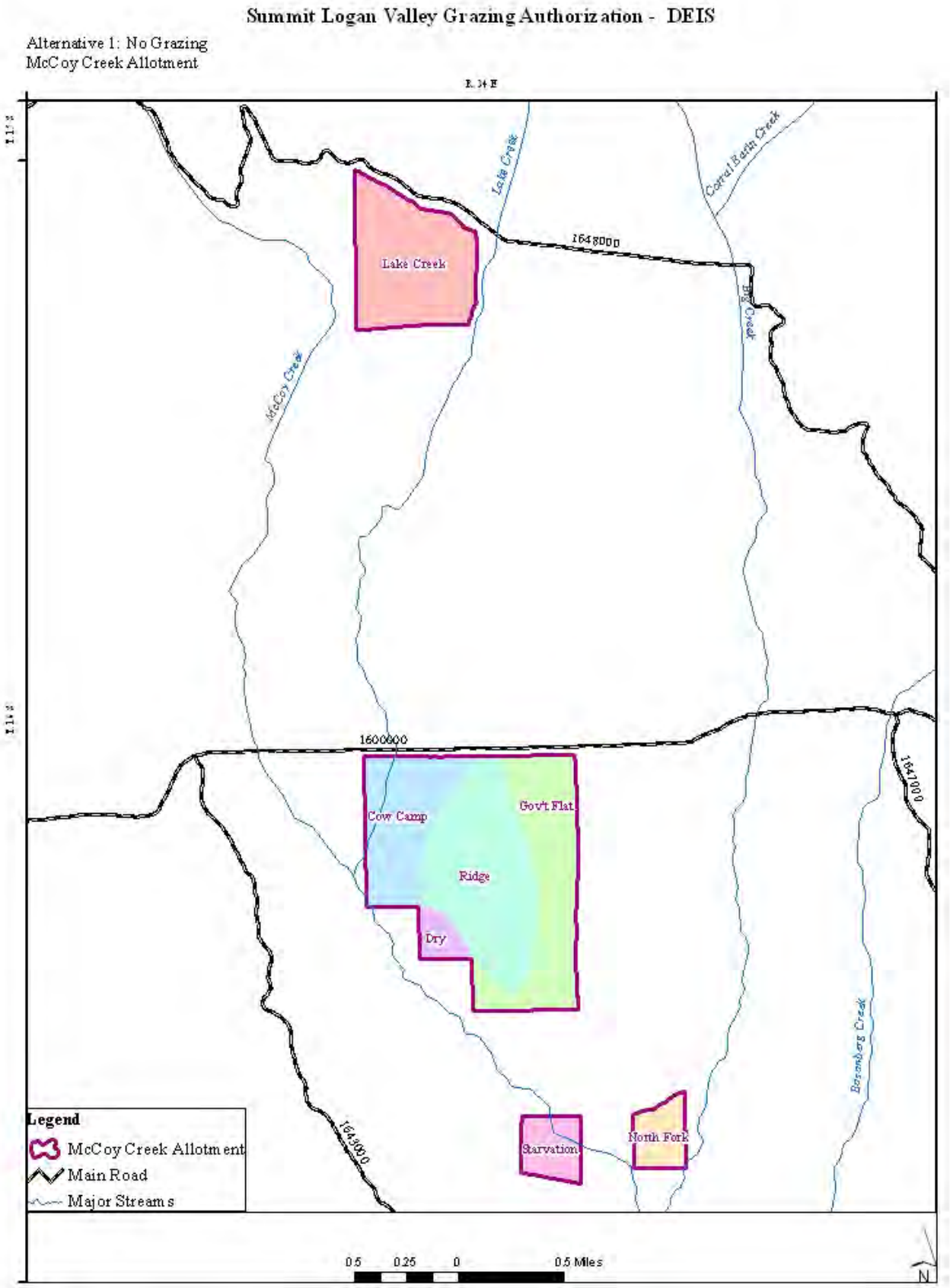

Figure 38. Alternative 1 - McCoy Creek allotment

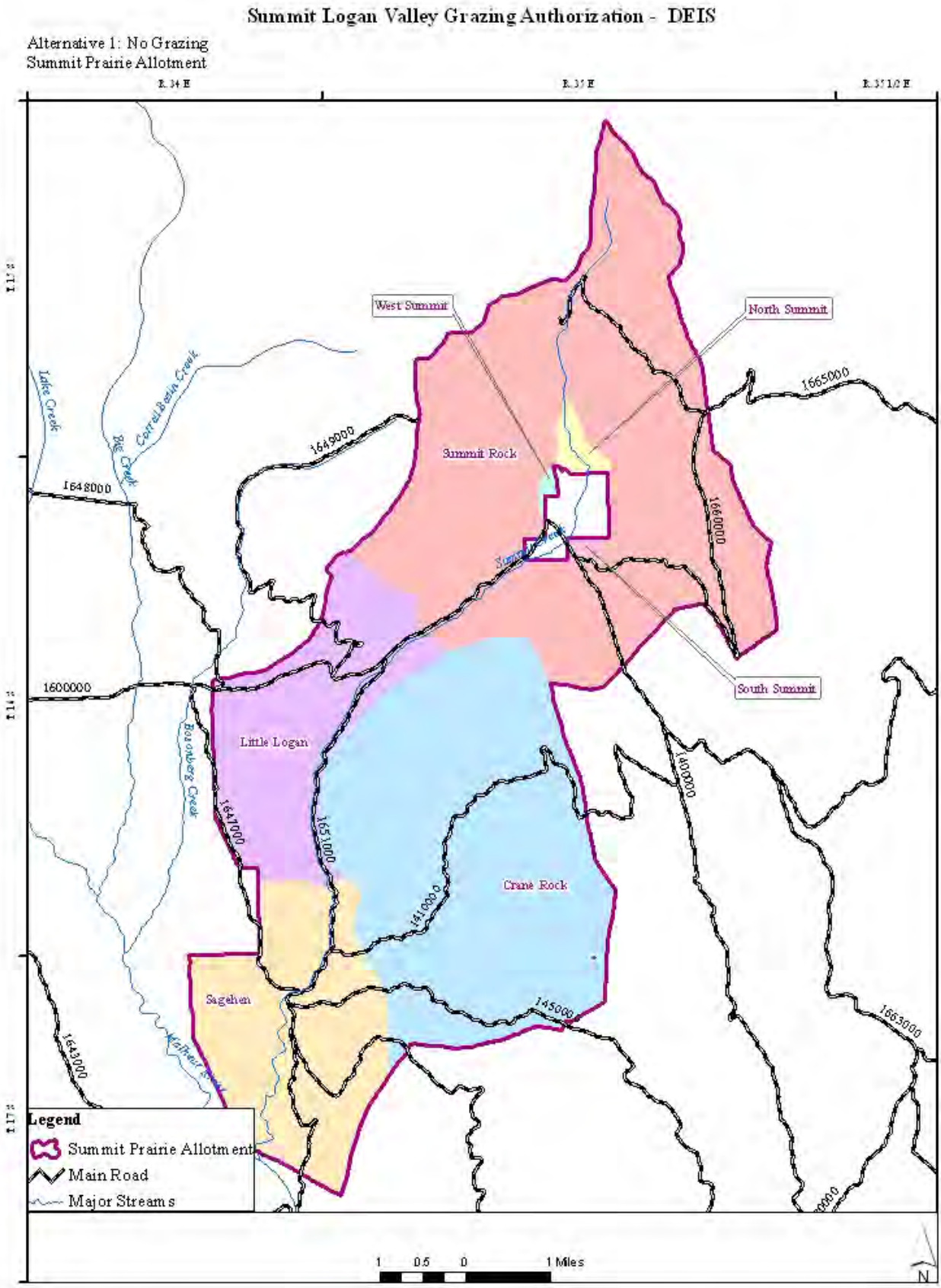

Figure 39. Alternative 1 - Summit Prairie allotment

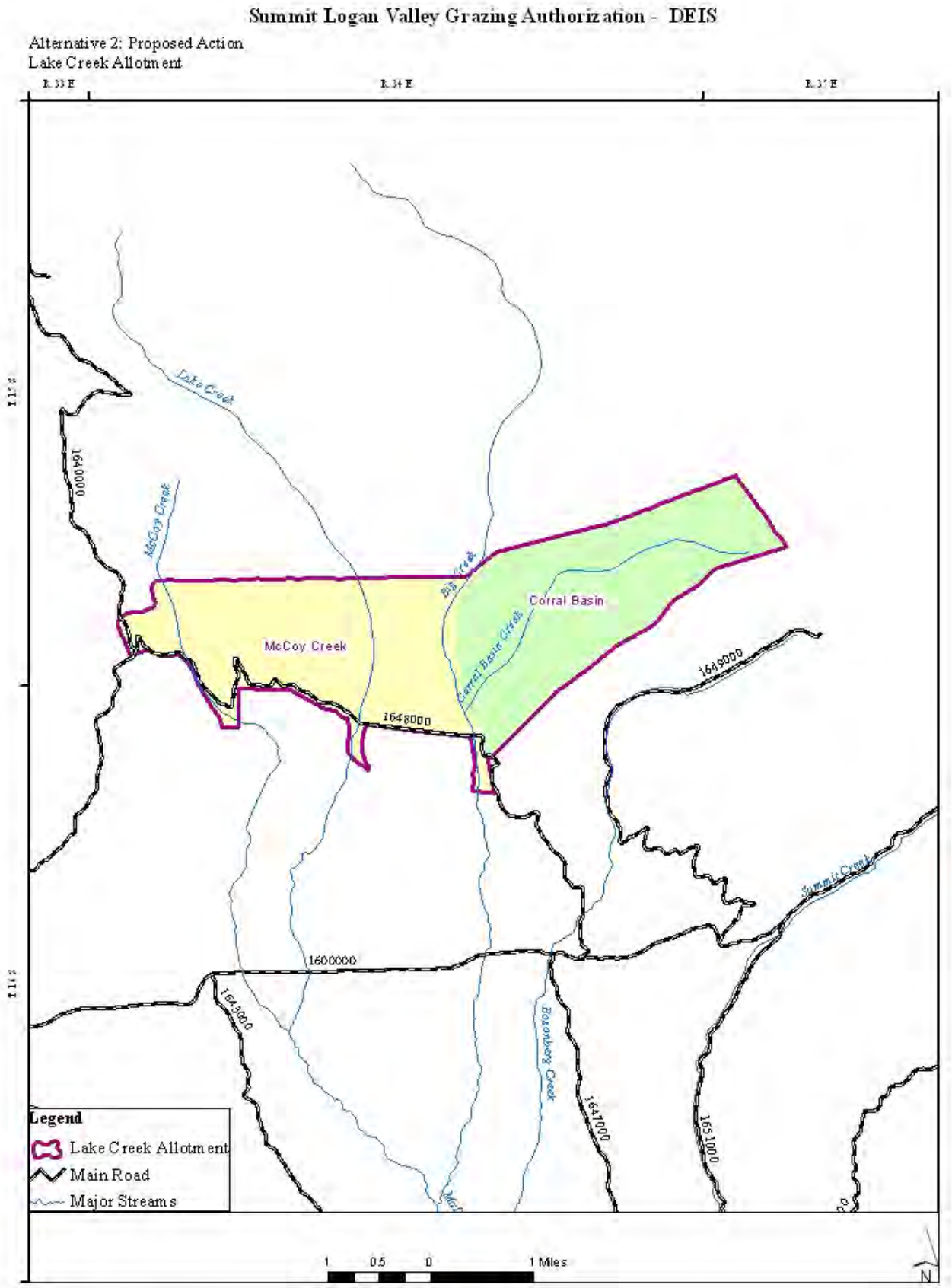

Figure 40. Alternative 2 - Lake Creek allotment

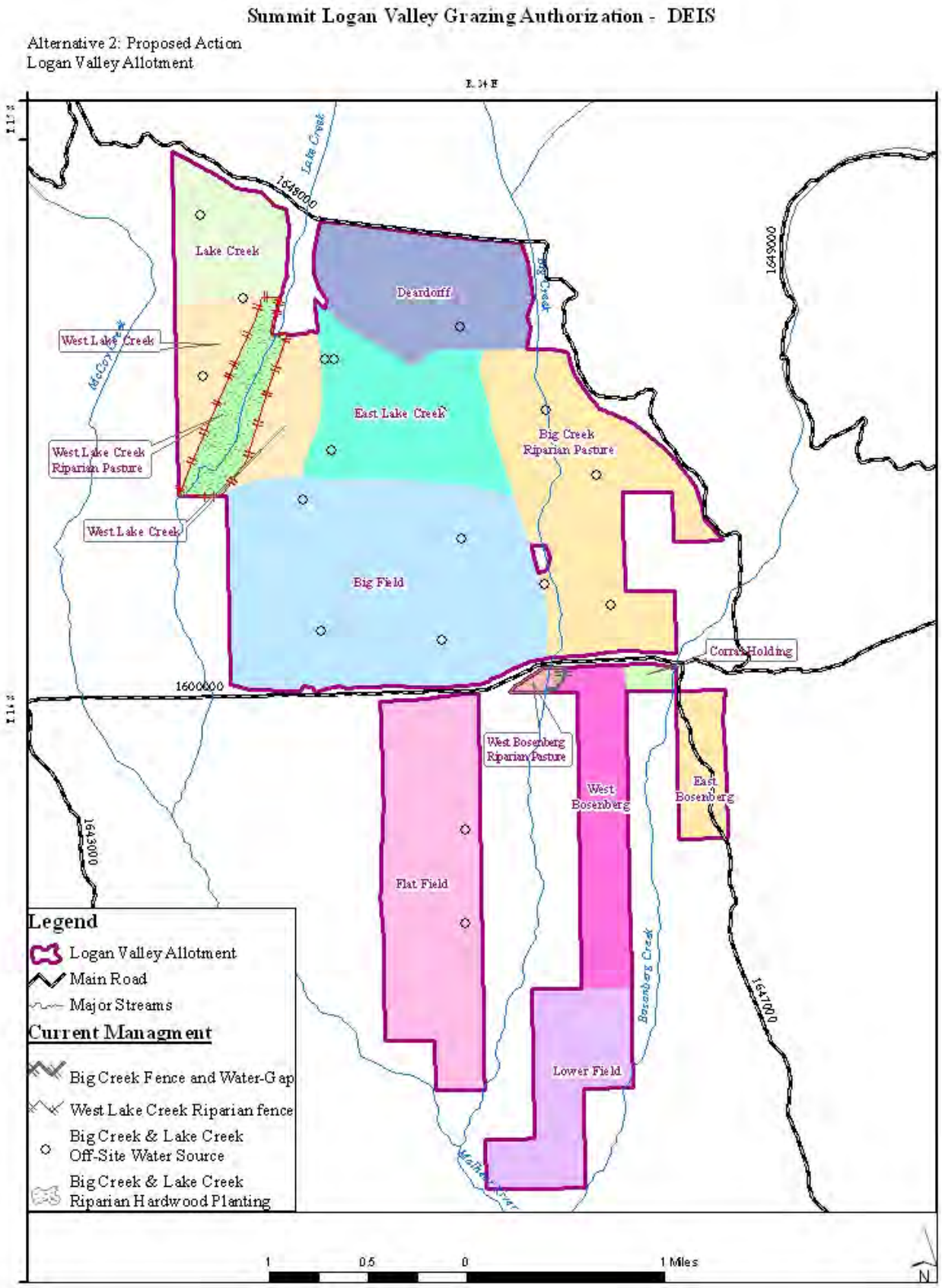

Figure 41. Alternative 2 - Logan Valley allotment

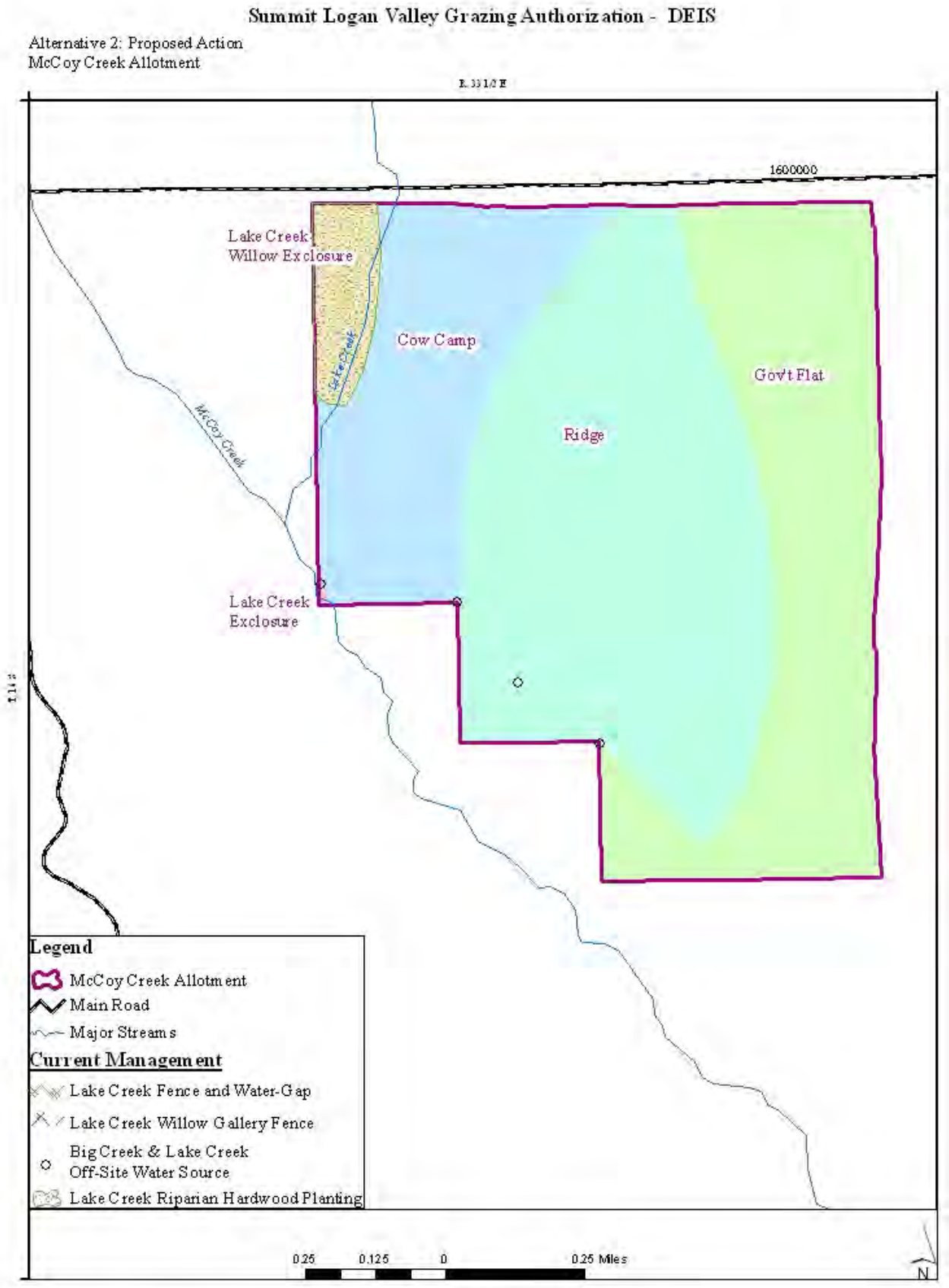

Figure 42. Alternative 2 - McCoy Creek allotment

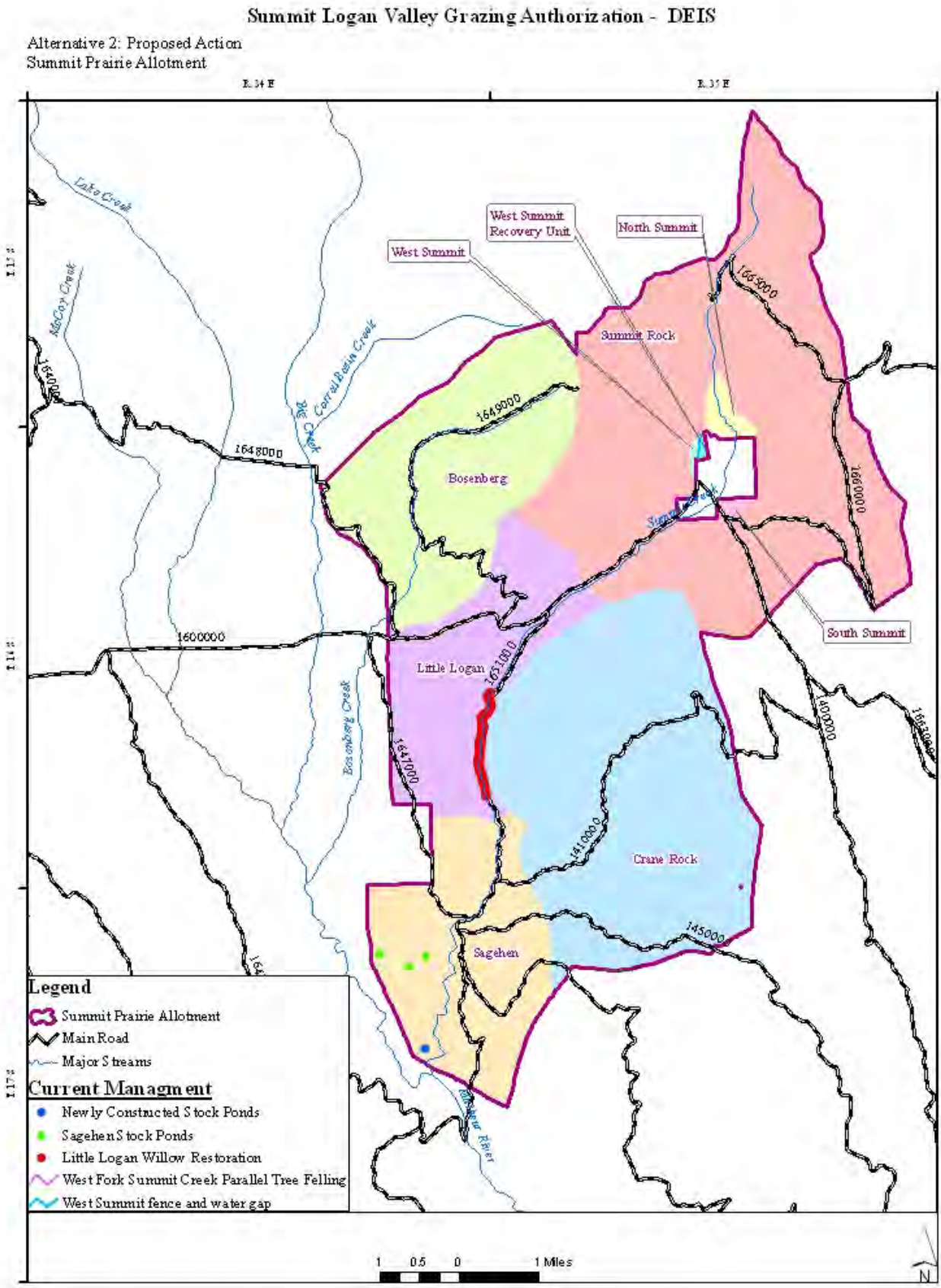

Figure 43. Alternative 2 - Summit Prairie allotment

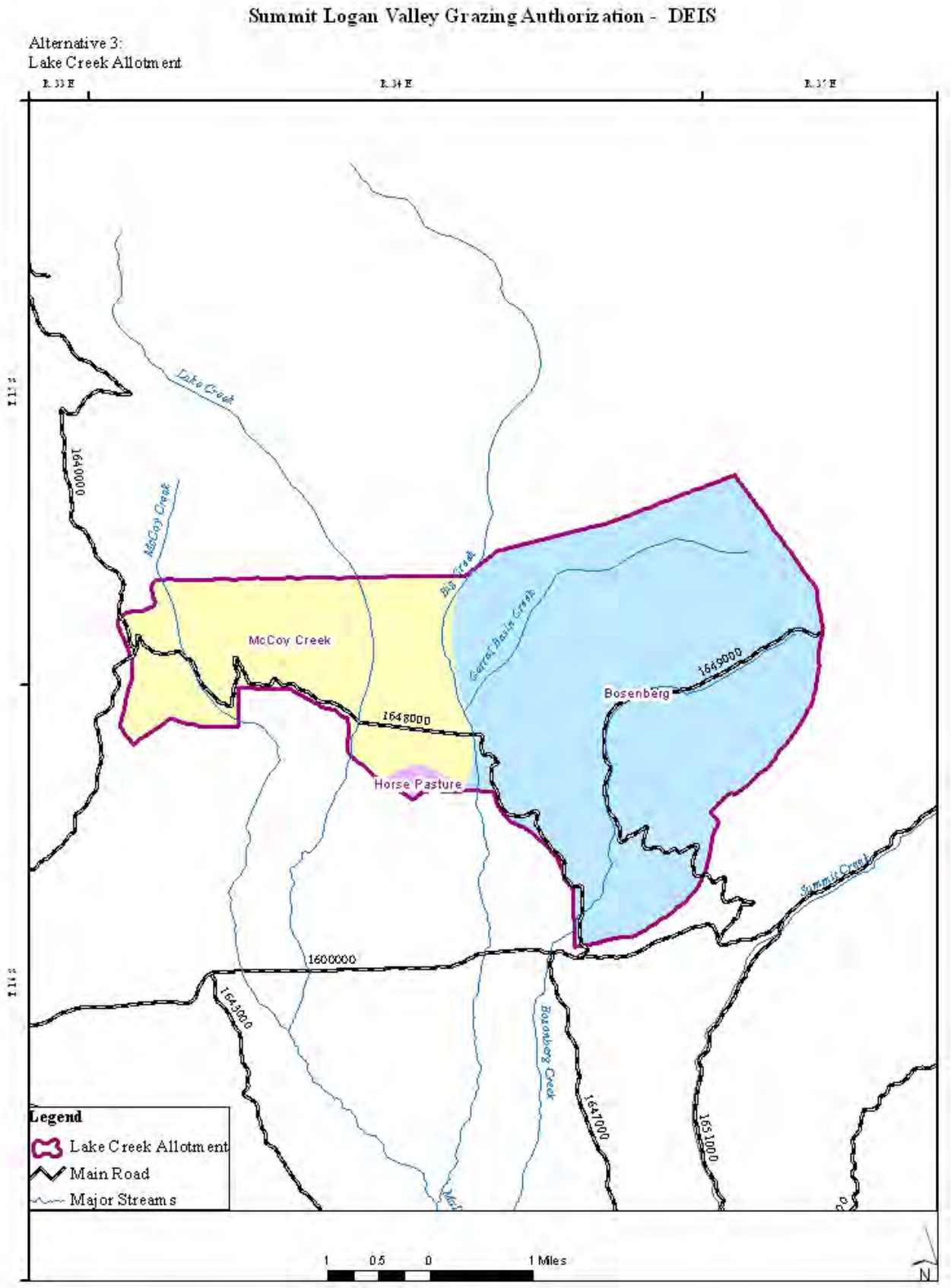

Figure 44. Alternative 3 - Lake Creek allotment

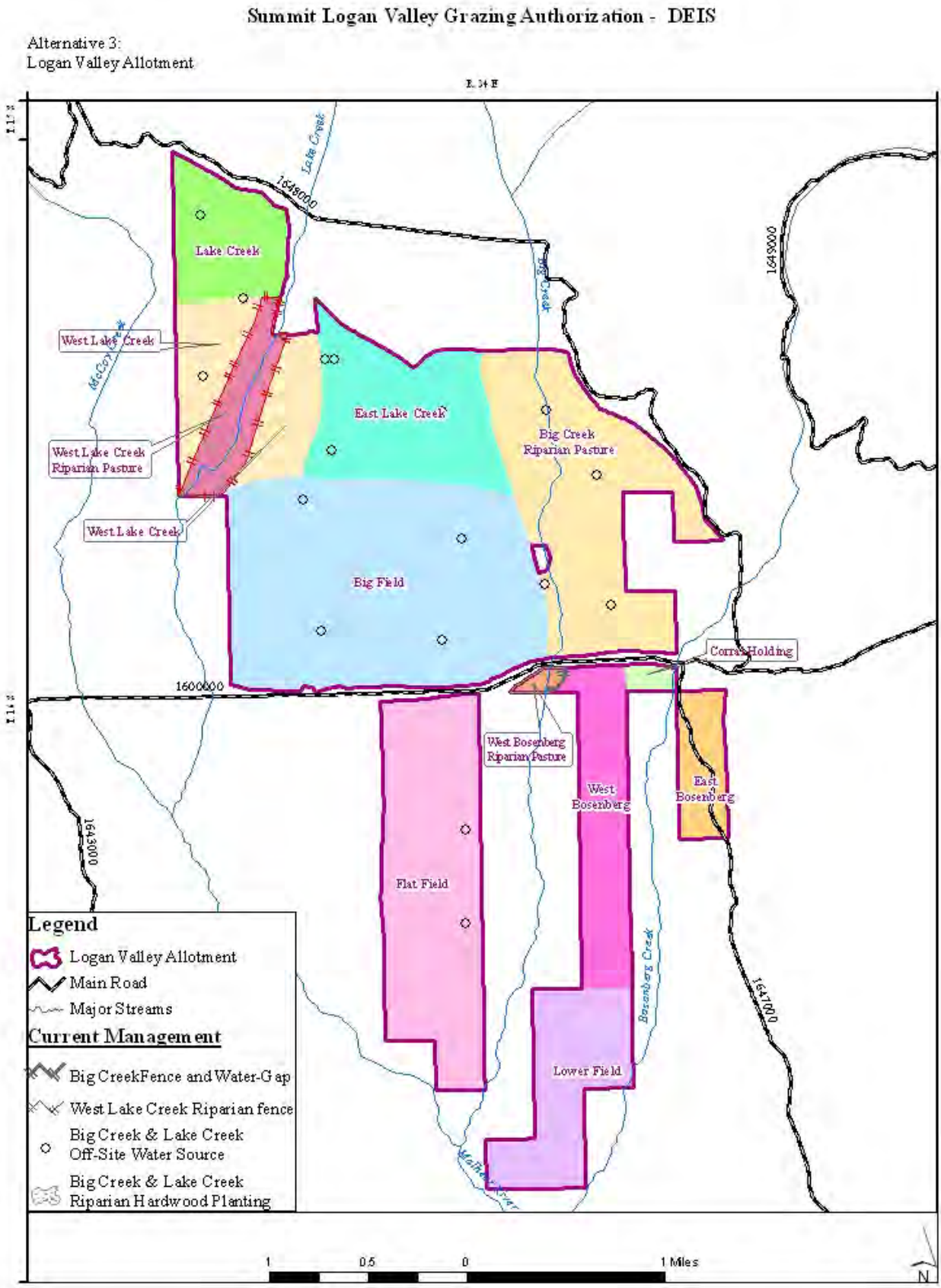

Figure 45. Alternative 3 - Logan Valley allotment

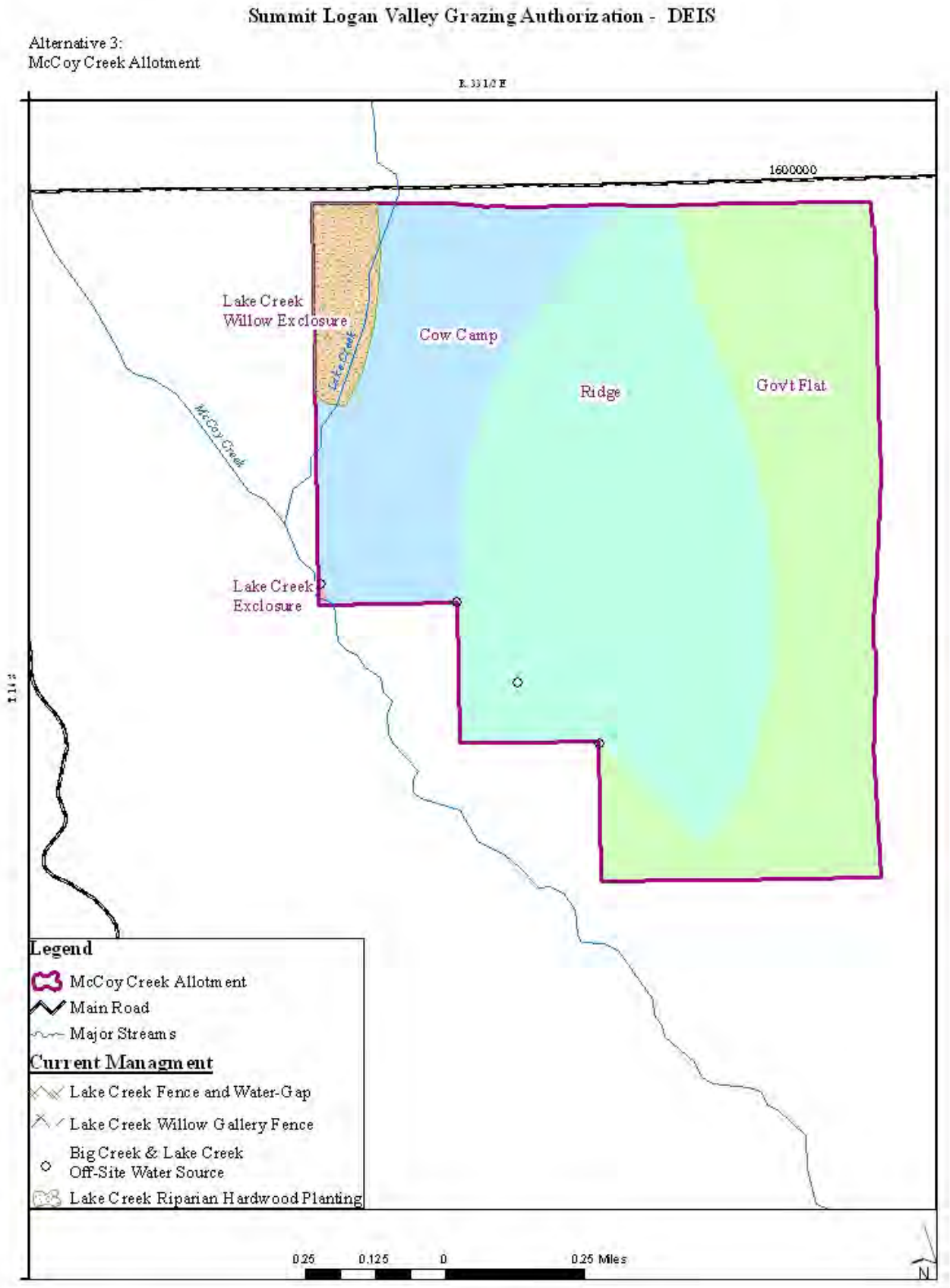

Figure 46. Alternative 3 - McCoy Creek allotment

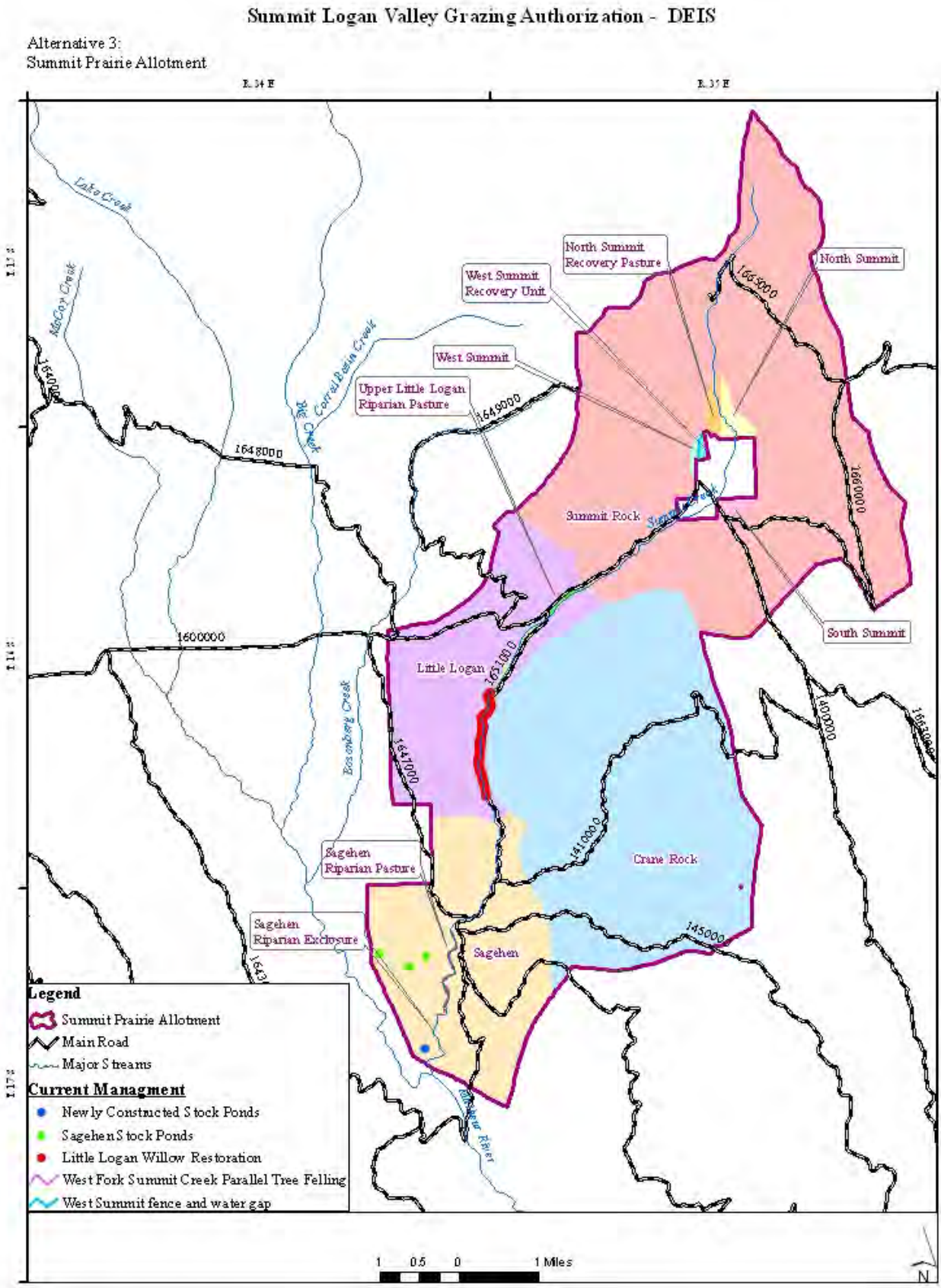

Figure 47. Alternative 3 - Summit Prairie allotment

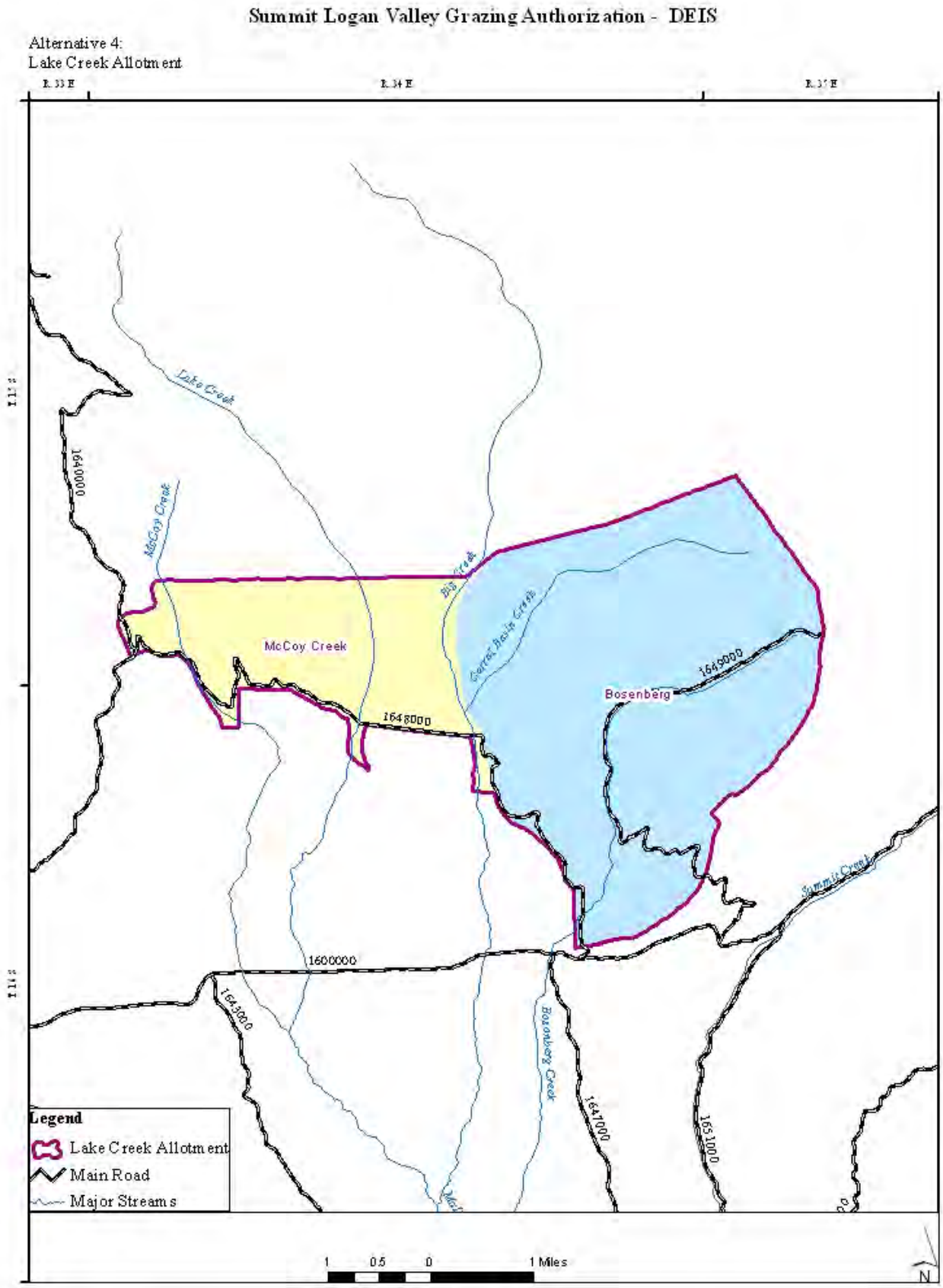

Figure 48. Alternative 4 - Lake Creek allotment

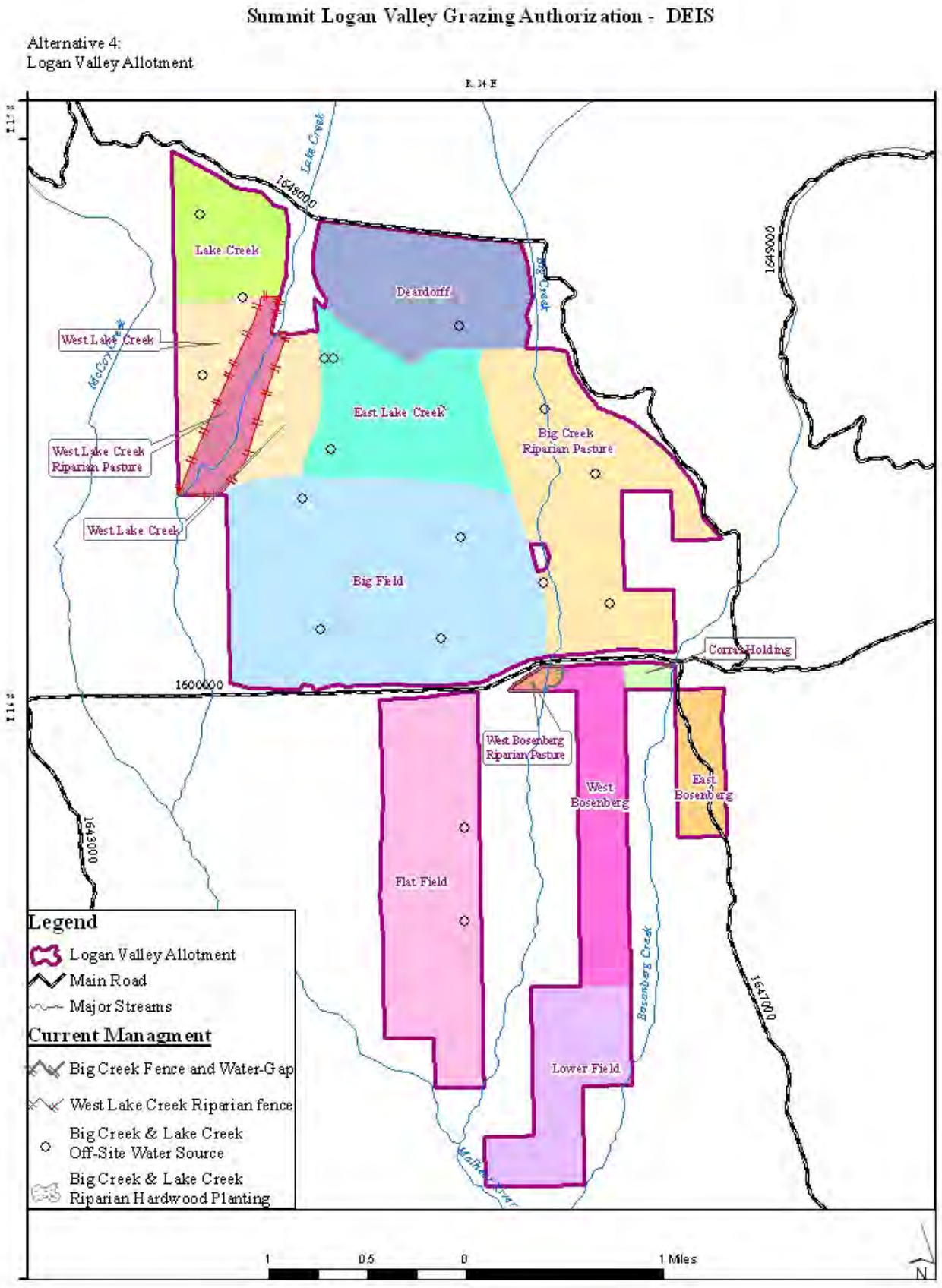

Figure 49. Alternative 4 - Logan Valley allotment

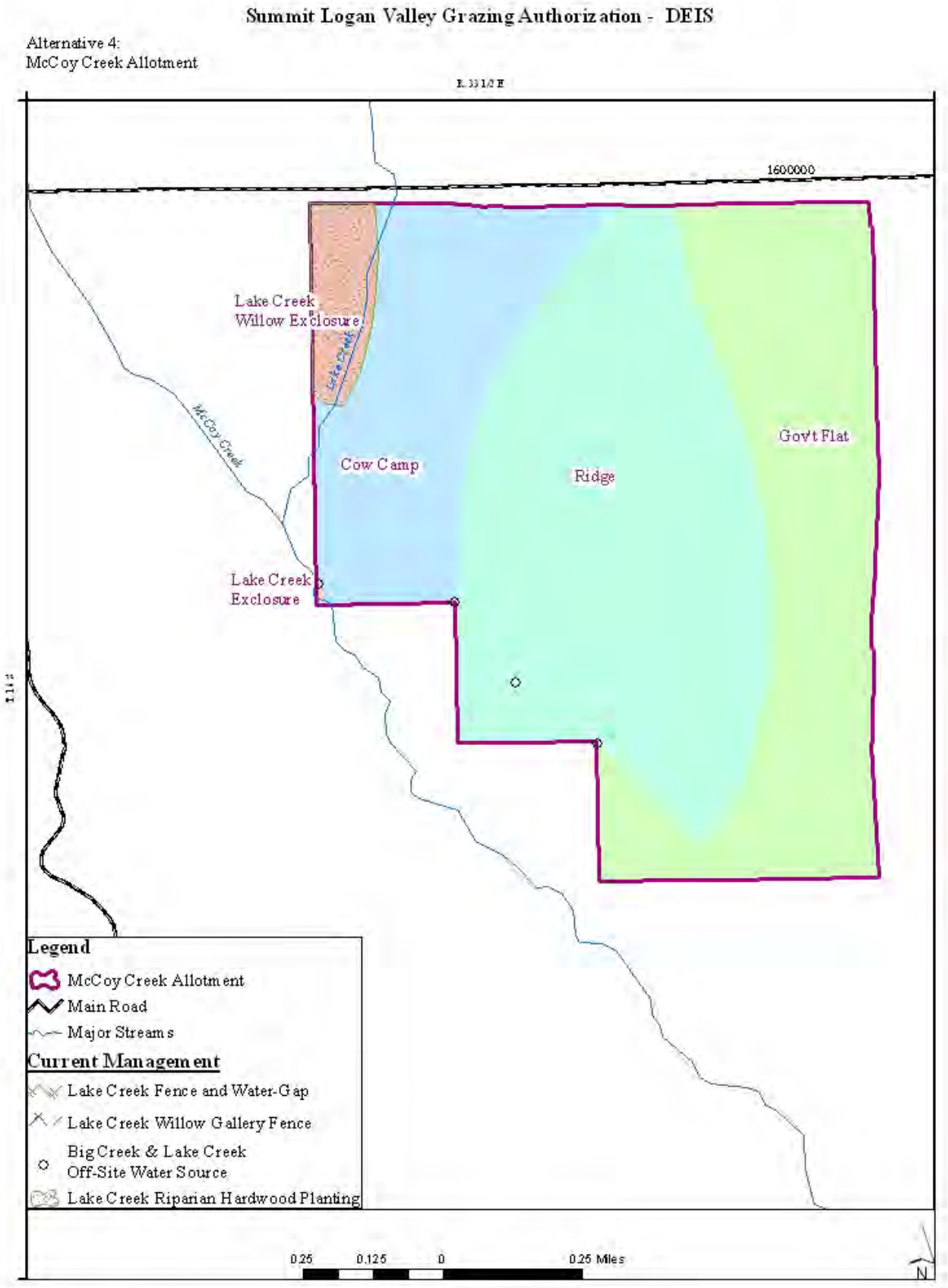

Figure 50. Alternative 4 - McCoy Creek allotment

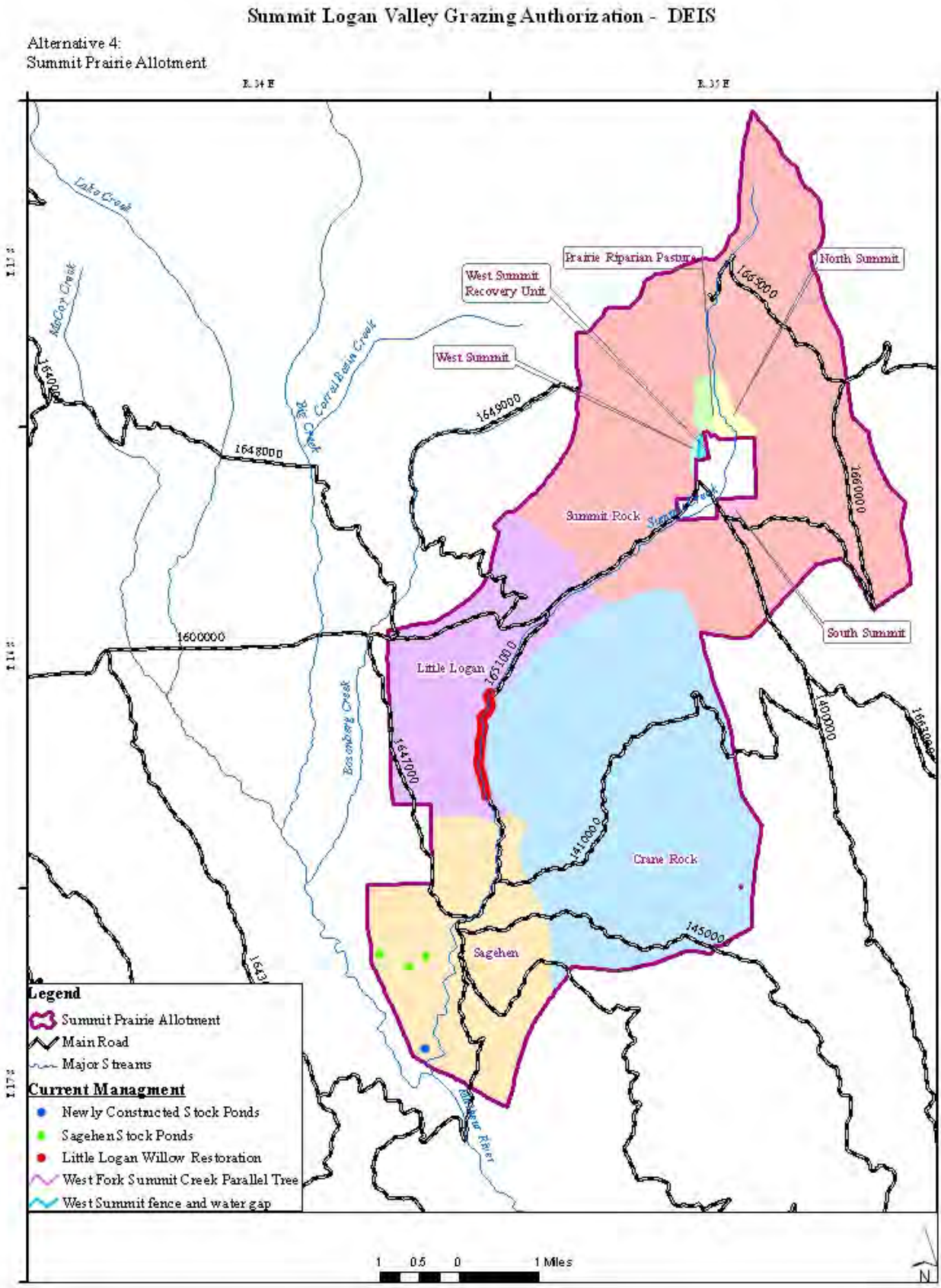

Figure 51. Alternative 4 - Summit Prairie allotment

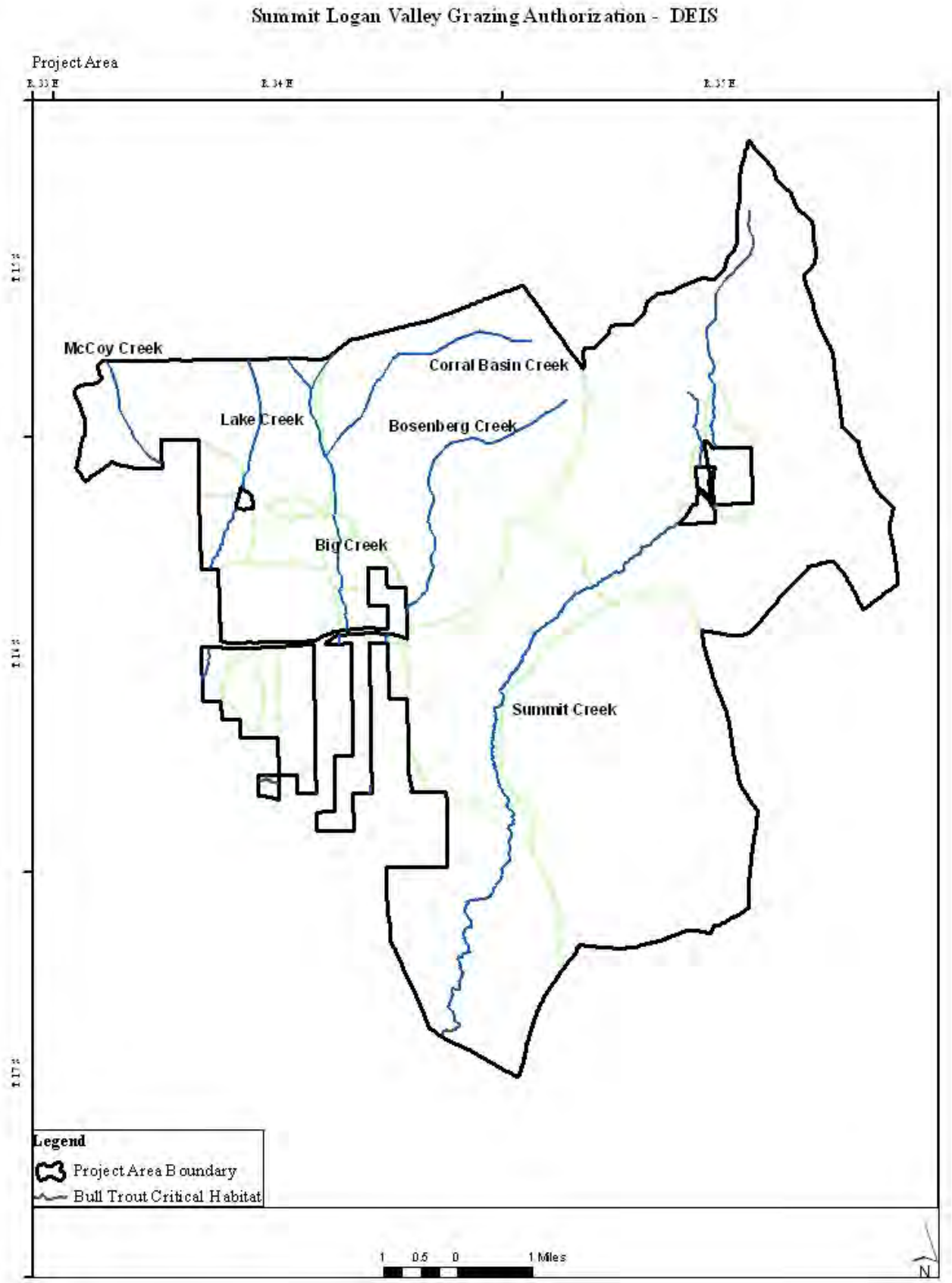

Figure 52. Bull trout critical habitat within the project area

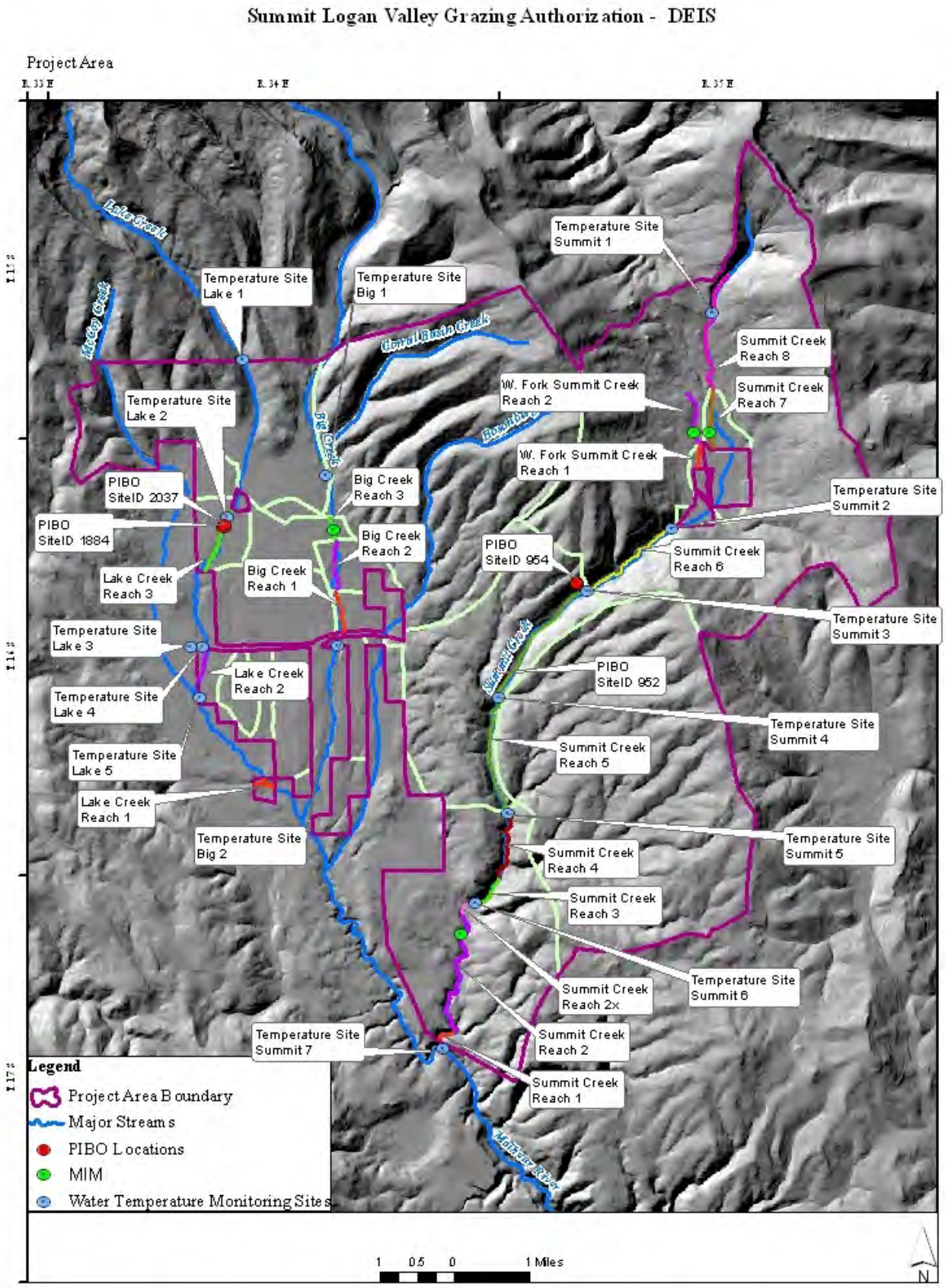

Figure 53. Monitoring sites and stream reaches within the project area

Appendix C – Cumulative Activities Considered

The following listed activities will be reviewed for cumulative effects within each of the resource sections. These activities are located within the project area unless otherwise noted. The project area consists of all or portions of the Upper Big Creek, Lake Creek, Summit Creek, and Bosenberg Creek subwatersheds in the Upper Malheur River Watershed. The year listed on the table is the year the activity was implemented or proposed for implementation.

Table 105. Past activities in the Summit Logan Grazing Authorization Project Area

Year	Sale Name	Harvest Type
Past Timber Sales		
1972	Little Logan	HPR
1972	Mickey Mouse	HSV
1974	Bosenberg	HPR
1975	Black Canyon	HPR
1977-1979	Lonsumess	HCC/HPR/HFR
1979	Muddy Shoe	HSH/HFR
1980-1983	Spiketail	HCR/HFR/HSH
1981	Big Pine	HSV/HPR/HCC
1981	Conroy	HPR
1981	Malheur River	HFR
1981-1984	Scots	HCC/HPR/HSH/HFR
1982	Stacked	HSV
1982	Logan IV	HCR
1982	Logan LP	HCR
1982-1983	Fourteen	HFR/HCC/HPR/HSV
1983	Logan 0	HCR
1983	Logan II	HCR
1983	Logan III	HCR
1983-1984	BO	HFR/HSV
1983-1984	Sage	HFR
1983-1987	Exchange II	HSV/HCR
1984-1985	Hare	HCC/HPR/HCR/HFR
1984-1986	Teen	HFR
1985	Bigham	HCR/HTH/HPR
1985-1987	Keystone	HSH/HFR
1986	Logan	HFR/HCR
1986	Exchange III	HCR/HFR/HTH/HPR
1986-1988	Exchange IV	HCR/HPR/HTH
1986-1988	PC Rock	HCC/HFR/HOR/HOH
1987-1989	Hilo Exchange II	HCC/HCR/HSH/HPR
1989-1995	McCoy	HCC/HCP/HOR/HSH
1990-1991	Parallel	HCC/HOR/HCP
1991-1992	Bullet	HCR/HCP/HSH
1991-1992	Silver	HSH/HCP/HSV/HCR

Year	Sale Name	Harvest Type
1991-1992	Sno A	HSH/HCC
1991-1992	Sno B	HCR/HCC
1991-1992	Sno C	HCC/HTH
1991-2001	Wickiup	HSH/HOR/HCC/HSV/HSA
2002-2011	Merit	HTH/HCR/HSH
2002-2011	Starvation Lodgepole	HTH

A map showing the locations of past harvest areas from 1960 to 2000 is located in the Malheur Headwaters Watershed Assessment (2000), Figure 37.

Harvest Prescription Definitions:

- HTH: Commercial thinning
- HCR: Regeneration harvest (even aged management; the stands naturally or artificially regenerated)
- HCC: Clearcut
- HSH: Shelterwood/Seed tree
- HOR: Harvest overstory removal
- HFR: Final removal (of a mature overstory to release established immature crop tree that were not a result of a prescribed regeneration cut)
- HPR: Partial removal
- HSV: Selection removal
- HSA: Salvage harvest

Past Wildfires

Year	Fire Name	Acres
1990	Snowshoe, Corral Basin, and Sheep	10,022
2002	High Robert	9,917

Other Past Activities

Years	Type of Activity	Description
Mid-1800s to Present	Livestock grazing (cattle/sheep)	From the mid-1880s to the 1900s, cattle mostly grazed in low-lying riparian areas but since the early 1900s, when overgrazing became an obvious problem, livestock grazing decreased considerably. Grazing activities include construction and maintenance projects (fences and water troughs) needed for range management. Currently, Dollar Basin, McCoy Creek, Summit Prairie and Logan Valley are active allotments; Lake Creek has been vacant with no livestock grazing since 1985.
Mid-1800s to Present	Private land livestock grazing adjacent to project area.	There are four private land owners adjacent to the project area. All private lands are grazed to some extent. The private lands located along Lake Creek and McCoy Creek are generally grazed from June through October. The private land located along Bosenberg Creek is generally grazed from June through October. The private land located south of the National Forest System road 16 is generally grazed May through October. The riparian areas have been placed in a conservation program and are currently not being grazed. The private land at the south end of the project area along the Malheur River is grazed early in the season from June to July, and in the fall for a week or two before livestock are trucked home. The private land located along Summit Creek is generally grazed from June through October.
Early 1900s to Present	Water withdrawal for irrigation	Construction and maintenance of diversions and ditches for either pasture irrigation or livestock watering.
Early 1900s to Present	Summer Recreation	Use includes camping, mushroom picking, fishing and sightseeing.

Year	Sale Name	Harvest Type
Early 1900s to Present	Fall Recreation	Use includes hunting and fishing.
1920s to Present	Use and Maintenance of National Forest System roads	Road maintenance includes but is not limited to cleaning culverts, ditches and cattleguards, blading, brushing and signing roads. All road maintenance activity follows the commercial roads rule requirements of 2009.
Early 1900s to 1960s	Railroad Line	Railroad lines were constructed from Seneca, Oregon to Summit Prairie. The track was abandoned and removed in the 1960s and the majority of the lines were converted to roads.
1950s to Present	Fire Suppression	Fire suppression activities
1950s	Introduction of Brook Trout	Introduction of brook trout into the Malheur River system.
1960s to Present	Firewood Cutting	Firewood cutting throughout the project area. Firewood cutting has increased since the 1920s as railroad lines and roads were established.
1960s to Present	Lake Creek Organization Camp	In 2005 a Special Use Permit (20 year permit) granting continued use of approximately 20 acres of NFS lands to Lake Creek Youth Recreational Camp, Inc. (Lake Creek Camp). The permit authorizes maintenance and seasonal operation of existing facilities on this site primarily for a youth camp. Additional conditions under the permit removal of facilities within Riparian Habitat Conservation Areas. Historically the area was a Forest Service Ranger Station (early 1900s).
1970s to Present	Winter Recreation	Use includes snowmobiling, grooming and use of existing snowmobile trails.
1990s	Sandpiper Habitat Restoration	Removal and piling of encroaching lodgepole pine saplings along the edges of meadow areas in Logan Valley.
2004	Burns Paiute Bridge	Construction of an access bridge.
2004	Bridge removal	Removal of two unsafe railroad bridges.
2005	Meadow Fork Culvert Replacement	Replaced the culvert on Meadow For Big Creek with a bridge.
2009-2010	Merit Road Closures and Decommissioning	Road closures (10.4 miles with gates and 15.3 miles with dirt berms) and decommissioning (12.6 miles) in the Lake Creek subwatershed.
2005-2011	Merit Precommercial Thinning	Precommercial thinning and machine piling and handpiling on approximately 370 acres in the Lake Creek subwatershed.
2010	Merit Underburning	Underburned 250 acres
2005-Present	Big Creek Aspen Restoration	Construction of buck and pole fence, commercial and noncommercial thinning, and fuel treatments on 22 acres. Still need to do jackpot burning.
2008	Logan Valley Meadow Restoration	5 acres of meadow restoration in Logan Valley. Noncommercial removal of encroaching lodgepole pine and handpiling in meadows.
2010 - Present	Logan Valley Meadow/Grassland Enhancement, Aspen Restoration Project.	Project is partially complete. Approximately 229 acres of grassland/meadow enhancement which includes combinations of hand cutting of encroaching lodgepole, fuel treatments, and underburning. Aspen restoration on approximately 18 acres which includes conifer cutting and seedling protection (hinging and fencing). Commercial thinning on approximately 100 acres to minimize the impacts of Mt. Pine beetle.

Table 106. Present or ongoing activities (2012)

Activity	Description
Water withdrawals/irrigation	Same as in the past
Firewood cutting	Same as in the past
Livestock grazing	Same as in the past
Invasive weed control	Same as in the past
Summer, fall, winter recreation	Same as in the past
Use and maintenance of National Forest System roads	Same as in the past
Fire suppression	Same as in the past
Lake Creek Organization Camp	Same as in the past
Logan Valley Meadow/Grassland Enhancement, Aspen Restoration Project.	Same as in the past
West Fork Summit Creek fence and water gap	Construct a 4-wire let-down fence along approximately 0.3 miles of West Fork of Summit Creek. The fence and water gap would be constructed along the west side of the stream.
West Fork Summit Creek parallel tree felling	Green lodgepole felled parallel along West Fork of Summit Creek for approximately ½ miles (roughly 50-75 trees).
Little Logan willow restoration (continued)	Enlarge or replace existing cages around willows. Cages would be approximately 20 ft. in diameter. Construct a ¼ mile buck and pole exclosure around a group of willows, removing cages.
Sagehen stock ponds	Construction of 3 stock ponds in the Sagehen unit. Ponds would be located in the uplands (outside of RHACs), capturing runoff from snow melt.
Lake Creek unit division fence reconstruction	Reconstruction of approximately 1 mile of 4-wire barbed wire let-down fence.
Big Creek fence and water-gap	Construct a 4-wire barbed let-down fence along approximately 0.2 miles of Big Creek. The fence (with rock jacks) and water gap would be constructed along the east side of the stream. Some willows may be cut or removed, depending on the timing, willow stems or entire places with roots may be transplanted to other locations along Big and/or Lake Creeks.
Lake Creek fence and water-gap	Construct a 4-wire barbed let-down fence with water-gaps along approximately 0.2 miles of Lake Creek.
Lake Creek willow gallery fence	Construct a 4-wire barbed wire fence with rock jacks along approximately 0.5 miles of Lake Creek.
Big Creek and Lake Creek off-site water source	A flex tub with pump would be placed in stream channel. A small piece of equipment would trench the pipeline from the adjacent riparian area to the troughs. A solar panel would be placed in the adjacent area of the stream channel to power the pump. Trough locations would be leveled and hardened with rocks.
West Lake Creek riparian fence	Construct a 4-wire let-down fence with rock jacks along approximately 1 mile of Lake Creek (totally 2.1 miles of fence).

Table 107. Foreseeable activities

Year	Approved	Foreseeable Activity	Description
Annual	Yes	Water withdrawals/irrigation	Same as in past
Annual	Yes	Firewood cutting	Same as in past
Annual	Yes	Livestock grazing	Same as in past
Annual	Yes	Summer, fall, winter recreation	Same as in past
Annual	Yes	Use and maintenance of National Forest System roads	Same as in past
Annual	Yes	Fire Suppression	Same as in past
2012-2013	Yes	Riparian Hardwood Planting Restoration	Planting of hardwood cuttings along approximately 1.2 miles of Lake Creek and 2.5 miles of Big Creek to restore shade and cover.
2013	NO	Malheur National Forest Travel Management	Cross country travel would be prohibited across 1,337,770 acres on the Malheur National Forest where it is not already prohibited with the exception of cross country travel from designated open routes for the sole purpose of dispersed camping when resource damage caused by motor vehicle use can be avoided. The distance that cross country travel would be allowed from open routes to existing dispersed camp sites would vary by alternative considered in the travel management analysis. Existing dispersed sites in a riparian area would also have a setback distance from the stream where motorized access would be restricted.
2013	No	Malheur National Forest Site- Specific Invasive Plant Treatment	Treatment of known and newly discovered invasive plants using herbicide, manual, mechanical, biological and/or cultural treatments.

Appendix E - Move Triggers and Allowable Use Levels

Alternatives 2, 3, and 4 propose different combinations of use levels that control the duration of the grazing management system to address the purpose and need and the significant issues shown in chapter 1. To control the duration of grazing, move triggers and thresholds for allowable use levels (end-point indicators) are identified for each alternative. Established thresholds are identified for upland and riparian herbaceous species use, bank alteration, and shrub browsing.

Monitoring would ensure that management is helping or moving towards attaining desired conditions. appendix A, Table 104 describes the monitoring that would be implemented with the action alternatives. The Malheur National Forest Range Monitoring Guidelines lists accepted methodologies for monitoring, which may continue to be updated overtime.

Allowable use, move triggers, and end-point indicators may change for pastures based on site specific data collected at representative monitoring sites based on adjustments made in response to monitoring results, timing, or climatic conditions. As recovery is obtained through meeting management objectives (see appendix A, Table 103), less restrictive use levels may be adequate to maintain or continue recovery of stream conditions. If management objectives are not being achieved in a timely manner, changes in move triggers and allowable use levels may be necessary to accelerate recovery (see appendix A, Table 104).

Table 108. Move triggers and allowable use levels by alternative

Indicator	Measurement Location	Move Triggers[a]	Allowable Use (End-Point Indicators)	Allotment and Pasture
Alternative 2 (Proposed Action)				
Stubble Height on herbaceous hydrophytic riparian species (i.e., sedges and rushes)	Along the greenline[b]	45% use OR 5-inch stubble height[c]	4-inch stubble height	All pastures not listed below
		35% use OR 7-inch stubble height	6-inch stubble height	Logan Valley Allotment: • West Bosenberg Riparian Pasture • West Lake Creek Riparian Pasture Summit Prairie Allotment: • Sagehen unit • West Summit Recovery unit • West Fork Summit Creek within in the Summit Rock unit
Grass and grass-like (non-hydrophytic species) within riparian benches[d] and upland[e] areas of the unit	Uplands and in soils that are non-hydrophytic in nature	45% use of available forage[f] within riparian benches and forested stands, 55% within grasslands and 50% within shrublands.		All pastures

Indicator	Measurement Location	Move Triggers[a]	Allowable Use (End-Point Indicators)	Allotment and Pasture
Riparian woody shrubs (i.e., willows, alders, dogwood, wildrose)	Riparian Areas	Light (30%) to moderate (50%)[g] hedging. Note: The level of use would be gathered in conjunction with estimates of age class distribution. A good mix of age classes is desired		All pastures
Bank Alteration	Along the greenline	20% bank alteration		All pastures not listed below
	Along the greenline	15% bank alteration		West Bosenberg Riparian pasture
	Critical DMA	10% bank alteration		Bosenberg unit
	Representative DMA	15% bank alteration		
Alternative 3				
Stubble Height on herbaceous hydrophytic riparian species (i.e., sedges and rushes)	Along the greenline	45% use OR 5-inch stubble height	4-inch stubble height	All pastures not listed below
		35% use OR 7-inch stubble height	6-inch stubble height	Logan Valley allotment: • West Bosenberg Riparian Pasture Summit Prairie allotment: • Sagehen unit • Little Logan unit • West Summit Recovery unit
		9-inch stubble height	7-inch stubble height	Logan Valley allotment: • Big Creek Riparian pasture • West lake Creek Riparian pasture Summit Prairie allotment: • Summit Rock unit (Reach 2 of W. Fork Summit Creek, Reach 6 of Summit Creek) • Upper Little Logan Riparian pasture • Lower Little Logan Riparian pasture • Sagehen Riparian pasture
Grass and grass-like (non-hydrophytic species) within riparian bunches and upland areas of the unit	Uplands and in soils that are non-hydrophytic in nature	45% use of available forage within riparian benches and forested stands, 55% within grasslands and 50% within shrublands.		All pastures

Indicator	Measurement Location	Move Triggers[a]	Allowable Use (End-Point Indicators)	Allotment and Pasture
Riparian woody shrubs (i.e., willows, alders, dogwood, wildrose)	Riparian Areas	30%	40%	All pastures not listed below
		20%	30%	Logan Valley allotment: • Big Creek Riparian pasture • West Lake Creek Riparian pasture Summit Prairie allotment: • Sagehen • Little Logan • North Summit Riparian pasture
Bank Alteration	Along the greenline	20%	25%	All pastures not listed below
		10%	15%	Logan Valley allotment: • Big Creek Riparian pasture • West Lake Creek Riparian pasture • West Bosenberg Riparian pasture Summit Prairie allotment: • Sagehen • Little Logan • Summit Rock (Reach 2 of W. Fork Summit Creek & Reach 6 of Summit Creek) • Upper Little Logan Riparian pasture • Lower Little Logan Riparian pasture • Sagehen Riparian pasture
		15%	20%	Summit Prairie allotment: • North Summit Riparian pasture

Indicator	Measurement Location	Move Triggers[a]	Allowable Use (End-Point Indicators)	Allotment and Pasture
Alternative 4				
Stubble Height on herbaceous hydrophytic riparian species (i.e., sedges and rushes)	Along the greenline	45% use OR 5-inch stubble height	4-inch stubble height	All pastures and greenlines not listed below
		35% use OR 7-inch stubble height	6-inch stubble height	Logan Valley allotment: • West Bosenberg Riparian pasture Summit Prairie allotment: • Prairie Riparian pasture (Summit Creek)
		9-inch stubble height	7-inch stubble height	Logan Valley allotment: • Big Creek Riparian pasture • West Lake Creek Riparian pasture Summit Prairie allotment: • Sagehen • Little Logan • Summit Rock units (Reach 2 of W. Fork of Summit Creek & Reach 6 of Summit Creek) • Prairie Riparian pasture and West Summit Recovery unit (7-9 inches on W. Fork of Summit Creek)
Grass and grass-like (non-hydrophytic species) within riparian bunches and upland areas of the unit	Uplands and in soils that are non-hydrophytic in nature	45% use of available forage within riparian benches and forested stands, 55% within grasslands and 50% within shrublands		Uplands and in soils that are non-hydrophytic in nature
Riparian woody shrubs (i.e., willows, alders, dogwood, wildrose)	Riparian Areas	30%	40%	All pastures and greenlines not listed below
		20%	30%	Logan Valley allotment: • Big Creek Riparian pasture • West Lake Creek Riparian pasture Summit Prairie allotment: • Sagehen unit • Little Logan unit • Prairie Riparian pasture and West Summit Recovery unit

Indicator	Measurement Location	Move Triggers[a]	Allowable Use (End-Point Indicators)	Allotment and Pasture
Bank Alteration	Along the greenline	20%	25%	All pastures and greenlines not listed below
		10%	15%	Logan Valley allotment: • Big Creek Riparian pasture • West Lake Creek Riparian pasture • West Bosenberg Riparian pasture Summit Prairie allotment: • Sagehen, Little Logan, & Summit Rock units (Reach 2 of W. Fork Summit Creek & Reach 6 on Summit Creek)
		15%	20%	Summit Prairie allotment: • Prairie Riparian pasture and West Summit Recovery unit

a – Move Triggers are used to determine when livestock should be relocated from an area or pasture to achieve desired use levels.

b – Greenline is the first hydrophytic perennial vegetation for the water's edge.

c – Stubble is the basal portion of herbaceous plants remaining after the top portion has been harvested by grazing animals.

d – Benches, riparian terraces or islands are those portions of the riparian areas slightly higher and drier than the rest of the riparian area.

e – Uplands are defined as the portion of the landscape above the valley floor or stream.

f – Available use is the portion of the forage production that is accessible for use by a specific kind or class of grazing animal.

g - In general, light (30%) hedging would be an expected end-point indicator. However, moderate (50%) hedging may be acceptable on an occasional basis if the woody component is in a healthy and vigorous condition and there is good representation of age cohorts and the moderate use does not result in significant suppression in the vigor or growth form of the plant.

Appendix F – Response to Comments

The USDA Forest Service, Malheur National Forest, received eight timely comments on the Summit Logan Valley Grazing Authorization Draft Environmental Impact Statement. All substantive comment comments were annotated and a response written.

Annotation Key:

1. Grant County Conservationists – Linda Driskill

Received Electronically, November 20, 2012
Postmarked November 26, 2012

- 3 page letter; no attachments

2. United States Department of the Interior – Office of Environmental Policy and Compliance- Allison O'Brien

Received Electronically, December 11, 2012

- 1 page letter, no attachments

3. Blue Mountains Biodiversity Project – Karen Coulter

Received by Mail, Postmarked December 16, 2012

- 2 page letter, 116 enclosure

4. Alan Jacobs and Jim Jacobs

Received Electronically, December 17, 2012

- 1 page, no attachments

5. Alan Jacobs

Received Electronically, December 17, 2012

- 1 page, no attachments

6. Jim Jacobs

Received Electronically, December 17, 2012

- 1 page, no attachments

7. United States Environmental Protection Agency- Christine Reichgott

Received Electronically, December 17, 2012

- 2 page letter, 1 page enclosure

8. Jim and Alan Jacobs

Verbal Comments Recorded by the Forest Service, December 13, 2012

- 2 page meeting notes

Comment Letter #1 – Grant County Conservationists

Comment	Response
Thank you for sending us a timely copy of the recent DEIS for the Upper Malheur River. Our scrutiny of this document, "Summit Logan Valley Grazing Authorization Project" raises some disturbing issues especially as the area in question on the Prairie City Ranger District is in designated Bull Trout Critical Habitat.	1-1
In 1998 (nearly 25 years ago) the Bull Trout was listed as Threatened by the USFWS. A year earlier the Oregon Department of Fish and Wildlife declared the Bull Trout "at a high risk of extinction" in the Upper Malheur Watershed. USFWS designated this area as Critical Habitat in 2010. For many years the ODFW with annual redd count surveys, and the Burns Paiute Tribes with telemetry surveys have been documenting the decline of the species[1].	1-2
The MNF has identified two key issues. It seems revealing that the first issue raised in the 279-page DEIS is that of the Rescission Bill and the agency's timely renewal of grazing permits. It is also revealing that basically one local ranch holds the permits to the entire project area. A small allotment is attached to the Oxbow Ranch owned by an absentee millionaire. Coming in second (and last) place is the need to "improve resource conditions for aquatic habitat". This presumably is an oblique reference to the threatened Bull Trout.	1-3
Much of the document (see Summary, page 5 and sequel) is devoted to the plight of the ranch most affected and the necessity of amending the Forest Plan's significant Amendment 29 so as to keep both in the commercial livestock business. We will return to this issue on the final page. Our "purpose and need" here is to focus on the issue of the Bull Trout, Critical Habitat, and the US taxpayer.	1-4
First, a quick review of the interacting chronology of the Forest's development of its preferred alternative in the DEIS. The Project's environment assessment was apparently begun in 2007 with allotment management shifting into a "be careful" mode. This resulted in a preliminary preferred Alternative: ALTERNATIVE 2. The USFWS voiced strong reservations, particularly as applied to the Summit Prairie Allotment that comprises much of the project area. So the MNF went back to the drawing board and, this time, with the collaboration of the permittees came up with ALTERNATIVE 4.	1-5
ALTERNATIVE 4 would promote "economic well being (and, hopefully, aquatic recovery) via continued livestock grazing. Specifically, this would be done by building more exclosures and riparian "pastures[2]", vegetation cages, upland water (spring) developments,[3] decrease the allowable use and the promise of a daily "rider" for a few hours a day. Lots of new fences – 13.6 miles. It is of interest that the projected costs of all this infrastructure (or "improvements") drops from $595,000 per the original ALTERNATIVE 2 to $306,000 in ALTERNATIVE 4 (permittee input?) Our question is who pays for all this?	1-6
No doubt the MNF believes such staggering expenditures are justified and the only conceivable route to "improving…. aquatic habitat". The DEIS defines the following benchmarks as imperative to the survival of the Bull Trout and its Critical Habitat. • A stabilizing plant cover of 80-95% of which least 25% are native floodplain species. • A "high" rating for hydrophytic (aquatic) vegetation. If not currently present, then the imminent achievement of said objective • A 90% or greater bank stability rating. • A 25% or greater proportion of saplings and/or young shrubs. • Overhanging banks of 75% in floodplains and non-forested areas. The MNF is to be commended for issuing (albeit only recently) improved riparian management guidelines such as those listed above. The problem from our perspective is that it is too little, too late. Points in case are the two recent (June 2011) photos shown above taken on Summit Creek in the Summit Prairie Allotment. Remember the Bull Trout was listed as Threatened 25 years ago. Maybe we can be forgiven for doubting that the continuation of livestock grazing in the project area will achieve the benchmarks in a timely manner?	1-7

Comment	Response
Summit Creek June 2011 The nearby livestock exclosure June 2011	
Summary of our major concerns: 1. The DEIS impresses us as a document primarily dedicated to promoting the continued grazing privileges of a single [albeit very progressive] ranch family.[4] For us, the paramount issue here is the national issue of a threatened species, the Bull Trout becoming extinct in the Malheur River.	1-8
2. The presence in the area of just recently “Non-functioning” and presently “Functioning-at-risk” stream segments.[5]	1-9
3. The well-documented historical presence of beaver throughout the Summit Creek drainage, whereas today they mainly exist in a small livestock exclosure. Beaver are faring better elsewhere in the Watershed, mainly on the land owned and managed by the Paiute Tribe.	1-10
4. The huge cost of protecting (literally) Summit Creek and other drainages in the Watershed by constructing many miles of new barbed wire fencing[6], water sources for livestock, etc.	1-11
5. The presence of several listed 303(d) streams[7] for temperature impairment and failure to meet the biological needs of the Bull Trout.	1-12
6. An unacceptable cursory treatment of the critical issue of forage available to all species, mainly livestock. The “analysis” is relegated to half a page and basically falls in the “trust us” category.	1-13
7. The same as concerns the DEIS treatment of the “noxious/”invasive” weed issue. Without any backup analysis, it is simply claimed to be an issue of “low risk”. Absent is an overview, much less a thorough critical examination of the health and vitality of native upland flora, grass species in particular.	1-14
8. The proposal to construct livestock water developments in areas that the district considers water deficient. At least one area of concern is the headwater spring development[8] in a “highly sensitive” area (but slated to be grazed) where a wildfire occurred two decades ago.	1-15
Finally, in order to expedite matters (i.e. the now preferred ALTERNATIVE 4), the forest would have to amend the (to us sacrosanct but usually ignored) Forest Plan Amendment 29, enacted over two decades ago by Forest Supervisor, Mark Boche. Amendment 29's intent was to strengthen the management guidelines mandated regionally by INFISH/PACFISH.	1-16
Given the preceding comments, our position is to urge a firm commitment by the Malheur National Forest to the recovery of the threatened Bull Trout and its critical habitat. We strongly feel that this can only be accomplished with the adoption of ALTERNATIVE 1, the no-grazing alternative. The DEIS states clearly that this can be implemented with a cancellation of the permits and a two-year grace period.	1-17

Comment	Response
[1] Conservation biologists have long considered the Bull Trout as a keystone species, as its survival depends on abundant clean, clear water in a complex habitat also needed by many other aquatic species. [2] There are already abundant fenced units, some as small as 14 acres. [3] Water scarcity is cited as an issue in the Watershed. [4] It is personally painful for us to put the spotlight on this because through many years on the ground, this progressive rancher is one we would like to see succeed. Unfortunately, he inherited a bad situation of mismanagement on this allotment on the Prairie City Ranger District. [5]The DEIS itself cites on page 151 that once a riparian area is non-functioning it usually takes large investments in time and money to recovery the area. [6] Albeit slightly more wildlife friendly. [7] And those, which should be listed such as Summit Creek. [8] Bosenburg Creek	

1-1

Bull Trout

After reviewing the public comments received during scoping, Bull Trout Critical Habitat was identified as a significant issue (see DEIS, Chapter 1, page 37). The information from public comments, the significant issues identified for the project and direction given by the Responsible Official including Forest Plan direction and amendments, existing State and Federal laws, and field related data was used to formulate a reasonable range of alternatives. See DEIS Chapter 2, page 39.

1-2

Bull Trout

Bull trout and bull trout critical habitat are discussed extensively in the DEIS, Hydrology and Aquatics, Chapter 3, pages 142 through 214. The Affected Environment section examines the existing and desired habitat conditions for bull trout on DEIS, Chapter 3, pages 156 through 175. The effects of proposed activities on bull trout and critical bull trout habitat are discussed in the DEIS, Chapter 3, pages 175 through 213.

1-3

Issues

To clarify, two significant issues were identified (see DEIS, Chapter 1, page 37). The two significant issues are Bull Trout Critical Habitat and Economic Impacts to Permittees and Community. Bull Trout Critical Habitat is the first significant issue discussed in the DEIS Significant Issues section, although the order that the issues are listed does not signify greater importance.

1-4

Amendment

The DEIS analyzes the effects of proposed alternatives on a variety of resources including aquatic habitat and water quality, wildlife, soils, sensitive plants, recreation, heritage resources; as well as social economic impacts to grazing impacts to the permittees and local communities. DEIS, Chapter 3, pages 142 through 214 specifically addresses the effects of alternatives on aquatic habitat and water quality, including bull trout and bull trout critical habitat.

Alternatives 2, 3, and 4 proposed amendments to the Malheur Land and Resource Management Plan as amended by Amendment #29. Specifically, the numeric value for shade in hardwood/meadow complexes from Forest Plan Amendment #29 would be modified for site specific stream reaches based on information collected by the Carex Working Group in 2012 and new science used in the Water Quality Management Plan completed by State of Oregon Department of Environmental Quality (2010). INFISH interim standards and guidelines replaced Forest Plan direction as amended by Amendment #29, except where the direction provides more protection for inland native fish habitat (INFISH Decision Notice). The numeric values for shade in hardwood/meadow complexes from Forest Plan Amendment #29 provide more protection for inland native fish habitat than INFISH Riparian Management Objectives (RMOs). Both Forest Plan Amendment #29 and INFISH allow changes in direction based on new or better information. Amendment 29 states that "If new information becomes available in the future which indicates changes in numeric values to achieve the stated desired condition, these values may be inserted as a clarification/correction to the individual standard". INFISH states that "RMOs should be refined to better reflect conditions that are attainable in a specific watershed or stream reach based on local geological, topography, climate, and potential vegetation. Interim RMO's may be modified by amendment in the absence of watershed analysis where watershed or stream specific data support the change". The rationale for amending the Malheur Plan as amended by amendment #29, is documented on DEIS, Chapter 2, pages 63 through 65; Chapter 3, page 153 through 214; and Appendix A, Part 1. In Summary, work carried out by the Carex Working group involved estimating the expected (and perhaps maximum) level of streamside shade (height and density) that could be attained from willows, sedges, and other hardwood under near-natural rates of recovery. Potential values for shade from the TMDL were derived using Ecoregion Based Effective Shade Curves if reference data was not available. These effective shade curves are general head load allocations that are identified by region and channel width for various riparian plant communities. The given values represent the maximum possible effective shade if the potential height and density are present.

1-5

Alternatives

A summary of the analysis chronology and future steps is as follows. Interaction with the Summit Logan allotment grazing permittees has been ongoing since the fall of 2007. This included several field trips and meetings. Field trips were facilitated by the National Riparian Service Team and attended by representatives from U.S. Fish and Wildlife Service and permittees. Public comments were requested on a proposed action in October, 2008 for this project. Since that time, the Summit Logan Grazing Authorization Project transitioned from and Environmental Assessment (EA) to an Environmental Impact Statement (EIS). On February 1, 2012, a scoping letter providing information on a proposed action, seeking public comment was mailed to approximately 230 agencies, groups, and individuals and other parties. Additionally, on February 8, 2012, a Notice of Intent was published in the Federal Register (see DEIS, Chapter 1, page 35). The Forest Service developed four alternatives: the No Action, the Proposed Action, and two other action alternatives generated in response to issues raised by the public during scoping (see DEIS, Chapter 2, pages 43-63). Several other alternatives were considered but eliminated from detailed study with the reasons for why they were not developed in detail discussed on DEIS, Chapter 2, page 39. Based on the analysis of effects Alternative 4 was identified as the preferred by the Forest Supervisor, Teresa Raaf. Identification of a preferred alternatives is a requirement of a DEIS. The cover letter mailed with the DEIS provided some rationale why Alternative 4 is the preferred alternative. Comments received on the DEIS will be considered in preparation of a Final Environmental Impact Statement (FEIS) and decision which will be documented in a Record of Decision (ROD).

1-6

Economics

Some of these statements are not consistent with the DEIS. The DEIS states that Alternative 4 was developed using public scoping comments and recommendations from Summit Prairie allotment grazing permittees. The DEIS states that daily riding by the permittee would be required when livestock are within the Saghen and Little Logan units to move and distribute animals into the uplands away from Summit Creek. The DEIS states that in the Logan Valley, McCoy Creek, and Summit Prairie allotments, proposed move triggers and allowable use levels for herbaceous forage and shrub use, and bank alteration vary by pasture based on the existing condition of the specific riparian area, its resiliency to grazing effects and other disturbances, and the presence of critical bull trout habitat (see DEIS Chapter 2, Alternative 4, page 57; and Appendix E for specific details).

Your concerns over new fence construction costs are acknowledged. The total cost associated with proposed structural improvements (including fence construction and removal) in Alternative 4 is estimated at $306,200. The DEIS, Chapter 3, Social and Economics, page 243 states that the Malheur National Forest would continue to receive one quarter of the grazing fees collected annually, for on the ground range improvements. Fences and other improvements are may also be completed using funds and labor from permittees, grants, and partnerships.

In reviewing your comment we found a consistency error between the Range Vegetation and Social-Economic sections. The miles of fence to be constructed in Alternative 4 is correct in the Social-Economic section and will be corrected in the Range Vegetation section.

1-7

Benchmarks

DEIS, Appendix A, Part 1 shows the existing and desired conditions for specific stream reaches in the Summit Logan project area. The purpose and need for action (why activities were proposed) was driven by the differences between the site specific existing and desired conditions (See DEIS, Chapter 1, Purpose and Need for Action, pages 30 and 31).

To acknowledge your concerns (doubts) in achieving the management objectives and the long- term desired condition. Chapter 2, pages 77 through 82 identifies the monitoring that would be required with the alternatives to ensure successful management and compliance with pertinent laws and policy. The effectiveness monitoring proposed would be used to determine if satisfactory progress is being made towards meeting the management objectives (Appendix A, part 2). If not, this would inform the decision maker to determine what additional changes to management would be needed from the suite of adaptive management options identified in Appendix A, Part 3.

1-8

Bull Trout

Improving aquatic habitat is part of the purpose and need, or why actions are being proposed (see DEIS, Chapter 1, Purpose and Need for Action, pages 30 and 31). Bull Trout Critical Habitat is a significant issue identified in DEIS (see Chapter 1, page 37). The alternatives identified in Chapter 2 were developed to 1: Meet the purpose and need for the project, and 2: Consider a reasonable range of solutions for the significant issues (see DEIS, Chapter 2, Development of Alternatives, page 39).

1-9

Functioning at Risk Streams

There are no "non-functioning" streams in the project area. There are streams that are functioning-at-risk (see Appendix A, Part 1). Part of the purpose and need is to develop an upward trend in riparian areas currently assessed as FAR with a downward or slowed trend, while continuing to improve or maintain riparian area with upward recovery trends or properly functioning conditions toward desired conditions identified in Appendix A (part 1). Each alternative proposes combinations of management that change the timing, duration and frequency of grazing based on the specific recovery needs of streams that are functioning at risk. The analysis in DEIS, Chapter 3, shows which streams are currently functioning at risk, discloses the expected recovery rates by stream, allotment, and grazing unit by alternative. See DEIS, Chapter 3, Hydrology and Aquatics section, page 153 through 214.

1-10

Beaver

Beaver habitat was a public concern identified during scoping. To address this concern an analysis issue was identified in the DEIS (see DEIS, Chapter 1, page 38).

> "Limited hardwoods have resulted in a loss of beaver habitat and reduction of populations"

Based on your comments this issue will be modified to read:

> "Limited hardwoods have resulted in loss of beaver habitat and reduction of animals within the project area"

Your concerns regarding beaver were tracked through the effects analysis using **"Short- and Long-term Effects on Shrub Development"** as a measure or indicator of the level of effect. The effects on Beaver are discussed in DEIS, Chapter 3, Wildlife, pages 276 through 277. The effects of proposed actions on shrub development are discussed in detail in DEIS, Chapter 3, Hydrology and Aquatics section, pages 153 through 214. The long-term and short term effects of shrub recovery in the Hydrology and Aquatics section are discussed by specific allotment, pasture, and stream reach.

1-11

Cost of Constructing Fences

See Response 1-6.

1-12

303(d) Streams

The Clean Water Act and 303(d) streams are discussed in several sections of the document. See the following sections of the DEIS:

- Chapter 1, Purpose and Need for Action, pages 30 through 31.
- Chapter 3, Hydrology and Aquatics, Clean Water Act, pages 145 through 146.
- Chapter 3, Hydrology and Aquatics, Water Temperature, pages 156 through 157.
- Chapter 3, Hydrology and Aquatics, Clean Water Act, page 214.

New Clean Water Act information has been supplemented in the FEIS. All streams listed for stream temperature were de-listed from the 303(d) list when EPA accepted the 2010 DEQ Integrated Report as identified in the DEIS on page 146. The Regulatory Framework has changed based on a decision by EPA to add 870 waterbodies to Oregon Department of Environmental Quality's 2010 303(d) list on December 14, 2012. One stream has been added to the 303(d) list in the Project Area. Summit Creek is 303(d) listed for parameter biological criteria with a Category 3c status, impairing pollutant unknown. This indicator states that waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities (ODEQ, 2013). The DEIS identifies monitoring objectives developed specifically for Summit Creek for macroinvertebrates (i.e. biological activities) on page 324 to ensure the trend is positive.

ODEQ, 2013. http://www.deq.state.or.us/wq/assessment/rpt2010/search.asp

See future response 3-46d.

1-13

Forage

The DEIS contains substantial analysis on livestock stocking rates, forage availability for livestock, and forage use related wildlife effects. Refer to the following sections of the DEIS.

- Chapter 1, Analysis Issues, Table 1-2, page 38.
- Chapter 2, Alternatives Considered but Eliminated from Detailed Study, Reduction of Grazing Numbers, page 40.
- Chapter 2, Other Requirements, Grazing Would be Based on AUMs, page 42.
- Chapter 2, Livestock number and grazing season, pages 44, 46, 48, 50, 52, 53, 56, 58, 60, 62.
- Chapter 2, Monitoring, pages 77 through 82.
- Chapter 3, Grazing Utilization Standards (History), pages 98 through 99
- Chapter 3, Rangeland Capability and Suitability Analysis, pages 99 through 100.
- Chapter 3, Forage Production and Stocking Rates Analysis, pages 100 through 102.
- Chapter 3, Rangeland Vegetation, Grazing Use Levels, pages 105-107.
- Chapter 3, Rangeland Management, Forage Production and AUMs, page 110.
- Chapter 3, Wildlife, pages 245 through 283.
- Appendix E – Forage allowable use, move triggers, and endpoint indicators

Additional information will be added to the FEIS to supplement the analysis on livestock stocking rates and forage availability.

1-14

Noxious/Invasive Weeds

The DEIS analyzes the potential effects of grazing on invasive weed species (see DEIS, Chapter 3, Invasive Weeds, pages 122 through 126. The DEIS also includes substantial analysis of the effect of proposed grazing frequency, duration, and intensity on vegetation health (see DEIS, Chapter 3, Rangeland Vegetation, pages 93 -97, 104 -110, 113-122. Additional information may be found in the Invasive Weeds Specialist Report, Appendices F. Based on your comment additional information will be added to the FEIS to supplement the Invasive Weeds analysis.

1-15

Water Developments/Fire Burned Area

Alternative 2 is the only alternative that proposes re-initiation of grazing in the Bosenberg Creek drainage. The effects of the proposed spring development project (Alternative 2 only) and re-initiation of grazing in the fire burned area are specifically addressed in DEIS, Chapter 3, page 193 and 194.

1-16

Forest Plan Amendment

See Response 1-4

1-17

Bull Trout and No Grazing Alternative

Your concerns related to threatened Bull Trout and its critical habitat are addressed in previous responses (see Responses 1-2 and 1-8). Your recommendation to select No Action (No Grazing) is noted.

Comment Letter #2 – United States Department of Interior- Office of Environmental Policy and Compliance

Comment	Response
The Department of the Interior has reviewed the draft environmental impact statement for the Summit Logan Valley Grazing Authorization Project. The Department does not have any comments to offer. We appreciate the opportunity to comment.	2-1

2-1

No Comments to Offer

Thank you for reviewing the Summit Logan Valley Grazing Authorization draft environmental Impact Statement.

Comment Letter #3 - Blue Mountains Biodiversity Project – Karen Coulter

Comment	DEIS page#	Response
Summit Logan Valley Grazing Authorization – DEIS *The Forest Service needs to stop managing through Forest Plan Amendments effectively gutting the standards and guidelines of the Malheur LRMP, the only source of site-specific guidelines to curb or prevent ecological damage.*	5	3-11
Proposed Forest Plan Amendments Alternatives 2, 3, and 4 propose amendments to the Malheur Land and Resource Management Plan as amended by Amendment #29. Specifically, the numeric value for shade in hardwood/meadow complexes from Forest Plan Amendment #29 would be modified for site specific stream reaches. *We are opposed to amending the Forest Plan to allow for not meeting LRMP standards for stream shade.*	5	3-12

<table>
<tr><th>Comment</th><th>DEIS page#</th><th>Response</th></tr>
<tr><td>Issues
Scoping identified the following issues. The issues were separated into three groups for the purpose of this analysis:
<u>Issues eliminated from detailed study</u> are identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The CEQ NEPA regulations require identification and elimination from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3). These are listed in project file with the rational for eliminating them from detailed study in this analysis.
The rational for eliminating issues from detailed study should be disclosed within this EIS.</td><td>8</td><td>3-13</td></tr>
<tr><td><u>Bull Trout Critical Habitat</u> – Grazing may degrade critical habitat for threatened bull trout. There may be direct, indirect, and cumulative effects of livestock use of streams and riparian areas that could negatively affect spawning and reproductive success. Livestock grazing may trample eggs, impact stream banks increasing sediment and widening stream channels, decrease shade-providing plants on the banks and increase water temperatures. Continued grazing on streams that are “functional at risk” may impact recovery of resource values including critical bull trout and beaver habitat. In areas that are functioning at risk, channels may not be interacting with the floodplain, substrate is often highly embedded and pool quality low, banks are incised with little vegetation, willows are under-represented in density and age classes, and water temperatures are high.
Based on this description of the Bull Trout Critical Habitat significant issues, such potential livestock grazing impacts must be fully prevented as Bull Trout are a federally listed species and the PS admits above that significant issues are those where the impacts cannot be reduced by normal Best Management Practices or Project Design Criteria such as those proposed by the action alternatives.</td><td>8</td><td>3-14</td></tr>
<tr><td>Table S-9: Comparison of Alternatives: Resource Areas
<table>
<tr><td>Threatened, Endangered and Sensitive Aquatic Species</td><td>See Table S-11</td></tr>
<tr><td>Forest Plan Consistency</td><td>Consistent with Management Area 3A standards, Amendment 29, and INFISH.</td></tr>
</table>
Use of a Forest Plan amendment for all action alternatives means they would not be consistent with the Forest Plan</td><td>18</td><td>3-15</td></tr>
<tr><td>Table S-9: Comparison of Alternatives: Resource Areas
<table>
<tr><td>Clean Water Act</td><td>Consistent with the Clean Water Act; providing for the recovery of the wetland obligate vegetation attributes and channel morphology, resulting in water temperatures that would provide for Bull Trout beneficial uses.</td></tr>
</table>
We question whether alts 2, 3, & 4 would really meet Clean Water Act standards in practice, given the violations and degradation so far.</td><td>18</td><td>3-16</td></tr>
</table>

<table>
<tr><th>Comment</th><th>DEIS page#</th><th>Response</th></tr>
<tr><td>Table S-10: Effects to Sensitive Plant Species
<table>
<tr><th rowspan="2">Concern / Impacts</th><th rowspan="2">Sensitive Species</th><th colspan="2">Alternative</th><th rowspan="2">Rationale</th></tr>
<tr><th>1</th><th>2, 3, 4</th></tr>
<tr><td>Species where impacts from herbivory / grazing is a concern.</td><td>Carex cordillerana
Muhlenbergia minutissima
Trifolium douglasii</td><td>BI</td><td>MDI</td><td>These three species are palatable and have the potential to be negatively impacted by intensive grazing (Bakker et al. 2010, NatureServe 2012, Wilson et al. 2008).</td></tr>
<tr><td>Species where impacts from trampling and defecation is a concern.</td><td>Botrychium ascendens
Botrychium hesperium
Botrychium lunaria
Botrychium montanum
Botrychium paradoxum
Botrychium pedunculosum
Bryum calobryoides
Eleocharis bolanderi
Listera borealis
Mimulus evanescens
Phacelia minutissima
Schistidium cinclidodonteum
Tortula mucronifolia</td><td>BI</td><td>MDI</td><td>These species are very small, delicate, and exists in areas with high soil moisture. Livestock are often concentrated in these areas. For these species, a single hoof print or cow pie can destroy an individual plant, and even a relatively small amount of hoof action and/or defecation can eliminate a small population.</td></tr>
<tr><td>Species where impacts from trampling, trailing, herbivory, and defecation in peatlands is a concern.</td><td>Anthelia julacea
Botrychium crenulatum
Harpanthus flotovianus
Helodium blandowii
Meesia uliginosa
Ophioglossum pusillum
Pseudocalliergon trifarium
Splachnum ampullaceum
Tomentypnum nitens
Utricularia minor</td><td>BI</td><td>MDI/BI</td><td>Adaptive management strategies that benefit these species would be implemented if detrimental effects are occurring and management objectives are not met within a 5 year period (SLVGA DEIS, Appendix A, parts 2 and 3).</td></tr>
</table>
We are concerned by the “May detrimentally impact” determination for all of these sensitive plant species for alt. 2, 3, &4 as there is no guarantee that the allowed livestock impacts would not cause a trend toward uplisting or end these species viability in the project area.</td><td>19</td><td>3-17</td></tr>
</table>

Comment	DEIS page#	Response
Table S-11: Effects to Threatened, Endangered and Sensitive Aquatic Species	20	3-18

Aquatic Species	Status	Effects Determination			
		Alt 1	Alt 2	Alt 3	Alt 4
Columbia River Bull Trout	T (MIS)	NLAA/BE	LAA	NLAA/BE	NLAA/BE
Columbia River Bull Trout Designated Critical Habitat	D	NLAA/BE	LAA	NLAA/BE	NLAA/BE
Interior Redband Trout	S (MIS)	MIIH/BI	MIIH	MIIH/BI	MIIH/BI
Columbia spotted frog	S	NI	MIIH	MIIH/BI	MIIH/BI
Western Ridged Mussel	S	MIIH	MIIH	MIIH/BI	MIIH/BI
Shortface Lanx	S	MIIH	MIIH	MIIH/BI	MIIH/BI

Table S-12: Threatened, Endangered and Sensitive Wildlife Species Summary

Terrestrial Species	**Status**	**Effects Determination**			
		Alt 1	**Alt 2**	**Alt 3**	**Alt 4**
Canada Lynx	Threatened	NE	NE	NE	NE
Gray Wolf	Sensitive	NI	NI	NI	NI
Bald Eagle	Sensitive	NI	NI	NI	NI
American Peregrine Falcon	Sensitive	NI	NI	NI	NI
California Wolverine	Sensitive	NI	NI	NI	NI
Pygmy Rabbit	Sensitive	NI	NI	NI	NI
Greater Sage-Grouse	Sensitive	NI	MIIH	MIIH	MIIH
Silver-bordered Fritillary	Sensitive	NI	MIIH	MIIH	MIIH
Wallowa Rosy Finch	Sensitive	NI	NI	NI	NI
Bobolink	Sensitive	NI	MIIH	MIIH	MIIH
Grasshopper Sparrow	Sensitive	NI	MIIH	MIIH	MIIH
Upland Sandpiper	Sensitive	NI	No Impact	No Impact	No Impact
Tricolored Blackbird	Sensitive	NI	No Impact	No Impact	No Impact

Comment						DEIS page#	Response
Bufflehead	Sensitive	NI	No Impact	No Impact	No Impact		
Lewis's Woodpecker	Sensitive	NI	MIIH	MIIH	MIIH		
White-headed Woodpecker	Sensitive	NI	MIIH	MIIH	MIIH		
Townsend's Big-Eared Bat	Sensitive	NI	MIIH	MIIH	MIIH		
Pallid Bat	Sensitive	NI	MIIH	MIIH	MIIH		
Fringed Myotis	Sensitive	NI	MIIH	MIIH	MIIH		
Johnson's Hairstreak	Sensitive	NI	No Impact	No Impact	No Impact		
Columbia Clubtail	Sensitive	NI	MIIH	MIIH	MIIH		
Columbia Spotted Frog	Sensitive	See Aquatic Section	MIIH	MIIH	MIIH		
Big Game Habitat (Elk)	MIS	NI	Not expected to affect elk population numbers or viability.				
Old Growth Habitat	MIS	No direct or indirect effects to old growth habitat and the MIS species associated with this habitat.	Cattle grazing would have little to no impact to Old Growth Habitat and associated MIS pileated woodpecker, American marten, and three-toed woodpecker.				
Primary Cavity Excavators	MIS	No direct, indirect or cumulative effects to the primary cavity excavators or their habitat.	No impact to snag and down wood habitat in ponderosa pine, lodgepole pine, or mixed conifer stands. Little or no impact to woodpeckers utilizing these habitats. Unprotected aspen stands may continue decline impacting nesting and foraging habitat.				
Goshawk, Osprey, Blue Grouse, Antelope	Features Species	No direct, indirect or cumulative effects to featured species or their habitat.	There would be no impacts to goshawk nesting habitat, osprey nesting habitat (snags), or blue grouse winter roosts. Improvements in riparian shrub density and age classes, as well as herbaceous cover, would improve habitat for small mammals, birds (northern goshawk prey), fisheries (osprey prey), or blue grouse foraging areas. Cattle grazing may displace female pronghorns. Because turn-out dates				

<table>
<tr><th colspan="4">Comment</th><th>DEIS page#</th><th>Response</th></tr>
<tr><td colspan="4">
<table>
<tr><td></td><td></td><td></td><td>would be in mid- June or later, this would not impact newly born fawns. Most antelope have had their young by June.</td></tr>
<tr><td>Beaver</td><td>Species of Concern During Scoping</td><td>No direct or indirect, or cumulative effects.</td><td>Recovery of herbaceous vegetation and riparian hardwoods could increase the expansion of beaver within the project area.</td></tr>
<tr><td>Landbirds Including Neotropical Migratory Birds</td><td>Migratory Birds</td><td>No direct or indirect, or cumulative effects.</td><td>Overall disturbance from activities would be limited in time and place, and therefore, would not be expected to impact populations of species at the landscape level.</td></tr>
</table>
We are concerned by potential impacts too all the species listed in Table S-11 and Table S-12 as they could still trend toward uplisting or lose viability.
</td><td></td><td></td></tr>
<tr><td colspan="4">After bull trout were listed as threatened in 1998, utilization standards were developed for allowable use of herbaceous riparian species, riparian woody shrubs, grass and grasslike species, and bank alteration through the consultation process with the US Fish and Wildlife Service (USFWS). From 1998 through 2004, utilization levels were 6-inch stubble height along the greenline, moderate browse use, 45% utilization in uplands, and 10% bank alteration.
From 2005 through 2011, utilization standards were 4-inches stubble height along the greenline, light to moderate browse use, 45% utilization in uplands, and 20% bank alteration. These levels are used as both livestock move triggers and end-point indicators.
Between 2005 and 2011 utilization standards have been met consistently in most grazing units with the exception of the West Lake Creek unit in the Logan Valley allotment and the North Summit and Sagehen units in the Summit Prairie Allotment.
In other words more deterioration of conditions was allowed from 2005-2001 than from 1998-2004</td><td>99</td><td>3-19</td></tr>
<tr><td colspan="4">A review of available science (summarized below) on the intensity of grazing shows that proposed use levels in all action alternatives are adequate to maintain or improve plant vigor (health) and allow continued improvement in forage condition trends. Studies show that light to moderate levels of livestock grazing have positive effects on maintaining, sustaining, and improving rangelands that are either in a satisfactory or unsatisfactory condition. All alternative propose the same use levels with riparian benches and upland areas of grazing units. Action alternatives vary in the proposed standards for the riparian communities along the “greenline” directly adjacent to streams. The “greenline is defined as the first communities dominated by perennial vegetation as you proceed outward from the center of the channel. The amount of forage left along the stream’s edge has been found to be important in catching sediments during the runoff periods, both from the stream channel as well as from overland flow (Clary and Webster 1988). The trapping of sediment is critical in rebuilding of streambanks as well as the maintenance of water quality. The effects of proposed differences in greenline stubble heights between the action alternatives on riparian vegetation and stream function and recovery is discussed in detail in the Aquatic Habitat section.
Yet sediment can be transported to the stream from at least within 100 feet of the stream edge – potentially further than the greenline.</td><td>106</td><td>3-20</td></tr>
<tr><td colspan="4"><u>Deferred Rotation Grazing System</u>
All action alternatives propose deferred rotation as part of the grazing system. Rotational grazing, where each area is grazed at a different season each year, was developed because different plant communities and physical features are affected differently at different seasons. All sites and species, over the grazing cycle, are grazed equally during seasons beneficial for each characteristic and seasons that are detrimental. This prevents preferred sites from receiving continuous detrimental timing (seasonal) effects and also limits the frequency of use during any one year.
Why don’t you drop all grazing with detrimental timing instead? Why plan for detrimental</td><td>107</td><td>3-21</td></tr>
</table>

Comment	DEIS page#	Response
impacts.		
In the project area, pastures along Lake Creek, Big Creek, Summit Creek, and West Fork Summit Creek contain a mix of riparian and upland vegetation. The riparian zones within the pasture are much different from the terrestrial systems, making management of the combined systems difficult. Livestock are selective grazers, therefore the frequency and severity of defoliation of individual plants or species of plants varies depending on preference and availability. The result is that most preferred plants would be defoliated more frequently or severely than less preferred plants. Because of this preference livestock tend to concentrate in the riparian areas, making management of the frequency and intensity of use in these areas a challenge. Use levels and move triggers in the riparian portion of units have historically been reached before authorized forage in upland areas can be utilized *So keep all livestock out of riparian zones!*	108	3-22
Rest All alternatives include rest as part of proposed management. All alternatives proposed resting of riparian pastures or riparian exclosures. Alternatives 2 and 4 propose rest as part of the grazing system (termed periods of non-scheduled rest and deferment). In most cases, rest is proposed as part of the management strategy to meet riparian area recovery objectives. The length of rest proposed in all action alternatives for the West Bosenberg, West Lake Creek, and West Summit Recovery unit pastures is 3 to 5 years. After this period of rest, grazing would resume with management strategies that vary between action alternatives (effects of rest are similar to those discussed under Alternative 1, no grazing.) *Just drop all grazing in these riparian area "pastures". Keep these areas permanently off limits to livestock.*	108	3-23
If monitoring indicates that specific objectives are not being achieved, at any given time the Line Officer can choose to apply the analyzed adaptive strategy to reduce delays in recovery timeframes. Specific adaptive management strategies with their potential effects are described below. *Based on this discussion it's obvious there's little difference between action alternatives and a lack of real choice due to an inadequate range of alternatives.*	109	3-24
Fencing to create riparian pastures – Construction of fences would have minimal ground effects to vegetation. With riparian pastures there is closer management and control to achieve goals and objectives. Each riparian pasture may be managed individually or rested depending on current conditions. *So how "riparian pastures" would be managed without fencing? Apparently fencing isn't assumed in the action alts.*	109	3-25
Over the last several years a section of electric fence (0.3 miles) has been maintained in the North Fork unit to exclude livestock grazing from Big Creek. All alternatives would replace the electric fence with a permanent let-down fence. The permanent fence would continue to protect the Big Creek Riparian area and effectively distribute livestock into the upland portions of the unit. *What is a let-down fence?*	109	3-26
Rangeland Management (All Allotments) Forage Production and AUMs All action alternatives propose to retain the currently permitted AUMs. The AUMs proposed are maximum limits and may be adjusted to allow flexibility for annual adjustment of both numbers and/or season. The analysis of available forage and stocking rates shows that adequate forage is available to support AUMs at levels currently permitted, including any proposed allotment boundary and management changes *Where is the analysis that supports this conclusion?*	110	3-27
Cumulative Effects Several ongoing projects in the Summit Logan Valley Grazing Authorization project area would provide additive benefits when combined with the actions proposed in the action	111	3-28

Comment	DEIS page#	Response
alternatives. The specific ongoing projects and their effects are described in Tables R: 4, 5, and 6. Additional cumulative effects discussions are provide for each specific alternative. *This cumulative effects section fails to analyze the combined effects of the various management activities including, notably, grazing impacts, which are not described. There have been various court rulings saying that such a simple listing of effects as in Table R-4 is inadequate.* Logan Valley Allotment Table R-4: Ongoing Activities in the Logan Valley Allotment		

Project Name	Specific Management Technique and General Effects
Big Creek Fence and Water-Gap Creates West Bosenberg Riparian pasture	Constructing a riparian pasture would protect riparian values. The pasture would provide closer management and control to achieve riparian goals and objectives. In the pasture may be managed individually or rested depending on resource conditions. Depending on the type and level of management in the riparian pasture there may be a loss of forage to the livestock operator. For this specific fence construction costs and maintenance labor costs would be incurred by a Forest Service partner. The water gap in the fence would maintain access to Big Creek from the adjacent upland unit for watering. The water gaps would limit access to only a few feet of the stream (approximately 20 feet) minimizing streambank impacts. The water gap would be hardened with rock material to reduce hoof impacts.
Big Creek & Lake Creek Off-Site Water Source	Water developments would provide key water in units that currently lack distributed water sources, and/or units where the available water from streams would be excluded by fences (i.e., exclosures and riparian pastures). Water developments would reduce livestock concentrations in riparian areas allowing recovery of vegetation and aquatic habitat. Water developments would improve livestock distribution and more uniform utilization of forage in the uplands. In some upland pastures operators have not been able to utilize available forage because move triggers and utilization levels in riparian areas are reached first. Improved water and livestock distribution would provide better utilization of forage in some upland pastures.
West Lake Creek Riparian Fence Creates West Lake Creek Riparian pasture	The effects would be similar to the Big Creek Fence (Bosenberg Riparian Pasture). Effects that are different include: Fence maintenance labor costs would be incurred by the grazing permittee. Water gaps would not be constructed.
Big Creek and Lake Creek Riparian Hardwood Planting	Planting of hardwood would increase the rate of willow recovery on Big Creek and Lake Creek. Expediting recovery would improve vegetation resiliency, allowing the pastures to be managed for grazing in the future.

It's interesting that only benefits of changes are mentioned, not any impacts from continued grazing, although such impacts are obviously identifiable and predictable.

For instance what would be the impact of allowed water gaps for cattle on Bull Trout and other aquatic and riparian species? How many water gaps, where, allowing how much sedimentation and loss of bank stability?

Comment	DEIS page#	Response
Alternative 1 - No Grazing Direct and Indirect Effects There would be no direct or indirect effects under Alternative 1 because no actions are being proposed. There would be no change to the treatment of noxious weed infestations within the project area under Alternative 1. *Yet Alt 1 is not really "No Action" but "No Grazing" which is a change from current management.*	124	3-29
Cumulative Effects Because Alternative 1 has no direct or indirect effects, there would be no cumulative effects. *Yet its beneficial direct, indirect and cumulative effects are not analyzed.*	124	3-30
Alternative 2, 3 & 4 Direct and Indirect Effects Under Alternatives 2, 3, and 4 the lands comprising the Summit Logan Valley Grazing Planning area would be managed to achieve a desired condition as described in the Forest Land and Resource Management Plan (Forest Plan) and would maintain a healthy ecosystem. The proposed activities would foster a healthy, weed-resistant plant community consisting of a collection of species diverse enough to fill all the niches. *Where is the analytic support for such optimistic conclusions? This reads more like advertising of a project than a DEIS.*	124	3-31
Although the action alternatives continue as a disturbance factor that provides a potential risk of invasive weed species introduction and spread, and provides for a greater level of disturbance, all actoin althernative retain current levels of recognition and reporting of new infestations. The increased spread and establishment of invasive weed species would be expected to be imperceptible when viewed in the context of all of the other ongoing activities. *Inadequate analysis of combined effects from other vectors and continued livestock grazing.*	126	3-32
Affected Environment As a result of all of the survey efforts, 14 sites of five different sensitive species have been discovered: three sensitive mosses, *Helodium blandowii* (Blandow's feather moss), *Tomentypnum nitens* (tomentypnum moss), and *Meesia uliginosa* (meesia moss), and two sensitive moonwort ferns *Botrychium crenulatum* (crenulate moonwort) and *Botrychium montanum* (mountain grape-fern). All of these species were found in or near the fen/peatland complex in the Big Field unit, West Lake Creek Riparian pasture, and Big Creek Riparian pasture of the Logan Valley Allotment. Table B-1 lists the sensitive species populations, management units, and approximate extent of the population. No sensitive species were found in the Lake Creek, McCoy Creek, and Summit Creek Allotments, even though the Summit Creek is one of the most intensively surveyed riparian areas on the Forest. *Prohibit all livestock grazing in these five sensitive species.*	128	3-33
Twenty-six sensitive species are further analyzed for potential effects (Table B-2). These species are either documented or are suspected to occur in the project area, and the specific characteristics of the species' habitat, ecology, and/or biology are such that a more detail analysis of potential effects are needed. *Why is this relegated to an appendix?*	129	3-34
Direct and Indirect Effects The twenty-six sensitive plant species that may be affected are analyzed for potential effects from the action alternatives. These species are either documented or are suspected to occur in the project area and are listed and analyzed by three *potential impact groups*: (1) impacts from grazing and herbivory, (2) impacts from trampling and/or defecation, and (3) impacts to peatlands and peatland-dependent species from trampling, trailing, herbivory, and defecation. Potential impact group are roughly based on groupings of species by preferred habitat, but also takes into consideration the	131	3-35

Comment	DEIS page#	Response

general biology, growth habits, and taxonomy of the species.

Table B-3 Direct/Indirect Effects to Sensitive Species by Alternative

Concern / Impacts	Sensitive Species	Alternative(s)		Rationale
		1	2, 3, 4	
Species where impacts from herbivory / grazing is a concern.	*Carex cordillerana* *Muhlenbergia minutissima* *Trifolium douglasii*	BI	MDI	These three species are palatable and have the potential to be negatively impacted by intensive grazing (Bakker et al. 2010, NatureServe 2012, Wilson et al. 2008).
Species where impacts from trampling and defecation is a concern.	*Botrychium ascendens* *Botrychium hesperium* *Botrychium lunaria* *Botrychium montanum* *Botrychium paradoxum* *Botrychium pedunculosum* *Bryum calobryoides* *Eleocharis bolanderi* *Listera borealis* *Mimulus evanescens* *Phacelia minutissima* *Schistidium cinclidodonteum* *Tortula mucronifolia*	BI	MDI	These species are very small, delicate, and exists in areas with high soil moisture. Livestock are often concentrated in these areas. For these species, a single hoof print or cow pie can destroy an individual plant, and even a relatively small amount of hoof action and/or defecation can eliminate a small population.
Species where impacts from trampling, trailing, herbivory, and defecation in peatlands is a concern.	*Anthelia julacea* *Botrychium crenulatum* *Harpanthus flotovianus* *Helodium blandowii* *Meesia uliginosa* *Ophioglossum pusillum* *Pseudocalliergon trifarium* *Splachnum ampullaceum* *Tomentypnum nitens* *Utricularia minor*	BI	MDI/BI	Adaptive management strategies that benefit these species would be implemented if detrimental effects are occurring and management objectives are not met within a 5 year period (SLVGA DEIS, Appendix A, parts 2 and 3).*no mention of threat re: MDI time line*

BI = Beneficial Impact, NI = No Impact, MDI = May Detrimentally Impact, but will not lead to a trend toward federal listing [40 CFR §1508.8, FSM 2672.42(5)]. Species identified in bold font are documented within the project area.

There is no basis given for action alts' livestock impacts not leading to an upward trend in federal listing for these species while there are plenty of reasons cited for concern re:

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elimination of single plants or even whole population in table B-3 and for protection from no grazing. Sensitive Species with Potential Impacts from Grazing/ Herbivory *(Page 132)* Species in this group are those which are known to be palatable to livestock, and are unlikely to be affected by any other potential impacts from livestock grazing. This includes the sedge *Carex cordillerana*, the grass *Muhlenbergia minutissima*, and the clover *Trifolium douglasii*. Currently, there are no known populations in the area. While these three species occur in different habitats, each species is palatable to livestock and have the potential to be negatively impacted by grazing (Bakker et al. 2010, NatureServe 2012, Wilson et al. 2008). Continued grazing under any of the three "action" alternatives may detrimentally impact these species, but would not lead to a trend toward federal listing. *There is no analysis as to why there would be no trend toward uplisting.*		
Portions of the fen complex exist throughout the allotment. *Drop the Logan Valley allotment from the livestock use to protect the fen complex that exists throughout the allotment, as fens take thousands of years to develop, are hotspots of biodiversity and cannot be easily restored. (See DEIS pp-132-133)*	133	3-36a
Management objectives for peatland habitats and peatland-dependent sensitive species focus on three general topics which address the integrity and resiliency of these sensitive ecosystems: hydrologic function, peat development, and species distribution and composition. Within five years the following management objective shall be met (Appendix A, parts 1 and 2): *Can the peat/fen complex wait 5 years for these goals to be met? Further, with continued livestock use there is no guarantee these goals will be met and high likelihood of further degradation.* Exposed or bare peat is less than or equal to 15%. Livestock trails are re-vegetating and are diverting less early season flow of water. The proportion of peat forming species is equal to or greater than 90%. The proportion of obligate wetland plant species is equal to or greater than 90%. Non-native and invasive plant species are absent or are not expanding. Sensitive plant species populations are maintained at current extent or are expanding. Sensitive plant habitats are maintained at current extent or are expanding. *How is it assumed that this is enough to keep the system going and maintain full native biodiversity?* A more detailed description of the management objectives and existing conditions are provided in Appendix A, parts 1 and 2, of the Summit Logan Valley Grazing Authorization DEIS. Failure to meet these management objectives within a five year period will trigger an adaptive management strategy. In this case, a riparian pasture fence shall be constructed around the fen complex; this is common to all three "action" alternatives (Appendix A, part 3). Construction of a riparian pasture would allow better control of livestock use in the fen complex, and would provide the option of rest or non-use of the riparian pasture(s). *The simple and most economically efficient solution is no livestock use.* Continued grazing under any of the three "action" alternatives may detrimentally impact documented populations of these species in the short-term, but would not lead to a trend toward federal listing. Furthermore, in the long-term (> 5 years), there should be a beneficial impact if either (1) the management objectives are met, or (2) adaptive management strategies are enacted. *Again there is no analyzed justification for the assumption of not leading to upward federal listing.*	133	3-36b
Cumulative Effects Potential cumulative effects to sensitive plant species may include past, present, and foreseeable future activities described in Appendix C. *This is not supported by any evidence. If sensitive plant protection has been ongoing*	133	3-37

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since 1990, why are no trends for these plant species in the protected area reported? Why no description of effects of past and current actions? wildlife, or trampling and trailing from wild ungulates, may also possibly contribute to cumulative effects on sensitive plant species. *So why is there no assessment of combined effects with continued grazing?* Consistency with Direction and Regulations This analysis has shown that the Summit Logan Valley Grazing Project is consistent with the Malheur National Forest Land and Resource Management Plan, as ammended. This analysis also indicates that there may potentially be detrimental impacts individuals, populations, and habitats of some sensitive plant species, but that this would not result in the loss of population or species viability nor cause a trend toward federal listing under the Endangered Species Act. Furthermore, with adaptive management strategies in place, there may be beneficial impacts to individuals, populations, and habitats of some sensitive plant species. *What analysis?* Irreversible and Irretrievable Commitments The Summit Logan Valley Grazing Authorization Project should not result in an irretrievable and irreversible commitment of resources. *Conclusion statements can't be substituted for compelling analysis.*		
Analysis Methods In order to check on how commonly current livestock use increases erosion, the project soil scientist visited the allotments (except Lake Cr. Allotment), examining selected areas for signs of erosion and overland runoff on September 22 and 26, 2008. The analysis area for this soil analysis is each allotment. The analysis time period for this soil analysis is the period that the management practices are applied. *Why did the FS Soil Scientist not survey soil conditions in the Lake Creek allotment? Even if this allotment was vacant, it could be a good control condition to compare with any future livestock use.*	135	3-38
Affected Environment Livestock detrimentally compact and puddle soil in the small areas where they concentrate, such as around salting ground and water troughs. However, on forested areas, current cattle impacts on the soil are minor because of the abundant ground cover and relatively small amounts of forage. **Thus, over the whole activity area of an allotment, livestock plus other sources of compaction (such as roads, logging, firewood gathering, and ATVs) cause a cumulative amount of compaction and puddling less than the 20% limit of Forest Wide Standard 126. On parts of Lake Creek Allotment burnt by the 1990 fires, ground cover has recovered so that soils function as forest soils and erosion is close to zero (Table S-2). On parts of the Lake Creek Allotment burnt by the 2002 High Robert fire, ground cover is nearly recovered, and soil erosion is close to zero (Table S-2, between 1997 & 2004). *These are not always small areas with soil impacts and they are generally critical areas for riparian values and plant biodiversity – especially around springs, streams and wet meadows.* ***Where is the data and calculation method that went into this assumption?* historic erosion, and still Standard 127. They continue to erode at rates greater than prior to the unregulated grazing. In places like these, plant production and resultant ground cover may have been decreased for hundreds of years. However, rates of erosion are fairly low in these allotments because of the relatively level ground. *Grazing and livestock use impacts are long-Term up to hundreds of year.* Impacts from livestock grazing on uplands generally are minor under current management. Livestock tend to prefer places where water, shade, or better forage are available. However, cattle do decrease ground cover where non-forest areas are adjacent to good forage, water, and/or salting ground, such as part of the North Fork Unit of McCoy Cr. Allotment, and places along lower Summit Creek. Areas such as this occupy probably well under 1% of any allotment. Burrowing mammals also decrease	135/137	3-39

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ground cover on some soils. Any sediment that may be produced from areas with decreased ground cover probably is filtered out on flat, well vegetated riparian soils before it reaches a stream. These observations are similar to other undocumented observations by the soil scientist elsewhere on Malheur National Forest. In summary, because impacts from current grazing on uplands are localized to small areas that do not affect water quality, Standard 127 is being met. *Yet there are no frames gives to support this for the different soil erosion hazard classes.*		
Meadows and Grassy Riparian Areas In places where ground cover has been decreased below potential, it would increase above current levels. Erosion of soil from outside stream channels would decrease. The decrease would be negligible because cattle are causing a negligible amount of soil erosion. Detrimental soil conditions would decrease. *Admission of impacts but no quantification or analysis with effects to fish, Columbia Spotted Frog, sensitive plants, etc.*	139	3-40
Compaction would decrease back to natural levels within 8 years (Kauffman and coworkers 2004), as root growth, animal burrowing, and soil freezing loosens the soil. *So what is the current level of livestock compaction and what are its effects*?	139	3-41
Cumulative Effects The areas considered for cumulative effects are each allotment individually. Effects from past and on-going actions are described in the Affected Environment section. Detrimental impacts on areas outside non-forest uplands, meadows and grassy riparian areas would remain at about current levels, as recovery from past activities (such as logging) is counter-balanced by impacts from future activities. *This is a huge generalization.* For future actions, implementation of the Travel Management plan would result in negligible decreases in soil erosion, because cross country travel is currently causing negligible erosion. Treatments of invasive weeds would comply with laws, regulations, and the Forest Plan. Thus, these treatments would not significantly increase erosion or detrimental soil conditions. No other foreseeable future action would take place on shallow soils, meadows, or grassy riparian areas, so no additional effects are expected. In summary, for every allotment, there would be a negligible decrease in erosion and detrimental soil conditions under Alternative 1. *Compliance with laws, regulations and the Forest Plan is not always 100% and does not mean that herbicide use would not cause significant detrimental soil conditions (by removing native and invasive plant cover) whether intentionally or not.*	139	3-42
Direct and Indirect Effects Non-Forest Upland Soils The parts of Lake Creek Allotment that would not be grazed would continue the small, slow recovery of ground cover, erosion, detrimental soil conditions, and biological soil crusts described under Alternative 1. On the parts of Lake Creek Allotment that would be grazed, conditions would become like the other three allotments with slightly reduced ground cover and biological soil crusts and slightly increased erosion and detrimental soil conditions. *How is slightly defined?*	139	3-43
Regulatory Framework Malheur National Forest Land and Resource Management Plan The MNF Land Management Plan (Forest Plan) provides program direction for wildlife and range management. The following elements are applicable to the proposed and other alternatives for the project area analysis (USFS 1990). *We request (by FOIA if necessary) the BE and the full ID Team reports for: Hydrology, fish, soils and sensitive plants.* *The full Biological Evaluation should have been included in the DEIS.*	142	3-44

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Allowable utilization of available forage in riparian areas (percent allowable use of available forage). Table IV-4 from the Forest Plan (IV-58). Note: all alternatives would use Strategy C. *Why is the more protective Stewardship Management level not chosen given the presence and decline of Bull Trout? Full utilization of forage available to livestock should take a backseat to riparian value given the Malheur LRMP goals, objectives, and standards cited and Bull Trout presence.*		
The following S&Gs are applicable to the proposed and other alternatives for the project area analysis. Modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent obtainment of RMOs or are likely to adversely affect inland native fish. Suspend grazing if adjusting practices is not effective in meeting RMOs *At what point is grazing suspended if RMOS are not met? Shouldn't grazing be suspended whenever RMOS are not being met given many years of adjustment and continued degradation.* Executive Order 11990 -- Wetlands Wetlands would be identified in the Project Area using Cowardin's Classification scheme. The basic requirement of E.O. 11990 is that a Federal agency would avoid construction or management practices that would adversely affect wetlands unless that agency finds that (1) there is no practicable alternative, and (2) the proposed *action includes all practicable measures to minimize harm to the wetlands.* *Yet there is a "practicable" alternative to adversely affecting wetlands (fens, wet meadows, riparian zones) in this case; suspending grazing in those aresa to protect them, which should be done.*	145	3-46a
The Act also requires States to identify the status of all waters and prioritize water bodies whose water quality is limited or impaired. For Oregon, the Department of Environmental Quality (DEQ) develops water quality standards and lists water quality limited waters. In addition, Region 6 of the Forest Service has entered into a Memorandum of Agreement (MOA) with the Oregon State DEQ to acknowledge the Forest Service as the Designated Management Agency for implementation of the CWA on National Forest land. In an effort to support the CWA, the Forest conducts a variety of monitoring and inventory programs to determine status of meeting state water quality standards as well as other regulatory and agency requirements. *So this is all evading the point of analyzing where these allotment grazing conditions stand with relation to the Malheur LRMP, amendment 29,, INFISH, Executive Order 11990, The Clean Water Act and the ESA then the action alts would effect compliance*	146	3-46b
By direction of the CWA, where water quality is limited, DEQ develops Total Maximum Daily Load (TMDL) plans to improve water quality to support the beneficial uses of water. For water quality limited streams on National Forest System lands, the USDA Forest Service provides information, analysis, and site-specific planning efforts to support state processes to protect and restore water quality. The Malheur River Basin TMDL Plan for stream temperature was approved by the Environmental Protection Agency on September 2010. Listed streams for water temperature are removed from the 303(d) list and stream recovery would be achieved through the implementation plan specified in the TMDL *So what is the TMDL implementation plan and how is it being implemented re: the project area? Were there 303(d) listed streams in the project area?*	146	3-46c
The TMDL addresses overgrazing impacts on riparian vegetation disturbance/removal reducing shade and increasing solar radiation, providing micro-climate effects that can provide cooler day time temperatures (Anderson et al 2007; Chen et al. 1999), and its role in stabilizing the channel characteristics and providing a narrower channel that has less surface area exposed to solar radiation. *Why is a surrogate being used for measuring stream temps directly?*	146	3-46d

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Bull trout Recovery Plan Bull Trout Recovery Objectives as Defined by USFWS in the Bull Trout Recovery Plan (USFWS 2006a) Recovery of bull trout requires reducing threats to the long-term persistence of populations, maintaining multiple interconnected populations of bull trout across the diverse habitats of their native range, and preserving the diversity of bull trout life-history strategies (*e.g.*, resident or migratory forms, emigration age, spawning frequency, local habitat adaptations). To recover bull trout, the following four objectives have been identified: *Livestock grazing is a clear and known threat to the persistence of Bull Trout populations, to maintaining multiple interconnected populations across diverse habitats and preserving the diversity of life history strategies – so why is more grazing in critical Bull Trout habitat planned with this DEIS in contravention of the Bull Trout Recovery Plan.*	147	3-47a
Bull Trout Recovery Actions Needed as Defined by USFWS in the Bull Trout Recovery Plan (USFWS 2006) Identify impaired stream channel and riparian areas and implement tasks to restore their appropriate functions. Restore shade and canopy, riparian cover, and native vegetation in all bull trout 146spawning areas. Summit Creek, the Malheur River downstream of Logan Valley, and Crooked Creek in the Upper Malheur subbasin have suppressed woody vegetation in reaches that need this component to become stable, as well as tributary streams to the North Fork Malheur on the lower end of the Malheur National Forest. *It looks like there's multiple RMOs compromised on Summit Creek, best meeting USFWS recovery actions needed by removing livestock.*	147	3-47b
Reduce grazing impacts in all bull trout spawning areas. Implement measures to reduce livestock impacts to streams, (*e.g.*, fencing, changes in timing and use of riparian pastures, off-site watering and salting), to accomplish this task. Areas that would benefit from shade restoration include lower Lake Creek, lower Big Creek, lower Bosenberg Creek, lower McCoy Creek, Crane Creek, and Buttermilk Creek, as well as, private and tribal lands in Logan Valley. The highest grazing management priority for the U.S. Fish and Wildlife Service is that no direct effects occur to spawning fish or redds after August 15. *Shade restoration for project area creeks will not be best accomplished with continuing livestock use.*	147	3-47c
Suspend grazing if adjusting practices is not effective in meeting bull trout biological needs and avoiding adverse effects on bull trout. *At what point does suspension of grazing permanently to avoid adverse effects to Bull Trout kick in? Arguably livestock grazing has not been effective so far in meeting Bull Trout biological needs.* Permanently exclude livestock from riparian habitat protection zones or streambank areas at high risk and with poor recovery potential when there is no practical way to protect them while grazing adjacent uplands *Constant herd riding to keep cattle off the stream does not seem to be a practical way to protect riparian zones and stream bank areas at high risk and this also calls for permanent exclusion for high risk areas, not just livestock exclusion for 3-5 years.* In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), in determining which areas occupied at the time of listing to propose as critical habitat, USFWS considered the physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are the PCEs laid out in the appropriate quantity and spatial arrangement for conservation of the species. *Ground water source persistent is at issue with the fens.* Springs, seeps, groundwater sources, and subsurface water connectivity (hyporehic flows) to contribute to water quality and quantity and provide thermal refugia.	148	3-47d

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Springs are often destroyed for diversion to livestock, depleting both ground water flow for fish and surface biodiversity of plants and wildlife. *Livestock use is well known to jeopardize all of those physical and biological features essential to the conservation of Bull Trout.*		
Analysis Methods Project area site visits for the analysis of livestock grazing began during 2007 by Malheur National Forest (MNF) staff and contractors and have continued through the spring of 2012. Data was collected to determine the existing condition of the vegetative, channel, fish habitat attributes, in conjunction with developing a desired condition. During this process we identified where there were differences or gaps between existing and desired condition related to livestock grazing within specific reaches of stream based on vegetative type, channel type, soil type, and slope. Data used in this analysis included: Proper Functioning Condition (PFC) assessment, Carex Working Group Report, USFS Region 6 Stream Surveys, PACFISH-INFISH Biological Opinion Monitoring (PIBO), Multiple Indicator Monitoring (MIM), water temperature data, and MNF Roads Analysis. The table below identifies the strengths and weaknesses associated with the data used for this analysis. *Analysis methods in the field, while varied, were not consistently applied to all riparian areas at issue, nor for all years, and had changing protocols. Not all methods were quantitative and they were limited regarding long term trends and by inconsistency in application and changing measurement protocols.*	150	3-48a
Analysis Process and Rates of Recovery The following premise was used to analyze effects related to proposed actions in each alternative to riparian vegetation, channel characteristics, bull trout critical habitat, and water quality recovery in the project area. Any action to improve PFC ratings especially vegetative characteristics would also improve fish habitat to some degree within a given stream reach because of the inter-connectivity of riparian areas and in-stream hydrological functions for fish habitat. The extent and rate of recovery is dependent on the existing condition, extent of action, and intensity within the alternative. It was assumed that vegetation would respond more quickly to passive/active restoration and hydrological function would follow at a slower rate for the improvement of in-stream fish habitat (Appendix A part 2). Riparian and in-stream functionality conditions are consistently in a state of flux and the ratings can vary from year to year especially for riparian areas rated below PFC. Likewise each stream reach can be in various stages of recovery or degradation. This can be manifested in the resiliency of the streambanks and vegetation along any individual reach (some are more susceptible to impacts than others) for example streambanks may be well armored with large cobble or boulders and thus more resistant to the actions of overland flow or other actions that may impact streambanks. Additionally riparian areas may be in a more advanced late seral state resulting in resiliency to natural disturbances such as fire and 20-50 year flood events or land management actions such as grazing. The likelihood of recovery beyond a rating of PFC also increases within a more advanced seral state coupled with the extent and intensity of proposed action. These two factors are correlated with the rate of recovery of a riparian area. *Why was it assumed that vegetation would respond more quickly to passive/active reforestation and how would this include livestock grazing for faster response?*	152/154	3-48b
The rates of recovery within Appendix A part 2 would occur within the 10 year time frame. *Based on what data?*	155	3-48c
Development of resilient riparian areas would allow for resumption of grazing within the pastures. *But then would the Desired Future Condition ever be reached or just set back?*	155	3-48d
Rates of Recovery for riparian areas would be the same or similar for those areas with no livestock grazing (alternative 1) compared to those where the appropriate management is proposed. *How is this assumed? Livestock are an exotic invasive influence and recovery for*	155	3-48e

<table>
<tr><th>Comment</th><th>DEIS page#</th><th>Response</th></tr>
<tr><td>riparian areas should be should be assumed to be better without them.</td><td></td><td></td></tr>
<tr><td>Table A-1: Water Temperature for Lake Creek
<table>
<tr><th rowspan="2">Stream</th><th rowspan="2">Site</th><th rowspan="2">Allotment</th><th rowspan="2">Unit</th><th rowspan="2">Elevation</th><th rowspan="2">7DADM (F)</th><th rowspan="2">TMDL 7DADM Standard (F)</th><th colspan="2">INFISH</th></tr>
<tr><th>Spawning & Rearing (F)</th><th>Adult Holding (F)</th></tr>
<tr><td rowspan="5">Lake Creek</td><td>Lake 1</td><td>Lake Creek</td><td>McCoy</td><td>5520</td><td>59.3</td><td rowspan="5">53.6</td><td rowspan="5">48</td><td rowspan="5">59</td></tr>
<tr><td>Lake 2</td><td>Logan Valley</td><td>W. Lake Creek</td><td>5520</td><td>58.2</td></tr>
<tr><td>Lake 3</td><td>Private</td><td>--</td><td>5060</td><td>75.6</td></tr>
<tr><td>Lake 4</td><td>Private</td><td>--</td><td>5060</td><td>73.2</td></tr>
<tr><td>Lake 5</td><td>McCoy Creek</td><td>Cow Camp</td><td>5020</td><td>75.0</td></tr>
</table>
These are high stream temperatures not suitable for Bull Trout spawning, rearing, or adult holding, and even excluding the 7 day average TMDL Standard – Suggesting the need to remove all livestock from All these streams.</td><td>157</td><td>3-48a</td></tr>
<tr><td>A radio telemetry study began in 2000 conducted by the Burns Paiute Tribe of fluvial bull trout in the upper Malheur River and tributaries. Bull trout tagged near the confluence of Big Creek and Lake Creek spawned in the Meadow Fork of Big Creek in 2000. Bull trout redds have been counted within the Meadow Fork of Big Creek every year since 2000 with the exception of 2003 in which no redds were observed. Radio tagged bull trout overwintered downstream of Lake Creek subwatershed in the vicinity of Malheur Ford.
So why continued livestock use proposed for Big Creek?</td><td>160</td><td>3-49b</td></tr>
<tr><td>Primary spawning areas for the Upper Malheur subpopulation are located in the Meadow Fork, Big Creek, Snowshoe Creek, and Lake Creeks. Meadow Fork is the key spawning stream for the local population. The majority of bull trout spawning within the project area occurs prior to mid-September. Due to the presence of brook trout redds are only counted as bull trout redds observed prior to mid-September. The estimated number of bull trout redds peaked in 2000 (39) and has since declined to 5 redds in 2004. The decline in the estimated number of redds is most likely attributed to the effects of the 2002 High-Roberts Fire and the 2003 flash flooding that originated in the area. A passage barrier on the Meadow Fork at culvert FSR 1648021 developed following the 2003 flash flooding.
Has the passage barrier been removed? # Of redds since 2004? Really, <u>no</u> monitoring of redds since 2004?!</td><td>160</td><td>3-50</td></tr>
<tr><td><u>Limiting Factors</u>
Stream temperatures and the quality of habitat are the major limiting factors to bull trout recovery within the Malheur River Watershed. Primary effects from grazing are related to vegetation removal and hoof action along the banks and areas of saturated soils. Though much of the area has improved from historical conditions, wide and shallow streambanks are still prevalent which increases solar radiation reducing the cooling effect of deep pools, undercut banks, and hardwood shade. Well shaded cover also provides productive terrestrial and aquatic macro-invertebrates for an abundant food base. This complexity of cover also reduces stress to individual trout allowing for productive growth and reproduction.
Reasons for our concern re: continued livestock use in Bull Trout critical habitat.</td><td>161</td><td>3-51</td></tr>
<tr><td>The Recovery Plan Addresses sediment issues identified in the upper Malheur River watershed assessment, (e.g., road related sediment in Lake Creek and Bosenberg Creek). Noted was a diversion ditch on Lake Creek that diverts flow into a draw where erosion and head-cutting have been occurring on the return flow ditch.
So what has been done about this diversion?</td><td>161</td><td>3/52</td></tr>
</table>

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Habitat in the Analysis Area – Rearing Habitat Currently, occupied rearing habitat for juvenile bull trout is present in Lake Creek,Big Creek, Meadow Fork, and Snowshoe Creek. Potential rearing habitat for juveniles is currently present in McCoy, Bosenberg, and Summit Creeks. Stream reaches with daily maximum water temperatures < 20ºC were considered to be potential rearing habitat for juvenile bull trout (Dunham and Chandler 2001). Currently, juvenile bull trout occupy about 63% of potential habitat in the Upper Malheur subpopulation area (Table A-6). *So take cattle out of all these areas and leave them out – obviously restoration isn't happening with livestock use.*	162/163	3-53
Bull trout Critical Habitat Lake Creek allotment is a stronghold for Bull Trout survival in the Upper Malheur Drainage. Much of the spawning and rearing takes place in the allotment. Meadow Fork of Big Creek had the highest density of redds until the wildfires introduced large amounts of sediment and have reworked the system. *So don't reopen the Lake Creek allotment to cattle use – cattle are not endangered but Bull Trout are.*	166	3-54
A fish barrier is present on Bosenberg Creek, inhibiting fish connectivity to cooler water upstream. R6 stream survey data suggests bankfull width/depth and LWD are meeting standards, whereas pool quantity did not. *So what is the Fish Barrier and is it removable?*	166	3-55
One water temperature monitoring site (Lake 2) occurs in the West Lake Creek unit and two approximately one mile downstream below the 16 road on two channels of Lake Creek (Lake 3 and 4). Lake 3 is the east channel and Lake 4 is the west channel. Lake 2 is near the most upstream extent of the unit. The 7DADM was 58.2°F at Lake 2, 75.6°F at Lake 3 and 73.2°F at Lake 4. Lake Creek heats up approximately 17.4°F between sites Lake 2 and 3 and heats up by 15°F from sites Lake 2 and 4. Site 1 met the 59°F INFISH standard for adult holding, but exceeded the 53.6°F TMDL standards and 48˚F INFISH standard for spawning and rearing. The temperature difference from sites Lake 2 to 3 and 4 is because of the irrigation withdrawals that occur on private land. *Stop irrigation withdrawals!*	169	3-56
Channel Characteristics Lake Creek reach 2 has a Rosgen E channel type and reach 1 a Rosgen C channel type that has channel stability controlled by vegetative attributes and is sensitive to livestock grazing. The beaver activity in reach 2 has created channel complexity that helps retain water and sediment and provide fish habitat faster than any other manner. The reach is a series of dams with a low gradient, meandering channel between the dams. Reach 1 has narrowed dramatically and is meeting Forest Plan standards for undercut banks. *Introduce Beaver to other creeks – why is this not considered as part of an alternative?*	170	3-57
An R6 stream survey was conducted on reach 1 of Lake Creek within the Starvation unit in 1999. Lake Creek reach 1 did not meet the INFISH and Forest Plan Amendment 29 criteria for average Bankfull Width/depth of 19.23. It met INFISH and Forest Plan Amendment 29 standards for stream bank stability with 91%. Lake Creek reach 1 measured 85% undercut banks and is meeting Forest Plan Standards Currently 0.72 miles of Lake Creek are occupied, spawning and rearing Bull Trout Critical Habitat within the Cow Camp and Starvation units. *Lake Creek reach 1 bankful with depth not to INFISH and Forest Plan Amendment 29 standards.*	171	3-58
An exclosure occurs on Reach 2 that has abundant age and height classes of different willow species and has beaver activity. *This suggests the PFC that would be attained by canceling livestock use in riparian areas.*	173	3-59
The average seven day average daily max was 72.5°F at Summit 5 and 78.7°F at Summit 7, heating up approximately 6°F. Site 1 is the only site to meet the INFISH standard for adult holding. All sites did not meet the INFISH spawning and rearing or	174	3-60

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TMDL standard. *High water temps, failure to meet INFISH, spawning and rearing (and all but one for holding) and TMPL standards.*		
Reaches 5 and 6 would primarily be used for migratory behavior by transitory bull trout currently because of the existing warm stream temperatures. However with improvement in existing condition cold influxes within reaches 5 and 6 may provide adequate rearing habitat. The components of quality migratory habitat include quality pools that are refugia for migrating fish and the absence of thermal barriers related to water temperature. A potential culvert barrier for adults and juvenile bull trout exists within reach 8 of Summit Creek which may limit access to cold water thermal refugia for juvenile bull trout. *So what is being done about the culvert barrier? How many times does this DEIS mention a passage barrier without any indication that the FS is correcting the problem*	175	3-61
Grazing would continue as permitted under the current permit for 2 years following notification of cancellation of the permit. The effects from another 2 years of grazing under the current permitted use are summarized in chapter 2 alternatives considered but eliminated from detail study (Current Management). Reaches of Summit Creek are not expected to improve at a rate sufficient for the desired conditions in Appendix A, part 1 under the existing management and therefore the existing condition within this area is expected to remain the same for those two years. *Cattle are a far greater threat to hard woods than native wildlife. Returning wolves should be allowed to keep native ungulates moving out of riparian areas.*	175	3-62
Bank Alteration: 20% (10-30% depending on measurement method used and on resiliency of site); like stubble height, streambank alteration is another annual or short-term indicator used to evaluate the potential effects of livestock grazing in riparian areas, primarily any potential effects to long-term streambank stability and channel shape. It is used as a tool to assess the intensity of grazing along streambanks and to determine when such intensity may be appropriate or deemed too excessive. It can also prove useful in determining the cause-and-effect relationships between livestock grazing and stream channel conditions and whether management changes are needed for the following year. Streams are naturally dynamic and have the ability to repair a certain amount of annual disturbance each year (the amount is variable based upon stream gradient, substrate composition, streambank materials, vegetation type and abundance, channel geometry, flow regime, etc.). The literature is not extensive but generally suggests 10-30% streambank alteration is consistent with providing adequate riparian protection, and is intended to vary by site depending on similarity to desired conditions, resiliency of the site being monitored, and the timing, duration and intensity of livestock use (Burton et al. 2011, Heitke et al. 2008, Bengeyfield 2006, Cowley 2002, Bengeyfield and Svoboda 1998). Bengeyfield (2006) found that when streambank alteration measured 15-20%, width to depth ratios showed an improving trend. He also noted that the vegetation improvements kept pace with the physical changes. This annual use indicator should be used in combination with long-term monitoring of streambank stability and channel geometry. In addition, it is worth noting that research is continuing to be conducted on the various ways that can be used to monitor for and measure actual streambank alteration (including MIM, which the District is presently using) to account for accuracy of results, reduction of variability among observers, and the resources necessary to carry out such measures. *How is bank alteration actually measured in percentages?*	178	3-63
These ongoing actions are common to all alternatives and the effects from these actions have been analyzed previously in other NEPA documents. This document considered the effects of these actions cumulatively in conjunctions with proposed actions in each of the alternatives within the Summit Logan Valley Grazing Authorization DEIS. Cumulatively these actions would have a net benefit to livestock management, riparian condition, bull trout critical habitat, and water quality within the project area. *Yet the extent of riparian/Bull Trout recovery would be greater with no grazing.*	187	3-64

Comment	DEIS page#	Response
Since impacts to aquatic habitat from the proposed actions are limited to negligible or not measureable decreases in overall riparian condition, wetland obligate plant communities, channel characteristics, water quality and aquatic habitat. It is unlikely that retarding of riparian condition and its relationships to aquatic dependent habitat would result in cumulative effects from timber, fuels and recreational management activities. *This has not been demonstrated that these would only be negligible or not measurable decrease in overall riparian condition, etc. Further these impacts would still contribute to the cumulative effects.*	187	3-65
Maintaining or slightly improving the riparian shrubs and channel characteristics would not measurably increase effective shade values in the Big Creek Riparian pasture within 10 years (Appendix A, part 2). These reaches represent all 1.7 miles of all life stages for Bull Trout Critical Habitat. Since the condition of the residual pool depth, pool quality and bankfull width/depth would not likely improve; spawning and rearing habitat would likely be maintained in their current condition. The creation of the Big Creek Riparian pasture may result 1.7 miles of critical habitat moving towards desired vegetation conditions, but not towards the desired channel characteristics within 10 years for reaches 1, 2 and 3 of Big Creek. Development of seed sources in the 0-3 foot height classes of shrubs may not likely occur due to the need of having consecutive years of no browse. The adaptive management strategy of additional rest or scheduled rest may allow continual movement towards or achievement of desired vegetative conditions identified in Appendix A, part 1. The ground disturbing impacts from removal of 1.2 miles of fencing would not be measurable. *It's unacceptable not to plan to move critical Bull Trout habitat to proper functioning condition with cooler stream temperatures and more stable banks to support Bull Trout viability and increased numbers and distribution.*	190	3-66
Bosenberg Unit The direct effects from authorizing livestock grazing in the Bosenberg Unit in the Summit Prairie Allotment would result in an increase in hoof shearing (bank alteration) of streambanks related to livestock grazing, increase in woody browse use (browse utilization), and maintenance of herbaceous plant vigor (stubble height). There are approximately 4.4 miles of Bull Trout Critical Habitat within the Bosenberg Unit that are not currently being grazed and would have grazing reinitiated. *Critical Bull trout habitat should not be opened to livestock grazing.*	191	3-67
The headwater spring proposed for development is within a highly sensitive area on a hill side because of the steep gradient. The dominant vegetation is hydric plant species. Soil composition is primarily organic and saturated. The spring has not fully recovered from the effects of past land management actions and the fire. Areas adjacent to the spring appear to have sloughed downhill. The direct and indirect effects of development of the spring would likely result in additional damage to the soils and vegetation surrounding the outlet of the spring. Movement of groundwater into a trough exposed to solar radiation may result in increased water temperatures on water returns to Bosenberg Creek. Bosenberg creek is one of a few creeks within the Upper Malheur watershed that likely meets bull trout temperature criteria (mostly groundwater inputs). *Keep cattle away from the spring entirely. Development sounds like a bad idea, directly threatening Bull Trout in Bosenberg and Big Creeks with higher water temperatures.*	193	3-68
If rest occurs only after exceedances of the previous grazing season, the vegetative and channel characteristics may retard or at a minimum maintain the current condition. Development of seed sources in the 0-3 foot height classes of shrubs may not likely occur due to the need of having consecutive years of no browse. The adaptive management strategy of additional rest or scheduled rest may allow continual movement towards or achievement of desired vegetative conditions identified in Appendix A part 1. The ground disturbing impacts from removal of 0.7 miles of fencing would not be measurable. *How is measurable defined? Of course they can be measured.*	195	3-69

Comment	DEIS page#	Response
Authorization of livestock grazing in the Sagehen unit would result in movement towards PFC, maintaining the vegetation existing conditions, and moving it towards the desired channel characteristics. Bull trout critical habitat on Reaches 1, 3 and 4 would likely achieve PFC in both 5 and 10 years. Reach 2 would likely move towards FAR UP in both 5 and 10 years, but not likely to achieve PFC because of the channel and riparian shrub existing conditions. Reaches 1, 3, and 4 would likely move towards the desired vegetation condition within 10 years (Appendix A, part 2). Reach 4 is adjacent to the road and would allow more efficient management of livestock. Reach 2 would likely maintain its existing vegetation condition because of the deficiency in riparian shrub, height classes and channel characteristics. Reaches 1, 3 and 4 would likely move towards desired channel characteristics. Reach 2 would likely move towards desired channel characteristics, but at a slow rate. If rest occurs only after exceedances of the previous grazing season, the vegetative and channel characteristics may retard or at a minimum maintain the current condition. Development of seed sources in the 0-3 foot height classes of shrubs may not likely occur due to the need of having consecutive years of no browse. The adaptive management strategy of additional rest or scheduled rest may allow continual movement towards or achievement of desired vegetative conditions identified in Appendix A, part1. *Problems with allowing PFC status to be a trigger for allowing continued livestock degradation of riparian values. Obviously the livestock degradation is even worse at FAR – (Functioning At Risk)*	197	3-70
Effects Determination <u>Columbia River Basin Bull Trout (T):</u> Likely to Adversely Affect (LAA) in the short term. <u>Bull Trout Designated Critical Habitat (D):</u> Likely to Adversely Affect (LAA) in the short term. *Rationale* Habitat for Bull Trout in the aquatic analysis area is currently in a degraded state. High water temperatures, riparian hardwood suppression and altered stream channels have reduced the habitat capability of streams in the aquatic analysis area to support Bull Trout. Riparian areas within the project area are deficient in riparian hardwoods. Some recovery has occurred from past activities related to livestock grazing and timber harvest and natural disturbances such as fire. However many of the stream reaches are early seral with sensitive stream banks and or have not achieved a rating of PFC which is the minimum required to withstand flood events. Many of the areas have not achieved a state of resiliency and are susceptible to degradation from livestock. The addition of approximately 4.36 miles of Bull Trout Critical Habitat within the Bosenberg Unit that is currently vacant and development of cold water spring sources within the Unit would result in adverse affects to Bull Trout Critical Habitat due to the early seral state of the riparian area within the Unit that is currently recovering from wildfires in 1990 (Snowshoe, Corral Basin, and Sheep) and 2002 High Roberts wildfire. The streambanks are composed of soft organic material that is easily sheared and compacted from hoof action.While measures such as a full time rider, adaptive management strategy of additional rest, establishment of two DMA's, bank alteration standards of 10% and 15% would alleviate the possible impacts the sensitivity of the riparian area to disturbance and likelihood that cattle would prefer to congregate within the riparian area based on forage availability carries a high degree of uncertainty whether these measures would be effective. Forage production within this unit is primarily in the riparian area with the uplands dominated by Ceanothus and young ponderosa pine. *So why is alt. 2 eve being considered, as it would likely adversely affect Bull Trout, a listed species and why then is alt. 1, no grazing, the most ecologically beneficial alt, relegated to the status of "No Action" as a baseline for comparison rather than the change it really represents and as a viable and preferable alternative.*	199	3-71
Plant vigor and the greenline stability rating would likely continue to improve under this management. The condition of the herbaceous plant communities is currently on an upward trend and would likely improve from the minimum rest requirements and scheduled rest. This condition was assessed with a 4 inch stubble height. *Starting with alt. 3 descriptions, there is no real substantiation given for optimistic*	203	3-72

<table>
<tr><th>Comment</th><th>DEIS page#</th><th>Response</th></tr>
<tr><td>assumptions that management strategies will necessarily result in PFC status or better.</td><td></td><td></td></tr>
<tr><td>Cumulative Effects
Table A-11: Summary of Expected Recovery for PFC Ratings by Unit Based on the Actions Proposed
<table>
<tr><th>Allotment</th><th>Unit</th><th>Miles</th><th>PFC in 5 Years</th><th>PFC in 10 Years</th><th>Desired Condition in 10 Years</th></tr>
<tr><td rowspan="2">Lake Creek</td><td>Bosenberg</td><td>8.64</td><td>>PFC</td><td>>>PFC</td><td>Y</td></tr>
<tr><td>McCoy Creek</td><td>5.66</td><td>>PFC</td><td>>>PFC</td><td>Y</td></tr>
<tr><td rowspan="4">Logan Valley</td><td>Big Creek Riparian Pasture</td><td>1.67</td><td>>PFC</td><td>>>PFC</td><td>Y</td></tr>
<tr><td>Corral Holding</td><td>0.12</td><td>PFC</td><td>>>PFC</td><td>Y</td></tr>
<tr><td>Flat Field</td><td>0.02</td><td>PFC</td><td>>>PFC</td><td>Y</td></tr>
<tr><td>Lower Field</td><td>0.12</td><td>PFC</td><td>>PFC</td><td>Y</td></tr>
</table>
Is >PFC <u>toward</u> PFC? Is >>PFC <u>beyond</u> PFC?</td><td>206</td><td>3-73</td></tr>
<tr><td>The rate of recovery for this unit would result in the second fastest movement towards desired conditions, behind Alternative 1.
So why isn't the Forest Service choosing the most ecologically preferable alt (Alt 1) – especially when a federally listed species is at stake, with acknowledged severe degradation of its critical habitat?</td><td>208</td><td>3-74</td></tr>
<tr><td>The indirect effects of livestock effects for West Fork Summit Reach 2 would result in an improvement to the herbaceous plant community and channel characteristics, but maintenance of the existing riparian shrub conditions for West Fork Summit Reach 2. The riparian shrub conditions are critical for the resource values present in these areas. For example, beaver complexes were evident in the PFC assessments for these reaches, however, it is not likely that this alternative would provide the dietary conditions needed to support beaver populations or Bull Trout overwintering habitat. The vertical stability issues from active headcutting may impede improvement until they are addressed through active restoration. West Fork Summit Reaches 1 and 2 were found to be functioning at risk with a downward trend. Reaches rated functioning at risk are not stable or resilient to impacts from frequent flooding or other land management actions but a minimum rest requirement of 3-5 years would facilitate recovery.
So alt. 1 would likely provide for beaver's dietary needs and Bull Trout over wintering habitats.</td><td>210</td><td>3-75</td></tr>
<tr><td>The direct and indirect effects of constructing 0.8 miles of fence along the boundary of the North Summit Riparian pasture may result in minimal ground disturbance from initial fence construction. Implementing the design criteria would minimize any effects to riparian areas, the viability of bull trout, redband trout or Columbia spotted Frog within the project area. The short term effects of fence construction are expected to result in long term beneficial effects for bull trout critical habitat within the North Summit Riparian pasture.
Minimizing effects is not the same as <u>avoiding</u> effects so consequences to Bull Trout, Redband Trout, and Columbia Spotter Frogs still should have been analyzed.</td><td>211</td><td>3-76</td></tr>
<tr><td>When cumulative effects common to Alternatives 2, 3, and 4 are considered with the Proposed Actions from Alternative 4, the result is the third fastest rate of recovery or movement towards a proper functioning condition and the desired condition for riparian areas and Bull Trout Critical Habitat within the Project Area. The rate of recovery is because of the fundamental livestock management strategy for Alternative 4 that largely includes range riders, creation of riparian exclosures and units, adaptive management of enlargement of riparian exclosures and changes in allowable use levels with starting allowable use levels similar to Alternative 3. The cumulative effects are within the scope of anticipated effects to aquatic resources determined in the Malheur National Forest</td><td>213</td><td>3-77</td></tr>
</table>

Comment	DEIS page#	Response
Land and Resource Management Plan EIS. *Why does the Forest Service prefer only the 3rd fastest rate of recovery?*		
Endangered Species Act The ESA requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. *This is unequivocal.* *Why is the Grazing Authorization Aquatic BE not done and not incorporated within this DEIS? This is information central to the larges key issue of the project – Bull Trout protection and recovery as a listed species.*	213	3-78
The completed BA and consultations can be found in the project file. *Shouldn't the Forest Service be required to avoid adverse effects to floodplains where possible, as is the case with this project?*	214	3-79
Consistency with the Forest Plan All alternatives are consistent with Management Area 3A standards, Amendment 29, and INFISH. Modifications for shade and their respective stream reaches are proposed for Amendment #29 Numberic Values as shown in Table 2-33. The proposed values for shade would be changed from the Amendment #29 values to the values identified in the TMDL or data collected by the Carex Working Group. The proposed shade values by reach are considered to be more site specific and realistic than the value present in Amendment 29. They take into consideration more factors that have localized effects on stream shade. *Actually alts. would not be consistent with Alt. 29, as modifications of standard (to lower standards)are proposed.*	214	3-80
Clean Water Act The CWA requires that that the Forest Service manages for the attainment of water quality criteria that provides for the most restrictive beneficial use present on a reach of a stream. The most restrictive beneficial use that is present in the Project Area is Bull Trout spawning and rearing. Many of the streams present in the Project Area were identified as water quality limiting for water temperature with supporting data collected continuously at multiple locations. Big Creek, Lake Creek and Summit Creek were identified with 303(d) listings that were followed with the development of a TMDL. *We believe that the "action" alts 2, 3, and 4are not consistent with the Clean Water Act as summarized before, as not managing most effectively for Bull Trout Spawning and rearing requirements.*	214	3-81
The purpose of the niche is to help us identify what makes each Forest special and allow us to narrow our focus to the most appropriate recreation opportunities so that we can provide quality recreation. *Why should the Forest Service determine for us "the most appropriate recreational opportunities"?*	216	3-82
It should be noted that livestock and livestock grazing are very much an integral part of western and local "traditional way of life". *Local traditional way of life is also native peoples' historic cultural ways – which are not related to intrusive livestock grazing. Many visitors and residents also hate the presence of cattle and sheep and the degraded landscape associated with livestock, but this is ignored.*	216	3-83
The Lake Creek Allotment is currently not active. East of the campground is an adjacent allotment that is not in use, thus lessening conflicts for recreating publics. However, livestock from a northwestern direction have occasionally entered the campground for the past several years As MA12, livestock is prohibited within campgrounds, however the campground has not been fenced excluding livestock entry. *Why not? There's a clear bias toward livestock in this whole discussion and in management.*	217	3-84
Campsites are concentrated primarily in flat areas off main transportation systems where water can be accessed. Many are near springs or creeks. Varied degrees of vegetation	217	3-85

Comment	DEIS page#	Response
and riparian zone damage occur throughout the watershed due to vehicles, sanitation practices, and removal of vegetation for various purposes. Use of Off Highway Vehicle Use (OHV) is often associated with dispersed camping. *So excluding livestock from all riparian areas would also benefit recreation and alleviate cumulative impacts.*		
Special Uses Alternative 2 would move the Horse pasture from Lake Creek allotment to Logan Valley allotment. Making the Horse pasture an active allotment pasture could have a negative impact on the Special Use Permit Horse Group that uses the Horse Pasture for an annual Recreation Event. If cows are pastured during the time of the event, the group may not be able to use the area at the same capacity as they did in the past. The vacant Horse Pasture is used as a campsite for the Horse Group that consist of approximately 100 people with horses, trailers, catering trucks and showers. *Another reason not to re-open a vacant allotment pasture to cattle use.*	222	3-86
Many communities are closely tied to the forest in both work activities and recreation. The local communities within an hour or two drive that are anticipated to be directly or indirectly affected by the proposed action, alternatives, and their associated economics include: Prairie City (population 1,080), Burns/Hines (4,565), Dayville (140), John Day/Canyon City (2,740), Long Creek (260), Mount Vernon (650), Monument (150), Seneca (230), Sumpter (175), and Unity (145). Larger towns and cities two or more hours away from John Day include: Baker City (10,160), LaGrande (12,795), Ontario (10,680), Bend (52,029), and Pendleton (16,915). The nearest metropolitan areas are the Tri-Cities area of Kennewick, Pasco, and Richland in Washington State, and Boise, Idaho. Most of the permittees live in the listed local communities. *Biased discussion: Some of these towns are pretty far away from the planning area – not much likelihood of socio-economic effects. Larger cities like La Grande, Ontario, Bend and Pendleton are very unlikely to be affected. The Tri-cities and Boise are completely irrelevant.*	236	3-87
However, the Forest Service does not recognize the permit as having additive financial value to an individual's property because there is no guarantee that the permit would remain with current permittee in perpetuity and that the sale of the property would automatically give the permit to the new owner. Therefore the Forest Service recognizes grazing permits as a privilege and not a right. *So why are economics so heavy a bias related to proposed grazing management, when livestock use is recognized by the forest to be a privilege, not a right.*	237	3-88
However, Alternative 1 would eliminates all permittee costs associated with the allotment. In addition, a fair market appraisal of improvements may be necessary to determine appropriate compensation for investments made on the allotments by the current permittees. The magnitude of the direct effects of this alternative is considered to be the three ranching operations currently holding permits for the allotments under consideration and the Government. *Only 3 ranching operations are causing this level of threat to Bull Trout and riparian functioning? Ecological impacts clearly outweigh the distribution of economic gain.*	240	3-89
The Warm Springs has purchased lands adjacent the Summit Logan Valley Grazing Authorization Project area. Virtually the entire Summit Logan Valley Grazing Authorization Project area falls within the ceded lands of the Confederated Tribes of the Warm Springs. Under the terms of the Treaty of 1855, the Confederated Tribes reserve the rights to hunt, fish, gather plant crops, and pasture livestock within these ceded lands. *So why are 18 ranchers given much higher consideration than the Confederated Tribes of Warm Springs, whose lands these really are?*	244	3-90
This is a summary of the Biological Evaluation (BE) and Wildlife Specialist Report that evaluates the potential effects of livestock grazing on wildlife species and their associated habitat within the Summit Logan Valley Grazing Authorization Project. The full Biological Evaluation and Wildlife Specialist Report can be found in Appendix F	245	3-91

<table>
<tr><th>Comment</th><th>DEIS page#</th><th>Response</th></tr>
<tr><td>which is available for review by request.
The full Biological Evaluation should have been incorporated in this DEIS. Please send us a hard copy of the BE and the wildlife specialist reports.</td><td></td><td></td></tr>
<tr><td>There is no designated or proposed critical habitat for Canada lynx in the affected subwatersheds. Based on the National Lynx Survey, the Malheur National Forest falls under the designation of “Unoccupied Mapped Lynx Habitat” (USFWS Memo, 2006). Consequently, there is No Effect (NE) to Canada lynx.
Yet this <u>is</u> Lynx habitat in the Northern moister mixed conifer area by the Strawberry Mountains and there have been no Lynx surveys to determine presence or absence!</td><td>247</td><td>3-92</td></tr>
<tr><td>Table W-1: Threatened, Endangered and Sensitive Wildlife Species Summary
<table>
<tr><th rowspan="2">Terrestrial Species</th><th rowspan="2">Status</th><th rowspan="2">Species Occurrence</th><th colspan="4">Effects Determination</th></tr>
<tr><th>Alt 1</th><th>Alt 2</th><th>Alt 3</th><th>Alt 4</th></tr>
<tr><td>Canada Lynx
Lynx canadensis</td><td>T</td><td>HN/N</td><td>NE</td><td>NE</td><td>NE</td><td>NE</td></tr>
<tr><td>* Gray Wolf
Canis lupus
East of Hwy 395</td><td>S</td><td>HD/S</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>Bald Eagle
Hailaeetus leucocephalus</td><td>S</td><td>HD/S</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>American Peregrine Falcon
Falco perigrinus anatum</td><td>S</td><td>HN/N</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>California Wolverine
Gulo gulo luteus</td><td>S</td><td>HD/S</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>Pygmy Rabbit
Brachylagus idahoensis</td><td>S</td><td>HN/N</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>*Greater Sage-Grouse
Centrocercus urophasianus phaios</td><td>S</td><td>HD/D</td><td>NI</td><td>MIIH</td><td>MIIH</td><td>MIIH</td></tr>
<tr><td>*Silver-bordered Fritillary
Boloria selene</td><td>S</td><td>HD/S</td><td>NI</td><td>MIIH</td><td>MIIH</td><td>MIIH</td></tr>
<tr><td>Wallowa Rosy Finch Leucosticte tephrocotis wallowa</td><td>S</td><td>HN/N</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>*Bobolink
Dolichonyx oryzivorus</td><td>S</td><td>HD/S</td><td>NI</td><td>MIIH</td><td>MIIH</td><td>MIIH</td></tr>
<tr><td>*Grasshopper Sparrow
Ammodramus savannarum</td><td>S</td><td>HD/S</td><td>NI</td><td>MIIH</td><td>MIIH</td><td>MIIH</td></tr>
<tr><td>Upland Sandpiper</td><td>S</td><td>HD/D</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
</table></td><td>248</td><td>3-93</td></tr>
</table>

Comment							DEIS page#	Response
Bartramia longicauda								
Tricolored Blackbird *Agelaius tricolor*	S	HN/N	NI	NI	NI	NI		
Bufflehead *Bucephala albeola*	S	HN/N	NI	NI	NI	NI		
*Lewis's Woodpecker *Melanerpes lewis*	S	HD/D	NI	MIIH	MIIH	MIIH		
*White-headed Woodpecker *Picoides albolarvatus*	S	HD/D	NI	MIIH	MIIH	MIIH		
*Townsend's Big-Eared Bat *Corynorhinus townsendii*	S	HD/S	NI	MIIH	MIIH	MIIH		
*Pallid Bat *Antrozous pallidus*	S	HD/S	NI	MIIH	MIIH	MIIH		
*Fringed Myotis *Myotis thysanodes*	S	HD/S	NI	MIIH	MIIH	MIIH		
Johnson's Hairstreak *Callophrys johnsoni*	S	HD/S	NI	NI	NI	NI		
*Columbia Clubtail *Gomphus lynnae*	S	HD/S	NI	MIIH	MIIH	MIIH		
*Columbia Spotted Frog *Rana luteiventris*	S	HD/D	See Aquatic Section	MIIH	MIIH	MIIH		
*We are concerned by potential negative impacts to these species (Marked with an *) from alts 2, 3, and 4. Especially as there have been no population studies for these species in the project area and thus no guarantee of their viability.*								
Table W-2: Management Indicator Species Summary (Malheur National Forest)							249	3-94a

MIS Species	Representing	Habitat Requirements	Habitat Present in Analysis Area
*Elk	Commonly hunted Big-game Species	Forested Mountains and meadows with grasses and forbs	Yes, including known calving area within Logan Valley fen and vicinity
American (Pine) Marten	Old Growth	Mature, mesic coniferous forests, with high structural diversity in the under story	Higher elevation mixed conifer stands: designated old growth stands, replacement old growth stands, late and old structure on Lake Creek and Big Creek.

<table>
<tr><th colspan="4">Comment</th><th>DEIS page#</th><th>Response</th></tr>
<tr><td colspan="4">
<table>
<tr><td>Pileated Woodpecker</td><td>Old Growth, Primary Cavity Nester, Snags and Down Wood</td><td>Extensive areas of dense coniferous forests with tall closed canopy, high basal area and large diameter snags</td><td>Yes, mixed conifer stands, drainages, designated old growth stands, replacement old growth stands, late and old structure on Lake Creek and Big Creek.</td></tr>
<tr><td>Three-toed Woodpecker</td><td>Old Growth, Primary Cavity Nester, Snags and Down Wood</td><td>Higher elevation (above 4,500ft) lodgepole pine and mixed conifer forests with a lodgepole component</td><td>Yes, lodgepole pine habitat within the project area.</td></tr>
</table>
We are concerned by potential negative impacts to these Management Indicator Species (Marked with an *) and populations of other species with similar habitat needs from alts 2, 3, and 4.
</td><td></td><td></td></tr>
<tr><td colspan="4">
<table>
<tr><td>*Lewis's Woodpecker</td><td>Primary Cavity Nester, Snags and Down Wood</td><td>Open forests and nests in large snags in cavities created by other cavity nesters or in very soft snags</td><td>Yes, have been documented nesting in aspen within the project area.</td></tr>
<tr><td>*Red-naped Sapsucker*</td><td>Primary Cavity Nester, Snags and Down Wood</td><td>Associated with riparian habitats consisting of a mixture of grasses shrubs and hard woods</td><td>Yes, associated with aspen stands</td></tr>
<tr><td>*Williamson's Sapsucker</td><td>Primary Cavity Nester, Snags and Down Wood</td><td>Mature higher-elevation coniferous forests for nesting and feeding</td><td>Yes, associated with aspen stands, associated with larger conifer.</td></tr>
<tr><td>*Downy Woodpecker</td><td>Primary Cavity Nester, Snags and Down Wood</td><td>Associated with riparian habitats consisting of a mixture of grasses shrubs and hard woods</td><td>Yes, Big Creek, Lake Creek, portions of Summit Creek provide the most suitable habitat, as well as aspen habitat in riparian areas</td></tr>
<tr><td>Hairy Woodpecker</td><td>Primary Cavity Nester, Snags and Down Wood</td><td>Habitat generalists that prefer large trees</td><td>Yes</td></tr>
<tr><td>White-headed Woodpecker</td><td>Primary Cavity Nester, Snags and Down Wood</td><td>Open ponderosa pine forests with large trees and snags in large patches</td><td>Yes, dry forest, large tree and open-canopied habitat.</td></tr>
<tr><td>Black-backed Woodpecker</td><td>Primary Cavity Nester, Snags and Down Wood</td><td>Forests with dead, insect-infested trees associated with large-scale disturbances such as fire or wind throw</td><td>Yes, lodgepole pine habitat within the project area.</td></tr>
<tr><td>Northern Flicker</td><td>Primary Cavity Nester, Snags and Down Wood</td><td>Habitat generalists that prefer large trees stands near meadows</td><td>Yes</td></tr>
</table>
Indicates our concern re: negative impacts to these species (Marked with an *) viability in the project area from alts 2, 3, and 4.
</td><td>250</td><td>3-94b</td></tr>
<tr><td colspan="4">In addition to Featured Species listed within the Malheur Forest Plan, American beaver are discussed, in response to public interest and comments generated by the proposed</td><td>251</td><td>3-94c</td></tr>
</table>

<table>
<tr><th>Comment</th><th>DEIS page#</th><th>Response</th></tr>
<tr><td>action.
Table W-3: Featured Species Habitat
<table>
<tr><th>Featured Species</th><th>Habitat Requirements</th><th>Habitat Present In or near Analysis Area</th></tr>
<tr><td>Northern Goshawk</td><td>Mature, multi-storied ponderosa pine stands, or mixed conifer stands that are dominated by ponderosa pine</td><td>Yes, documented within or near vicinity of the project area</td></tr>
<tr><td>Blue Grouse</td><td>Clumps of mistletoe infected Douglas-fir on tops or upper slopes of ridges</td><td>Yes, upper elevations within project area</td></tr>
<tr><td>*Sage Grouse</td><td>Open sagebrush plains from 4000-9000 ft in elevation.</td><td>Yes, incidental observations, Logan Valley. See TES section.</td></tr>
<tr><td>Osprey</td><td>Large dead trees suitable for nesting (30”dbh greater than60’ in height) adjacent to or near large rivers or lakes</td><td>Yes, active nests documented on Big Creek in Logan Valley, and near Summit Prairie</td></tr>
<tr><td>*Pronghorn Antelope</td><td>Open grasslands, with low sagebrush being an important component</td><td>Yes, animals use area in vicinity of fen as fawning area; also observed along Summit Creek</td></tr>
<tr><td>California Bighorn Sheep</td><td>Alpine-desert grasslands associated with mountains, cliffs, foot-hills, and river canyons</td><td>No, the project area does not fall with suitable habitat for Bighorn sheep</td></tr>
<tr><td>*Upland Sandpiper</td><td>Large open mountane meadows and grasslands</td><td>Yes, potential habitat; historically nested in project area. See TES section.</td></tr>
<tr><td>*American Beaver*</td><td>Lower gradient perennial streams with riparian vegetation</td><td>Yes, present in several stream reaches</td></tr>
</table>
* American beaver are discussed, in response to public interest and comments generated by the proposed action
We are concerned by potential negative impacts to these “featured” species (Marked with an *) from alts 2, 3, and 4 and to Neo-tropical Migratory songbirds.</td><td></td><td></td></tr>
<tr><td>Table W-4: Neotropical Migratory Birds – Priority Habitat Features & Associated Focal Landbirds Species within Project Area
<table>
<tr><th>Habitat Type</th><th>Habitat Feature/ Conservation Focus</th><th>Focal Species</th><th>Potential Grazing Effects</th></tr>
<tr><td rowspan="4">Dry Forest Old Forest</td><td>* Large patches of old forest with large trees and snags</td><td>White-headed woodpecker</td><td>No impacts for conifer habitat impacts, associated with aspen habitat</td></tr>
<tr><td>Old forest with interspersion of grassy openings and dense thickets</td><td>Flammulated Owl</td><td>Yes</td></tr>
<tr><td>Open understory with regenerating pines</td><td>Chipping sparrow</td><td>Yes</td></tr>
<tr><td>*Patches of burned old forest</td><td>Lewis’ woodpecker</td><td>No impacts to confier habitat, impacts associated with</td></tr>
</table></td><td>252</td><td>3-94d</td></tr>
</table>

Comment				DEIS page#	Response
			aspen habitat		
Mesic Mixed Conifer Old Forest	Large snags	Vaux's swift	No		
	Overstory canopy closure	Townsend's warbler	No		
	Structurally diverse; multi-layered	Varied thrush	No		
	*Dense shrub layer in forest openings and understory	McGillivray's warbler	Yes		
	Edges and openings created by wildfire	Olive-sided flycatcher	No		
Montane Meadow	*Wet or dry open tracts of short grasslands	Upland sandpiper	No impacts for upland sandpiper, contigent on monitoring (see Design Elements)		
Shrub Steppe	Juniper, sage brush with small openings	Vesper sparrow	Yes		
Riparian Shrub	*Willow/alder shrub patches	Willow flycatcher	Yes		
Aspen	*Aspen stands	Red-naped sapsucker	Yes		
Neotropical songbirds of potential concern for us re: grazing impacts from alt 3, 4, and 2.					

Upland Sandpiper	Historically Present	TES section, historically present, current status unknown
Long-Billed Curlew	Present	See Landbird Discussion
Yellow-Billed Cuckoo	Present	Documented infrequently in Logan Valley, see Landbird Discussion
Flammulated Owl	Present	See Landbird Discussion
Black Swift	Absent	Outside Range of Project Area
Lewis' Woodpecker	Present	See TES section
Williamson's Sapsucker	Present	MIS - Primary Cavity Excavator Discussion, see Landbird Discussion
White-Headed Woodpecker	Present	See TES section
Olive-sided Flycatcher	Present	See Landbird Discussion
Willow Flycatcher	Suspected	See Landbird Discussion
Loggerhead Shrike	Suspected	See Landbird Discussion
Sage Thrasher	Absent	Outside Range of Project Area
Brewer's Sparrow	Present	See Landbird Discussion
Sage Sparrow	Absent	Outside Range of Project Area
McCown's	Absent	Outside Range of Project Area

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Comment	DEIS page#	Response
<table><tr><td>Longspur</td><td></td><td></td></tr><tr><td>Black Rosy-Finch</td><td>Absent</td><td>Outside Range of Project Area</td></tr><tr><td>Cassin's Finch</td><td>Present</td><td>See Landbird Discussion</td></tr></table> *Neotropical songbirds species and birds of conservation concern of particular concern to us re: grazing impacts from alt 2, 3, and 4 and other reasons for our concern re: impacts to neotropical migratory songbirds and birds of conservation concern.*		
<u>Gray Wolf:</u> <u>Alternative 2, 3 & 4</u> Direct and Indirect Effects Wolves are limited by prey availability and are threatened by negative interactions with humans. Generally, land management activities are compatible with wolf protection and recovery, especially actions that maintain ungulate populations. Elk populations on the Malheur National Forest are stable; within the project area, elk populations are at or slightly above management objectives set by Oregon Department of Fish and Wildlife (ODFW 2010). *Inadequate analysis re: potential impacts to wolves of alt 2, 3, and 4.*	254	3-95
<u>Greater Sage-Grouse:</u> <u>Alternative 2, 3 & 4</u> Direct and Indirect Effects No documented leks of greater sage-grouse males, hens, or hens with broods have been recorded within the project area. Incidental sightings of sage-grouse have occurred in vicinity of Flat Field, within the Logan Valley allotment. This area may have some of the higher potential for sage grouse use, given its lack of conifer encroachment and open grass and sagebrush habitat. *Greater Sage Grouse are on the verge of uplisting and now require detailed conservation plans. The following discussion fails to adequately analyze potential impacts to Greater Sage Grouse from alts 2, 3, and 4.*	256	3-96
Direct and Indirect Effects Impacts to silver-bordered fritillary caterpillars or habitat would depend on timing of cattle grazing, and concentration of animals within pastures containing preferred meadow habitat. Grazing may impact butterfly eggs, young, or food plants. Because of variations in dates of turn-out, not all areas of potential habitat would be impacted by cattle in a given grazing season. *Inadequate analysis of impacts to Silver-bordered Fritillary*	257	3-97a
Determination Grasshopper sparrow have not been documented within the project area. However, because meadow or grassland habitat exists within all of the allotments, there is potential for direct impacts to habitat from cattle grazing. However, not all habitat would be impacted concurrently throughout the project area, providing nesting and foraging habitat for grasshopper sparrow. The proposed alternatives May Impact Individuals or Habitat (MIIH), but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. *There is no attempt to quantify or qualitatively describe potential impacts of livestock grazing to Grasshopper Sparrow, Bobolink, Greater Sage Grouse, Silver-bordered Fritillary, et al.*	259	3-97b
If upland sandpipers are documented during these surveys, turnout would be postponed in order to allow nesting and incubation of upland sandpipers to occur without risk of trampling or disturbance. Foraging habitat is available in several pastures within Logan Valley. *So how is foraging habitat affected by livestock use? Why no discussion of that. Species need foraging habitat, not just nesting habitat.*	260	3-98
Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not	262	3-99

Comment	DEIS page#	Response
be expected to adversely affect populations of Lewis's woodpecker on the Forest. *Especially the combined effects would be expected to adversely affect populations of Lewis Woodpecker where ever there is livestock use continuing in historic aspen clone areas and existing Aspen stands.*		
Consequently, the proposed alternatives May Impact Individuals or Habitat (MIIH), but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. *By definition, mid to long term negative effects could contribute to a trend toward federal listing and loss of viability.*	263	3-100
Determination No surveys for Townsend's big-eared bat have occurred within the project area, however potential roost and foraging habitat does exist. Improvements to riparian vegetation would benefit Townsend's big-eared bat prey species. Lack of sapling recruitment within aspen stands continues to be an adverse impact from ungulate grazing. Conifer shading and competition with aspen compounds this problem. Depending on placement, wire fencing has potential to impale bats, directly impacting individuals. Direct impacts from fences could be minimized by making fences more visible (see Design Elements). *Once again, in the absence of population surveys for this species, there is no known viability threshold for the population and impacts could cause a trend toward uplisting.*	264	3-101
Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of Townsend's big-eared bat on the Forest. *Why not? What ate the cumulative other effects to Townsend's Big Eared bat? Why are these not analyzed? What about loss of snags? Disturbance of caves?*	265	3-102
Cumulative Effects Cumulative effects were analyzed at the project area level. All of the activities listed in Appendix C were considered for their cumulative effects on pallid bats or their habitat. *Inadequate Cumulative Effects Analysis for at least several species.*	265	3-102
<u>Alternative 1 - No Grazing</u> Direct, Indirect and Cumulative Effects Under the No Action Alternative, there would be no management activities, no grazing would occur on any of the allotments. Impact to upland and riparian forage and shrubs from domestic livestock would be eliminated. Lack of displacement or competition for forage from cattle, especially in meadow and riparian systems, could be beneficial for big game species. Competition between cattle and big game in and around water sources, both developed and undeveloped, would be eliminated. If interior fences are not removed, lack of maintenance of those fences could be detrimental if loose wire resulted in entrapped or injured animals. *Alt. 1 is also better for elk.*	268	3-104
Overall, the combined effects of the Summit Logan Valley Grazing Authorization Project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations of primary cavity excavators on the Forest. *What about cumulative effects to local populations of primary cavity excavators.*	274	3-105
Once beaver become established in an area, grazing management may become more critical. Beaver cut willows at the base, which stimulates suckering and growth, while tip browsing by both wild and domestic animals can arrest growth (Kindschy 1985). Heavy browsing by ungulates, in addition to riparian hardwood use by beaver, can be detrimental for shrub recovery (Baker 2003). However, beaver currently exist on both Lake Creek and Big Creek within Logan Valley, and their activities appear to be compatible with some level of cattle grazing. Willows and other hardwoods are present in both areas. *Failure to remove cattle from degraded riparian areas may result in not enough hardwood recovery to support beaver establishment, yet this is not discussed.*	276	3-106

Comment	DEIS page#	Response
Climate Change The effects of proposed livestock grazing on climate change, aren't measurable and are likely insignificant at the global scale. *This ignores the cumulative contribution of livestock grazing to climate change.*	282	3-107

3-1

Purpose and Need

The purpose and need for action is described in the DEIS in Chapter 1, pages 30 through 31. The purpose and need statement defines the scope and objectives of the proposal. It describes in detail why the action is being proposed. 40 CFR 1502.13 states that the environmental impact statement shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action. A well-written purpose and need statement narrows the range of alternatives that may need to be developed in the "alternatives" section. The purpose and need may be tiered to other EISs (such as the FEIS for the Malheur Forest Plan) that influence the scope of the analysis or support the rationale for the need for action (40 CFR 1502.20).

The no action alternative is required to be included in an EIS (40 CFR 1502.15). The No Action (No Grazing) alternative is discussed in the DEIS in Chapter 2, page 41 and substantial detail is included in the DEIS, Chapter 3 to compare its merits with other alternatives considered in detail.

3-2

Bull Trout

See previous responses 1-1, 1-2, and 1-8 related to bull trout. Improving resource conditions for aquatic habitat is part of the purpose and need for action identified in the DEIS, Chapter 1, pages 30 and 31. Bull trout critical habitat is a significant issue in the DEIS (see DEIS, Chapter 1, page 37). Your statement referencing INFISH is partially correct. INFISH Standard and Guideline (GM-1) states "modify grazing practices (e.g. accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect inland native fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objectives.

3-3

Vacant Allotments

Your concern regarding not grazing the existing vacant Lake Creek allotment was addressed in the range of alternatives considered in detail. In Alternative 3, the entire vacant Lake Creek Allotment would remain vacant with no authorized grazing proposed in the three existing grazing units (see DEIS Chapter 3, page 52). Alternative 4 proposes to add portions of the Lake Creek allotment to the Logan Valley allotment (see DEIS, Chapter 2, page 58). The areas containing critical bull trout habitat would remain vacant in both Alternatives 3 and 4. Table 2-36 (DEIS, Chapter 2, page 84) shows the acres that are currently vacant that would be shifted to active livestock use (would be grazed) and the miles of critical bull trout habitat that are currently vacant that would be grazed for each alternative studied in detail.

3-4

Economics and Reduce Livestock Numbers

The social and economic effects of the alternatives studied in detail are disclosed in the DEIS on pages 235-245. This section displays the construction costs of improvements associated with each alternative and also discusses how ranching contributes to the total core employment in Grant and Harney Counties. Additional information will be added to the FEIS to supplement the social-economics analysis.

3-5

Bull Trout Habitat

See previous responses 3-1 and 3-2 relating to bull trout habitat. Your concerns over aquatic habitat and bull trout habitat are addressed in the purpose and need statement and significant issues. The analysis tracks measures identified for the bull trout critical habitat significant issue and compares the effects for each alternative (see DEIS, Chapter 2, Table 2-36, page 83). The hydrology and aquatics effects analysis in Chapter 3 of the DEIS discloses in great detail the effects of alternatives on bull trout and bull trout habitat (see DEIS, Chapter 3, pages 142 through 214.

3-6

Livestock Distribution and Riparian Impacts

Your concerns regarding distribution of livestock riparian impacts are addressed in the alternatives by controlling the timing, frequency, duration, and intensity of grazing. The alternatives propose different types of actions to control these factors. These include combinations of grazing systems, allowable grazing use levels, pasture rest, pasture configurations (construction of riparian pastures and exclosures), livestock numbers and grazing season, allotment boundary changes, and herding (riding) practices. The specific actions proposed are disclosed in DEIS, Chapter 2, pages 43 through 63. All action alternatives are based on “adaptive management”. Adaptive management is explained in detail in the DEIS, Chapter 2, pages 41 through 42. In summary, the adaptive management process provides the flexibility to adapt or change management practices based on monitoring to ensure that riparian recovery objectives are being achieved in a timely manner. Adaptive management strategies that may be used with each alternative are identified in DEIS, Appendix A (part 3).

Alternative 2 is the only alternative that proposes spring developments in the Bosenberg Creek drainage. The effects are described on DEIS, Chapter 3, pages 191 and 192.

Specific Design Criteria to reduce impacts of spring developments and water gap construction are listed in DEIS, Chapter 2, Table 2-35, pages 71-73 and 76-77.

3-7

Misc. Concerns

Your comments are addressed specifically in other comment responses.

3-8

Socioeconomic, Endangered Species Act, Clean Water Act

These concerns are addressed specifically in future comment responses.

3-9

Inadequate Cumulative Effects Discussions

Each resource section in Chapter 3 discusses the cumulative effect of the alternatives proposed. Appendix C of the DEIS contains a list of past, present or ongoing, and foreseeable future projects or activities considered in the cumulative effects analysis. Additional cumulative effects analysis will be added to some sections in the FEIS. More detailed responses are provided on future comments.

3-10

Misc. Wildlife Species Concerns

Your comments regarding specific wildlife and aquatic species are addressed where you provided more detailed hand written notes on the DEIS.

3-11

Forest Plan Amendments

See previous comment response 1-4.

3-12

Forest Plan Amendments

See previous comment response 1-4.

3-13

Issues Eliminated

To address your comment the issues eliminated from detailed study along with the discussion of why these issues were eliminated will be added to the FEIS.

3-14

Significant Issues

A range of alternatives developed meet the purpose and need and address the two significant issues identified and discussed in Chapter 1 of the DEIS. Forest Service regulations specify that an alternative should meet the purpose and need and address one or more significant issues related to the proposed action. Since an alternative may be developed to address more than one significant issue, no specific number of alternatives is required or prescribed. Chapter 3 of the DEIS discloses the environmental consequences of the significant issues; consistency with the Forest Plan as amended by INFISH; and consistency with applicable laws, including the Endangered Species Act and Clean Water Act. Consultation with US Fish and Wildlife Service will be initiated prior to signing of a NEPA decision on federally listed bull trout and critical habitat to meet the Endangered Species Act (ESA) requirement. See comment response 3-78 for more information.

3-15

Forest Plan Consistency

The wording in the FEIS will be clarified. Alternatives 2, 3, and 4 propose amendments to the Malheur Land and Resource Management Plan as amended by Amendment #29. Specifically the numeric value for shade in hardwood/meadow complexes from Forest Plan Amendment #29 would be modified for site specific stream reaches so that the alternatives are consistent with the Forest Plan as amended. See previous response 1-4 for more detail on the proposed amendment.

3-16

Clean Water Act Consistency

The Existing Condition Section discusses the upward trends measured in riparian plant communities and channel form that have contributed to improving water temperatures. Immediate adjustments in the timing, intensity and duration of livestock grazing occurred after the 2007 PFC inventories identified issues. Please see the Environmental Consequences Section on pages 175 through 213 where it discusses the various configurations of livestock management and how it affects riparian vegetation, channel form and water temperatures. The action alternatives contain a monitoring strategy that utilizes site-specific management objectives. These objectives would ensure that each site remains on an upward trend towards desired condition. Adaptive management strategies are present to ensure that management continues to trend upwards if monitoring indicates that the condition is trending away from desired condition.

3-17

Sensitive Species Effects

Based on this comment, additional or expanded analyses will be considered in preparation of a Final Environmental Impact Statement (FEIS). Also, existing and future monitoring will trigger adaptive management strategies that will “protect” sensitive species if they are being negatively impacted (DEIS Chapter 2, pages 47, 54, 61, and 81; Chapter 3 page 133; Appendix A, Part 1, pages 318 and 319; Appendix A, Part 2, pages 328 and 329; Appendix A, Part 3, page 334).

3-18

Loss of Viability

This comment will be addressed in more detail in future responses.

3-19

Past Grazing Utilization Standards

This section is an overview of the history of livestock grazing management. Although science indicates that there can be a correlation between forage, browse use, and stream bank alteration and the riparian condition, there other important factors to consider. These include the potential vegetation, type of stream channel, and the condition of the stream. Pages 177 through 180 of the DEIS describe the science behind various numeric ranges of use levels. Appendix A, Part 1 shows the existing and desired condition, vegetation community potential for the stream reaches in the project area. Appendix E shows the proposed move triggers and allowable use levels by alternative and pasture. DEIS page 375 describes the process in which the use levels were established for this proposed project.

3-20

Sediment

Providing adequate vegetative stubble along the greenline functions to ensure plant health is maintained and to provide floodplain roughness. The DEIS addresses how vegetative stubble filters sediment as snowmelt floods spill across the floodplain. This builds the floodplain and narrows the channel, ultimately offering cool, clean water important for biologic communities native to the Project Area. Please refer to DEIS, Chapter 3, Hydrology and Aquatics, Livestock Grazing, pages 177 through 182.

3-21

Deferred Rotation Grazing

This wording will be clarified in the FEIS.

3-22

No Grazing of Riparian Zones

Your comment recommending keeping all livestock out of the riparian zones is noted. This alternative will be added to the FEIS as an alternative considered but eliminated from detailed study. We feel that the purpose and need and significant issues identified in Chapter 1 can be addressed with the strategies proposed in the action alternatives that address the timing, duration, and frequency of grazing in riparian areas without removing livestock entirely from all riparian zones. These strategies vary by alternative and include periodic rest of riparian areas, fencing to create riparian pastures and exclosures to better control the duration and frequency of grazing, variations in use levels and move triggers, and herding techniques such as daily riding to move livestock away from riparian areas.

3-23

Rest of Riparian Areas

The West Bosenberg, West Lake Creek, and West summit Recovery unit pastures would be rested for 3-5 years in all alternatives. Grazing would resume after management objectives have been achieved. In the DEIS, “management objective” is defined as conditions that have resilient vegetation and stream characteristics capable of withstanding disturbance and moving towards the desired condition when grazing is resumed”. Site specific management objectives by time periods are shown in Appendix A (Part 2). If it is determined through monitoring that management objectives are not being achieved through the actions prescribed, then the respective adaptive management strategy would be applied to accelerate recover. Adaptive management strategies are shown in Appendix A (part 3).

3-24

Range of Alternatives

Your comment on inadequate range of alternatives is being made on the first few pages of the effects analysis in Chapter 3, in a specific section describing the direct and indirect effects related to rangeland vegetation that are common between all action alternatives. We encourage you to review the entire effects analysis chapter. Other sections point out the differing effects of the alternatives studied in detail.

3-25

Big Creek Riparian Pasture

Gates are left open and additional holes in the fence allow for livestock movement between pastures.

3-26

Define Let-Down Fence

Let-down fence: Is a three or four-strand fence that can be laid down as a unit but remains under tension. Also known as a lay-down or snow fence, is commonly used in mountainous areas where snow packs for four feet or more commonly loosen or breaks wires and pull over posts. This definition will be added to Appendix D (Definition of Terms).

3-27

Available Forage to Support AUMs

This analysis is provided in the DEIS, Chapter 3, Forage Production and Stocking Rates Analysis, pages 100 through 102. The analysis on forage production and stocking rates will be supplemented in the FEIS. See previous response 1-13 for additional information.

3-28

Cumulative Effects

Table 4 describes the ongoing activities in the Logan Valley Allotment and their general effects. As stated in the text above the table, “additional cumulative effects discussions are provided for each specific alternative”.

This section is specifically discussing the cumulative effects on rangeland vegetation and rangeland management. Future sections in the DEIS document discuss the cumulative effect to wildlife, bull trout, riparian species, and sedimentation.

See previous response 3-9.

3-29

No Action

You are correct, No Action is “no grazing” in this analysis.

3-30

Noxious Weeds- Beneficial Direct and Indirect Effects of No Action

The DEIS, Chapter 2, page 41 states that the no action alternative is interpreted as “No Grazing”.

Direct, Indirect, and Cumulative effects are defined as:

- **Direct effects** are caused by the **action** and occur at the same time and place. (40 CFR § 1508.8)
- **Indirect effects** are caused by the **action** and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related

effects on air and water and other natural systems, including ecosystems. (40 CFR § 1508.8) Indirect effects and secondary effects are used interchangeably by FHWA.

- **Cumulative impact** is the impact on the environment, which results from the incremental impact of the **action** when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR § 1508.7

The no action alternative does not propose any actions, so based on the above definitions there would be no direct, indirect or cumulative effects. We do acknowledge that there would be beneficial outcomes or consequences from removing grazing and grazing allotment management that relate to noxious weed spread. In the FEIS we will discuss these.

3-31

Analytic Support for Conclusions

Based on your comment the noxious weeks analysis will be supplemented in the FEIS.

3-32

Noxious Weed Cumulative Effects

Some foreseeable actions were not addressed in the noxious weeds cumulative effects analysis. These will be addressed in the FEIS.

3-33

Eliminated Grazing from Sensitive Species Habitat

See response 3-35.

3-34

Why is the Existing and Desired Condition Table an Appendix?

We chose to make the Existing and Desired Condition table (Appendix A, Part 1) an appendix primarily because of its size. The table is 14 pages.

3-35

Sensitive Plant Effects Rationale

Based on this comment, additional or expanded analyses will be considered in preparation of a Final Environmental Impact Statement (FEIS). Also, existing and future monitoring will trigger adaptive management strategies that will “protect” sensitive species if they are being negatively impacted (DEIS Chapter 2, pages 47, 54, 61, and 81; Chapter 3 page 133; Appendix A, Part 1, pages 318 and 319; Appendix A, Part 2, pages 328 and 329; Appendix A, Part 3, page 334).

3-36a

Fen

Based on this comment, additional or expanded analyses will be considered in preparation of a Final Environmental Impact Statement (FEIS). Also, existing and future monitoring will trigger adaptive

management strategies that will “protect” sensitive species if they are being negatively impacted (DEIS Chapter 2, pages 47, 54, 61, and 81; Chapter 3 page 133; Appendix A, Part 1, pages 318 and 319; Appendix A, Part 2, pages 328 and 329; Appendix A, Part 3, page 334).

3-36b

Management Objectives

The bulleted management objectives were determined by information provided in Weixelman & Cooper (2007) as cited in DEIS Appendix A, Part 2, pages 328 and 329. Based on the comment received on the DEIS, additional or expanded information will be considered in preparation of a Final Environmental Impact Statement (FEIS).

3-37

Sensitive Plant Cumulative Effects

Based on this comment, additional consideration will be included in the Final Environmental Impact Statement (FEIS).

3-38

Lake Creek Allotment

The soil scientist did not visit the Lake Creek Allotment because he was checking on how commonly current livestock use increases erosion, and Lake Creek Allotment does not have current livestock use.

3-39

Misc. Comments on Soils

Detrimentally impacted soil around salting grounds and water troughs is usually less than 3 acres. In response to this comment, the Soil Specialist Report was clarified regarding soil impacts in grassy riparian areas, with a description of the calculation.

Typos in Table S-2 are corrected in the FEIS. The difference between the two clusters is that one was seeded. Ground cover on C & T clusters is estimated from transects, not photos.

In this context, "minor," "slightly," and "negligible" mean causing no significant effects.

3-40

Current Levels of Soil Compaction

Soil effects of past and current grazing are described in the Soil Affected Environment section. Effects to other resources are described in the appropriate sections of this EIS.

3-41

Soil Compaction Cumulative Effects

The Soils Specialist Report has been revised to clarify the probable maximum level of compaction on the allotments, as described in the response to Comment 3-39. As described in the Soil Regulatory Framework section, compaction and puddling decrease infiltration and productivity, and thus they can affect ground cover and erosion. Ground cover and erosion are described in the Soil Affected

Environment section. As described in the Environmental Consequences section, decreased grazing (compared to current grazing) would cause decreased effects, and vice versa.

3-42

Herbicide Use Cumulative Effects

Effects of herbicide use would be disclosed in that Environmental Analysis. It is unlikely that invasive plant treatments would increase erosion, even if an occasional mistake is made, because the individual areas treated would be small.

3-43

Define Term (Slightly)

In this context, "minor," "slightly," and "negligible" mean causing no significant effects.

3-44

Request for Specialist Reports and Biological Evaluations

Appendix F containing Specialist Reports has been mailed to you.

3-45

Forest Plan Grazing Use Levels

This is explained in DEIS, Chapter 3, Range Vegetation, Grazing Utilization Standards (History), pages 98 through 99.

3-46a

Regulatory Framework

This is explained in the Inland Native Fish Strategy direction that amendment the Malheur Forest Plan. Standard and Guideline GM-1 states “modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect inland native fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objectives. As stated in previous responses all action alternatives are based on “adaptive management”. Adaptive management is explained in detail in the DEIS, Chapter 2, pages 41 through 42. In summary, the adaptive management process provides the flexibility to adapt or change management practices based on monitoring to ensure that riparian recovery objectives are being achieved in a timely manner. Adaptive management strategies that may be used with each alternative are identified in DEIS, Appendix A (part 3).

3-46b

303(d) listed streams

All streams listed for stream temperature were de-listed from the 303(d) list when EPA accepted the 2010 DEQ Integrated Report as identified in the DEIS on page 146. Please see comment 1-12 about the newly added 303(d) listed stream in the Project Area since the DEIS was released to the public for comments.

3-46c

Clean Water Act

The USFS is responsible for complying with the Clean Water Act and the Total Maximum Daily Load for temperature through development of the Water Quality Recovery Plan (WQRP). The WQRP has not been developed yet, but Proposed Alternative is compliant with the framework of the WQRP identified in the DEIS on page 214. Please also refer to comments 1-12 and 3-16.

3-46d

Stream Temperature and Shade

The Clean Water Act is implemented through the Oregon Department of Environmental Quality (DEQ). DEQ has jurisdictional authority for establishing how water temperature will be measured and reported. This comment is outside of the scope of this analysis. Please refer DEIS, Chapter 3, Hydrology and Aquatics, Clean Water Act, pages 145 through 146.

3-47a

Bull Trout Habitat

Your comment has been addressed in several previous responses. See specifically responses 1-1, 1-2, and 3-3.

3-47b

Riparian Management Objectives

The affected environment and effects to bull trout and bull trout critical habitat are discussed in detail in DEIS, Chapter 3, Hydrology and Aquatics, pages 156 through 214.

3-47c

Stream Shade

Improving resource conditions for aquatic habitat is part of the purpose for the project. Specifically the DEIS on page 31 states that there is a need to improve aquatic habitat in Lake Creek, Big Creek, and Summit Creek to support all life stages of bull trout. This includes improvements in riparian vegetation and hardwoods to enhance stream shade, temperature, riparian composition and vigor and streambank stability. All action alternatives were developed to meet the purpose and need considering the existing and desired condition of specific stream reaches shown in Appendix A (Part 1). The effects of proposed alternatives on shade and stream temperature is specifically addressed in the DEIS, Chapter 3, Hydrology and Aquatics, pages 156 through 214.

See Response 3-46a

3-47d

Permanent Exclusion of Livestock

Permanent exclusion of livestock is only one of the protection and recovery guidance measures recommended in the Bull Trout Recovery Plan. This measure is recommended for riparian habitat protection zones or streambank areas at high risk and with poor recovery potential when there is no practical way to protect them when grazing uplands. The plan recommends several other measures which

includes fencing and herding livestock out of riparian area for as long as necessary to allow vegetation and stream banks to recover; controlling the timing of grazing; adding more rest to the grazing cycle to increase plant vigor, allow stream banks to heal, or encourage more desirable plant species composition; limiting grazing intensity to a level that would maintain desired species composition and vigor. These are all tools considered and applied in the various alternatives studied in detail in the Summit Logan analysis. The recovery plan also recommends implementing monitoring and implementing changes consistent with the results. This is consistent with the monitoring and adaptive management strategies that are part of each alternative.

3-48a

Analysis Methods

The Analysis Methods Section identifies the strengths and weaknesses associated with the different inventory and monitoring methodologies that were used for this project. Proper Functioning Condition (PFC) was implemented first in 2007 and is a qualitative protocol for determining issues. Then, detailed quantitative monitoring through Pacfish/Infish Biological Opinion (PIBO), Multiple Indicator Monitoring (MIM) and Carex Working Group datasets informed the interdisciplinary team of the existing, desired condition and any trends; please see pages 164 through 175 for information pertaining to inventories and monitoring in the Project Area. Information was collected for previous timber sales or other projects that may only be applicable for certain allotments. Also, protocols change as they are improved for better accuracy and repeatability. Having a consistent set of inventory and monitoring data is extremely helpful, but typically is not available. The information available for this project is more than commonly available for a similar analysis.

3-48b

Rates of Recovery

The DEIS discusses the assumptions used to evaluate the various action alternatives and their unique rate of recovery. In the DEIS on pages 152 through 156, it outlines the best available science and professional judgments used to develop these assumptions. Essentially, the basic building blocks of good aquatic habitat is vegetation and is affected by livestock grazing primarily through herbivory (i.e. eating plants). Vegetation improvements narrow the channel that affect shade, water temperature and overall aquatic habitat for the viability of bull trout and other aquatic organisms; please see Figure 1 on page 154 of the DEIS. Varying levels of livestock management changes were analyzed across the alternatives. These variations were derived from different use levels, rest periods, and adaptive management strategies.

3-48c

Rates of Recovery (Data)

Best scientific articles, quantitative site specific measurements and professional judgment were used to develop monitoring objectives within Appendix A part 2 as discussed in the DEIS on pages 149 through 156. Please refer to comment 3-152 for additional information that pertains to rates of recovery.

3-48d

Would the Desired Condition be Reached

With the prescribed monitoring and adaptive management strategies the desired condition would be achieved. If it is determined that the resumption of grazing within a specific pasture is not allowing

objectives or desired future condition to be achieved through the actions prescribed in a timely manner, then the pre-determined adaptive management strategy would be applied to allow continued recovery.

3-48e

Rates of Recovery

The DEIS at page 155 discusses when riparian vegetation and channel characteristics are in balance and composed of resistant vegetation, risk of the system unraveling is decreased and recovery is more likely. Furthermore, on page 177 of the DEIS it discusses "general effects would be lessened annually or not measureable if a site is at greater than PFC and the existing condition is very close to the desired condition. If a reach is below PFC and there is large departure from desired condition, then the annual effects will be exacerbated. This is because the vegetative and channel attributes are not resilient enough to provide channel stability.

3-49a

Stream Temperatures

Temperatures across the project area are higher than desired. The purpose and need in Chapter 1 under Aquatic Habitat states that there is a "need to improve aquatic habitat in Lake Creek, Big Creek, and Summit Creek to support all live stages of bull trout. This includes improvements in riparian vegetation and hardwoods to enhance stream shade, temperature, riparian vegetation composition and streambank stability". The alternatives proposed in Chapter 2 of the DEIS were develop to address the purpose and need. See response 3-47c.

3-49b

Bull Trout Spawning

Spawning surveys have been ongoing in the project area as a partnership with the Oregon Department of Fish and Wildlife and the Burn Paiute Tribe. Additional spawning survey data is available and will be added to the FEIS.

3-50

Passage Barrier

The passage barrier has been removed and replaced with a bridge.

3-51

Bull Trout Recovery Plan

In reviewing your comments on the DEIS we noted some citation errors related to the Bull Trout Recovery Plan. These will be corrected in the FEIS and References Cited (Chapter 5).

3-52

Lake Creek Diversion

No measures have been implemented to address this diversion.

3-53

Restoration

See previous response 3-47c.

3-54

Don't Reopen the Lake Creek Allotment

See previous response 3-3.

3-55

Fish Barrier

The barrier is an old railroad grade. It is potentially removable at a high dollar cost because of the large amount of material fill that would need to be removed over the barrier.

3-56

Stop Irrigation Withdrawals

Stopping irrigation withdrawals is not within the scope of this analysis. This is a state regulated process.

3-57

Beaver Introduction

Including beaver recovery projects was an alternatives considered from detailed study.

3-58

South Summit Unit

More information will be supplemented (added) to the FEIS regarding why the South Summit Unit will not be analyzed. The South Summit Unit contains approximately 20 feet of stream access and did not have issues identified during PFC inventories. It is utilized as a livestock watering access point. No management options are present other than to provide access to water. Therefore, the South Summit Unit will not be analyzed in the proceeding sections.

3-59

Proper Functioning Condition (PFC)

DEIS, Chapter 3, Tables A-11, A-12, A-13, and A-14 disclose the expected recovery for PFC Ratings by grazing unit for the alternatives (including No Action). Table 2-36, Summary Comparison of Alternatives, compares the rates of recovery by showing the miles of critical habitat expected to achieve PFC in 5 years and 10 years.

3-60

High Water Temperatures

See previous responses 3-46c, 3-46d, and 3-81.

3-61

Culvert Barriers

The Existing Condition Section identifies passage barriers that restrict aquatic habitat from being utilized in various reaches in the Project Area, please see the DEIS in pages 156 through 175. The DEIS on pages 30 through 31 define the purpose and need of the proposed action as two-fold; meeting the Rescission Act and Aquatic Habitat. The Aquatic Habitat purposes of the proposed action are defined in the DEIS on page 31 as improvements in riparian vegetation, channel form and water temperatures.

3-62

Wolves

Returning wolves is outside the scope of this analysis.

3-63

Bank Alteration

The Monitoring Section of the DEIS at page 80 identifies Multiple Indicator Monitoring (MIM) as the monitoring tool to address implementation indicators including bank alteration. In the MIM Technical Reference (Interagency Technical Reference 1737-23), it discusses bank alteration as "an estimate of the percent of the length of bank altered along the greenline based on the presence or absence of a hoofoprint(s) intercepting one (or more) of the five lines within a plot". Also, the MIM monitoring frame is 2100 cm^2 and the average cattle hoof is 208 cm^2. If one hoof intercepts one of the five lines, then 20% alteration would be recorded for that plot.

3-64

Bull Trout Habitat

See responses 1-2.

3-65

Foreseeable Activities

Thanks you for your comment. Minor supplements to the cumulative effects section will be made in FEIS.

3-66

Big Creek

This section discloses the effects of Alternative 2 on riparian habitat and bull trout critical habitat. See future response 3-71.

3-67

Critical Bull Trout Habitat and Vacant Allotments

See previous response 3-3.

3-68

Bosenberg Unit Spring

See previous response 3-3. Alternative 2 is the only action alternative that proposes to initiate grazing within the currently vacant Bosenberg unit. In Alternative 2 the headwater spring source would be developed with specific design criteria that would fence the spring source and pipe water to troughs located a minimum of 300 feet from the spring (See DEIS, Chapter 2, Design Criteria, page 71).

3-69

Definition of Measurable and Effects from Fence Removal

A definition of measureable will be added to the FEIS. The ground disturbing impacts from removal of 0.7 miles of fencing would not affect shade or add measureable sediment contributions to surface waters or degrade aquatic habitat.

3-70

PFC as Trigger

The Analysis Methods Section of the DEIS at pages 149 through 156, discuss how PFC and Desired Condition were used as indicators for the Bull Trout Critical Habitat significant issue. It also discusses how the PFC condition is directly linked to livestock grazing and aquatic habitat. The DEIS Summary (page 15 through 16), and Chapter 2 (page 83) compares the alternatives relative to the significant issue measures.

3-71

Why Consider Alternative 2

Alternative 2 is the proposed action that was developed to address the purpose and need for action. In the analysis process public comments/concerns were requested on the proposed action. Two significant issues were identified from public comments and were used to develop alternatives to the proposed action. All of the alternatives studied in detail (including the proposed action) address the purpose and need for action. However, the alternatives to the proposed action (Alternatives 3 and 4) were developed to respond to one or more of the significant issues. As stated in Response 3-14, Forest Service regulations specify that an alternative should meet the purpose and need and address one or more significant issues related to the proposed action. Combined the alternatives provide a range of alternatives for analysis and consideration by the Deciding Official. A reasonable range of alternatives is required by Regulation.

3-72

Optimistic Assumptions

The Hydrology and Aquatics Effects Section in the DEIS on pages 175 - 212 discusses how various management actions, including creation of riparian pasture, and reduction in annual use levels will influence the attributes used to rate PFC and Desired Condition identified in Appendix A, Part 1 (DEIS on pages 307-320). The analysis prioritizes discussion of the attributes that were considered deficient to provide a functioning condition or desired aquatic habitat.

3-73

Define Symbols in Table

A footnote will be added at the bottom of the table to define symbols (>PFC and >>PFC).

3-74

Alternative 1 (most ecological alternative)

Your preference for Alternative 1 is acknowledged. In making a decision the effects on the physical, biological, and social environments disclosed in the FEIS will be considered.

3-75

Prairie Riparian Pasture

The Hydrology and Aquatics Effects Section discusses resting the Prairie Riparian Pasture for an immediate 3-5 years or until management objectives have been met in the DEIS on pages 209 through 211. The objective is to ensure the riparian area is functioning properly and resilient prior to resuming livestock grazing in this pasture.

3-76

Minimizing Effects

More effects rationale for these species will be provided in the FEIS.

3-77

Why Is Alternative 4 the Preferred Alternative

Alternative 4 was identified in the DEIS as the agency preferred alternative. A brief rationale of why Alternative 4 was identified as the preferred alternative was provided in the cover letter mailed with the DEIS. The letter states that “Alternative 4 was developed using public scoping comments and recommendation from Summit Prairie Allotment grazing permittees. I feel that Alternative 4 addresses the significant issues identified during scoping and provides a good balance between improving critical bull trout habitat for threatened bull trout and addressing the economic impacts to permittees and the local economy”. Although Alternative 4 was identified as the preferred alternative in the DEIS, public comments and changes made between the draft and final EIS will be taken into consideration in making a final decision.

3-78

Endangered Species Act

Some errors have been noted in this section and will be corrected in the FEIS. The Endangered Species Act (ESA) requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the U.S. Fish and Wildlife Service (FWS) if a proposed activity may affect the population or habitat of a listed species. Preparation of a Biological Assessment for initiation of formal ESA section 7 consultation with the FWS is expected to occur prior to signing a Record of Decision. Federally listed fish species and their proposed or designated critical habitat in the project area subject to consultation include bull trout and their critical habitat.

3-79

Floodplains

The Hydrology and Aquatics Effects Section addresses how use levels specific for bank alteration will affect the channel form indicators greenline to greenline width and width/depth in the DEIS on pages 175 through 213. No structures are being established on the floodplain that would affect flooding severity downstream.

3-80

Consistency With The Forest Plan

See response 3-15. Wording in the FEIS will be clarified to address your comment.

3-81

Clean Water Act – Temperature

The Hydrology and Aquatics Affected Environment Section (pages 156 - 174) addresses how there have been documented improvements in the trend of some attributes since PFC inventories started in 2007. Management objectives (Appendix A, Part 2; DEIS pages 321 – 329) were developed for the attributes where differences occur between the existing and desired condition. The management objectives will also serve to ensure the condition is maintained in a stable condition or improved on an upward trend. Monitoring (DEIS pages 77 – 81) will be implemented on 5 and 10 year time scales to document the response of riparian condition attributes and compare the management objectives to the monitored dataset. Adaptive management strategies (Appendix A, Part 3; DEIS pages 330 – 334) are in place to induce management changes if the trend is not upward due to livestock management. We believe the alternatives are consistent with the Clean Water Act through demonstrating that the trend is upward, or management changes will occur to ensure that stream temperatures improve towards desired conditions identified in the Malheur TMDL.

3-82

Forest Niche

Some additional information will be added to the FEIS. Forest Niche conforms to direction established by the Forest land and resource management plan to prepare a facilities master plan. Niche can be thought of as a unique or special location, opportunity, or zone that contributes to the provision of highly valued experiences or significant benefits that, for Recreation Site Facility Master Planning, is expressed in terms of “Settings, Special Places, Values, Opportunities, Activities, and Primary Customers”. Niche is where the broader agency mission or role is narrowed to deliver specific experiences and benefits on a unit. A niche is the area (can be a geographic and/or an opportunity area) of specific focus within which the unit is most suited to add value to the agency and society, and from which features in recreation sites “facilitate” the unique opportunities, activities, experiences, and benefits.

The niche is based on analyzing the market demand (what people want) and the supply (what we have) with the recreation opportunity market “niche” the National Forest unit best serves as a result of the unit capability (supply) and sustainability (financial, environmental, and community). The fundamental basis for identifying the unit niche is determining and analyzing the demand/supply ratio for the unit recreation sites and the market for the use of those sites. It is the sites and facilities that are to be evaluated during facility master planning.

3-83

Livestock Visitor Impacts

The effects of grazing on developed recreation sites, dispersed recreation sites, snowmobile trails, bike trails, and other recreation activities are disclosed in the DEIS, Chapter 3, pages 215 through 224.

3-84

Livestock in Developed Campgrounds

Wording in the FEIS will be clarified. The Lake Creek allotment is east of Murray Campground. The Lake Creek allotment has been vacant with no grazing for over 20 years. The livestock that have periodically entered the campground have come from an allotment to the northwest, outside the Summit Logan Project area. These are unauthorized livestock that have entered the campground by going around or through an allotment boundary fence.

3-85

Dispersed Recreation and Grazing Cumulative Impacts to Riparian Areas

The cumulative impacts of dispersed recreation and riparian areas are discussed in the DEIS, Chapter 3 on pages 184 through 188.

3-86

Recreation Event

Changes to this wording will be made in the FEIS. A special use permit for the horse group has been authorized on a year by year basis. The group has requested this permit for a couple of events over the last decade. The permit does not authorize grazing and requires the group to supply their own weed free hay for their horses.

3-87

Communities Affected Economically

The DEIS on page 236 states that the local communities within an hour or two drive that are anticipated to be directly or indirectly affected by the proposed action, alternatives, and their associated economics include: Prairie City, Burns/Hines, Dayville, John Day/Canyon City, Long Creek, Mount Vernon, Monument, Seneca, Sumpter, and Unity. Larger City such as LaGrande, Ontario, Bend, and Pendleton are identified as larger towns and cities two or more hours way from John Day. The DEIS does not state that the larger cities are likely to be affected.

3-88

Livestock grazing is subsidized on public lands

The Federal grazing fee, which applies to Federal lands in 16 Western states on public lands managed by the BLM and the U.S. Forest Service, is adjusted annually and is calculated by using a formula originally set by Congress in the Public Rangelands Improvement Act of 1978. Under this formula, as modified and extended by a presidential Executive Order issued in 1986, the grazing fee cannot fall below $1.35 per animal unit month (AUM); also, any fee increase or decrease cannot exceed 25 percent of the previous year's level. (An AUM is the amount of forage needed to sustain one cow and her calf, one horse, or five sheep or goats for a month.)

The Federal grazing fee is computed by using a 1966 base value of $1.23 per AUM for livestock grazing on public lands in Western states. The figure is then adjusted each year according to three factors – current private grazing land lease rates, beef cattle prices, and the cost of livestock production. In effect, the fee rises, falls, or stays the same based on market conditions, with livestock operators paying more when conditions are better and less when conditions have declined.

3-89

Ecological Impacts Outweigh Economic Gain

The effects section in an EIS describes the impacts of proposed alternatives on the environment and documents the methodologies used in evaluating these impacts. Information in this section is used to compare project alternatives and their impacts. 40 CFR 1508.8 requires discussions of direct, indirect, and cumulative effects. Effects to be discussed include ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. In making a final decision all impacts of proposed alternatives will be considered.

3-90

Confederated Tribes of Warm Springs

DEIS, Chapter 1, page 35 describes the ongoing tribal consultation that is occurring with the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of Warm Springs Reservation.

3-91

Biological Evaluation

We have mailed you a hard copy of the Biological Evaluation as requested.

3-92

Canada Lynx

The Malheur National Forest worked with USFWS personnel to develop a comprehensive sampling grid to conduct lynx hair snare surveys forest-wide as part of the USFWS National Lynx Survey (1999-2001). Training for set up of hair snare sites and hair sample collection protocols were provided by USFWS. Supplemental funding for personnel, equipment and materials to support the study were provided to the forest. Hair samples collected at survey sites and sent in for analysis ranged from coyote, bobcat, black bear, cougar and other animals. No samples of lynx hair were collected. Based on the results of these surveys, the USFWS has designated the Malheur National Forest as unoccupied mapped lynx habitat (USFWS 2006). The Lynx Conservation Assessment and Strategy (LCAS) applies to occupied lynx habitat. Compliance with section 7(a)(2) of the Endangered Species Act is not required for lynx on national forests determined to be unoccupied by lynx (USFWS 2006).

3-93

Population Surveys and Studies

The feasibility of comprehensive population and distribution studies for all wildlife species addressed in this DEIS is limited, in part due to the personnel and funding needed for systematic survey efforts, as well as the detectability of the animals themselves (bats, for example). Rather, effects on habitat are discussed, with the assumption that if appropriate habitat is available for a species, then that species occupies or

could occupy the habitat. This strategy is based on science that demonstrates connections between species populations and the quantity and condition of habitat at appropriate scales of analysis (Baydack et al. 1999 in USFS Thorn Fire Salvage Recovery Project FEIS 2008).

Within the project area, species presence/absence determinations were based on habitat presence, review of recorded wildlife sightings in District and Forest wildlife databases, the National Resources Information System (NRIS) Wildlife database, non-Forest Service databases, Oregon Department of Fish and Wildlife reports, as well as notes, maps, and summary reports of wildlife observations made during field reconnaissance for several smaller projects in the area in 2011, with some follow-up visits early spring 2012.

Improvements in riparian and upland vegetation, which is the desired future condition for all action alternatives, would result in improved habitat for all of the wildlife species discussed. Monitoring would be critical to determine if the desired outcome is occurring. Benchmarks are established to provide a measure for meeting these goals (See Appendix A, DEIS). Adaptive management strategies are to be implemented if target outcomes are not being achieved in a timely manner. Monitoring of these adaptive management strategies would also be required. Adaptive management strategies range from additional fencing to reduction in numbers of cattle, and are discussed in Chapter 2 (page 41) and Appendix A (Part 3) of the DEIS.

3-94a

Management Indicator Species- Elk

See Wildlife Specialist Report: The Murderer's Creek and Malheur River Big Game Management Units are sufficiently large to provide for existing populations of big game. Elk populations have remained stable, meeting or exceeding ODFW management objectives. Elk distribution may shift depending on various configurations of the allotments and where cattle are grazing at any given time and place within the Summit Logan Valley Grazing Authorization Project area. However, the proposed alternatives would not be expected to affect elk population numbers or viability at the Forest level.

Improvements in riparian and upland vegetation, which is the desired future condition for all action alternatives, would result in improved habitat for all of the wildlife species discussed, including forage availability for elk. Monitoring would be critical to determine if the desired outcome is occurring. Benchmarks are established to provide a measure for meeting these goals (See Appendix A, DEIS). Adaptive management strategies are to be implemented if target outcomes are not being achieved in a timely manner. Monitoring of these adaptive management strategies would also be required. Adaptive management strategies range from additional fencing to reduction in numbers of cattle, and are discussed in Chapter 2 (page 41) and Appendix A (Part 3) of the DEIS.

3-94b

MIS Woodpecker Associated with Aspen

See Wildlife Specialist Report for more information.

Based on this comment, an additional recently fenced aspen stand in vicinity of the fen would be added to the aspen monitoring plan. This would allow us to evaluate aspen recruitment and sucker/sapling growth within a stand protected by 4-wire fencing.

This information will be updated in the aspen monitoring plan and included in the FEIS.

3-94c

Featured Species

See Wildlife Specialist Report for more information.

3-94d

Neotropical Migratory Birds

See Wildlife Specialist Report for more information.

3-94e

Birds of Conservation Concern

See Wildlife Specialist Report for more information.

3-95

Gray Wolves

Additional Information will be added to the FEIS regarding Gray Wolves. As of February, 2013, Oregon's wolf count is 46 wolves, including six packs (all breeding pairs[12]). The six Oregon packs are, in order: Imnaha, Wenaha, Walla Walla, Snake, Umatilla, and Minam.
http://www.dfw.state.or.us/wolves/wolf_program_updates.asp

While individual wolves or tracks of large canids have been sighted, there are currently no known packs or denning pairs documented for the Malheur National Forest. Communication with USFWS indicates that because of the variety and range of habitat used by gray wolves, from alpine zones, forest habitat, sage steppe, to desert, "they did not consider any of our forest management activities to have any negative impacts on wolves." (Reames, Forest Biologist, personal communication 2012, 2013). If and when a den site and reproducing animals are documented, USFWS would require a buffer around such sites.

Shooting of wolves, whether intentionally or by accident, is illegal. The consequences of such activities are discussed in detail in the Oregon Wolf Conservation and Management Plan (ODFW 2010). This plan outlines procedures for dealing with problem animals and depredation of livestock, should the situation occur.
http://www.dfw.state.or.us/Wolves/docs/Oregon_Wolf_Conservation_and_Management_Plan_2010.pdf

3-96

Greater Sage-grouse

See Wildlife Specialist Report: Unregulated livestock grazing earlier in the century may have impacted shrub, grass, and forb composition within potential greater sage-grouse habitat in the Summit Logan Valley Grazing Authorization Area….Over time, and with changes in grazing management, habitat has improved. It is expected that the current proposed use levels for all alternatives would continue an upward trend in riparian and upland habitat.

[12] For monitoring purposes, a wolf pack is four or more wolves that travel together in winter. A breeding pair is two adult wolves that produce at least two pups that survive through Dec. 31 of the year of their birth (ODFW 2010).

"The effects of grazing on sage-grouse habitat vary widely with timing and intensity of use … Light to moderate levels of grazing can have a positive or neutral impact on sage-grouse habitat, meaning this land use can be compatible with healthy sage-grouse habitat" (Species Fact Sheet, USFWS, accessed 2013).

The Oregon Department of Fish and Wildlife "Greater Sage Grouse Conservation Assessment and Strategy for Oregon…" (ODFW, updated April 2011) provides conservation guidelines for grazing, including adaptive management strategies similar to those proposed in the DEIS.

This additional information regarding greater sage-grouse will be added to the FEIS.

3-97a

Silver-bordered Fritillary

See DEIS page 257, see Wildlife Specialist Report. Food plants for this butterfly and its larvae are found forest-wide in suitable habitat. Not all habitat would be impacted concurrently throughout the Project Area, providing areas where food plants would persist for this butterfly and its larvae.

3-97b

Quantity or Quality Impacts – Various Species

Acres rested or not grazed, as well as acres available for grazing, by alternative, are described in the Summary section of the DEIS, page 16.

The Logan Valley and Summit Creek allotments would be managed with periods of rest or deferment during the season of use. Rest or deferment would be determined based on resource needs and would not be a systematic or scheduled rotation. For McCoy Creek, a deferred rotation grazing system would be applied throughout the allotment. This system provides for a systematic rotation of deferment among units and provides flexibility to change the time of year when units would be used (See DEIS, pages 2 through 4). Depending on alternatives, portions of the Lake Creek Allotment would fall under the grazing systems for the Logan Valley or Summit Creek allotments.

Generally, cattle are moved from pasture to pasture, as move triggers are met and animals are shifted to other areas. Consequently, qualitative assessments of impacts to various wildlife species were discussed; specific acres impacted by cattle grazing at any given time were difficult to quantify. Design criteria to avoid critical breeding and nesting periods, minimizing disturbance for known calving and fawning areas, etc. are listed in Chapter 2 of the DEIS.

3-98

Upland Sandpipers

See Monitoring Plan for Upland Sandpipers, DEIS. See Wildlife Specialist Report.

Additional literature review indicates that late season light to moderate grazing appears to be compatible with upland sandpipers. These additional references will be incorporated into the FEIS.

3-99

Lewis Woodpecker and Aspen Habitat

The Aspen Monitoring Plan will be added to the FEIS.

3-100

White-headed Woodpecker and Aspen Habitat

The Aspen Monitoring Plan will be added to the FEIS.

3-101

Townsend's Big-eared Bat

Additional information will be added to the FEIS. Surveys for bat species have been conducted on the Emigrant Creek Ranger District as part of the Oregon Bat Grid project, which was initiated in 2002. Both acoustic surveys using Pettersen Bat Detectors and recording devices, as well as mist netting for identification and determination of reproductive status, as well as collecting genetic and bat call information, were part of that study. Surveys confirmed the presence of several bat species found in a variety of habitats on the forest. http://www.batcon.org/index.php/media-and-info/bats-archives.html?task=viewArticle&magArticleID=1007

In addition, acoustic surveys have been conducted on the Blue Mountain and Prairie City Ranger Districts, associated with proposed mine closures and bat gate installations as well as proposed vegetation and fuels reduction projects (Soda Bear and Elk 16).

Townsend's big-eared bat is documented in cave habitat (Emigrant Creek Ranger District), pallid bat and fringed myotis are suspected, based on the presence of suitable habitat.

See Wildlife Specialist Report and Design Elements (DEIS, page 74 and 75) for more information.

3-102

Disturbance of caves, loss of snags

No impacts to roost habitat (cliffs, rock outcrops, rock crevices, hollow trees, old buildings) are expected from cattle grazing. See DEIS, Chapter 3.

Design elements are in place to increase visibility of fencing in key areas, and to minimize loss of snags during fence building or other developments. See DEIS, Chapter 2, pages 73 through 75.

Improvements in riparian and upland vegetation, which is the desired future condition for all action alternatives, would result in improved habitat for all of the wildlife species discussed. Monitoring would be critical to determine if the desired outcome is occurring. Benchmarks are established to provide a measure for meeting these goals (See Appendix A, DEIS). Adaptive management strategies are to be implemented if target outcomes are not being achieved in a timely manner. Monitoring of these adaptive management strategies would also be required. Adaptive management strategies range from additional fencing to reduction in numbers of cattle, and are discussed in Chapter 2 of the DEIS.

3-103

Pallid Bat – Cumulative effects

No impacts to roost habitat (cliffs, rock outcrops, rock crevices, hollow trees, old buildings) are expected from cattle grazing. See DEIS, Chapter 3. Consequently, there would be no cumulative effects from grazing to roost habitat.

Improvements in riparian and upland vegetation, which is the desired future condition for all action alternatives, would result in improved foraging habitat for pallid bats.

3-104

Elk

See Response 3-94.

3-105

Aspen and Cumulative Effects to Primary Cavity Excavators

See Response 3-102.

3-106

Beaver

Grazing management that allows for recovery of herbaceous vegetation and riparian hardwoods could increase the expansion of beaver within the project area (DEIS, page 276). See Wildlife Specialist Report, pages 56 and 58.

Improvements in riparian and upland vegetation, which is the desired future condition for all action alternatives, would result in improved habitat for all of the wildlife species discussed. Monitoring would be critical to determine if the desired outcome is occurring. Benchmarks are established to provide a measure for meeting these goals (See Appendix A, DEIS). Adaptive management strategies are to be implemented if target outcomes are not being achieved in a timely manner. Monitoring of these adaptive management strategies would also be required. Adaptive management strategies range from additional fencing to reduction in numbers of cattle, and are discussed in Chapter 2 of the DEIS.

3-107

Climate Change

Additional analysis related to climate change will be added to the FEIS.

Comment Letter #4 – Alan Jacobs and Jim Jacobs

Comment	Response
Chapter I page 37 identifies Bull Tout Critical Habitat and Economic Impacts to the Permittees and the Local Community as significant issues. Significant issue indicators are also described for these two issues in Chapter I on page 37. Chapter II of the draft EIS describes the alternatives. Chapter II also provides a table that summarizes the effects of implementing each alternative in regard to the purpose and need for action and Significant and Analysis Issues identified in Chapter I. Chapter III discloses the potential consequences to the environment, including the physical, biological, social, and economic environments, from implementing the alternatives. I have the following concerns related to Chapter III: The Hydrology and Aquatics section has the potential to have the most significant impact on grazing of all the issues discussed in Chapter III. The effects discussion is very difficult to understand because it contains numerous run on sentences, some of which are five and six lines long. In addition a person would have to be a hydrologist and/or fish biologist to understand some of the terminology used in this section. The effects analysis needs to be written in plain English with shorter sentences. This section does a good job of discussing adaptive management and how it will be used to mitigate the effects of livestock grazing on fish and riparian vegetation.	4-1

Comment	Response
The analysis of effects in the Economic Section of Chapter III is flawed because there is absolutely no discussion of how adaptive management will impact the economic viability of the permittees operation. The economics section does an adequate job of discussing the cost of building fence and developing springs but totally ignores the cost of adaptive management. There is neither a qualitative or quantitative disclosure of the economic impacts associated with changing allowable use levels, additional periods of rest, constructing additional enclosures and constructing additional pasture fences. All of these activities have the potential to economically impact operations. Adaptive management is part of Alternatives 2, 3, and 4 and the cost of implementation needs to be included in the economic analysis.	4-2

4-1

Hydrology and Aquatics Section

We understand your concerns regarding the complexity of the analysis in the Hydrology and Aquatics section. We will take a hard look to see what we can do to improve the Hydrology and Aquatics section and other parts of the document based on your comment in the final EIS. Hopefully, when we met with you on December 13 to discuss the DEIS, it helped clarify some of your questions. If there are particular areas of the DEIS that you would like to further discuss or clarify, the hydrologist and fish biologist will gladly sit down with you and explain them. We also want to point out that at the front of the DEIS there is a summary (see Summary pages 1 through 22). The summary compares in an abbreviated form the alternatives considered and their effects.

4-2

Economics Section

Based on your comment, the social economic and rangeland management effects sections will be supplemented to discuss adaptive management impacts.

Comment Letter #5 – Alan Jacobs

Comment	Response
1) Stubble height and move triggers should be more practical and scientifically described given the varying soil moisture, temperature variations from year to year. They should be varying do the changing conditions.	5-1
2) The No Action alternative would have direct and indirect disastrous effects on the economic status of these family size operations. The direct affects are outlined fairly well on pgs 239-240 of the EIS. The indirect effects such as stress on the livestock, interruptions in the reproduction, and general management are not addressed.	5-2
3) Since the conditions of the riparian areas are in an upward trend, then move triggers should be looked at individually.	5-3
4) Availability of adjoining or close alternate grazing areas should be a very important part of continuing the upward trend of our riparian areas. This would allow for continuous grazing and less of an economic impact on the producers	5-4

5-1

Stubble Height and Move Triggers

We agree that move triggers and allowable use levels should vary by changing conditions. We also feel that they should vary based on the existing condition and the need for change to move towards the desired condition. The alternatives propose different types of actions to control the timing, frequency, duration,

and intensity of grazing to address the purpose and need and significant issues identified in DEIS Chapter 1. These include combinations of grazing systems, allowable grazing use levels, pasture rest, pasture configurations (construction of riparian pastures and exclosures), livestock numbers and grazing season, allotment boundary changes, and herding (riding) practices. The specific actions proposed are disclosed in DEIS, Chapter 2, pages 43 through 63. The utilization tables for the various alternatives can be found on pages 375 through 379.

Scientific investigations regarding stubble height and move triggers were discussed in the DEIS on pages 177 through 182.

All alternatives are based on the concept of adaptive management which allows this flexibility. Adaptive management is explained in detail in the DEIS, Chapter 2, pages 41-42. Appendix E on page 375 explains that allowable use, move triggers, and end-point indicators may change for pastures based on site specific data collected at representative monitoring sites during the life of the analysis base on adjustments made in response to monitoring results, timing, or climatic conditions. As recovery is obtained through meeting management objectives (see Appendix A, part 2), less restrictive use levels may be adequate to maintain or continue recovery of stream conditions. If management objectives are not being achieved in a timely manner, changes in management including move triggers may be necessary to accelerate recovery. The goal of use levels, combined with management tools establishes appropriate timing, intensity, duration, and frequency of livestock grazing. This should move the condition towards management objectives and ultimately desired condition.

5-2

No Action Alternative and Effects on Livestock Stress and Reproduction

Your economic concerns related to no action are noted. Based on your comment, the economic and rangeland management effects analysis sections will be supplemented in the FEIS.

5-3

Move Triggers

See previous response 5-1.

5-4

Alternate Grazing Areas

Your comment regarding availability of adjoining or close alternative grazing areas is noted. During the Summit Logan analysis we were unable to identify any adjoining or close alternate grazing areas, with the exception of the currently vacant Lake Creek grazing allotment. Alternatives 2 and 4 propose adding different amounts and areas of the Lake Creek allotment to the Logan Valley and Summit Prairie Allotments. The objective in adding these additional acres is to provide flexibility to periodically rest entire grazing units or defer the season of grazing to restore riparian conditions, while maintain enough acres to be grazed annually to support a viable operation. In the future, perhaps additional opportunities to utilize adjoining or close alternative grazing areas will be available.

Comment Letter #6 – Jim Jacobs

Comment	Response
The biggest concern that I have with proposed alternate 4 is the amount of stubble height. Stubble height, bank alteration, and woody use have always been the suggested method for triggering moves for the cattle. In the EIS, it says that Clary stated that recovery can be accomplished with a stubble height of 4-5.5. Also the EIS states that Boyd and Svejcar found similar results, 4-6 in and still have recovery. Moving stubble height to 6in would surpass the recommended lever from Clary and be at the high end of the scope for Boyd and Svejcar's recommendation. There are certain reaches of Summit Creek were the stubble height doesn't get 6 in high. We can still improve the riparian areas and improve fish habitat having a 4 in. stubble height, this is an unnecessary step and makes no since to me. It has been proved that Summit Creek is in recovery, and we continue to manage the way that we have in the past, recovery will still occur. Increasing the stubble height will only make managing more difficult, and increase the chances for us to exceed standards. In talking with the USFS about introducing part of Bosenberg into the Summit Prairie Allotment would be, "setting us up to fail," I believe that changing the stubble height to 6in. would also be setting us up to fail. I feel that since we are on the road to recovery and the 4in. stubble height is working that the 6in stubble height should be used in the adaptive management.	6-1
The second concern that I have is how the adaptive management will impact the economic viability of our operation. If adaptive management is put into place, what will the affects over the long term be on our operation? We do have somewhat of an idea of the short term effects but this document does not do a good job of stating what monetary affects will be.	6-2
The third concern that I have has to do with the Prairie Riparian Pasture in the North Summit Unit. I do not believe that the Prairie Riparian Pasture needs to be included into alternative 4. I believe that with the introduction of willow plantings, and small enclosures and with the new addition of the jack straw, that we will be able to meet our goals with out making this a riparian pasture. I believe that the Prairie Riparian Pasture should be included into the adaptive management and not included into Alternative 4.	6-3
In conclusion: I still hold firm on my position along with the decision of the National Riparian Team, that Summit Creek is in a recovery mode. I feel that drastic measures don't need to be taken, but smaller less evasive improvements can always be made to sensitive areas. As I have stated in the past, I feel that the USFS should take more of a proactive approach to help with some of these sensitive area, and less of a reactive approach. We are onboard with the USFS when it comes to most all projects that will improve fish habitat and riparian areas.	6-4

6-1

Stubble Height

Best available science was considered for establishing move triggers and allowable use levels (DEIS pages 177 - 179). Clary recommends a 4 inch stubble height as a starting point. The DEIS at page 178 (and Clary) state that "6-8 inches may be required to limit streambank trampling or reduce willow browsing". It's important to note that most of these studies did not occur where ESA values and Clean Water Act listings were in place. It is also important to note that stubble height values in Appendix E are not a cookie cutter approach, or one consistent number applied across the Project Area. Rather, these values are identified on a reach by reach basis that is site specific and factors in the departure of the existing to desired condition (Appendix A, Part 1; DEIS on pages 307-320). A MIM report in the project record identifies how monitoring data for stubble height affects the long term condition attributes (i.e. streambank stability and cover) per designated monitoring area. This dataset illustrates how stubble height is tied to the condition of the reach and suggests these values are needed to meet the monitoring objectives at the rate of recovery analyzed in the Environmental Consequences Section of the DEIS (pages 156-174). Please refer to comments 5-1 and 5-3.

Appendix E, Move Triggers and Allowable Use Levels DEIS on pages 375 – 379 illustrates the range of use levels associated with each alternative that were analyzed in the Hydrology and Aquatics Affected Environment Section (DEIS pages 156 - 174). The range of alternatives were developed to address the Purpose and Need.

Appendix E (DEIS page 375) also states that use levels "may change for pastures based on site specific data collected at representative monitoring sites during the life of this analysis based on adjustments made in response to monitoring results, timing, or climatic conditions. As recovery is obtained through meeting management objectives (see Appendix A, part 1), less restrictive use levels may be adequate to maintain or continue recovery of stream conditions. If management objectives are not being achieved in a timely manner, changes in move triggers and allowable use levels may be necessary to accelerate recovery (see Appendix A, part 3)".

We feel that is important to note that greenline stubble height measurements will only occur along the greenline (DEIS at page 80) where the water table should support growth of at least 6 to 18 inches.

6-3

Prairie Riparian Pasture

On March 13, 2012 we met with you and discussed the public comments received during scoping, and concepts for additional alternatives to address the comments. At the meeting you stated that you would like to propose a different fence configuration concept for the North Summit Unit. The Prairie Riparian pasture was proposed based on your recommendations and the map that you provided to the District.

6-4

Summit Creek is in a Recovery Mode

Summit Creek is in recovery mode as stated by the national riparian team. As part of that process stream channels that have become incised are in the process of widening (eroding banks). As a result of the incision floodplains have become elevated and are no longer wetted resulting in a conversion from more hydric plant species with deep root masses to more mesic species (shallow rooted roots). This makes existing banks and plants more susceptible to the impacts of livestock grazing and care must be taken to allow these plants to thrive and re-establish. While it is true that Summit Creek is in recovery mode we must be cautious because early seral riparian areas in recovery are susceptible to losing the recovery that has happened and re-setting. By facilitating a transition from early seral (colonizers) to mid-late seral species we are ensuring that the likelihood of a resetting event does not occur in Summit Creek by doing this we are reducing the risk of failure to the permittee.

Comment Letter #7 – United States Environmental Protection Agency

Comment	Response
In accordance with our responsibilities under Section 309 of the Clean Air Act and the National Environmental Policy Act (NEPA), the U.S. Environmental Protection Agency has reviewed the U.S. Forest Service Draft Environmental Impact Statement (DEIS) for Summit Logan Valley Grazing Authorization Project (CEQ number: 20120347) on Prairie City Ranger District of the Malheur National Forest in Grant County, Oregon. Based on our review, we have assigned a rating of LO (Lack of Environmenta Objections) to the Preferred Alternative (Alternative 4). A summary of the EPA's rating is attached.	7-1

Comment	Response
The DEIS evaluates potential environmental impacts of authorizing continued livestock grazing in the Summit Logan Valley Grazing Authorization Project area that includes Lake Creek (10, 196 acres), Logan Valley (3,756 acres), McCoy Creek (980 acres) and Summit Prairie (25,331) allotments. The analysis area would be about 40,263 acres of public lands and within which there are nearly 5,000 acres of private land. The DEIS considered four alternative actions, including a proposed action (Alternative 2), Preferred Alternative (Alternative 4) and No Action (Alternative 1). Under the Preferred Alternative, FS would authorize grazing on Logan Valley, McCoy Creek and Summit Prairie allotments and modify management to include no grazing on almost 9,459 acres of Lake Creek allotment, additional grazing area for Logan Valley (603 acres) and Summit Prairie (52 acres). Implementation of the proposed project would also require modifications to the Malheur Forest Plan Amend-ment #29 to address streamside shade and renewal of existing Allotment Management Plans approved in the 1960s and 1970s. The EPA supports the overall goals of the proposed action to allocate forage for livestock grazing, while improving range conditions particularly in riparian areas, and a grazing strategy that combines early season, rest-rotation grazing systems with fences and water developments to preserve and protect resources. We also commend Forest Service staff for considering public comments in the NEPA analysis for the project and modifying alternatives in response to inputs received. Additionally, we support Forest Service's selection of Alternative 4 as the Preferred Alternative for implementation as it includes additional measures in the Summit Prairie allotment to encourage recovery of riparian vegetation to enhance stream shade, riparian vegetation composition and vigor, and streambank stability.	7-2
Overall, we believe the DEIS includes a good description of resources within the project area, analysis of anticipated environmental impacts, measures to offset the impacts, and monitoring programs (p. 77- 82) to meet resource management objectives and other requirements. We would encourage additional early actions to address impaired streams currently listed by the State of Oregon as violating water quality standards, primarily for temperature (p. 2 14). We believe that additional, early actions to increase shade and improve flood plain function (in terms of channel morphology and connection to ground water) would benefit the project. Such early actions would also benefit the many riparian areas in the Summit Prairie allotments presently functioning at risk. Additional protection of certain riparian areas may be warranted, especially within the Summit Prairie allotment where many creeks are not expected to meet desired conditions for a number of years, and other areas where impacts may affect high quality habitat(s), drinking water sources, or other sensitive resources.	7-3
Because bacteria and nutrients are usually associated with livestock grazing, we recommend that the final EIS also include available data on these parameters for streams in the project area. We recognize that actions in the Preferred Alternative would likely result in water quality benefits for these parameters as well as temperature. For additional perspective on addressing water quality impairments on National Forest System Lands, please consult the 2007 Memorandum of Agreement (MOA) between the EPA and Forest Service in addition to the 2002 MOA between the Forest Service and Oregon Department of Environmental Quality.	7-4
We applaud and encourage continued coordination with the Oregon Department of Environmental Quality and the US Fish and Wildlife and National Marine Fisheries Services. The final EIS should include outcomes of consultations with the Services and recommended measures to reduce risks and protect biota and habitat. Thank you for the opportunity to review and comment on this DEIS. If you have questions about our comments, please contact me at (206) 553-1601 or by electronic mail at reichgott.christine@epa.gov or contact Theogene Mbabaliye of my staff at (206) 553-6322 or by electronic mail at mbabaliye.theogene@epa.gov.	7-5

7-1

Assigned Rating

We are pleased that you do not have any environmental objections to the preferred alternative (Alternative 4).

7-2

Support the Goals of the Proposed Action

Thank you for your support of the project goals.

7-3

Encourage Additional Early Actions

Thanks for your recommendations on develop early actions and additional protection measures. We believe the DEIS addresses both of these concepts. Early actions to improve shade and channel form on impaired streams are addressed through the development of management objectives (Appendix A, Part 2; DEIS at pages 321 – 329). These management objectives were developed at representative monitoring areas, on these impaired streams using quantitative monitoring protocols (DEIS pages 77 – 81). Effective shade curves (DEIS pages 5, 64, 214) were developed for the Malheur Basin TMDL and were used for defining desired conditions (Appendix A, Part 1; pages 307 – 321). Management objectives will allow the interdisciplinary team to understand if the trend is downward, static or upward. Adaptive management strategies (DEIS pages 41 - 42) are the additional protection measures that may be warranted if the trend is not upward and due to livestock management.

7-4

Data on Bacteria and Nutrients

No data is available for bacteria or nutrients in the project area. Therefore, it will not be discussed in the final EIS. DEQ does not identify any streams in the project area that are listed as being water quality limited for these parameters neither.

7-5

Include Outcomes of Consultation in FEIS

The FEIS or Record of Decision will include the final outcomes of consultation. Thank you for your review and comments.

Comment Letter #8 – Alan and Jim Jacobs

Comment	Response
Allen started by sharing, while his family was college educated, they found the document to be hard to read and extremely difficult to understand. He appreciated the letter of transmittal which had a brief summary. He felt the document needed to have a summary (brief) upfront. Ryan informed him there was. Given the transmittal letter had indicated the preferred alternative was #4, Allen admitted he spent most of his time looking at that alternative. Randy explained while he may be leaning that way (towards Alt. 4) he has the ability to pick and choose from elements in all alternatives, therefor any comments the Jacobs may have need to be as specific and focused as possible.	8-1

Jacobs had a major concern with the economic analysis not accurately reflecting the short and long term effects on the operators; i.e. lower numbers, let a hired man go. We asked them to please comment and assist with providing information on that matter. Randy and Ryan indicated no permitted AUMs would be lost, however the analysis was for upper limit numbers.	8-2
Use Levels: Jim recognizes the numbers remain the same in the analysis, however he also recognizes with more stringent use levels he will surely need to reduce the time or the numbers in a pasture. Stream bank alteration is not scientific (more of a farce for control). Ryan referred to pg 177-180 on the effect of the use levels. Jim & Allen shared they are conscientious businessmen, having held public lands permits for quite some time, they treat the land as their own and take care of it accordingly for a sustainable product. (History was shared.) Bottom-line is they are proud of the outcome which is and has been recovery for the resources, with minor bumps along the way. A discussion ensued regarding "recovery" and "how fast is fast enough" and for whom? Ryan referred them to Appendix A (pg. 307-321). Jim indicated they fine tune their operations daily, annually to find what works best to remain in recovery mode and wonders why you would want to change what works. If we want to accelerate recovery we should provide alternative resources (forage) for resting other areas. They should comment on that. There are "vacant" allotments not being used. This would require an analysis, but potentially in the long run provide options. Randy mentioned Bob Crisler reviewing the document for Jacobs and offered if he had any questions he should call Ryan. There was an immense amount of conversation not capture. Allen & Jim are completely frustrated about being dictated to when they are so conscientious.	8-3

8-1

Document Hard to Read and Understand

See response 4-1.

8-2

Economic Analysis

See response 4-2.

8-3

Stringent Use Levels

See responses 5-1 and 6-1.

Appendix G – Biological Evaluation

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