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Draft Environmental Impact Statement

North End Sheep Allotment

Walla Walla Ranger District
Umatilla National Forest
Union, Wallowa, and Umatilla Counties, Oregon

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Draft Environmental Impact Statement

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Union, Wallowa, and Umatilla Counties, Oregon

February 2011

Lead Agency USDA Forest Service

Responsible Official Michael L. Rassbach, District Ranger
Walla Walla Ranger District
Umatilla National Forest
1415 West Rose St
Walla Walla, WA 99362
(509) 522-6290

Further Information Holly Harris, Team Leader
Walla Walla Ranger District
Umatilla National Forest
1415 West Rose St
Walla Walla, WA 99362
(509) 522-6290

This document is available on the internet:
http://www.fs.fed.us/r6/uma/projects/readroom/

Abstract

This Draft Environmental Impact Statement (EIS) documents the detailed analysis of five alternatives for the management of the North End Sheep Allotment. The North End Sheep Allotment analysis area is located approximately six miles northwest of Elgin, Oregon. Alternatives include Alternative 1 (proposed action), Alternative 2, Alternative 3, Alternative 4, and Alternative 5 (no grazing). The preferred alternative is Alternative 4 which would authorize sheep grazing consistent with Forest Plan standards and guidelines while implementing specific resource protection measures.

The Responsible Official must receive comments on the Draft EIS within 45 days after publication of the notice of availability in the Federal Register. Comments received will be part of the public record for this EIS.

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Summary of the Draft Environmental Impact Statement

Introduction

This draft Environmental Impact Statement (DEIS) analyzes and discloses the potential site-specific environmental effects of a proposal to continue to authorize domestic sheep grazing on the North End Allotment. The current allotment configuration includes approximately 132,000 acres on the Walla Walla Ranger District of the Umatilla National Forest (Figure 1). The North End Allotment is located in Umatilla, Union, and Wallowa Counties of the state of Oregon, and within the Umatilla River and Upper Grande Ronde subbasins.

Purpose and Need for Action

The purpose of this action is to authorize domestic sheep grazing in a manner that is consistent with the Umatilla National Forest Land and Resource Management Plan [Forest Plan], as amended.

The North End Allotment is scheduled for an environmental analysis of grazing use on the Umatilla National Forest, as required by the Rescission Act (Burns Amendment 1995). The purpose of this analysis is to ensure that proposed sheep grazing is consistent with the most current laws, regulations, and management direction.

Part of the allotment is near occupied Rocky Mountain bighorn sheep range. There is a need to effectively separate permitted domestic sheep from bighorn sheep. Effective separation is defined as spatial and/or temporal separation between wild sheep and domestic sheep or goats, resulting in (at most) a minimal risk of potential respiratory disease transmission (WAFWA 2010).

There is also a need to maintain management flexibility such that a grazing operation is economically and environmentally feasible.

Tribal and Public Involvement

A letter describing the proposed action was mailed to 33 individuals, organizations, and agencies on April 10, 2009. A Notice of Intent to prepare an Environmental Impact Statement was published in the Federal Register on December 24, 2009. Scoping efforts generated responses from five individuals, five organizations, two state agencies, one federal agency, and one Tribe. Responses are documented in nine letters, as well as several e-mails, telephone conversation records, and meeting notes. These documents are filed in the project record.

Contacts were made throughout the analysis process with staff members of the CTUIR and Nez Perce Tribes. Meetings were held with tribal biologists to discuss possible effects of livestock grazing in the North End Allotment on treaty reserved resources. Updates on the project status were also provided to tribal staff members at the yearly coordination meetings.

Coordination with Oregon Department of Fish and Wildlife was conducted through several informal meetings and telephone conversations.

The permittee holding the grazing permit for this allotment was included throughout the analysis process. The permittee provided input for alternatives and site-specific grazing operations information.

Key Issues

Issues that could best be addressed by forming an alternative or introducing mitigation or monitoring were identified and categorized as 'Key Issues'. Two issues were considered to be major or relevant to the development of alternatives to the proposed action. Key Issue 1 addresses concerns about bighorn sheep. Key Issue 2 addresses concerns regarding the economic viability and operability of proposed grazing. Many of the other concerns raised by the public were addressed in the EIS by providing additional information. A summary of key issue effects is presented below. More detailed information can be found in Chapter 3.

Key Issue 1 – Bighorn Sheep

Part of the North End Allotment is near occupied Rocky Mountain bighorn sheep range. There is the potential for physical contact between the permitted domestic sheep and wild bighorn sheep. Contact between domestic sheep and bighorn sheep would likely be detrimental to the health of the bighorn sheep herd, and could result in substantial population declines. There is a need to effectively separate permitted domestic sheep from bighorn sheep. Effective separation is defined as spatial and/or temporal separation between wild sheep and domestic sheep or goats, resulting in (at most) a minimal risk of potential respiratory disease transmission (WAFWA 2010). This can be achieved through a combination of factors including maintaining separation distance appropriate for the terrain, managing livestock properly, and coordinating closely with the state wildlife agency.

There is also a desire by several agencies and publics to establish a bighorn sheep herd in the South Fork Walla Walla River area (SFWW), which would necessitate additional changes to the allotment boundary.

The following indicators were used to compare the effects of alternatives to bighorn sheep (Table 2):

- Separation distance between the allotment and the Wenaha bighorn sheep herd, and separation distance between the allotment and the potential SFWW release area.

- Separation effectiveness between domestic sheep on the allotment and the Wenaha bighorn herd, and separation effectiveness between domestic sheep on the allotment and prospective bighorn sheep in the SFWW river area.

Key Issue 2 – Management Feasibility

Alternatives to address the separation of bighorn sheep from permitted livestock could cause a reduction in the size of the allotment and/or the number of permitted sheep. This in turn could affect the permittee, the livestock industry, and how the allotment is managed. Any reduction in the size of the allotment without reducing the number of livestock could result in unwanted resource effects. Stocking levels and the reduction in acres were brought up in public comments. It was also suggested that additional acreage be offered to compensate for acres proposed for removal from the allotment.

Measures for evaluating this issue are (Tables 3 and 4):

- Operations: sheep herd routing and access challenges based on stocking rate and configuration of allotment
- Administration: water development and range monitoring needs
- Economics: revenue and jobs based on number of livestock

Alternatives

This DEIS includes an analysis of the proposed action and four additional options, including no grazing. These 5 options are collectively referred to as alternatives (Table 1). A comparison of key issue effects is presented below in Tables 2 and 3.

Alternative 1 is the Proposed Action. The proposed action would establish a new allotment boundary and reduce the allotment size from 132,000 acres to 101,000 acres. Four bands of sheep (3,962 ewe/lamb pair) would be allowed to graze within 5 pastures. The proposed action reflects how the allotment has been managed since 2008 through Annual Operating Instructions.

Alternative 2 would establish a new allotment boundary and grazing would be limited to the area south of Lookingglass Creek (Figure 3). Three bands (3,000 ewe/lamb pair) would be authorized to graze within an 81,500 acre area. This alternative provides better separation of the allotment from the Wenaha bighorn sheep herd, and also allows for a rest rotation or deferred grazing system.

Alternative 3 would establish a new allotment boundary which would include portions of a former grazing area known as the Goodman Allotment. Grazing would be limited to the area south of Lookingglass Creek, and grazing would not occur in the North Fork Umatilla Wilderness Area. Three bands (3,000 ewe/lamb pair) would be authorized to graze within an 79,600 acre area. This alternative better addresses both the Wenaha bighorn sheep issue as well as providing a wider buffer from the prospective SFWW bighorn area, while maintaining a sizeable area for grazing.

Alternative 4 would establish a new allotment boundary similar to Alternative 3, but this alternative does not include grazing in the Goodman area. Grazing would be limited to the area south of Lookingglass Creek, and grazing would not occur in the North Fork Umatilla

Wilderness Area. The amount of grazing area would total 52,600 acres, and could be grazed by up to 2,000 ewe/lamb pair. This alternative was developed to give decision makers and the public a range of alternatives to compare the effects with and without the Goodman area.

Alternative 5 is the "No Grazing" alternative.

Alternative 4 is the agency preferred alternative.

Table 1. Alternative Summary.

Alternative	**1**	**2**	**3**	**4**	**5**
Allotment size (acres)	101,000	81,500	79,600	52,600	0
Ewe / lamb pairs	3,962	3,000	3,000	2,000	0
Number of bands	4	3	3	2	0

Table 2. Separation distance and separation effectiveness by alternative.

Measure	Current allotment boundary	**Alternative**			
		1	2	3 and 4*	5 – no grazing
Separation distance between allotment boundary and **Wenaha** bighorn sheep (air miles)	1	8	10.5	12	NA
Separation effectiveness between North End permitted sheep and **Wenaha** bighorn sheep	Low	Moderate	High	High	NA
Separation distance between allotment boundary and **SFWW** bighorn sheep habitat (air miles)	1	1	4	9	NA
Separation effectiveness between North End permitted sheep and potential **SFWW** bighorn sheep	Low	Low	Low to Moderate	High	NA

Table 3. Comparison of Operation and Administration by alternative.

Measure	Current permit	Alternative				
		1	2	3	4	5
Stocking Rate (acres /SHM)	5.1	5.8	6.2	6.1	6.0	0
Herd route management challenges	Low	Moderate	Moderate	High	Moderate	NA
Access and grazing management challenges	No	No	No	Yes	No	NA
Increased monitoring needs	No	Yes	Yes	Yes	Yes	NA
Water development costs	0	0	0	$50,000 or less	0	0

Table 4. Economic indicators by alternative.

Measure	Current permit	Alternative				
		1	2	3	4	5
Revenue	$385,899	$385,899	$292,200	$292,200	$194,800	0
Grazing Fees to U.S. Treasury	$7,012	$7,012	$5,309	$5,309	$3,539	0
County payments (25 %)	$1,753	$1,753	$1,327	$1,327	$885	0
Jobs	5.1	5.1	3.9	3.9	2.5	0
Percent reduction for all of the above	-	0 %	24 %	24 %	50 %	100 %

Affected Environment and Environmental Consequences

The affected environment and environmental consequences were disclosed for range, soils, water, fish, wildlife, and plants, recreation, and specially designated areas. Direct, indirect and cumulative environmental effects that could result from the implementation of any of these alternatives are disclosed in Chapter 3. The alternatives were found to be consistent with Forest Plan standards and guidelines, including Forest Plan amendments such as PacFish, and the Region 6 Invasive Species Management Plan. The environmental consequences indicate consistency with the Clean Water Act, and processes have been followed consistent with the Endangered Species Act. For further information, see Chapter 3 of the DEIS.

Chapter 1 - Purpose of and Need for Action

Introduction

The Walla Walla District Ranger proposes to authorize the continuation of domestic sheep grazing on the North End Allotment.

This chapter identifies the analysis area, explains the purpose and need for action, and describes the proposed action. This chapter also describes the decision framework and outlines applicable management direction. Treaty rights and tribal consultation are addressed. The chapter closes by summarizing public involvement and lists the issues identified during scoping.

Analysis Area

The North End Allotment is located northwest of Elgin, Oregon in Umatilla, Union, and Wallowa Counties. It occurs primarily within the Upper Grande Ronde and Umatilla River Subbasins, and includes major tributaries such as Phillips Creek, Lookingglass Creek, Thomas Creek, and the North Fork Umatilla River. See Figure 1, Vicinity Map.

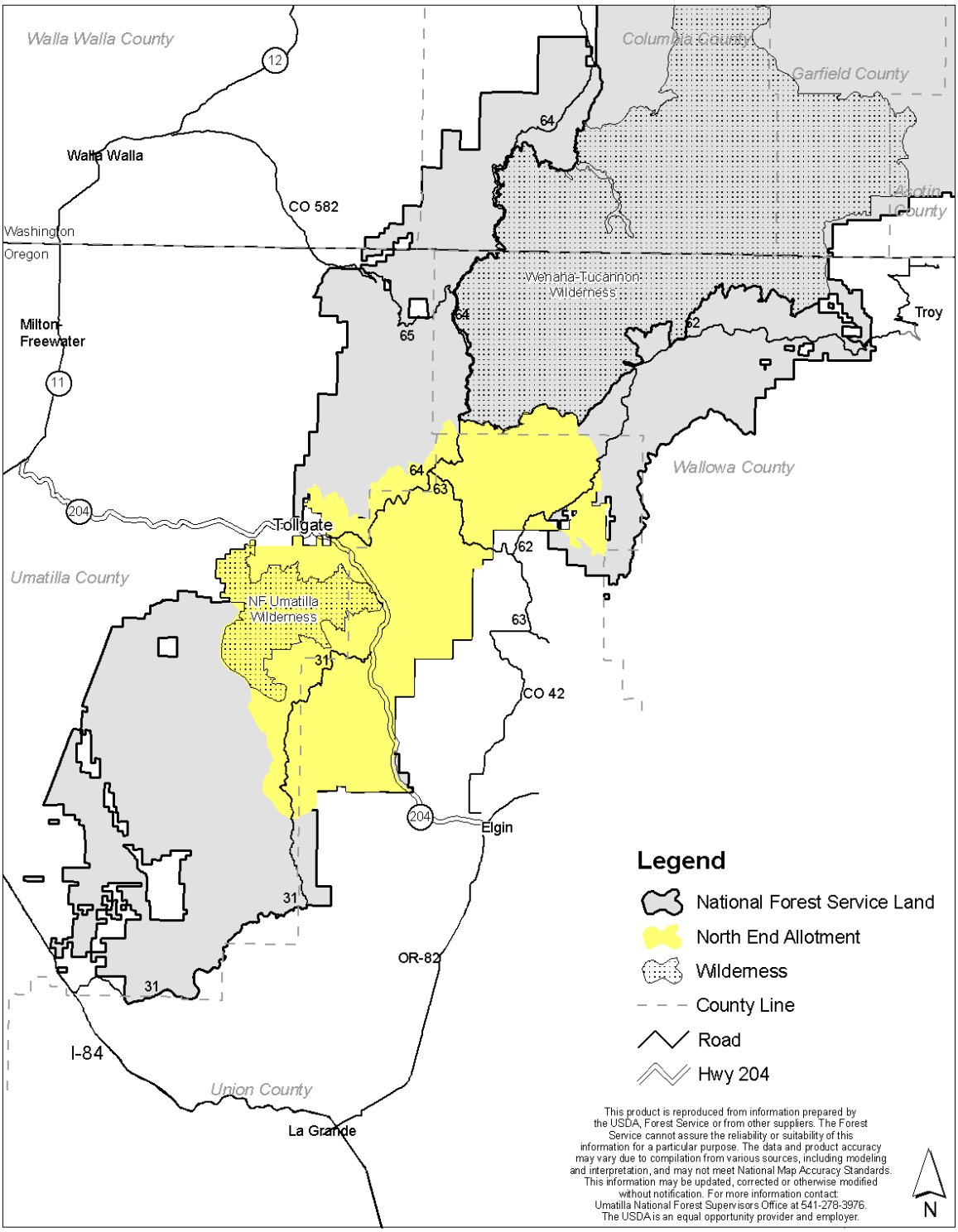
The current allotment boundary covers roughly 132,000 acres of National Forest and interspersed private land. The large size of the allotment makes for a diverse array of mountain uplands and plateaus dissected by large canyons. The allotment includes some steep terrain; however, much of the allotment is gentle or rolling uplands. Approximately 75 percent of the allotment is covered by mixed conifer forest.

Allotment History

Sheep grazing has occurred in the Blue Mountains since the late 1800's, including the area known as the North End Allotment. Sheep herders moved sheep each year into the Blue Mountains following the snow as it melted from the valley bottoms in the spring to high elevations during the summer months. Historically, forage was first come, first serve, resulting in degraded vegetative and soil conditions. In 1905, before the establishment of the Wenaha Forest Reserve, the north half of the Umatilla National Forest was used by an estimated 275,000 sheep, 40,000 head of cattle and 15,000 horses (Powell et. al, 2008). The Forest Service began attempting to regulate sheep grazing in the early 1900's, but it wasn't until 1935 that the Taylor Grazing Act established grazing districts and specific regulations.

More recently on the North End Allotment, domestic sheep primarily graze the ridges tops, rolling upland hills, and headwater areas. These areas have primarily been used because of good vehicle access, an abundance of forage for sheep, and the relatively easy ability to herd sheep. These areas are also where timber management practices have been focused, which has provided transitory range for livestock. Over 70 developed water sources (ponds and troughs) have been constructed to improve livestock distribution across these areas.

Figure 1. North End Allotment Vicinity Map



In 1986, an Allotment Management Plan (AMP) was prepared for the North End Allotment. The AMP allowed for 5,000 sheep on 6 units or "pastures[1]," however the Forest Service and permittee have elected to graze 3,962 sheep with the exception of a few years. As a result, four bands have generally utilized four pastures, allowing for a rest rotation in two pastures each year.

Purpose

The purpose of this action is to authorize domestic sheep grazing in a manner that is consistent with the Forest Plan, as amended. Providing forage for permitted domestic livestock is proposed in this allotment because of the following:

- Where consistent with other multiple use goals and objectives, there is Congressional intent to allow livestock grazing on suitable lands (Multiple-Use Sustained-Yield Act of 1960; Wilderness Act of 1964; Forest and Rangeland Renewable Resources Planning Act of 1974; Federal Land Policy and Management Act of 1976; and National Forest Management Act of 1976).

- It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for livestock grazing consistent with land management plans (36 CFR §222.2 (c); and Forest Service Manual [FSM] 2203.1).

- The Umatilla Forest Plan, which directs the management of lands contained within this Analysis Area, has as one of its goals to manage the forage resources while providing for forage productivity and making suitable range available for livestock grazing (Forest Plan, p. 4-63).

Need

National Forests are required by Section 504 of the 1995 Rescission Act to establish and implement schedules to complete NEPA analysis on all livestock grazing allotments. The North End Allotment is scheduled for an environmental analysis of grazing use on the Umatilla National Forest. This analysis is needed to ensure that livestock grazing on this allotment is consistent with the most current laws, regulations, and management direction. Upon completion, the terms and conditions of the existing grazing permit may be modified or reissued, if necessary.

The present Allotment Management Plan was completed in 1986, prior to the signing of the Forest Plan. There is an overall need to analyze the possible effects of grazing in order to create a new Allotment Management Plan that is reflective of current laws, regulations, and new information.

Part of the allotment is near occupied Rocky Mountain bighorn sheep range. There is a need to effectively separate permitted domestic sheep from bighorn sheep. Effective separation is defined as spatial and/or temporal separation between wild sheep and

[1]Management units are commonly called pastures and subpastures; however the areas are not fenced.

domestic sheep or goats, resulting in (at most) a minimal risk of potential respiratory disease transmission (WAFWA 2010). This can be achieved through a combination of factors including maintaining separation distance appropriate for the terrain, managing livestock properly, and coordinating closely with the state wildlife agency.

There is also a need to maintain management flexibility such that a grazing operation is economically and environmentally feasible.

Proposed Action

The Walla Walla Ranger District, Umatilla National Forest, proposes to authorize the continuation of domestic sheep grazing on the North End Allotment under the following terms:

Grazing Area:
The grazing area would be approximately 101,000 acres including the English Springs, Middle Ridge, Phillips Creek, Spout Springs, and portions of the Swamp Creek pastures (Figure 2). Portions of the Swamp Creek pasture and all of the Jarboe pasture would be eliminated from the allotment to increase the separation distance from bighorn sheep populations.

Number of Livestock:
A maximum of 3,962 ewe/lamb pairs or a maximum of 17,300 Sheep Head Months (SHMs) would be allowed. Annual authorized livestock numbers would be based on existing conditions, available water and forage, and predicted forage production for the year. Adjustments may occur during the grazing season based on conditions and/or range inspections.

Season of Use:
The season of use would be from June 1 to October 9. Sheep would not be allowed on the allotment outside of this time period.

Management:
Livestock grazing would occur through a rest rotational grazing system. Routing schedules would be designed each year to allow deferment and to rest areas within the allotment. Sheep would be routed through the allotment in separated bands of approximately 1,000 ewes and their lambs. Each band of sheep would be managed by a herder and dogs. This allows control of where the sheep graze and protects riparian and other sensitive areas. Existing corrals and water improvements would be used and maintained. Closed roads may be used by special permit to route sheep, access water sources, and for camps.

Decision Framework

The Responsible Official for this analysis is the Walla Walla District Ranger. After comments are considered on this Draft EIS, and based on the analysis presented in the DEIS, the Walla Walla District Ranger will decide whether to continue authorization of livestock grazing on the North End Allotment. If the District Ranger decides to authorize

livestock grazing, the decision would include determining how the grazing resources are to be managed to best meet the goals of the Forest Plan and meet the purpose and need for the project. The decision would also include the kind and number of livestock, season of use, terms and conditions, and mitigation and monitoring as needed. A new Allotment Management Plan would be prepared and implemented in the summer of 2011.

Project Record

A Project Record will be maintained at the Walla Walla Ranger District. The Project Record includes: scoping letters sent to tribes and other governmental organizations; public mailing lists; letters received during the scoping process from concerned citizens; emails from concerned citizens and Forest Service IDT members; meeting minutes; the project initiation letter; and specialist reports. This Project Record may be viewed at the Walla Walla Ranger District, 1415 West Rose, Walla Walla, Washington.

Management Direction

In order to eliminate repetition and focus on site-specific analysis, this DEIS is tiered to the following documents as permitted by 40 CFR 1502.20.

- The Umatilla National Forest Land and Resource Management Plan FEIS and Record of Decision (ROD) dated June 11, 1990, and all subsequent NEPA analysis for amendments.

- The 2005 Pacific Northwest Region Invasive Plant Program Final Environmental Impact Statement and Record of Decision that amended the Umatilla National Forest Plan by adding management direction relative to invasive plants.

This DEIS also incorporates by reference the following documents:

- The Biological Opinion for the Implementation of Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH) from National Marine Fisheries Service dated January 23, 1995. PACFISH itself does not propose any ground-disturbing actions, but sets in place certain riparian management goals and management direction with the intent of arresting the degradation and beginning the restoration of riparian and stream habitats.

- Environmental Assessment for the Management of Noxious Weeds, Umatilla National Forest, May 1995. Implements a long-term integrated weed management program on 773 specific noxious weed management projects beginning in 1995.

- Invasive Plants Treatment Project Environmental Impact Statement, Umatilla National Forest, July 2010. Authorizes treatment of invasive species over a 5-15 year period. Up to 4000 acres may be treated annually, including known sites and those detected in the future.

- The Integrated Scientific Assessment for Ecosystem Management in the Interior

Columbia Basin released 1996. Links landscape, aquatic, terrestrial, social, and economic characterizations to described biophysical and social systems.

Forest Plan Goals, Standards, and Guidelines

The existing North End Allotment includes portions of 17 different Forest Plan Management Areas. Livestock grazing is allowed in all of these Management Areas at varying levels. Management Areas are mapped and described in Appendix A.

Additional forest-wide standards and guidelines related to livestock grazing apply to this allotment. Compliance with these standards and guides is addressed by each resource specialist and summarized at the end of each section in Chapter 3.

Treaty Rights

The Forest Service, through the Secretary of Agriculture, is vested with statutory authority and responsibility for managing resources of the National Forests. Commensurate with the authority and responsibility to manage is the obligation to consult, cooperate, and coordinate with Indian Tribes in developing and planning management decisions regarding resources on National Forest system land that may affect the exercise of treaty rights.

Locally, the North End Allotment lies within areas ceded to the United States government by the Nez Perce Indians, and areas ceded by the Confederated Tribes of the Umatilla Indians (CTUIR) as a result of the Treaties of 1855. Elements of respective Indian cultures, such as tribal welfare, land, and resources were entrusted to the United States government as a result of the treaties. Trust responsibilities resulting from the treaties dictate, in part, that the United States government facilitate the execution of treaty rights and traditional cultural practices of the CTUIR and Nez Perce Indians by working with them on a government to government basis in a manner that attempts a reasonable accommodation of their needs, without compromising the legal positions of the respective tribes or the federal government. Both Tribes were contacted during the scoping phase of the project and their input, concerns and issues have been incorporated in the development of the alternatives.

Specific treaty rights applicable to that land base managed by the Umatilla National Forest area generally articulated in Article I of the CTUIR Treaty of 1855 and Article III of the 1855 Nez Perce Treaty, include:

> "The exclusive right of taking fish in all the streams where running through or bordering said reservation is further secured to said Indians; as also the right of taking fish at all usual and accustomed places in common with citizens of the Territory; and of erecting temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land."

Although the 1855 Treaties do not specifically mandate the federal government to manage habitats, there is an implied assumption that an adequate reserve of water will be available for executing treaty related hunting and fishing activities.

Because tribal trust activities often occur in common with the public, Umatilla National Forest will strive to manage tribal ceded land to enable the execution of tribal rights, as far as practicable, while still providing goods and services to all people.

Consultation with Tribes

Contacts were made throughout the analysis process with staff members of the CTUIR and Nez Perce Tribe. Meetings were held to discuss possible affects on treaty reserved resources from livestock grazing activities. The following meetings were held specific to the North End Allotment. Meetings were held with local agency biologists, including tribal representative Carl Scheeler, on May 13, 2008, October 30 2008, December 1, 2008, and October 23, 2009. Keith Lawrence, representing the Nez Perce tribe, attended 2 meetings – December 1, 2008, and October 23, 2009. Updates on the project status were also provided to tribal staff members at the yearly coordination meetings.

Public Involvement

Scoping

The Forest Service encourages public involvement in the identification of issues and development of alternatives through a process called 'scoping'. Public scoping was initiated in April 2009 with the project's inclusion on the quarterly Schedule of Proposed Actions. On April 10, 2009, a letter describing the proposed action was mailed to 33 individuals, organizations, and agencies for their comment. These individuals and organizations included State and Federal resource management agencies, special interest organizations, and the grazing permittee. A Notice of Intent to prepare an Environmental Impact Statement was published in the Federal Register on December 24, 2009.

Scoping efforts generated responses from five individuals, five organizations, two state agencies, one federal agency, and one Tribe. Responses are documented in nine letters, as well as several e-mails, telephone conversation records, and meeting notes. These documents are filed in the project record.

Coordination with Oregon Department of Fish and Wildlife (ODFW) was conducted for this proposal through several informal meetings and telephone conversations.

The permittee holding the grazing permit for this allotment was included throughout the analysis process. The permittee provided input for alternatives and site-specific grazing operations information.

To clarify the concerns, follow-up telephone conversations, meetings, and e-mails were made between the Interdisciplinary Team and those who submitted comments.

Responses expressed a wide variety of opinions about the proposed action and information to be disclosed in the EIS. These comments were used to identify issues, alternatives to the proposed action, and the extent of environmental analysis necessary for making an informed decision. Information obtained from the scoping process is contained in the Project Record.

In addition to issues identified through public response, the Interdisciplinary Team considered potential issues not identified by the public. The Interdisciplinary Team considered these potential conflicts or issues, together with those identified during scoping, to determine whether it required development of an alternative to the proposed action, needed mitigation measures, or whether it was beyond the scope of this project.

Issues

Relevant issues are defined as "unresolved conflicts between alternative uses of available resources" [NEPA § 102(2)(E)]. A comparison of alternatives and their effects to resources is presented at the end of Chapter 2, Alternatives. A more detailed discussion can be found in Chapter 3, Affected Environment and Environmental Consequences.

Issues that could best be addressed by forming an alternative or introducing mitigation or monitoring were identified and categorized as 'Key Issues'. Two issues were considered to be major or relevant to the development of alternatives to the proposed action. Key Issue 1 was developed to address concerns about bighorn sheep. Key Issue 2 was developed to address concerns regarding the economic viability and operability of proposed grazing. Many of the other concerns raised were addressed in the EIS by providing additional information. A summary of key issue effects can be found in Chapter 2, Tables 8, 9, and 10. More detailed information can be found in Chapter 3.

Issue 1 – Bighorn Sheep

Part of the North End Allotment is near occupied Rocky Mountain bighorn sheep range. There is the potential for physical contact between the permitted domestic sheep and wild bighorn sheep. Contact between domestic sheep and bighorn sheep would likely be detrimental to the health of the bighorn sheep herd, and could result in substantial population declines. There is a need to manage livestock distribution to reduce the likelihood of contact between domestic and bighorn sheep.

In addition, unoccupied bighorn sheep habitat in the South Fork Walla Walla River (SFWW) area has long been identified as a potential bighorn re-introduction site (ODFW 2003). Establishing a bighorn sheep herd in this area would provide hunting opportunities for CTUIR tribal members and the general public; provide recreational wildlife viewing opportunities; and return a native species to the ecosystem. This area lies just to the northwest of the allotment. Changes to the management of this allotment would be necessary before re-introduction of bighorn sheep into the SFWW area could occur.

Comparison of Alternatives

The following indicators were used to compare the effects of alternatives to bighorn sheep:

- Separation distance between the allotment and the Wenaha bighorn sheep herd, and separation distance between the allotment and the potential SFWW release area.

- Separation effectiveness between domestic sheep on the allotment and the Wenaha bighorn herd, and separation effectiveness between domestic sheep on the allotment and prospective bighorn sheep in the SFWW river area.

Issue 2 – Management Feasibility

Alternatives to address the separation of bighorn sheep from permitted livestock could cause a reduction in the size of the allotment and/or the number of permitted sheep. This in turn could affect the permittee, the livestock industry, and how the allotment is managed. Any reduction in the size of the allotment without reducing the number of livestock could result in unwanted resource effects. Stocking levels and the reduction in acres were brought up in public comments. It was also suggested that additional acreage be offered to compensate for acres proposed for removal from the allotment.

Measures for evaluating this issue are:

- Operations: sheep herd routing and access challenges based on stocking rate and configuration of allotment

- Administration: water development and range monitoring needs

- Economics: revenue and jobs based on number of livestock

Other Issues

Issues that were not considered major, but which relate to existing regulations or which help to better understand the consequences of the proposed activities were considered and are listed below. These other issues are generally of high interest or concern to the public or are necessary to understand the full extent of the alternatives.

Range Conditions
There was a concern that grazing could negatively impact native vegetation.

> Response: Range conditions have been analyzed for each alternative. The amount of native vegetation affected differs by the allotment size in each alternative. However, range conditions would be in satisfactory condition under all alternatives. See the Range section of Chapter 3.

Suitability and Capability
A suitability and capability analysis was requested to determine if and where grazing should occur.

> Response: The Range section of Chapter 3 includes a suitability and capability analysis.

Invasive Plants
There is the potential for the spreading of existing noxious and invasive plant sites by grazing activities.

Response: The potential for weed spread by livestock is considered relative to the allotment size. Differences between alternatives are displayed in Table 11 of Chapter 2, and addressed in the Invasive Plant section of Chapter 3.

Recreation

User conflict may increase in areas where grazing activities overlap during increased recreation use.

Response: Grazing would occur in the North Fork Umatilla Wilderness in some alternatives. Grazing would occur in an area that has not been grazed for many years in one alternative. See Table 11 of Chapter 2 and the Recreation section of Chapter 3.

Roadless Areas, Wilderness Areas, and Potential Wilderness Areas

A concern was expressed about the impacts of grazing in the North Fork Umatilla Wilderness as well as several large uninventoried and inventoried roadless areas.

Response: The effects of grazing in these areas are discussed in the Recreation section of Chapter 3. Livestock grazing is an approved and appropriate use of wilderness if it occurred prior to formal designation. Livestock grazing has been occurring in the Analysis Area since the early 1900s. The North Fork Umatilla Wilderness was designated in 1984. Livestock grazing in the wilderness has been conducted in accordance to the regulations associated with the 1964 Wilderness Act, and Forest Plan standards and guidelines for wilderness areas.

Grazing would occur in roadless areas to varying degrees with all action alternatives. Because livestock grazing would not cause any areas to be less suitable for future wilderness designation, an in-depth analysis of potential wilderness areas is not necessary in this EIS.

Consultation

Because the grazing allotment is within the ceded lands of the CTUIR and Nez Perce tribes, consultation with affected Tribes to identify potential effects on cultural properties was expressed as a concern.

Response: Consultation with CTUIR and Nez Perce tribes is ongoing.

Treaty Rights

Possible effects that permitting domestic sheep grazing may have on historic properties of religious and cultural significance should be taken into account. Grazing domestic sheep have the potential to affect the Tribe's ability to hunt bighorn sheep due to the decline in their populations. This, in turn, may have an effect on exercising their treaty rights.

Response: Consultation with affected Tribes is ongoing. Concerns regarding bighorn sheep are addressed within the bighorn sheep key issue. See Chapter 2, Table 8 and Chapter 3, Key Issues.

Water Quality
There was a concern that grazing activities have the potential to alter stream discharge and degrade riparian areas and water quality.

> Response: Requirements are in place to protect water quality. In general, sheep are herded to watering sites such as rock pit ponds and watering troughs, and kept away from streams. The nature of this allotment and the way that livestock are required to be managed by herders has alleviated most concerns with soils and water quality. For more information, see the Water Quality section of Chapter 3.

Climate Change
An analysis of project effects on Climate Change was requested.

> Response: Chapter 3 contains a section on Climate Change.

Threatened, endangered, and sensitive species
The NEPA document should evaluate the impacts of grazing to endangered, threatened, and candidate species under ESA, and other species within the project area.

> Response: Chapter 3 addresses threatened, endangered, and sensitive fish, wildlife, invertebrate, and plant species. Determinations of effect did not differ between action alternatives.

Chapter 2 – Alternatives

This chapter describes the alternatives, summarizes the environmental impacts of each, and considers how well they achieve project objectives. A more detailed discussion of environmental impacts is presented in Chapter 3.

Alternatives were developed to respond to relevant issues. Public and interagency issues centered on the configuration of the allotment, potential effects to the livestock industry, potential effects to vegetation, soils, and water quality, and potential effects to fish and wildlife.

Five alternatives were developed, including the "No Action Alternative," which is defined as no livestock grazing. All action alternatives have been designed to satisfy the purpose and need of the action (see Chapter 1 – Purpose and Need). Each was designed to reduce the potential for contact between domestic sheep and bighorn sheep while providing forage for domestic livestock. Four other alternatives were considered but not analyzed in detail. This provided a wide range of reasonable alternatives.

Alternatives Considered and Analyzed in Detail

Alternatives vary by the configuration (location and size) of the allotment and the number of sheep bands allowed. All action alternatives incorporate the same Management Requirements, which are listed beginning on page 19. All action alternatives also incorporate the following management strategy described in Chapter 1:

> Livestock grazing would occur through a rest rotation grazing system. Routing schedules would be designed each year to allow deferment and to rest areas within the allotment. Sheep would be routed through the allotment in separated bands of approximately 1,000 ewes and their lambs. Each band of sheep would be managed by a herder and dogs. This allows control of where the sheep graze and protects riparian and other sensitive areas. Existing corrals and water improvements would be used and maintained. Closed roads may be used by special permit to route sheep, access water sources, and for camps.

Alternative 1

Alternative 1 is the Proposed Action. The proposed action would establish a new allotment boundary and reduce the allotment size from 132,000 acres to 101,000 acres. There would no longer be grazing in the Jarboe pasture and part of the Swamp pasture. The northeast edge of the allotment would follow Forest Road 63 (Figure 2).

This alternative reflects how the allotment has been managed since 2008 in order to provide a separation area between permitted domestic sheep and wild bighorn sheep. Annual operating instructions to the permittee were adjusted as an interim measure until a full analysis could be completed, and was used as the starting point in this EIS. This alternative provides a separation distance of 8 miles from the Wenaha bighorn sheep herd, and 1 mile from the SFWW potential release site.

A maximum of 3,962 ewe/lamb pairs would be allowed to graze from June 1st to October 9th. Four bands of sheep would be allowed to graze within 5 pastures (English Springs, Phillips Creek, Middle Ridge, Spout Springs, and a portion of Swamp Creek). Sheep would be managed in 4 separate bands within the remaining allotment. Each band would be routed in separate areas of the allotment using routing schedules within the pastures and subpastures.

Alternative 2

Alternative 2 would establish a new allotment boundary and grazing would be limited to the area south of Lookingglass Creek (Figure 3). There would no longer be grazing in all of the Swamp Creek and Jarboe pastures. The size of the allotment would be approximately 81,500 acres.

A maximum of 3,000 ewe/lamb pairs would be authorized to graze from June 1st to October 9th. Three bands would be allowed to graze within 4 pastures (Spout Springs, Middle Ridge, Phillips Creek, and English Springs), which would allow for a rest rotation or deferred grazing system.

This alternative would further increase the separation distance between the allotment and the Wenaha bighorn sheep herd while providing for a relatively large number of domestic sheep at an appropriate stocking level. There would be a 10.5 mile separation from the Wenaha bighorn sheep herd, and a 4 mile separation from the SFWW potential release site.

Alternative 3

Alternative 3 would establish a new allotment boundary and grazing would be limited to the area south of Lookingglass Creek except for the North Fork Umatilla Wilderness Area (Figure 4). The Jarboe, Swamp Creek, and English Springs pastures would no longer be part of the allotment and the Spout Springs pasture would be slightly smaller. The wilderness boundary was used because it follows a topographic break and is easily identifiable with signs. Using parts of the wilderness was considered but deemed impractical and of little benefit to the sheep operation under this alternative.

This alternative better addresses the bighorn sheep issue in the SFWW area by increasing the separation distance to 9 miles. There would also be more separation from the Wenaha bighorn sheep herd (12 miles).

Unique to Alternative 3 is the addition of the Goodman area on the southwest side of the allotment (Figure 4). The Goodman allotment has not been grazed for over 50 years, and is currently administratively closed. Parts of the Goodman allotment are included in this alternative in order to provide a grazing area in exchange for areas removed near bighorn sheep.

By adding this area, a relatively large number of domestic sheep could be sustained at an appropriate stocking level. The total amount of grazing area would be similar to Alternative 2 with 79,600 acres, and forage would be provided for up to 3,000 ewe/lamb pairs.

Alternative 4

Alternative 4 would establish a new allotment boundary similar to Alternative 3, but this alternative does not include grazing in the Goodman area (Figure 5). The amount of grazing area would total 52,600 acres, and could be grazed by up to 2,000 ewe/lamb pairs in three pastures (Middle Ridge, Phillips Creek, and Spout Springs).

This alternative was developed to address the bighorn sheep issue without adding new land to the grazing area. This alternative was developed to give decision makers and the public a range of alternatives to compare the effects with and without the Goodman area. The effectiveness of the bighorn sheep – domestic sheep separation would be the same as Alternative 3.

Alternative 5

Alternative 5 is the "No Grazing" alternative. The Council for Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) require that a 'no action' alternative be developed as a benchmark from which the agency can evaluate the proposed action. No action in livestock management planning is defined as 'no permitted livestock grazing' (USDA-FS 2005).

Under this alternative, livestock grazing would be discontinued and the North End Allotment would no longer exist. The North End Allotment would be closed by a separate decision signed by the Forest Supervisor. The existing Term Grazing Permit would be cancelled under the time period provisions of FSH 2209.13 (USDA-FS 2005). This would not be a permanent elimination of grazing. At any point in the future, grazing could be proposed with a new NEPA analysis.

Table 5. Alternative Summary.

Alternative	**1**	**2**	**3**	**4**	**5**
Allotment size (acres)	101,000	81,500	79,600	52,600	0
Ewe / lamb pairs	3,962	3,000	3,000	2,000	0
Number of bands	4	3	3	2	0

Figure 2. North End Allotment Alternative 1

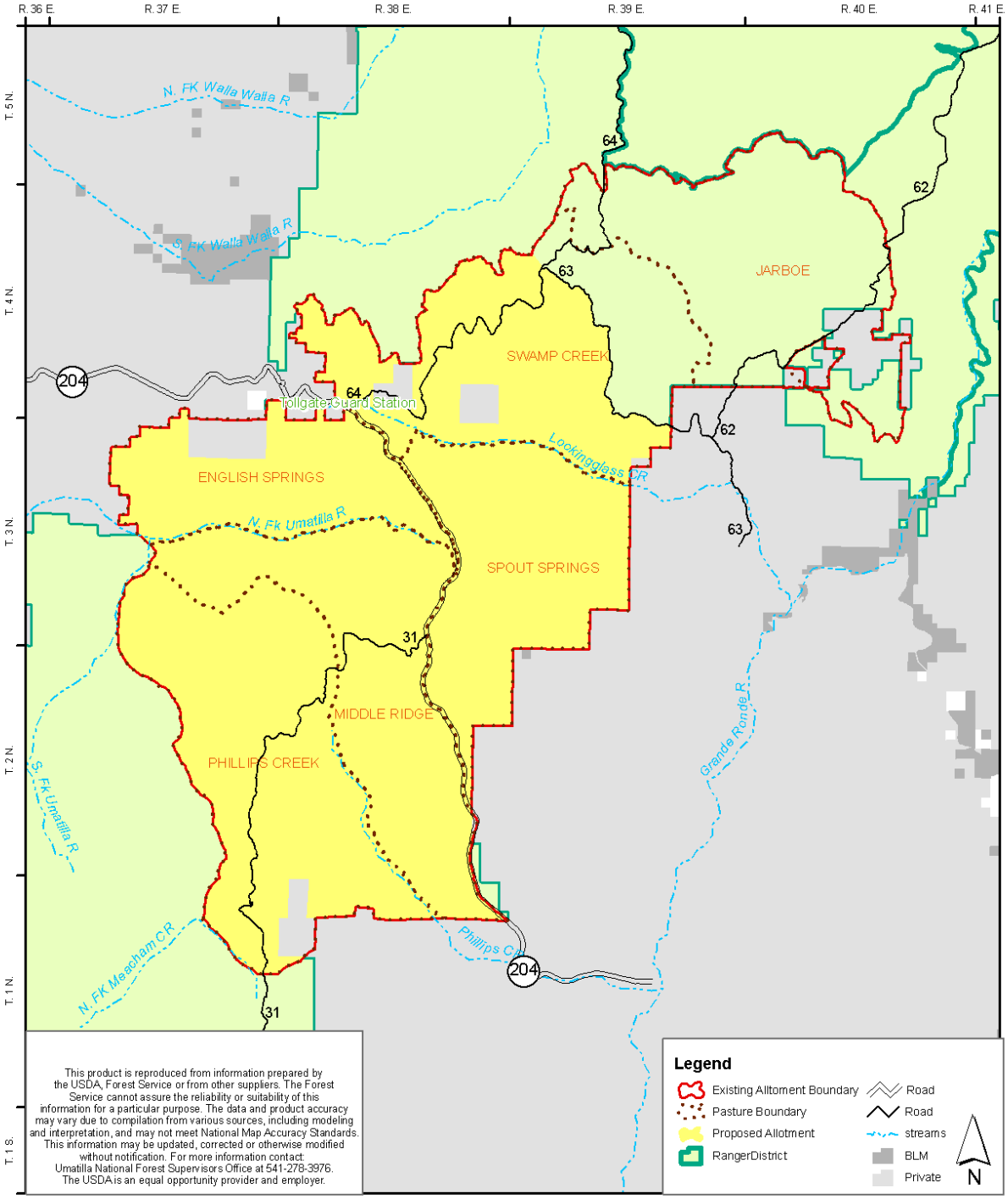


Figure 3. North End Allotment Alternative 2

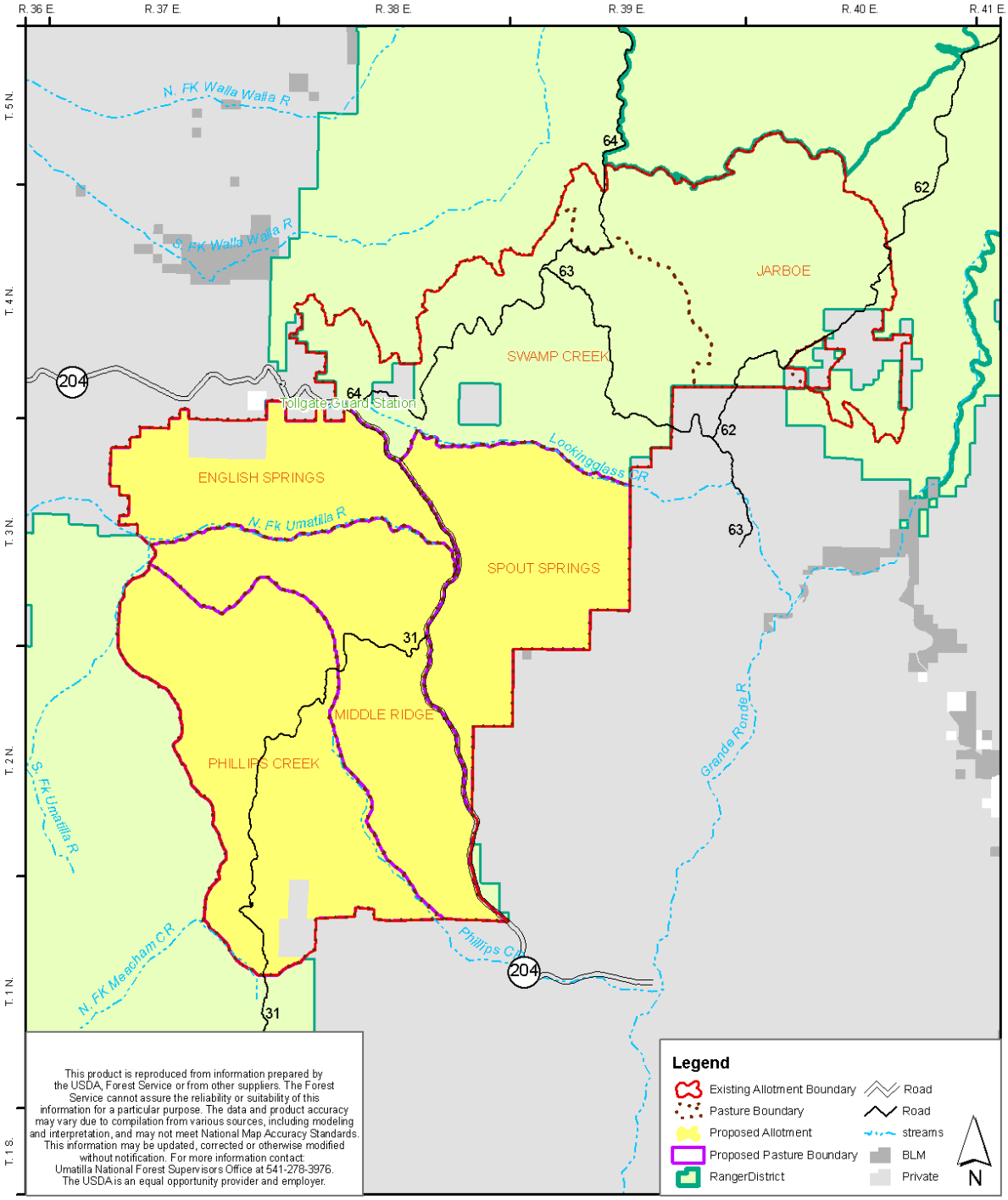


Figure 4. North End Allotment Alternative 3

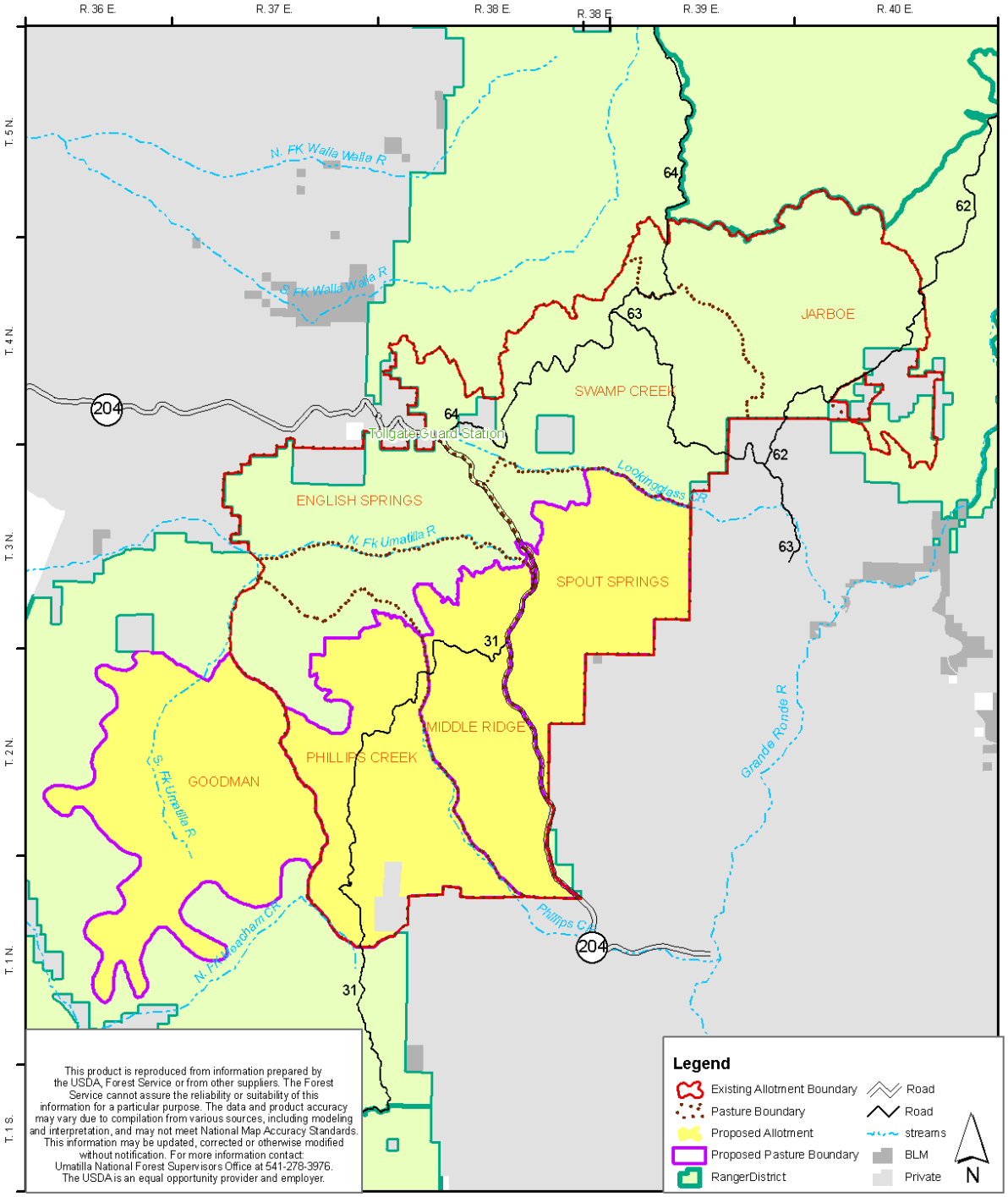
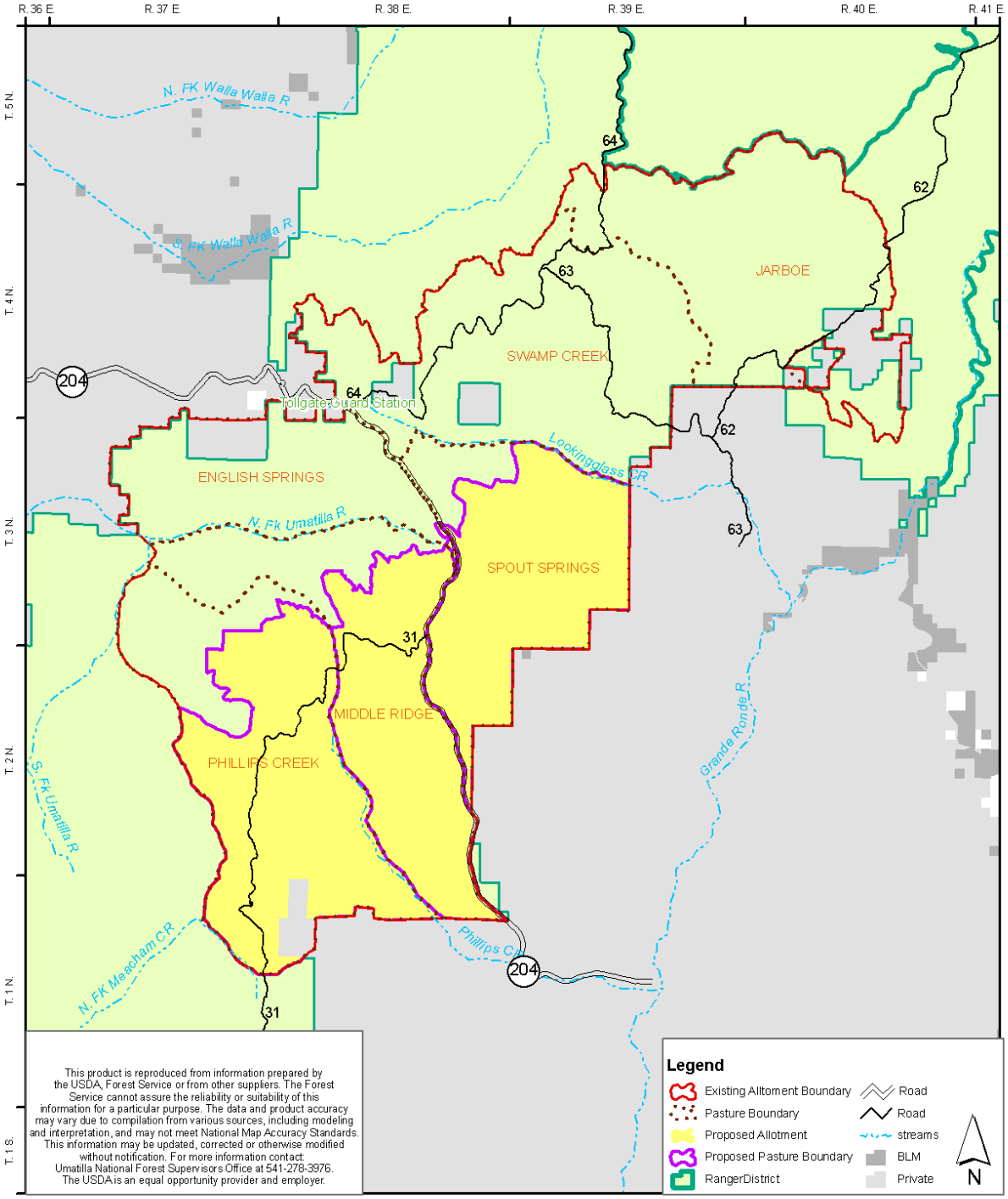


Figure 5. North End Allotment Alternative 4



Management Requirements

Management requirements apply to all action alternatives and will be incorporated into the Allotment Management Plan. These requirements are generally over and above the Forest Plan requirements.

General Management of livestock

Salting

- Salt will be located in areas such as old road beds or bare rock sites. Salting will be done from a container, and no salt is to remain at the site after the sheep have moved on.

Livestock Bedding

- Noon and overnight bed grounds should be used only once, except for densely timbered or rocky areas, (livestock will not normally be bedded in areas of dedicated old growth). Bedding should not occur on slopes greater than 30 percent, or on canyon edges or rims.
- Sheep will not be bedded within 300 feet of streams, seeps, and developed or undeveloped springs.

Herder Camps

- Camps will be placed at least 300 feet from live water, including undeveloped springs and seeps.
- Camps will be kept clean and garbage packed out.
- All fires built for any purpose by the permittee and/or herder will not be left unattended and will be completely extinguished. Each camp must be equipped with a serviceable shovel and ax. During periods the Forest has enacted fire restrictions, these restrictions will be followed.

Sick and Dead Livestock

- Producers/permittees should take appropriate measures to prevent turnout of sick or diseased domestic sheep. Sick or diseased animals should be removed or otherwise eliminated as soon as possible after their recognition.

- Dead livestock located on Forest Service administered lands and within 300 feet from any water source or designated roads, trails, or recreation sites will be promptly removed and properly disposed.

Working dogs

- Working dogs will be under the herder's control and must be non-threatening to people working or recreating on the forest.
- The Forest Service will post information about sheep herder working dogs at high public use areas in the allotment.

Stray management

- The permittee will count the number of sheep turned onto the allotment and the number of sheep taken off the allotment. If sheep are unaccounted for when leaving

the allotment, the permittee will notify the Forest Service immediately and make a concerted effort to locate the animals.

- The permittee will be required to mark all sheep in such a way that allows for easy identification of ownership.
- A herder is required to be with sheep at all times.
- The permittee will provide herders with an effective means of communication such that incidents can be reported promptly.
- If the herder and/or permittee are aware of or are notified that stray domestic sheep are outside the permitted area, the permittee or their agent will respond immediately and make best efforts to find and retrieve them, and notify the Forest Service within 24 hours.
- If the herder observes domestic sheep straying or notices that sheep are missing from the herd, he will call the permittee immediately, and the herder and or permittee will notify the Forest Service.
- The permittee is expected to make arrangements for retrieval of strays if he/she cannot be present, no more than 24 hours after discovery. The permittee will notify the Forest Service if delays occur.

Wildlife

- Troughs will be installed with escapement ramps to reduce potential mortality to bats and other species.
- The herder and/or permittee will report any interactions with wolves and follow appropriate procedures as outlined in the Wolf Management Plan (ODFW 2005).
- If a wolf den or rendezvous site is located in the allotment, the Forest Service will determine if seasonal restrictions or other requirements are necessary. Because these sites difficult to locate and can change from year to year, this will need to be assessed on an ongoing basis.
- A response protocol will be developed and reviewed annually which outlines agency and permittee responsibilities if bighorn sheep are seen near domestic sheep herds, or if domestic sheep are separated from the permitted area.
- The Forest Service will provide identification materials written in both English and Spanish to assist herders with identification of bighorn sheep, which includes phone numbers for both the Forest Service and ODFW.
- If the permittee or herder observes any interaction between wild and domestic sheep or sees any wild bighorn sheep within the permitted area, it is the herder's and the permittee's responsibility to immediately notify the Forest Service.

- The Forest Service will confer with ODFW regarding the need to locate, capture, or remove bighorn sheep.

- The Forest Service will post advisory signs at campgrounds, trailheads and other high-use recreational areas to educate visitors about sheep in the area and the need to report stray domestic sheep or observations of bighorn sheep.

Range Improvements

Maintenance of existing ponds and spring developments

- Water rights and uses will be assessed as developed water sources are maintained, rebuilt, and developed.

- Berms and dams will be reconstructed and maintained as needed to prevent leakage, downstream erosion, and minimize the risk of failure.

- Adequate spillways shall be developed and maintained to allow the safe release of water out of the pond. If needed, spillways will be hardened to ensure that down cutting does not occur.

- Ponds will be kept clean of logs and will be cleaned out when silted in.

- Permittees shall notify the USFS if a pond is leaking.

- Spring boxes will be kept clean to ensure that water flows freely from the spring box.

- Where no spring box exists, one will be installed or perforated pipe will be used.

- The fence around the water source will be maintained to prevent livestock from trampling the spring source. If no fence has been installed, one will be constructed or other methods will be used to protect the source (logs, bury, herding, etc).

- Leaks in the pipe will be fixed and lines will be checked to ensure they are free of air locks.

- The trough will be kept level and cleaned out to prevent water from overflowing.

- The overflow shall be maintained to ensure the excess water flows through the overflow pipe and off site (usually back to original water course).

- Leaks in troughs will be fixed or new troughs will be installed.

- Troughs will be installed with escapement ramps to reduce potential mortality to bats and other species.

New spring developments

- New developments are not needed unless Alternative 3 is selected and the Goodman area is added to the allotment. Specific locations have not been identified; therefore any new developments will be addressed in a separate NEPA document prior to implementation.

- The spring source will be collected into a spring box or perforated pipe. If a spring box is used, gravel will be placed behind and in the spring box to act as a filter.

- The spring box will be buried or fenced to protect the spring source from animal trampling.

- The spring will be piped from the box or perforated pipe some distance away from the source to a trough or series of troughs to prevent livestock concentration near the source. The pipe shall be buried deep enough to protect it from animals as well as from freezing.

- An adequate overflow will be installed from the troughs to drain excess water away from the troughs. The overflow pipe shall be directed back to the original water course.

Water Quality

See Term Grazing Permit for terms and conditions associated with livestock administration on the North End Allotment. Best Management Practices (Ref: November 1988 PNW publication titled General Water Quality Best Management Practices) and corresponding mitigation measures include:

<u>Best Management Practice, Range Management (RM)-2</u>: Soil and water resources will be protected through management of livestock numbers and season of use.

- Permission to turn out must be obtained from the Forest Officer at least five (5) days in advance. Livestock entry onto the allotment or into a specific pasture will not be permitted until:
    - Soils are dry enough to prevent damage
    - Key plant species are ready to withstand grazing.
- The off-date for a pasture is when stock will be fully out of the pasture, or in the case of the last pasture in the rotation, fully off the Forest. It may be necessary to begin gathering early or hire additional help to achieve this.

- If implementation standards are reached on key areas prior to the scheduled move/turn off date, livestock will be required to move to the next pasture or off the Forest earlier than scheduled.

- Livestock numbers, season of use, and movement may be adjusted each year through the Annual Operating Instructions to allow for resource management needs.

- Adjustments to livestock numbers, season of use, and movement may also be made during implementation to respond to resource conditions that develop as the season

progresses. These conditions may include: drought, wildfire, achievement of key plant species utilization levels, stubble height, etc. The type of mitigation used will be determined by the Forest Officer in charge, based on the degree of the problem and its cause. If mitigation activities do not achieve desired results, additional action will be taken (for example, reductions in stocking or season of use in subsequent years).

Best Management Practice RM-3: Preclude concentration of stock in areas that are sensitive to concentrated use and/or preclude prolonged use of an area which will result in loss of vegetative cover and soil compaction or damage to seeps and springs.

- In no case will salt be placed closer than ¼-mile to streams, springs, or other wetlands without prior approval.

Best Management Practice RM-4: Safeguard water quality under sustained forage production and manage forage harvest by livestock and wildlife.

- Forage resources will be allocated on a pasture-specific basis to meet basic plant and soil needs as a first priority. Forage production above basic resource needs will be available to wildlife and permitted livestock. See Table 6 in the Monitoring section below.
- Management activities will be designed and implemented to retain sufficient ground vegetation and organic matter to maintain long-term soil and site productivity.

Fish Habitat

The following Forest Plan standards (PACFISH) associated with livestock grazing apply to all Riparian Habitat Conservation Areas (RHCAs) and activities outside of RHCAs that will degrade them:

- Grazing Management (GM)-1: Modify grazing practices (e.g. season, stocking, access to riparian areas) that retard or prevent attainment of Riparian Management Objectives, or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusted practices are not effective in meeting Riparian Management Objectives and avoiding adverse effects on listed anadromous fish.

- GM-2: Locate new livestock handling and/or management facilities outside of RHCAs. For existing livestock handling facilities inside RHCAs, assure that facilities do not prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be achieved.

- GM-3: Limit livestock trailing, bedding, salting, loading, watering, and other handling efforts to those areas and times that will not retard or prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish.

- Grazing will not be authorized within 300 feet (PACFISH buffer) either side of streams with steelhead, Chinook or bull trout populations except at designated crossings as described below.

- Sheep will not bed within RHCAs of streams, springs, or other wet areas.

- Protect stream channel crossings by reviewing designated crossings to ensure there are no conflicts with fish, fish habitat, or bank stability. Select crossings that are dry during season of use, and have stable, naturally rocky banks. Road crossings will be used where available.

- Forest Plan riparian utilization standards will be followed. See Table 6 in the Monitoring section below.

Steelhead and Critical Habitats (spring-spawning species)

- Sheep will not be authorized to graze within 300 ft. of stream reaches that are used by steelhead except at crossings.
- Sheep will not be allowed to cross those stream reaches that are used by steelhead for spawning until after July 15th except at road crossings (where a bridge or culverts are present) or above perennial flow.

Bull Trout and Chinook salmon and Critical Habitats (fall-spawning species)

- Sheep will not be authorized to graze within 300 ft. of stream reaches that are used by bull trout or Chinook salmon except at crossings.
- Sheep will not be allowed to cross those stream reaches that are used by bull trout or Chinook salmon for spawning after August 15th except at road crossings (where a bridge or culverts are present) or above perennial flow.

  [Steelhead, bull trout, and/or Chinook salmon habitat occurs on the following streams: Lookingglass, Little Lookingglass, Swamp, Mottet, Eagle, Spring, Buck, Johnson, Woodward, Lick, Ryan, Shimmiehorn, Spring, Summer, Cabin, SF Cabin, Gordon, Phillips, East Phillips, Little Phillips, Dry, Creeks, Thomas, Bear, and NF Meacham creeks; Boston Canyon; Umatilla River, SF Umatilla River, NF Umatilla River, and SF Walla Walla River.]

Heritage resources

- The appropriate level of compliance with National Historic Preservation Act (NHPA), Section 106 must be completed before maintenance of existing and development of new improvements.

Special Management Areas

- Sheep will not graze on special Botanical Areas as described in the Special Interest Management Area in the Forest Plan (p. 4-131), which include Farr Meadow (50 acres), Ruckle Junction (5 acres), Shimmiehorn Canyon (140 acres), and Woodward Campground (15 acres).

- Sheep will be routed around all viewpoint special interest areas as described in the Special Interest Management Area in the Forest Plan, which include Bald Mountain, Gray Rock, Lookout Mountain, and Umatilla Breaks. None of the alternatives propose grazing near Lookout Mountain.

- Sheep will normally be routed around all developed recreation areas. The following recreation sites are included in the Developed Recreation Management Area of the Forest Plan (p. 4-117): Beaver Marsh, Buck Creek, Umatilla Forks, Corporation, Jubilee Lake, Woodland, Woodward, Mottet, Spout Springs, Tollgate, and Target Meadows. In some cases, sheep may be routed near developed recreation sites but will not be allowed to stay for an extended period of time. Sheep may be authorized to graze the Spout Springs ski area to maintain desired vegetative conditions.

- Livestock will be managed within wilderness areas to minimize impacts on the wilderness environment and to minimize potential conflict with other users of the area. For example, high use areas such as trailheads will be avoided, and sheep will be routed away from or around people using the area.

Sensitive Plant Areas

- Livestock will not be allowed in Lookingglass Creek and the slopes immediately above it to protect *Rorippa columbiae.*

- Livestock will not be allowed in the *Carex cordillerana* area near Umatilla Forks.

- Livestock use will be monitored near the *Carex vernacula* area in the Middle Ridge pasture and appropriate measures will be taken to exclude sheep where necessary.

Invasive Plants

- The Allotment Management Plan map will show current, inventoried noxious weed infestations to be avoided and/or monitored.

- Locations of infestations shall be discussed with the permittee during annual meetings to prevent spread of these sites. Permittee will be given identification information about noxious weeds during annual meetings with the Forest Service.

- The permittee should inform the Forest Service of infestations on the allotment.

- Vehicles used in managing livestock on the allotment shall be cleaned of any weed transporting material such as hay, mud, or seeds prior to entering Forest Service lands.

- All hay used on USFS land shall be certified weed free.

- Any seeding for restoration purposes will utilize certified weed-free seed.

- Native plant materials are the first choice in re-vegetation for restoration and rehabilitation where timely natural regeneration of the native plant community is not likely to occur. Non-native, noninvasive plant species may be used in any of the following situations: 1) when needed in emergency conditions to protect basic resource values (e.g., soil stability, water quality and to help prevent the establishment of invasive species), 2) as an interim, non-persistent measure

designed to aid in the reestablishment of native plants, 3) if native plant materials are not available, or 4) in permanently altered plant communities. Under no circumstances will nonnative invasive plant species be used for re-vegetation.

Monitoring

The following monitoring would occur as part of implementing grazing in the North End Allotment. These standards and monitoring methods have proven to be effective on the Umatilla National Forest and supported by the Forest Plan, past monitoring, permit administration, and long term monitoring data.

Forest Plan Utilization Standards
The Umatilla Forest Plan identifies utilization standards to assure continued maintenance or improvement of vegetation and soils. Maximum utilization standards have been set for both riparian and upland vegetative communities depending on range condition (Satisfactory or Unsatisfactory) (Table 6). Utilization of grass and forbs are measured by percent weight of forage remaining, while shrubs are measured by annual growth remaining. These utilization standards are maximum levels of use, regardless of which animal species uses the forage or browse. The standard reached first will be the most restrictive and livestock will be removed prior to that standard being exceeded. If standards do not maintain the desired conditions, a more restrictive standard will be prescribed as part of the adaptive management process.

Table 6. Allowable grazing utilization standards.

Measure	Upland			Riparian	
	Grass and Forbs		Shrub	Grass and Forbs	Shrub
	Forested	Grassland			
Satisfactory	45%	55%	40%	45%	45%
Unsatisfactory	35%	35%	30%	35%	30%

The Forest Service range manager assesses utilization during and after grazing. Monitoring of riparian vegetation occurs in areas that are representative of the associated pasture. The monitoring areas are locations where forage utilization would first become evident, or where utilization would lead to unacceptable resource conditions. Upland monitoring may be conducted by the permittee, with visual inspections by the Forest Service range manager. If the range manager visually identifies an area of concern, more intensive measurements are taken.

Height/weight curves for many rangeland plant species have been converted to utilization measures to provide a quick, reasonable estimate of the level of grazing that could be sustained, while still allowing plants to store carbohydrates for seasonal growth and persistence.

Interagency Implementation Monitoring
Implementation monitoring is required on grazing allotments to meet the terms of the 1998 PACFISH/INFISH Biological Opinions. This monitoring will occur at Designated Monitoring Areas (DMA) along streams within each pasture. Monitoring will occur on herbaceous vegetation (stubble height or % utilization), bank alteration, and utilization of woody vegetation. This monitoring will occur on the greenline. Designated Monitoring Areas may be moved to different locations based on resource conditions. If there is not an appropriate monitoring area within a management unit, a DMA will not be established.

Effectiveness Monitoring
Effectiveness monitoring, or long term monitoring, is used to determine the trend of riparian and upland vegetation as they relate to livestock grazing activities in the North End Allotment. Described below is the effectiveness monitoring plan for the North End Allotment.

Upland Habitats
Two Condition and Trend (C&T) Clusters were established in 1993 have been monitored to determine the trend of vegetation and soil conditions on the allotment. These C&Ts would continue to be monitored approximately every 10 years by the Forest Service. Trend evaluation would be used to help determine if livestock grazing on the allotment is allowing maintenance of or movement towards desired vegetation conditions (Forest Plan Goal). Other monitoring protocols may be used to help determine vegetation condition and trend.

Riparian Habitats
The majority of the riparian habitats within the allotment will not be grazed. Compliance checks will occur to ensure that sheep are not accessing streams with fish populations (RHCAs). Riparian monitoring/assessments may occur in the headwaters of streams or in small isolated meadows to determine the condititon of plant communtities and the condition of undeveloped seeps and springs. Adjustments in routing schedules may occur based on these assessments.

Maintenance of developed water sources and their management is intended to protect spring and seep integrity, to prevent damage to wet soil, and to control erosion and sedimentation from watering sources. Effectiveness of these BMPs will be monitored at selected developed sources each year of grazing.

Other Implementation Monitoring
Implementation of BMPs identified for developed water source maintenance and management will occur each year of grazing.

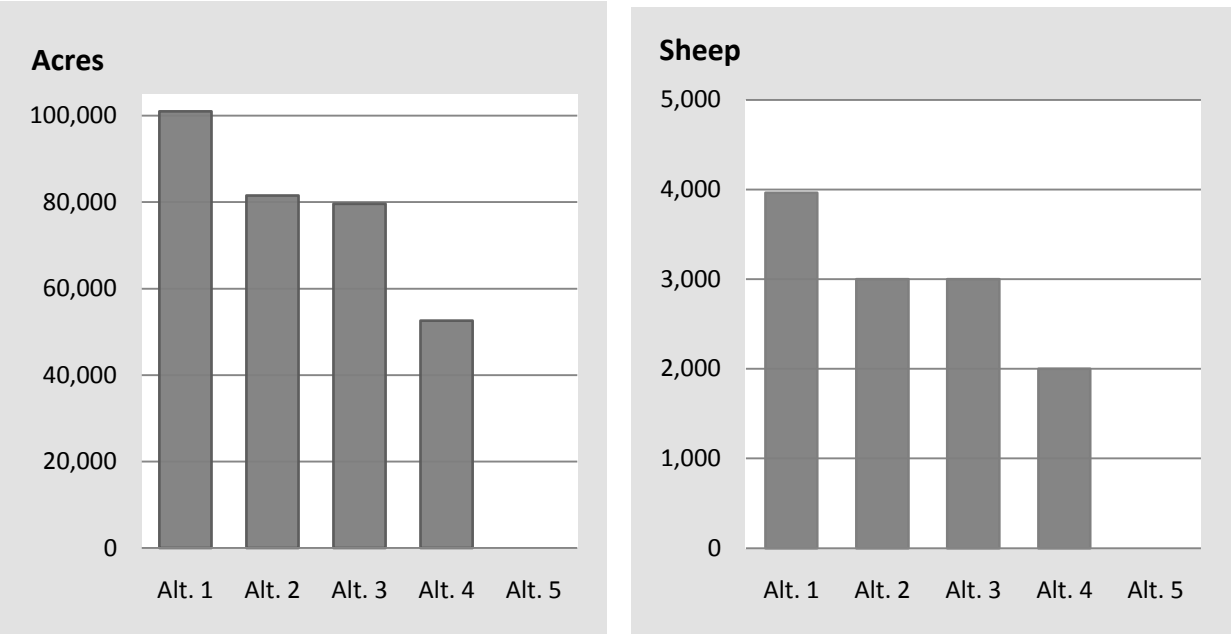
Monitoring results since 1992 are detailed in the Range Report.

Alternative Comparison and Summary

Table 7. Alternative Summary.

Alternative	1	2	3	4	5
Allotment size (acres)	101,000	81,500	79,600	52,600	0
Ewe / lamb pairs	3,962	3,000	3,000	2,000	0
Number of bands	4	3	3	2	0

Figure 6. Acres grazed and number of sheep by alternative.



Comparison of Alternatives by Key Issue

Key Issue: Bighorn Sheep

There is a need to effectively separate permitted domestic sheep from bighorn sheep. Effective separation is defined as spatial and/or temporal separation between wild sheep and domestic sheep or goats, resulting in (at most) a minimal risk of potential respiratory disease transmission (WAFWA 2010). This can be achieved through a combination of factors including maintaining separation distance appropriate for the terrain, managing livestock properly, and coordinating closely with the state wildlife agency.

All action alternatives increase the distance separating domestic sheep on the North End allotment from bighorn sheep. Separation distance is measured in air line miles from the edge of allotment to the closest known area used by bighorn sheep. Simply stated, the further apart the two species, the less likely they will contact one another.

Separation effectiveness is a relative rating based on distance in combination with other factors. Local knowledge of the area was used to determine the relative ranking of high, moderate or low separation effectiveness. After considering potential vegetative and topographic deterrents to bighorn sheep movement, considering available bighorn sheep radio telemetry data, and considering separation distance, a relative rank of high, moderate or low separation effectiveness was assigned to each alternative

The following indicators were used to compare the effects of alternatives to bighorn sheep (Table 8):

- Separation distance between the allotment and the Wenaha bighorn sheep herd, and separation distance between the allotment and the potential SFWW release area.

- Separation effectiveness between domestic sheep on the allotment and the Wenaha bighorn herd, and separation effectiveness between domestic sheep on the allotment and prospective bighorn sheep in the SFWW river area.

Table 8. Separation distance and separation effectiveness by alternative.

Measure	Current allotment boundary	Alternative			
		1	**2**	**3 and 4***	**5 – no grazing**
Separation distance between allotment boundary and **Wenaha** bighorn sheep (air miles)	1	8	10.5	12	NA
Separation effectiveness between North End permitted sheep and **Wenaha** bighorn sheep	Low	Moderate	High	High	NA
Separation distance between allotment boundary and **SFWW** bighorn sheep habitat (air miles)	1	1	4	9	NA
Separation effectiveness between North End permitted sheep and potential **SFWW** bighorn sheep	Low	Low	Low to Moderate	High	NA

*The effects of Alternatives 3 and 4 are the same because Alternative 4 was not designed to respond to the bighorn sheep issue.

Key Issue: Management Feasibility

The management feasibility rating compares the current management of the allotment as written in the 1986 Allotment Management Plan to each alternative. All action alternatives result in a reduction in management flexibility as compared to the current management of the allotment.

- Operations: sheep herd routing and access challenges based on stocking rate and configuration of allotment (Table 9)
- Administration: water development and range monitoring needs (Table 9)
- Economics: revenue and jobs based on number of livestock (Table 10)

Table 9. Comparison of Operation and Administration by alternative.*

Alternative	Current permit	1	2	3	4	5
Stocking Rate (acres /SHM)	5.1	5.8	6.2	6.1	6.0	0
Herd route management challenges	Low	Moderate	Moderate	High	Moderate	NA
Access and grazing management challenges	No	No	No	Yes	No	NA
Increased monitoring needs	No	Yes	Yes	Yes	Yes	NA
Water development costs	0	0	0	$50,000 or less	0	0

*Routing challenges are expected because the allotment would be smaller with fewer options to rest areas. The "high" rating for Alternative 3 reflects the current lack of knowledge about managing the new grazing area. Access challenges refer to expected difficulties with road access in the new grazing area. An increase in vegetation monitoring would be expected in all alternatives because the allotment would be smaller with fewer options to rest areas.

Table 10. Economic indicators by alternative.*

Alternative	Current permit	1	2	3	4	5
Revenue	$385,899	$385,899	$292,200	$292,200	$194,800	0
Grazing Fees to U.S. Treasury	$7,012	$7,012	$5,309	$5,309	$3,539	0
County payments (25 %)	$1,753	$1,753	$1,327	$1,327	$885	0
Jobs	5.1	5.1	3.9	3.9	2.5	0
Percent reduction for all of the above	-	0 %	24 %	24 %	50 %	100 %

*Revenue is estimated based on a 100 lb. lamb sold at the 2008 sale price of $97.40 per hundred weight. Jobs are calculated as 0.3 employees for every 1000 head month (HM) livestock grazed. Grazing fees are based on the 2010 rate of $1.35 per SHM.

Other Issues

Issues that were not considered major, but which relate to existing regulations or which help to better understand the consequences of the proposed activities were considered and are listed below (Table 11). These other issues are generally of high interest or concern to the public or are necessary to understand the full extent of the alternatives.

Table 11. Other Issues by Alternative.

Alternatives	**1**	**2**	**3**	**4**	**5**
Invasive plant sites within the allotment boundary	429	313	325	278	0
Wilderness acres within allotment boundary	20,520	20,520	0	0	0
Roadless acres within allotment boundary	7,500	5,300	13,800	3,860	0
Recreation	Occasional contact / minor effects	Occasional contact / minor effects	Occasional contact / minor effects	More opportunities in undeveloped areas than Alternatives 1-3	

For additional information on Alternative effects, see Chapter 3.

Preferred Alternative

Alternative 4 is the agency preferred alternative.

Alternatives Considered but Not Analyzed in Detail

Additional options were considered in response to public comments, but were dismissed because they would not reasonably meet the Purpose and Need for action. They are as follows:

- Keep entire allotment as described in the 1986 Allotment Management Plan. This would not meet the stated purpose and need for action (see Chapter 1, Purpose and Need) because there would not be adequate separation between domestic sheep and bighorn sheep.

- Convert allotment to cattle grazing. Conversion to cattle does not meet the purpose and need because management feasibility would be greatly reduced. It would be costly to plan and administer a cattle allotment. It would be costly to build fences and cattle guards. In addition, cattle grazing would likely result in negative impacts to other resources.

- Use the Proposed Action boundary, but reduce the number of livestock. This scenario is based on a presumption that resource damage may occur if the land base is smaller with the same number of sheep. On the contrary, all alternatives were designed to continue to meet soil, water, and vegetation objectives as well as address the bighorn sheep issue.

- Limit allotment to areas south and west of Highway 204 in order to provide separation between domestic sheep and bighorn sheep. Alternatives 3 and 4 are believed to provide a sufficient separation between the two sheep species. In reality, if the allotment were further pulled back to Highway 204 along Little Phillips Creek, there would be no added separation because grazing on adjacent private land would likely continue.

Chapter 3 – Affected Environment and Environmental Consequences

This chapter describes the environment and the environmental impacts that would likely result from the various alternatives. It focuses on the following resources that are relevant to or affected by the proposed activities: bighorn sheep, management feasibility, rangeland conditions, invasive plants, sensitive plants, soils and water quality, fish and aquatic habitat, wildlife species and habitats, recreation, wilderness, and cultural resources.

This chapter summarizes the analysis provided by each resource specialist (listed in Chapter 4). Resource specialist reports and biological evaluations are part of the Project Record. Each of the following resource sections identifies the existing condition for that resource and the direct, indirect, and cumulative effects of the proposed activities. Past, ongoing, and future foreseeable projects in the area include aquatic restoration projects, invasive plant treatments, landscape prescribed fire, recreation site maintenance, timber harvest and fuel reduction projects.

The chapter ends with specifically required disclosures which demonstrate consistency with applicable laws and regulations.

Key Issue: Bighorn Sheep

Background

At one time, Rocky Mountain bighorn sheep were possibly the most common big game mammal in the mountain regions (Toweill and Geist 1999). One historic estimate was that up to 2 million animals occurred in North America prior to European settlement. Currently there are about 35,000 Rocky Mountain bighorn sheep in North America (Toweill and Geist 1999).

Bighorn sheep are native to the mountain and canyon country in northeastern Oregon and southeastern Washington (Bailey 1936), but were gone from the region by 1945 due to over-hunting, competition for forage with domestic livestock, and introduced diseases (Coggins and Mathews 1996, HCBSRC 2004).

A long history of bighorn sheep die-offs has been documented across Canada and the United States, many coinciding with the influx of domestic sheep (Goodson 1982, Jessup 1985). Singer et al. (2001) found that the persistence of bighorn sheep populations was negatively correlated with the presence of domestic sheep. For decades, biologists and scientists have emphasized the need to maintain spatial separation of domestic and wild sheep in order to reduce disease transmission.

Disease transmission

Bighorn sheep and domestic sheep are closely related, and they are naturally attracted to one another (Schommer and Woolever 2001). Bighorn sheep are native to North America, whereas domestic sheep most likely descended from the wild mouflon of Asia (Mason 1996). Domestic sheep have been selectively bred for disease resistance, among other factors, and have historically been raised in concentrated flocks. North American bighorn sheep evolved in high mountains and arid climates at relatively low population densities, and are generally more susceptible to each of the diseases they share with livestock (Jessup 1985).

The primary factor limiting bighorn sheep populations and long-term viability is their susceptibility to disease transmission from domestic sheep and goats (Beecham et al. 2007, George et al. 2008). This is followed by lack of connectivity and/or loss of genetic fitness due to habitat fragmentation; habitat loss; human disturbance; competition for resources with domestic livestock; and predation on small, isolated herds (Beecham et al. 2007). Bighorn sheep have a low tolerance to over hunting, poor range conditions, and habitat loss compared to other wild ungulates (Martin et al. 1996).

Bighorn sheep are highly susceptible to pneumonia and particularly to pasteurellosis, a generic term for disease caused by bacteria in the *Pasteurellaceae* family (Miller 2001). This condition is known to cause individual deaths, large-scale herd mortality events, and depressed lamb recruitment (George 2009). Other factors that can potentially predispose a bighorn sheep to disease or increase the potential for mortality include the presence of lungworms, respiratory viruses, other bacteria, other microbial agents, gastrointestinal and external parasites; breeding behavior; and genetics (Foreyt 1998). Harsh weather and poor nutrition may periodically reduce the ability of bighorn sheep to resist disease (Garde et al. 2005).

Bighorn sheep pneumonic deaths are most often caused by a bacteria known as *Mannheimia haemolytica* (formerly *Pasteurella haemolytica*), and other *Pasteurella* species (Foreyt 1990). *Mycoplasma ovipneumoniae* has also been recently implicated, which appears to cause a predisposition to fatal pneumonia due to *M. haemolytica* (Dassanayake et al. 2010). Domestic sheep are often carriers of *Pasteurella spp*. but do not exhibit clinical signs (Foreyt 1989). These bacteria species survive less than 24 hours outside the host and thus do not persist in the environment (CAST 2008, Garde et al. 2005, Onderka and Wishart 1988).

A recent study unequivocally demonstrated the transmission of tagged *M. haemolytica* bacteria from infected domestic sheep directly to several bighorn sheep, leading to death of the bighorns (Lawrence, et al. 2010). *Mannheimia haemolytica* generally requires direct physical contact between animals for transmission (Foreyt et al. 1994), such as nose to nose or sneezing in close proximity.

There have been close encounters between domestic sheep and bighorn sheep that did not result in disease (Coggins 2002). The development of immunity to pasteurellosis in bighorn sheep is complex and poorly understood (Miller 2001). Vaccines to protect bighorn sheep have thus far been ineffective (Foreyt 1992, Foreyt 1998, Foreyt and Silflow 1996). However, individual bighorn sheep that recover from pasteurellosis may remain healthy during subsequent epidemics (Miller et al. 1991).

This analysis recognizes the complexity associated with various disease pathogens. All bighorn sheep disease epidemics cannot be specifically attributed to contact between domestic and bighorn sheep, however numerous empirical studies and field observations demonstrate that interactions between domestic and bighorn sheep increases the probability of mortality and reduced lamb survival (CAST 2008). There is widespread support in the scientific community to do as much as we can to keep the two species separated until additional research provides other solutions.

Bighorn sheep habitat

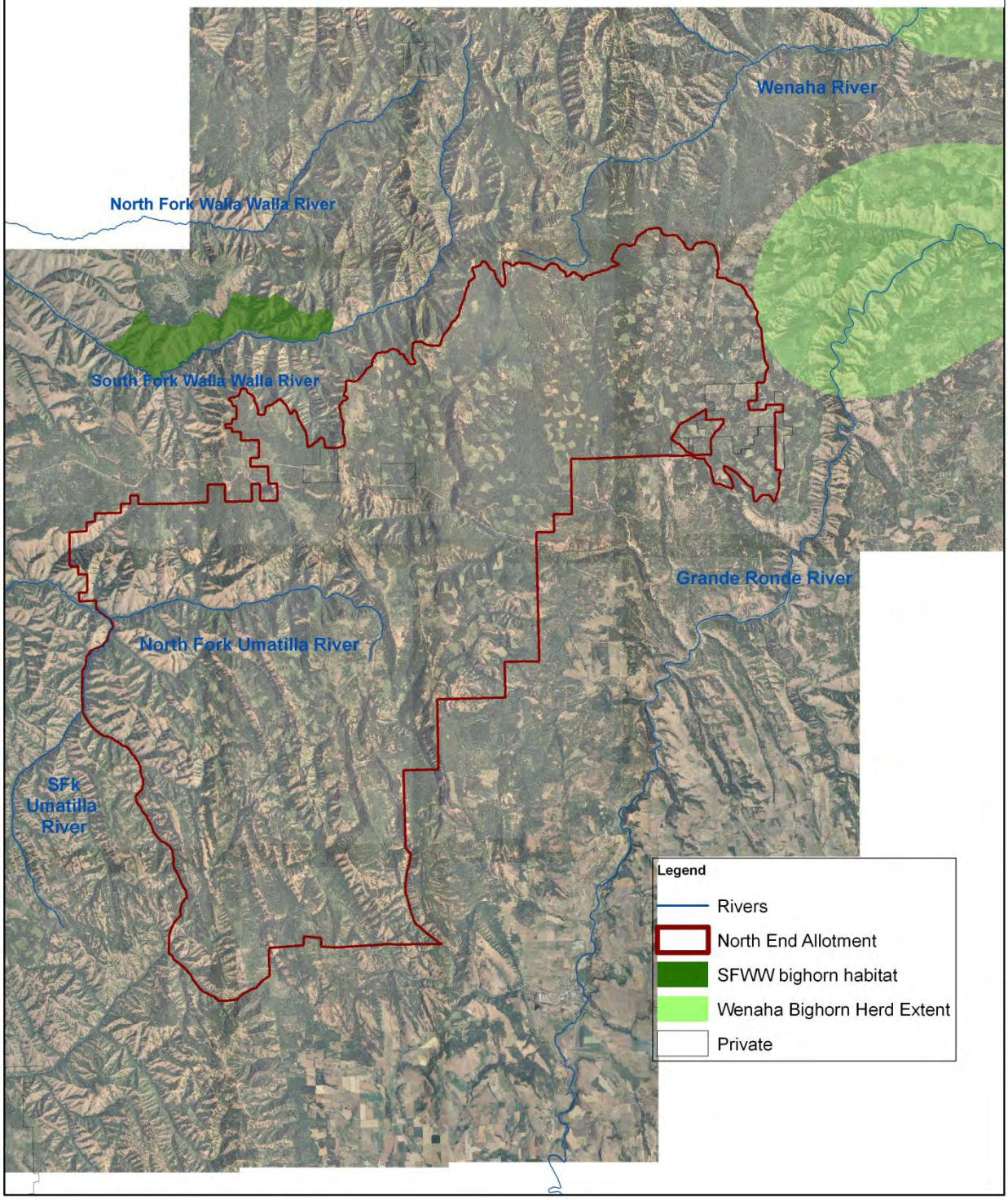
Primary bighorn sheep habitat consists of rugged, open to semi-open grassland or grass/shrub plant communities that allow high visibility. Terrain is characterized by a mix of steep or gentle slopes, broken cliffs, rock outcrops, and canyons and their adjacent river benches and mesa tops (Beecham 2007). Expanses of rim rock, broken cliffs, and rock outcrops are especially important for lambing and escape from predators. Most northeast Oregon bighorn sheep herds have excellent grassland ranges with abundant food (ODFW 2003). Grasses are the staple forage species, complemented seasonally with forbs and shrubs.

The North End Allotment itself contains very little potential bighorn sheep habitat and would not likely support a bighorn population (Schommer pers. comm., Kirsch pers. comm.). Portions of the Umatilla River drainage contain steep, open areas; however there is a very limited amount of exposed basalt (rocky habitat) that bighorn sheep need for escape terrain. There is also little to no contiguity of bighorn habitat between the Wenaha / Grande Ronde bighorn habitat and the Umatilla River area because of the large tracts of conifer forest (Figure 7).

The South Fork Walla Walla River (SFWW) area has long been identified as high quality, unoccupied Rocky Mountain bighorn sheep habitat. This bighorn sheep habitat is on Forest Service and Bureau of Land Management lands. The area is identified as a potential transplant site in the state of Oregon's Bighorn Sheep and Rocky Mountain Goat Management Plan (ODFW 2003). Establishing a bighorn sheep herd in this area would provide hunting opportunities for CTUIR tribal members and the general public; provide recreational wildlife viewing opportunities; and return a native species to the ecosystem.

Although there are no immediate plans to introduce bighorn sheep there (Kirsch, pers. comm.), individual bighorn sheep could migrate there on their own. At least two bighorn sheep have appeared in the general SFWW area in the past, and were removed by ODFW because it was likely they had come into contact with domestic sheep (Kirsch, pers. comm.).

Figure 7. Aerial view of North End Allotment.



Wenaha bighorn sheep herd

This analysis focuses on the Wenaha herd, but acknowledges the potential for interaction with other bighorn sheep populations in the Hells Canyon bighorn sheep metapopulation. In particular the Wenaha bighorn sheep population is closely linked to the Mountain View/Cottonwood bighorn sheep population in Washington on the Grande Ronde River north of Troy.

The Wenaha bighorn sheep herd was established with animals translocated from Idaho, Oregon, and Washington. In 1983, 30 Rocky Mountain bighorn sheep were released into the Wenaha River canyon. Additional transplants occurred in 1984 and 1986, for a total of 72 animals released (HCBSRC 2004). The population grew quickly, peaking in 1992 with an estimated 130 animals (HCBSRC 2004).

In 1995 and 1996, a pneumonia die-off spread throughout bighorn sheep herds in the region. Bighorn sheep first began dying north of the Grande Ronde River in Washington. The pneumonia outbreaks spread south to other herds near the Grande Ronde River and lower Hells Canyon (Cassirer et al. 1996). The Wenaha herd was reduced down to 50 animals.

In 1997 a joint effort to radio collar and monitor bighorn sheep began as part of the Hells Canyon Initiative (HCBRSC 1997). Between 1997 and 2009, an average of 16 bighorn sheep have had functioning radio-collars annually (range of six in 2009 to 23 in 2006). With the exception of three rams collared with GPS radio-collars in 2007, all collars were equipped with VHF transmitters and located approximately every two weeks.

In addition to immediate all-age bighorn sheep herd deaths, long-term reductions in lamb survival and recruitment can result in stagnant populations over many years (George et al. 2009). Adult sheep that survive the initial pneumonia episode have apparently remained infected for many years or have been periodically reinfected but have some level of protective immunity. Between 1997 and 2003, in the years after the initial die-off, survival of adult rams averaged 89 percent and ewe survival averaged 93 percent. However, lamb survival to weaning averaged less than 50 percent and recruitment averaged 23 lambs per 100 ewes (Cassirer and Sinclair 2007).

Productivity observed in the Wenaha population from 1997 to 2003 averaged 63 percent, but in most years over 70 percent of these lambs will die within the first few months of life from pneumonia, apparently caused by exposure to the bacteria shed in nasal secretions of adults (Foreyt 1990, Cassirer and Sinclair 2007). Eighty-six percent of lambs found dead are diagnosed with pneumonia (Akenson 1998, Cassirer and Sinclair 2007).

Summer lamb survival rates in the Wenaha herd have fluctuated widely, but generally remain low and pneumonia continues to be detected in dead lambs. Seven radio collared ewes were observed with lambs each year in 2008 and 2009, but only one of these lambs made it to October (IDFG 2009, HCBSRC December 2009 – meeting minutes).

In 2008 the Wenaha herd numbered about 90 individuals (ODFW 2009). The maximum count in 2009 was 57 sheep in the Wenaha segment of the population and 34 in Mountain

View/Cottonwood. Essentially, the Wenaha herd has still not recovered from the 1995 - 1996 pneumonia epizootic.

In 2010, the Forest Service provided funds to purchase additional radio collars and increase monitoring of the Wenaha bighorn herd. Radio collars were placed on 21 bighorn sheep in the Wenaha and Mountain View/Cottonwood populations. Seven of these are GPS (Global Positioning System) collars with an Argos uplink, and two are "store on board' GPS collars (Cassirer pers. comm.). GPS collars provide several locations per day and are accompanied by ground and aerial surveillance.

Wenaha herd distribution in relation to the North End Allotment

Based on radio telemetry and visual observations, the majority of bighorn sheep in the Wenaha herd are located along the Wenaha River and the lower Grande Ronde River near Troy, Oregon. A small number of bighorn sheep are frequently located further to the south immediately adjacent to the North End Allotment (Figures 7 and 8). At current population levels, about 20 bighorn sheep make use of this area primarily in summer and fall (Cassirer pers. comm.).

The 1986 North End Allotment Management Plan acknowledged the potential for conflicts with bighorn sheep in this area. The allotment boundary was pulled back from the breaks of the Grande Ronde River, providing a one mile buffer between bighorn habitat and the allotment edge. The portions of the allotment that are in close proximity to the Wenaha bighorn herd is forested, although there has been a great deal of timber harvest and roading. There are no obvious dispersal corridors through the forest between suitable patches of bighorn habitat.

Although bighorn sheep do not favor timbered areas, they will pass through them and are extremely hard to detect when this happens (Schommer 2009). Bighorn sheep exhibit strong site fidelity and dispersal rates are believed to be low (Beecham 2007), but occasional long distance movements do occur. Patterns of long distance movements have not been adequately studied (Beecham 2007). In general, dispersal of individuals tends to occur when resources are abundant and individuals are strong and healthy (Toweill and Geist 1999). Newly established (transplanted) populations in high quality habitat are prone to disperse (Beecham 2007, DeCesare and Pletcher 2006).

No bighorn sheep have been documented in the North End Allotment for the past 13 years. However, there were 2 years in the 1990's in which bighorn sheep were present. In 1994, two bighorn sheep were removed just west of the North End Allotment (Kirsch pers. comm.). In 1997, two additional bighorn rams had to be removed from within the allotment (Kirsch pers. comm.). None of these animals were radio collared, so we do not know where they came from, but presumably they traveled from either the Grande Ronde River area or the Wenaha-Tucannon Wilderness.

Both bighorn rams and ewes can be attracted to domestic sheep (Coggins 2002). The Jarboe pasture was grazed by domestic sheep in both 1994 and 1997, which at some points is within a mile of known bighorn sheep use areas. It is possible that the presence (sound and sight) or lingering sign (odor and droppings) of domestic sheep on the allotment affected the behavior of these wandering bighorn rams.

Domestic sheep have also strayed from permitted grazing areas into bighorn sheep territory. Two domestic sheep moved off the North End Allotment in 2008. One was found east of the Grande Ronde River with a cow, and the other was observed to the north in the Wenaha-Tucannon Wilderness with a mountain goat (Coggins and Mathews 2008, District records).

Domestic sheep herds have been grazing on large tracts of private property adjacent to Forest Service land. These areas are owned by Forest Capital Partners (formerly Boise Cascade Corporation), a private timber company. Documented straying incidents include a domestic sheep that moved from private land at least 30 miles north through rugged terrain. This ewe joined some cattle in close proximity to the Wenaha bighorn herd (Coggins 2002). Another stray ewe, presumably from the same area, moved 12 miles south and joined some mule deer (Coggins 2002).

WAFWA Recommendations

A document written by the Western Association of Fish and Wildlife Agencies (WAFWA) Wild Sheep Working Group (2010) provides numerous recommendations to consider in the management of grazing allotments near bighorn sheep.

Applicable recommendations have been incorporated into the planning process, the project design, and the management requirements outlined in Chapter 2 of the North End Allotment EIS. In turn, these measures will be appropriately incorporated into an Allotment Management Plan.

WAFWA (2010) provides additional suggestions for permittees. These are suggestions rather than recommendations because they are not based on evidence or evaluations of effectiveness (WAFWA 2010). These items have also been considered in the management of this allotment.

WAFWA recommends that a 'detection and response protocol' be in place for domestic sheep allotments near bighorn sheep range. This has been completed and will be reviewed annually. The protocol outlines who does what if bighorn sheep are seen near domestic sheep herds, or if domestic sheep are separated from the permitted area.

Evaluation of Effects to Bighorn Sheep

Several bighorn sheep models were recently developed for the Payette National Forest (NF) as part of an EIS to modify the Southwest Idaho Eco-group Land and Resource Management Plan (USDA-FS 2010). These models were developed to assess bighorn sheep population viability on the Payette NF.

A more simplified approach was used in this analysis because the EIS objectives as well as the environmental conditions are different than the Payette EIS. This EIS does not amend the Umatilla NF forest plan. Population viability is more appropriately addressed at a larger scale, and as such it will be addressed in the upcoming revisions of the Umatilla, Malheur, and Wallowa-Whitman forest plans. Unlike the Payette, the North End

Allotment does not directly overlap occupied bighorn sheep habitat, and the allotment is 75 percent forest with little to no contiguity of potential bighorn sheep habitat.

To determine the potential effects of domestic sheep grazing on the Wenaha bighorn sheep herd and on the potential South Fork Walla Walla bighorn sheep herd, we relied on local, expert knowledge and published literature on bighorn sheep distribution, habitat use, and behavior.

Effective separation is defined as spatial and/or temporal separation between wild sheep and domestic sheep or goats, resulting in (at most) a minimal risk of potential respiratory disease transmission (WAFWA 2010). This can be achieved through a combination of factors including maintaining separation distance appropriate for the terrain, managing livestock properly, and coordinating closely with the state wildlife agency.

Simply stated, the further apart the two species, the less likely they will contact one another. Separation distance between the two species is of utmost importance (Coggins 2002), although it will not prevent long distance movements by either species. Additional management strategies were developed to reduce the potential for contact (see Chapter 2, Management Requirements). A response protocol is also in place which outlines procedures to take if straying does occur, or if bighorn sheep travel into the allotment (Wildlife Report).

Comparison of Alternatives

The following indicators were used to compare the effects of alternatives to bighorn sheep (Table 12):

- Separation distance between the allotment and the Wenaha bighorn sheep herd, and separation distance between the allotment and the potential SFWW release area.

  Separation distance is measured in straight air miles from the edge of the allotment at the point nearest the bighorn sheep range, to the closest known bighorn sheep use area.

- Separation effectiveness between domestic sheep on the allotment and the Wenaha bighorn herd, and separation effectiveness between domestic sheep on the allotment and prospective bighorn sheep in the SFWW river area.

  Separation effectiveness is a relative rating based on distance in combination with other factors. Separation effectiveness relies heavily on distance and the fact that the distance space is primarily forested (Figure 7). Bighorn sheep do not like to move through areas where visibility is low and they are vulnerable to predation. Therefore, the fact that the 'buffer' area between bighorn sheep and the allotment is primarily forested (low visibility) is a key consideration. Other factors were considered such as past bighorn sheep movements in this area, and allotment management requirements (Wildlife Report).

Table 12. Separation distance and separation effectiveness by alternative.

Measure	Current allotment boundary	Alternative			
		1	2	3 and 4*	5 – no grazing
Separation distance between allotment boundary and **Wenaha** bighorn sheep (air miles)	1	8	10.5	12	NA
Separation effectiveness between North End permitted sheep and **Wenaha** bighorn sheep	Low	Moderate	High	High	NA
Separation distance between allotment boundary and **SFWW** bighorn sheep habitat (air miles)	1	1	4	9	NA
Separation effectiveness between North End permitted sheep and potential **SFWW** bighorn sheep	Low	Low	Low to Moderate	High	NA

*The effects of Alternatives 3 and 4 are the same because Alternative 4 was not designed to respond to the bighorn sheep issue.

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

Management Requirements are in place and apply to all alternatives (Ch. 2, Management Requirements). Specific management requirements related to bighorn sheep have been taken into consideration in this effects analysis. These requirements include procedures which are designed to deter bighorn/domestic sheep contact, and procedures to take if co-mingling occurs or could predictably occur.

If bighorn sheep are found within any part of the allotment during an active grazing season, ODFW personnel will attempt to remove them (ODFW 2003). Once wandering bighorns have potentially come into contact with domestic sheep or goats, they cannot be allowed to return to the main herd and spread disease. It may only take one contact by one domestic sheep to spread respiratory illness throughout and between bighorn sheep herds (Gross et al. 2000, George et al. 2008). This potential for lethal removal could have a direct effect to individual bighorn sheep and indirect effects to the population under all action (grazing) alternatives.

If lost domestic sheep are found in close proximity to occupied bighorn sheep range, the Forest Service and ODFW would work with the allotment permittees on both private and federal land to determine ownership, and take appropriate action to remove the domestic sheep.

While management requirements are important for protecting bighorn sheep, the primary way to avoid conflicts is to maintain distance between bighorn sheep and domestic sheep (Schommer 2009). Most of the time, domestic sheep would be even farther away than indicated in Table 12; in other words, they would spend little time near the boundary from which distance was measured.

The likelihood that bighorn sheep in the Wenaha herd would come into contact with domestic sheep on the North End Allotment is considerably reduced in all alternatives. Separation distance is increased by at least 7 miles and separation effectiveness is improved from low to moderate or high in all alternatives (Table 12).

The likelihood that prospective bighorn sheep in the South Fork Walla Walla (SFWW) River area would come into contact with domestic sheep on the North End Allotment is considerably reduced in Alternatives 3 and 4, but under Alternatives 1 and 2 there would not be any reduction. Alternatives 3 and 4 increase the separation distance by 8 miles compared to the existing condition (Table 12).

In addition, domestic sheep are removed from the allotment by October 9, so there is little to no overlap with the bighorn sheep rut period of late October to early December. Male bighorn sheep may be more likely to roam during this period and be attracted to domestic ewes.

Direct and Indirect Effects Unique to Alternative 1

The 31,000 acres of the existing allotment that are closest to the Wenaha bighorn herd would no longer be grazed by domestic sheep. The number of domestic sheep would not change, so 3,962 ewe lamb pairs would graze in a smaller allotment compared to the existing allotment. The distance between the edge of the existing allotment boundary and the Wenaha bighorn herd would be a minimum of 8 to 9 air miles, which is a 7 mile increase in separation (Figure 8).

The separation effectiveness for the Wenaha bighorn herd would be improved to **Moderate** (Table 12). The area that would be dropped from the allotment is primarily managed, mixed conifer forest. While this does not guarantee that bighorns would not move through it, there would be a forested buffer that would be unattractive to bighorn sheep.

The relative separation effectiveness for the SFWW is considered **Low** (Table 12). If bighorn sheep were to occupy the South Fork Walla Walla River (SFWW) area in the future, Alternative 1 would not maintain adequate separation between domestic sheep and the potential SFWW bighorn sheep area. The distance between the allotment boundary and the SFWW bighorn habitat would only be 1 to 2 air miles. If bighorn sheep were to move into this area on their own, they would likely have to be removed by ODFW.

Direct and Indirect Effects Unique to Alternative 2

More than 50,000 acres nearest the bighorn herd would be eliminated from the allotment. The number of sheep would decrease to 3 bands, or 3000 ewe/lamb pair. Having 25 percent fewer domestic sheep on the allotment could reduce the chances that any would become lost and end up contacting wild sheep. The distance from the allotment boundary to the Wenaha herd would be 10 to 11 air miles, a 2 mile improvement over Alternative 1 (Figure 9). Separation effectiveness is considered **High** for the Wenaha bighorn sheep herd (Table 12).

The distance from the allotment boundary to the SFWW bighorn habitat would be 4 miles, a 3 mile improvement over Alternative 1. If bighorn sheep were to occupy the SFWW area in the future, there would still be a moderate potential for contact with domestic sheep in the North Fork Umatilla Wilderness. Separation effectiveness is considered to fall between **Low and Moderate**. If bighorn sheep move into the SFWW area, they may have to be removed by ODFW.

Direct and Indirect Effects Unique to Alternative 3

Just over 79,000 acres nearest the bighorn herd would be eliminated from the allotment. Similar to Alternative 2, the number of domestic sheep would decrease to 3 bands, or 3000 ewe/lamb pair. Having 25 percent fewer domestic sheep on the allotment could reduce the chances that any would become lost and end up contacting wild sheep. The distance from the allotment boundary to the Wenaha herd extent would be 12 air miles (Figure 10). The addition of the Goodman area would not increase or decrease the separation distances between the allotment and both bighorn sheep areas. Separation effectiveness is considered **High** for this alternative (Table 12).

Separation effectiveness is also considered **High** for the SFWW potential bighorn area. The closest distance from the allotment boundary to the SFWW bighorn habitat would be at least 9 miles. If bighorn sheep were to occupy the SFWW area in the future, there would be a low potential for contact with domestic sheep on the North End Allotment. The future transplant of bighorn sheep into this area could be feasible if this alternative is chosen.

Direct and Indirect Effects Unique to Alternative 4

Alternative 4 is similar to Alternative 3 in regards to bighorn sheep (Table 12), except that only 2000 pair of domestic sheep would be permitted. Having 50 percent fewer permitted sheep on the allotment would reduce the chances that any might become lost and end up contacting wild sheep.

Just over 79,000 acres nearest the bighorn herd would be eliminated from the allotment. The distance from the allotment boundary to the Wenaha herd extent would be the same as Alternative 3 which is 12 air miles (Figure 11). This would be an 11 mile improvement in separation distance compared to the existing allotment boundary.

Separation effectiveness is also the same as Alternative 3. Separation effectiveness is considered **High** for both the Wenaha bighorn sheep and the SFWW potential bighorn area

(Table 12). The closest distance from the allotment boundary to the SFWW bighorn habitat would be 9 miles, an 8 mile improvement compared to the existing situation. The future transplant of bighorn sheep into this area could be feasible if this alternative is chosen.

Because the smallest number of domestic sheep would be permitted under Alternative 4 (see Table 7), this alternative would provide the best situation for bighorn sheep in both the Wenaha and SFWW areas besides the 'no grazing' alternative.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Eliminating livestock grazing on this allotment would be the best scenario for bighorn sheep. The chance that domestic sheep would move from this allotment into bighorn sheep territory would be eliminated. If bighorn sheep were to wander onto the allotment, there would be no need to remove them unless they move too close to sheep on private land. As long as domestic sheep herds are permitted on adjacent private holdings, they will continue to be an issue for both the Wenaha herd and any expansion of bighorn sheep into the SFWW.

It is unlikely that removal of sheep on the North End Allotment would create issues for bighorn sheep in other areas. The current North End Allotment permittee is based in Nevada, and holds numerous grazing permits on BLM land in Nevada. Elimination of livestock grazing on the North End Allotment could result in the permittee keeping all of their sheep in Nevada. The degree to which this could affect bighorn sheep in Nevada depends on how those allotments near bighorn sheep are managed.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

The issue of effective separation is further complicated by the presence of domestic sheep on nearby private lands. In some areas, these private grazing areas are contributing to the risk of contact between the two species. Private land sheep grazing operations may or may not follow the best management practices that deter bighorn sheep – domestic sheep contact.

Limited information indicates that domestic sheep graze on private land within six miles of the Wenaha bighorn sheep in the lower Lookingglass Creek area. At least one time a domestic sheep wandered away from the private Lookingglass grazing area and into bighorn sheep territory (Coggins 2002).

Domestic sheep are also currently grazing on private land in the South Fork Walla Walla River (SFWW) area within one mile of high quality bighorn sheep habitat (Figure 7). This bighorn sheep habitat is on Forest Service and Bureau of Land Management lands, but is surrounded by a large privately held tract. It is highly unlikely that bighorn sheep can become established in the SFWW as long as this sheep operation is active. If bighorn sheep naturally expand into this area, ODFW would likely have to remove them.

Considering both public and private land sheep operations, the alternatives in this analysis would result in overall increased separation effectiveness between bighorn sheep and

domestic sheep, and would not contribute to adverse cumulative effects for bighorn sheep populations or habitat.

Other activities that could potentially result in cumulative effects to bighorn sheep include the presence of domestic sheep on other FS sheep allotments, ongoing landscape burning and other forest management activities, recreational use of pack goats and llamas, and bighorn sheep harvest.

Domestic sheep grazing occurs on other parts of the Walla Walla Ranger District. The chance that bighorn sheep would encounter domestic sheep in these areas is extremely low. The Butcher Creek and Spring Mountain allotments are farther away from the Wenaha bighorn herd (>25 miles) and the SFWW area, and have no history of conflict with bighorn sheep. There are no obvious travelways such as contiguous, steep, open slopes that bighorn sheep would be comfortable moving through to access these areas. Likewise, the Mud Creek sheep allotment on the Wallowa-Whitman National Forest (WWNF) is separated from the Wenaha herd by ten air miles, and has no history of conflicts with bighorn sheep. The Spring Creek sheep allotment on the WWNF is also > 25 miles away, and across the interstate highway.

Proposed landscape burning would have a positive effect on bighorn sheep. After burning, there will be a mosaic of unburned, lightly burned, moderately burned, and intensely burned patches. As green-up occurs the following spring and summer, the new sprouts will be highly palatable and rich in nutrients. Burning can also increase visibility in areas where conifers have encroached on grassland. Burning has been planned on up to 10,000 acres of primarily grassy slopes along the Grande Ronde River over a 10 year period. In October 2010, about 2,000 of these acres were completed.

Ongoing treatment and control of invasive plants would also have a positive effect on bighorn sheep. Other management activities such as ongoing and proposed timber harvest, fuels reduction, road work, and people recreating have little effect to bighorn sheep because the bighorn sheep are relatively restricted to areas that are difficult to access, and most of these projects are far away from the bighorn sheep.

Goats and llamas can also spread disease to bighorn sheep. There are no goat or llama commercial packing outfitters on the forest. Recreational use of pack llamas is increasing in the Wenaha-Tucannon wilderness. On the north end of the forest, pack goats have only been seen twice in the past 10 years. Potential contact between bighorn sheep and recreational pack llamas or goats could occur in the Wenaha-Tucannon Wilderness. This is currently considered a low risk because the use of pack goats and llamas is sporadic and these animals are usually tightly controlled by their owners.

Hunting of bighorn sheep has been highly regulated. After the 1996 herd die-off, there were no bighorn tags offered in the Wenaha herd for many years. In 2006, the herd had stabilized enough that Oregon and Washington each offered one tag. CTUIR also agreed to limit tribal harvest to one bighorn. Therefore, typically three bighorn sheep per year were harvested for several years. Due to concerns over low numbers of rams, and in light of the considerable disease problems occurring throughout the Northwest, ODFW and WDFW decided not to issue tags for the Wenaha herd in 2010.

The activities described above were reviewed to assess whether, in combination with the likely effects of domestic sheep grazing on the North End Allotment, there would be any cumulative effects to bighorn sheep. Based on this review there would be no adverse cumulative effects.

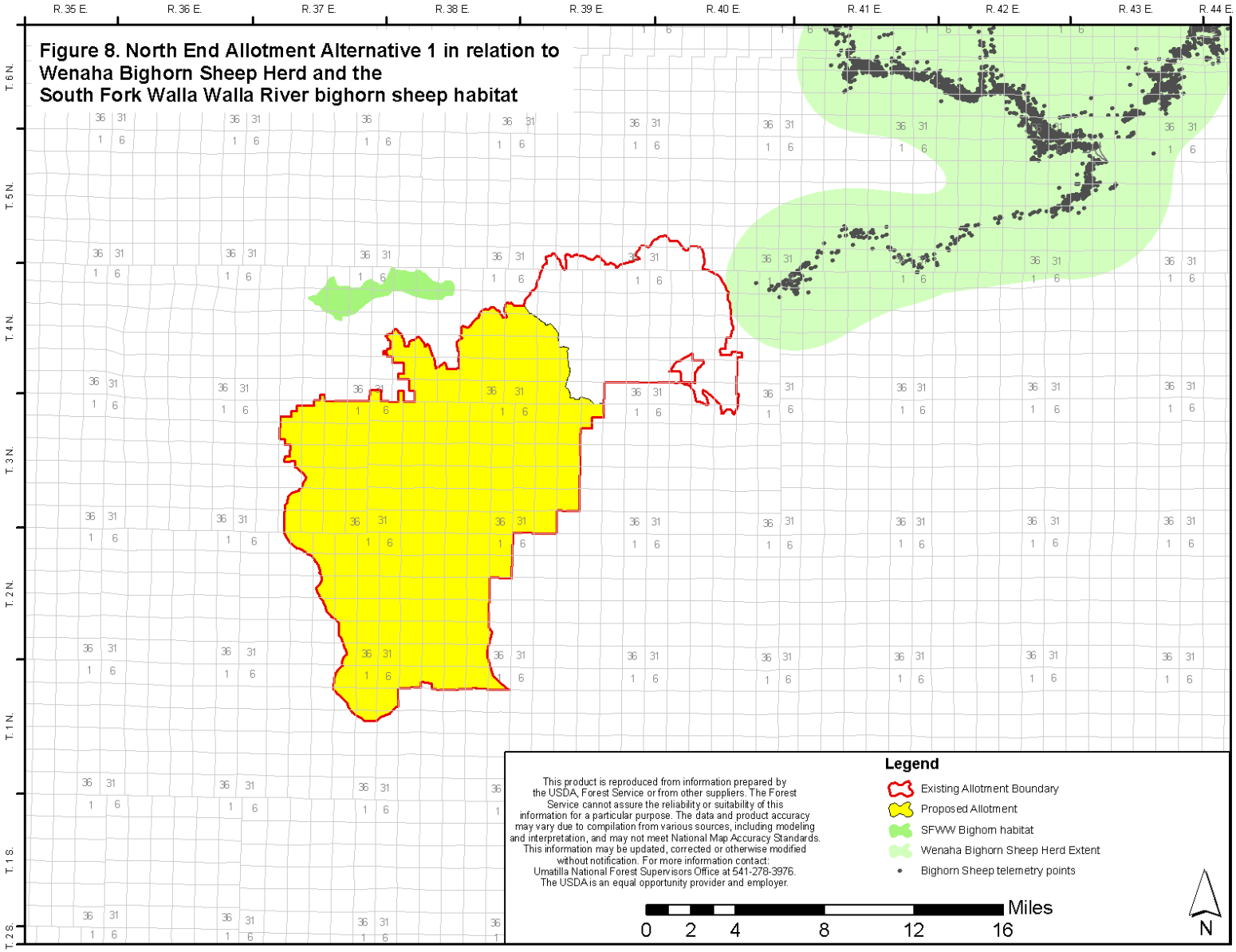


Figure 8. North End Allotment Alternative 1 in relation to Wenaha Bighorn Sheep Herd and the South Fork Walla Walla River bighorn sheep habitat

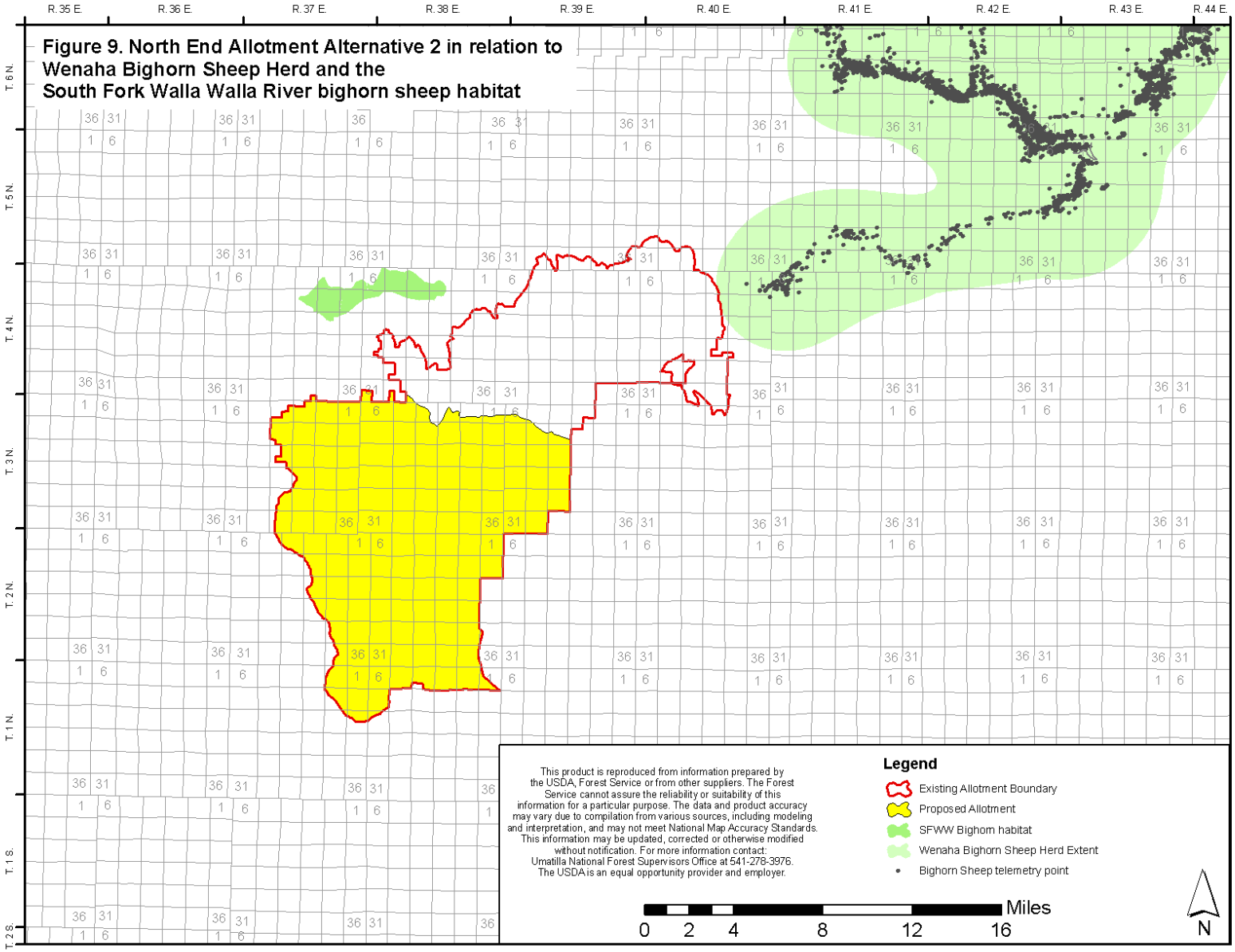


Figure 9. North End Allotment Alternative 2 in relation to Wenaha Bighorn Sheep Herd and the South Fork Walla Walla River bighorn sheep habitat

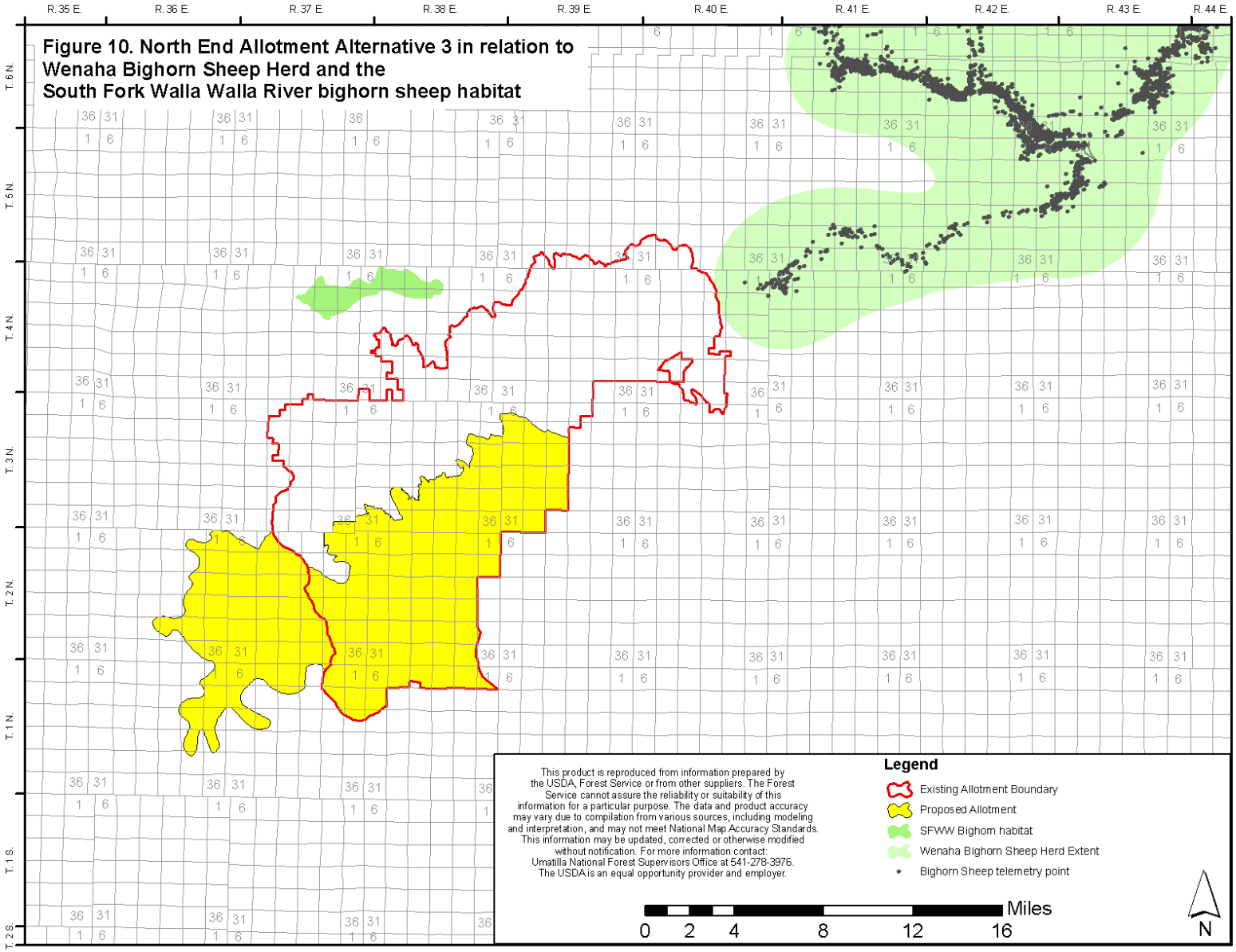


Figure 10. North End Allotment Alternative 3 in relation to Wenaha Bighorn Sheep Herd and the South Fork Walla Walla River bighorn sheep habitat

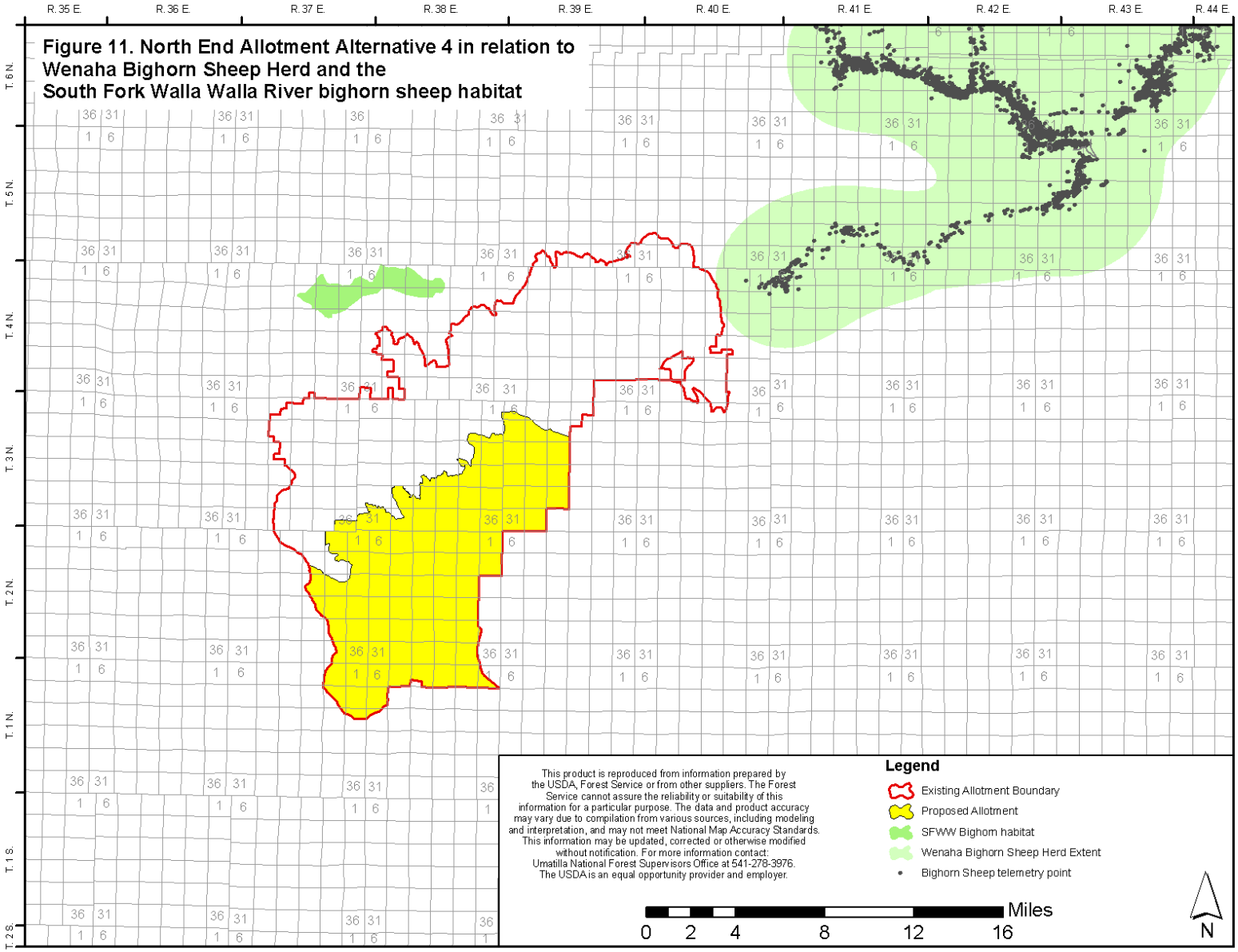


Figure 11. North End Allotment Alternative 4 in relation to Wenaha Bighorn Sheep Herd and the South Fork Walla Walla River bighorn sheep habitat

Key Issue: Management Feasibility

Measures for evaluating this issue are based on:

- Operations: sheep herd routing and access challenges based on stocking rate and configuration of allotment
- Administration: water development and range monitoring needs
- Economics: revenue and jobs based on number of livestock

Existing Condition

Operations

The North End Allotment is approximately 132,000 acres in size, with diverse topography and vegetation. Most of the allotment ranges in elevation from 4,000 to 5,000 feet, and approximately 75 percent is forested vegetation. The allotment includes some rugged river and stream drainages like the North Fork Umatilla River, however, much of the allotment is gentle or rolling uplands. Domestic sheep have primarily used the ridges tops, rolling upland hills, and the headwaters of streams. These areas have primarily been used because of good vehicle access, an abundance of forage for sheep, and the relatively easy ability to herd sheep. These areas are also where timber management practices have been focused, which has provided transitory range for livestock.

The North End Allotment has been managed differently over the history of the Forest Service. The number of sheep authorized, the size of the allotment, the number of pastures, and the rotations have all changed over the years. The current management of the allotment has been in effect since the signing of the 1986 Allotment Management Plan (AMP). This AMP authorized 5,000 sheep (five bands) on the allotment from June through September on six units or "pastures"[2]. Only five of the six units would be used each year, allowing for a rest rotation strategy. Grazing use was rotated so that each pasture was be deferred every sixth year (1986 AMP*)*.

Though the AMP allowed for 5,000 sheep, the Forest Service and permittee have elected to graze 3,962 sheep per year with the exception of a few years. As a result, four bands have utilized four pastures, allowing for a rest rotation in two pastures per year. However, sheep have been routed into portions of the rested pastures to increase livestock distribution and reduce the potential for resource damage.

There have been a number of management changes since development of the current AMP. The Forest Plan was signed; several fish species were listed on the Endangered Species list; and the Forest Plan was amended with PACFISH riparian management objectives, standards and guidelines. As a result, changes in implementation requirements have been

[2] Management units are commonly called pastures and subpastures; however the areas are not fenced.

added to the AMP using Annual Operating Instructions. Use of the allotment has been relatively consistent over the last 20 years.

The 1986 AMP acknowledged the presence of bighorn sheep adjacent to the allotment, as well as the potential reintroduction area in the South Fork Walla Walla River area. Small buffer zones were established in both areas.

The portions of the allotment nearest the Wenaha bighorn sheep herd have not been grazed since 2005. The permittee took nonuse in 2006 and 2007. In 2008, the Jarboe pasture and a portion of the Swamp pastures were not grazed by agreement with the permittee. Full sheep numbers were grazed in the other 4 pastures. In 2009, the permittee brought only one band of sheep, and in 2010 the permittee was given nonuse for resource protection. This has afforded the Forest Service the time and flexibility to study the issues and determine how the allotment should be managed in the future.

Administration

Over the years, over 70 developed water sources (ponds and troughs) have been constructed to improve livestock distribution across these areas. The majority of these improvements have been constructed since the early 1980's.

Monitoring of both rangeland conditions and sheep routing schedules are conducted by both the permittee and USFS. USFS monitoring efforts have focused on the routing schedules as it relates to utilization standards and other resource conditions. Spot checks and utilization monitoring occurs annually. Long term vegetation health monitoring occurs at longer intervals (every 5-10 years).

Utilization monitoring has shown that the management of the North End Allotment has consistently met Forest Plan utilization standards.

Economics

The North End Allotment is grazed by sheep belonging to one permittee for about four months. The North End Allotment provides a small but important contribution to the overall success of the permittee's sheep growing operation.

Benefits from permitted grazing can be evaluated by both the potential income to the permittee and opportunities to employ individuals who assist in the operations. Indirect economic benefits come from the purchase of local goods and services for allotment operations. In addition, approximately 25 percent of grazing fees collected from the permittee are returned from the U. S. Treasury to the local community for roads and schools.

Revenues generated by the sale of sheep that graze on this allotment can be roughly estimated. In 2008 the average price for lambs was $97.40 per hundred weight (cwt) (USDA 2009). Currently 3,962 head of ewe/lamb pairs are permitted on the allotment for about 4.37 months. Potentially this would produce 3,962 lambs weighing approximately 100 pounds at time of sale. Therefore each lamb would be valued at approximately $97.40 each, or a minimum of **$385,898.00** for all lambs on the allotment. This assumes that there are no twins, and does not account for losses to predation, etc. An accurate prediction of net

revenue is not possible because operating expenses vary from year to year. Therefore a gross sales indicator is used in this analysis.

Employment is an important variable contributing to the economic stability of the region. The employee effects from grazing the allotment were derived from a multiplier obtained from the IMPLAN (Impact Analysis for Planning) model for the Umatilla National Forest Impact zone (USDA-FS 1990b). These IMPLAN coefficients for employment were used in the Final Environmental Impact Statement for the Umatilla National Forest Land and Resource Management Plan. The direct employment coefficient was 0.3 direct jobs per 1,000 HM livestock (USDA-FS 1990b).

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

Alternatives are compared to the current management of the allotment as written in the 1986 Allotment Management Plan. All action alternatives have the same management requirements, which are described in Chapter 2. All action alternatives result in a reduction in management feasibility as compared to the current management (permit).

Operations

Sheep would be managed within individual bands and each band would have approximately 1,000 ewes and their lambs. A herder employed by the permittee would be with each band at all times. A routing schedule would be prepared before each grazing season identifying the route of the sheep through the allotment during the grazing season. The grazing season for all action alternatives is from June 1st to October 9th. The primary difference between all action alternatives is the allotment size in acres, and the number of sheep authorized on the allotment (Figures 12 and 13).

Figure 12. Number of sheep authorized by alternative.

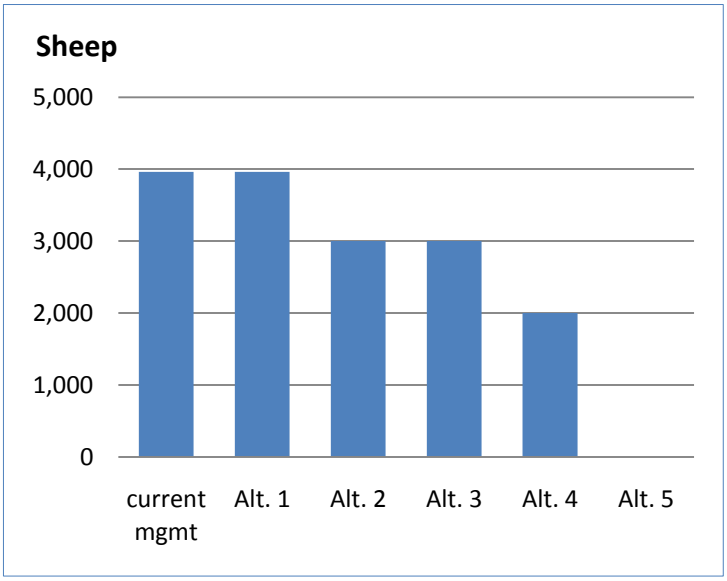
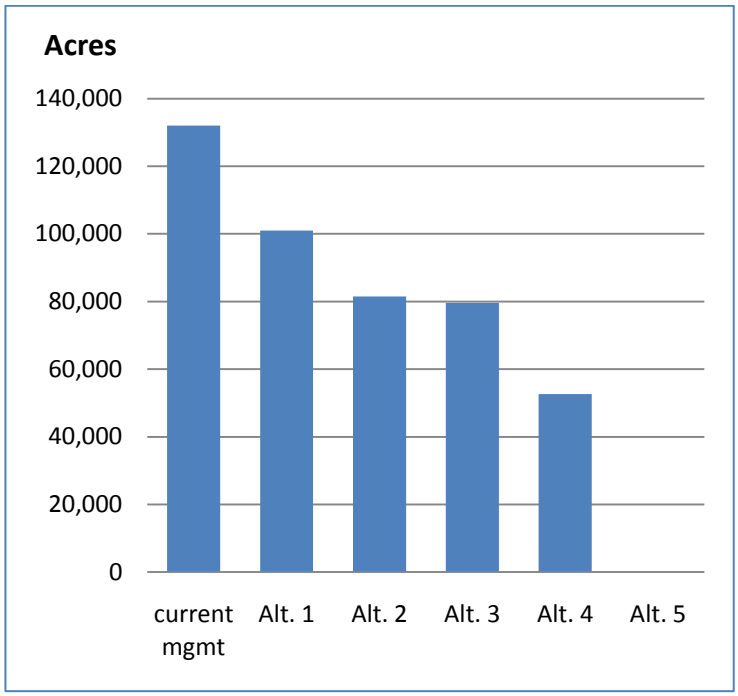


Figure 13. Allotment acres by alternative.



In the past, there has been an average stocking rate of approximately 5.1 acres per sheep head month, and portions of two pastures were rested each year. There is little difference between each alternative in terms of stocking rates (Table 13). The stocking rates range among the action alternatives from 5.8 to 6.2 acres per sheep head month (SHM). This was prescribed to ensure that standards and objectives for vegetation would be met in a similar manner that has occurred in the past. The stocking rates on the North End Allotment have been very light compared to other allotments on the Forest, and this would continue to be the case under all action alternatives.

Table 13. Stocking rates by alternative.

	current management	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Allotment size	132,000	101,000	81,500	79,600	52,600
Number of Head on Allotment	3,962	3,962	3,000	3,000	2,000
Days / Months on Allotment	131/4.37	131/4.37	131/4.37	131/4.37	131/4.37
Head Months	17,314	17,314	13,110	13,110	8,740
Stocking Rate (acres /SHM)	5.1	5.8	6.2	6.1	6.0

All action alternatives have a lower stocking rate than what has been prescribed in the past, but they do not have the flexibility of resting two pastures each year. All action alternatives allow small areas within the allotment to be rested each year, as well as deferment through adjustments in the routing schedules. Management of the routing schedule would be more intensive due to the reduction in flexibility that was previously afforded with a larger allotment.

The flexibility of managers and the permittee to respond to change of annual conditions such as drought or wet conditions would be reduced in Alternatives 1-4 because there are fewer pastures (Table 14). The flexibility of managers and permittees to respond to events that may occur in the allotment such as wildfires, prescribed burning, harvest activities, or a change in resource conditions would also be reduced. Although a rest rotation strategy is not required and is not a normal strategy on grazing allotments on the Umatilla National Forest, it is the strategy that has been applied on the North End Allotment since 1986. Without the ability to rest large areas within the allotment, a reduction in authorized numbers or a reduced season of use may be required in some years in order to respond to a change in annual conditions. This management scenario is typical for allotment management on the Umatilla National Forest. The grazing strategy for all action alternatives is consistent with the Umatilla National Forest Plan.

Table 14. Comparison of Operation and Administration by alternative.

Alternative	Current permit	1	2	3	4	5
Herd route management challenges	Low	Moderate	Moderate	High	Moderate	NA
Access and grazing management challenges	No	No	No	Yes	No	NA
Increased monitoring needs	No	Yes	Yes	Yes	Yes	NA
Water development costs	0	0	0	$50,000 or less	0	0

Administration

Monitoring costs in terms of time, energy and funds would increase for both the Forest Service and permittee to ensure that desired conditions are met. This is because the allotment would be smaller and have fewer options to rest large areas. The action alternatives do not allow for two pastures to be rested from grazing each year as they were in the past, because of the smaller size of the allotment. Instead, routing schedules would be used to allow for small areas within the allotment to be rested as well as allowing a deferred grazing strategy. A reduction in authorized numbers or a reduced season of use may be required in some years in order to respond to changes in annual conditions. This management scenario is typical for other allotments on the Umatilla National Forest.

Economics

Changing permitted livestock numbers could affect grazing related jobs and income, and changes in livestock management can affect costs to the permittees and the Forest Service. This analysis does not include the costs of livestock transport, veterinary expenses, supplemental feed, employee payment, maintenance and upkeep of ranch property etc. These are normal expenses by the ranch operator and were not requested from the permittee.

Economic conditions are displayed as a function of revenue and employment for each alternative (Table 15). All costs are averaged. They are relative and should be used for comparison purposes only and not as actual costs. They represent an example based on current costs that are being used to determine differences in values between alternatives. Costs to permittee and the Forest Service are not enumerated, but relative indicators are displayed in Table 14.

Revenue is estimated based on a 100 lb. lamb sold at the 2008 sale price of $97.40 per hundred weight (cwt). Jobs are calculated as 0.3 employees for every 1000 head month (HM) livestock grazed. Grazing fees are based on the 2010 rate of $1.35 per SHM.

Table 15. Economic indicators by alternative.

Alternative	current permit	1	2	3	4	5
Revenue	$385,899	$385,899	$292,200	$292,200	$194,800	0
Jobs	5.1	5.1	3.9	3.9	2.5	0
Grazing Fees to U.S. Treasury	$7,012	$7,012	$5,309	$5,309	$3,539	0
County payments (25%)	$1,753	$1,753	$1,327	$1,327	$885	0
Percent reduction for all of the above	–	0 %	24 %	24 %	50 %	100 %

Direct and Indirect Effects Unique to Alternative 1

Operations

Alternative 1 would reduce the allotment size from 132,000 acres to 101,000 acres. The Jarboe Creek pasture and part of the Swamp Creek pasture would no longer be grazed (Figure 2). The current permit would not be affected in terms of the authorized number of sheep (3,962) or the season of use (June 1st to October 9th).

Routing schedules would be adjusted to account for the loss of the Jarboe Creek Pasture and portions of the Swamp Creek Pasture. Four separate bands of approximately 1,000 sheep would be routed in different areas within the allotment by herders. Stocking rates would be lower with more acres per sheep (5.8 acres per SHM) than past management (5.1 acres per SHM).

A reduction of 30,682 acres while maintaining 3,962 sheep would not allow two pastures to be rested each year. Small areas within the allotment could be rested each year by adjusting the routing schedules. Deferment could also be prescribed through adjusting the annual routing schedule.

Administration

Twelve developed ponds would no longer be needed for livestock. The 12 ponds would be assessed to determine if they need to be removed and restored, abandoned and allowed to recover naturally, or maintained for other purposes such as wildlife or road maintenance.

The improvements that would continue to be maintained include 59 ponds, 7 spring developments, and 4 corrals.

Economics

Alternative 1 maintains the current authorized number of sheep and the same grazing season that has been authorized in the recent past. No change in domestic sheep numbers or time spent on the allotment would occur. There is no change in economic values when compared to the current grazing permit.

Direct and Indirect Effects Unique to Alternative 2

Operations

Alternative 2 would reduce the size of the allotment from 132,000 acres to 81,500 acres (Figure 3). The Jarboe pasture and the entire Swamp Creek pasture would no longer be grazed. The remaining pastures would be Phillips Creek, Middle Ridge, Spout Springs, and English Springs. This would reduce the allotment size by approximately 50,500 acres, and the permit would be reduced by 962 sheep. Therefore the number of authorized sheep would be 3,000 while maintaining the same grazing season of June 1st to October 9th.

Herding and routing plans would require a similar effort as in Alternative 1, but stocking rates would be slightly lower with more acres per sheep (6.2 acres/SHM). Management of the routing schedule would be more intensive than was previously afforded with a larger allotment. Managing 3,000 sheep within the Alternative 2 boundary would not allow two pastures to be rested each year. Routing schedules would be used to allow for small areas within the allotment to be rested as well as allowing a deferred grazing strategy. This alternative allows the use of the English Springs pasture to allow rest or deferment in portions of the other pastures.

Administration

There would be 20 ponds and 1 corral that would no longer be needed for livestock watering. The Swamp Creek corral would be disassembled and removed. The 20 ponds would be assessed to determine if they need to be removed and restored, abandoned and allowed to recover naturally, or maintained for other purposes such as wildlife or road maintenance.

The remaining improvements that would require maintenance include: 51 ponds, 7 springs, and 3 corrals.

Economics

There would be a 24 percent reduction in potential sale revenue, grazing fees collected, and county payments per year (Table 15). One seasonal herder would no longer be employed.

The Wenaha bighorn sheep population would have a better chance at maintaining a healthy population than with Alternative 1. This could generate income in the form of recreational viewing and hunting of the Wenaha bighorn sheep population.

This alternative would not provide enough separation to ensure that a bighorn herd could be established in the South Fork Walla Walla River (SFWW) area, so no additional recreational income would be generated there.

Direct and Indirect Effects Unique to Alternative 3

Operations

Alternative 3 would reduce the size of the allotment from 132,000 acres to 79,600 acres. The configuration of the allotment would change with the removal of the North Fork Umatilla Wilderness, and the addition of the Goodman area (Figure 4).

The existing permit would be reduced by 1,000 sheep, resulting in 3,000 sheep to be authorized within remaining allotment boundary from June 1st to October 9th. Stocking rates would be lower than past management and the grazing system would remain the same.

Routing and access issues in the wilderness would no longer be a concern, but there would be routing and access challenges in the Goodman area (Table 14). Typically snow drifts keep the roads closed in this area until late June or early July. Snow plowing would be needed to provide access, or use would need to be deferred until the road is passable.

Additionally, there is a lack of knowledge about how to best use the area for grazing. There would be an increase in administrative time and expense to develop routing schedules for the Goodman area. There would be an increase in the amount of monitoring to ensure that routing schedules are adjusted to meet desired conditions.

Full use of the allotment would not be authorized within this area until an adequate number of water sources were developed.

Administration

There would be an increase in the amount of monitoring required within the Goodman addition. Since livestock grazing has not been authorized in the Goodman area for a considerable length of time, the Forest Service and the permittee would need to monitor the effects of grazing within this area closely. Monitoring would be used to make adjustments in the annual routing schedules to meet prescribed standards and desired conditions.

The total number of existing watering sources requiring maintenance would change. There would be 44 ponds, 4 springs, and 2 corrals. With the Goodman area addition, developing stock watering structures would be required to manage sheep within the area in order to meet prescribed standards. Twelve potential water developments have been identified. Ten of those are new or complete reconstructions and 2 are existing developments that need maintenance. More water developments may be needed to graze the area to full capacity. The cost to build or reconstruct these structures would be up to $50,000.

Economics

Effects are the same as Alternative 2. There would be a 24 percent reduction in potential sale revenue, grazing fees collected, and county payments per year (Table 15). One seasonal herder would no longer be employed.

The Wenaha bighorn sheep population would have a better chance at maintaining a healthy population than with Alternative 1. This could generate income in the form of recreational viewing and hunting of the Wenaha bighorn sheep population.

This alternative would not provide enough separation to ensure that a bighorn herd could be established in the South Fork Walla Walla River (SFWW) area, so no additional recreational income would be generated there.

Direct and Indirect Effects Unique to Alternative 4

Operations

Comparatively, Alternative 4 would be the smallest allotment alternative. The size of the existing allotment would be reduced from 132,000 acres to 52,600 acres. The allotment would consist of portions of Phillips Creek and Middle Ridge pastures outside of the North Fork Umatilla Wilderness, and most of the Spout Springs pasture (Figure 5).

The number of sheep permitted on the allotment would also be reduced by about half. The permit would allow 2000 sheep for grazing season of June 1st to October 9th.

The grazing strategy would also remain the same within the remaining area to be grazed. Herding and routing plans would require a similar effort per area, but the area would be much smaller to manage. Stocking rates would be similar to Alternative 3 (6 acres/SHM). Management of the routing schedule would be more intensive than was previously afforded with a larger allotment.

Managing 2,000 sheep within the Alternative 4 boundary would not allow two pastures to be rested each year. Routing schedules would be adjusted each year to allow small areas within the allotment to be rested and to allow deferment.

Administration

There are a total of 27 ponds, 3 spring developments, and 2 corrals that would no longer be used. The ponds would be assessed to determine if they need to be removed and restored, abandoned and allowed to recover naturally, or maintained for other purposes such as wildlife or road maintenance. The spring developments would either be maintained for wildlife or removed. If they were removed, all troughs, piping, spring boxes, and fences would be disassembled and removed from the site. The Swamp Creek and Coyote Ridge corrals would be disassembled and removed.

The remaining improvements that would require maintenance in accordance with design criteria described in Appendix B of the Range Report include: 44 ponds, 4 springs, and 2 corrals.

Economics

There would be a 50 percent reduction in potential sale revenue, grazing fees collected, and county payments per year (Table 15). Jobs provided would also decrease to 2.6, so essentially two herders would no longer be needed.

Alternative 4 would provide the most separation between domestic sheep and both the Wenaha bighorn sheep and the SFWW area (other than Alternative 5). This degree of separation would result in the least potential for bighorn sheep population decline. The potential influx of income that could be generated by healthy bighorn sheep populations through recreational hunting and viewing could offset any grazing related economic losses to the community.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Operations

Sheep would not be authorized to graze the North End Allotment and there would be no management.

Administration

Alternative 5 would not authorize grazing and would therefore not require any monitoring to assess domestic sheep grazing effects to resources.

There are 4 corrals on the allotment that would be disassembled and removed. The 7 developed springs would be restored by removing the trough, pipe, fences, and spring boxes. The springs would flow in their historic channel. The 71 ponds on the allotment would be assessed to determine if they would be restored, abandoned and allowed to recover naturally, or maintained for other uses.

Economics

Livestock would not be permitted on the North End Allotment and the allotment would provide no value to the profitability of this ranching operation. This is a 100 percent reduction in value added to livestock on National Forest System lands. Additional and likely more expensive pasture or hay would be needed to maintain the livestock and this would likely lead to a smaller ranching operation and lower net returns. There would be no grazing related employment generated and no grazing fees would be collected.

Eliminating domestic sheep from this allotment could eliminate a source of potential bighorn sheep population decline. Bighorn sheep hunting and viewing opportunities could generate income for the local communities, as well as support state wildlife management programs.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Current and future timber harvest, fuel reduction activities, and prescribed burning will occur within or adjacent to the allotment. These activities can create transitory range by increasing forage and improving access to forage. Stocking will not change as a result of a change in forage condition in this decision. Any improvements in the amount or condition of forage will allow managers more flexibility in routing schedules and reduce overall utilization. This effect is relative to the amount of acres treated within the alternatives.

If wildland fires occur, burned areas may be rested until it is determined that livestock grazing would not cause cumulative effects to vegetation health. This would cumulatively add to management challenges. As the size of the allotment becomes smaller, the flexibility to respond to events such as fires also decreases. A reduction in numbers or season may be required to respond to large fires.

Rangeland Conditions

The area's capability and suitability for livestock grazing are discussed, as well as vegetation and rangeland health. Existing rangeland conditions are based on past monitoring and analysis of the existing configuration of the North End Allotment (132,000 acres).

Suitability Analysis

In forest planning, the suitability and potential capability of National Forest System lands for producing forage for grazing animals and for providing habitat for management indicator species shall be determined as provided in paragraphs (a) and (b) of this section. Lands so identified shall be managed in accordance with direction established in forest plans.

(a) Lands suitable for grazing and browsing shall be identified and their condition and trend shall be determined. The present and potential supply of forage for livestock, wild and free-roaming horses and burros, and the capability of these lands to produce suitable food and cover for selected wildlife species shall be estimated. The use of forage by grazing and browsing animals will be estimated. Lands in less than satisfactory condition shall be identified and appropriate action planned for their restoration.

(b) Alternative range management prescriptions shall consider grazing systems and the facilities necessary to implement them; land treatment and vegetation manipulation practices; and evaluation of pest problems; possible conflict or beneficial interactions among livestock, wild free-roaming horses and burros and wild animal populations, and methods of regulating these; direction for rehabilitation of ranges in unsatisfactory condition; and comparative cost efficiency of the prescriptions (36 CFR 219.20).

The North End Sheep Allotment EIS and project record provides a project specific analysis of suitability. The alternatives in the EIS and project record discuss grazing systems, the range improvements needed for each alternative, and the design criteria for each alternative. The Wildlife Report discusses management indicator species and other species, and the Range report discusses the condition and trend of vegetation. A capability analysis is discussed below as well as areas that are considered unsuited for grazing.

Capability

Whether lands are capable of being managed for grazing depends on conditions such as slope, aspect, geology, soil types, vegetation type, and climate. The North End Allotment covers a large area with a diverse landscape of mountain uplands and plateaus dissected by large canyons. Only 20 percent of the allotment consists of grasslands, and 75 percent is forested.

The range capability analysis determined that approximately 45 percent (60,928 acres) of the North End Allotment, in its existing configuration, is fully capable of being managed for

livestock grazing. Areas with slopes over 60 percent, canopy cover over 60 percent, and lands with low forage production were less than fully capable.

Areas considered fully capable represent where sheep spend most of their time and where effects would most likely occur. Though sheep grazing may occur in areas that are less than fully capable, it is expected that use would be infrequent or inconsistent. Prescribed utilization standards are adequate to ensure that resource needs are met on lands considered less than fully capable. Timber and fuels management such as commercial thinning, noncommercial thinning, prescribed fire, and wildfires can reduce canopy cover below 60 percent, creating transitory rangeland and changing those areas to fully capable.

Suitability

Areas considered unsuitable for grazing generally include developed campgrounds, administrative sites, exclosures, and other areas where grazing has been eliminated for various reasons. Research Natural Areas are usually excluded unless grazing is used to achieve a vegetation objective.

Areas considered unsuitable for grazing within the North End Allotment in its current configuration include the following developed recreation sites: Beaver Marsh, Buck Creek, Umatilla Forks, Jubilee Lake, Woodland, Woodward, Mottet, Tollgate, and Target Meadows. Sheep may graze the Spout Springs Ski Area to manage vegetation if authorized through the annual instructions.

The following Special Interest Areas are also considered unsuitable: Big Sink, Target Meadows, Burnt Cabin Overlook, Bald Mountain, Gray Rock, Lookout Mountain, Umatilla Breaks, Ruckel Junction, Farr Meadow, Shimmiehorn Canyon, and Woodward Campground.

Since sheep are herded across the landscape within bands, sheep can be simply herded around areas that are unsuitable for grazing. All other areas within the allotment are considered suitable under the prescribed management (design criteria) for the allotment.

Grazing in wilderness:
Livestock grazing is an approved and appropriate use of wilderness if it occurred prior to formal designation. Livestock grazing has been occurring in the Analysis Area since the early 1900s. The North Fork Umatilla Wilderness was designated in 1984. Livestock grazing in the wilderness has been conducted in accordance to the regulations associated with the 1964 Wilderness Act, and Forest Plan standards and guidelines for wilderness areas.

Vegetation

The Umatilla Land and Resource Management Plan goal for range is to "manage the forage resources for an upward vegetative trend in areas in less than fair condition and an upward or stable trend for areas in fair or better condition, while providing for forage productivity and making suitable range available for livestock grazing (Page 4-63).

Upland Habitats
Upland vegetation makes up approximately 95 percent of the allotment. Upland vegetation can be classified as either grassland plant communities or forested communities. Upland forest occurs on approximately 70 percent of the allotment. Conifer species present in order of prevalence include: grand fir, ponderosa pine, Douglas fir, Western larch, lodgepole pine, subalpine fir, and spruce.

Grassland dominates about 20 percent of the uplands. Grassland communities within the allotment are most often found on south facing slopes and in areas where soil depths limit tree survival. Shallow soil types are often found along ridges or steep slopes where rock outcrops occur. Grassland communities within the allotment are usually dominated by native bunchgrass species such as Idaho fescue, bluebunch wheatgrass, and Sandberg's bluegrass. Shrubs are usually absent in these community types within the allotment, though they can be found in small isolated pockets with less than 10 percent cover.

Riparian Habitats
Riparian vegetation can be found on perennial, intermittent, and ephemeral streams as well as wetlands. Many of the streams within the allotment are found in the bottoms of steep canyons. Sheep primarily use the broad ridge tops and rolling topography found on the uplands. The uplands are where much of the fully capable areas are found, where timber harvests have occurred and created transitory rangeland, and where stock water has been developed. As a result, riparian communities are generally not a major source for livestock forage or water within the allotment in any of the action alternatives.

Rangeland Health and Utilization Monitoring

To assess the North End Allotment and determine the existing conditions of vegetation, a variety of tools were used. Assessment of range health was conducted on grasslands across the allotment using the Interpreting Indicators of Rangeland Health (IIRH) protocols (Pellant et al. 2005). Past grazing management and the results were analyzed. Past utilization levels and general field reconnaissance was also used to help determine if management was meeting objectives for the allotment. Established Condition and Trend Plots were analyzed to determine the trend of range health. Photo interpretations were also used in conjunction with the collection and analysis of data. All of these assessment tools were collectively used to determine the condition and trend of vegetation within the allotment.

Past implementation monitoring has focused on utilization and residual stubble height monitoring on both upland and riparian habitats. Utilization monitoring measures the percentage of available forage that has been consumed (weight of plant, number of plants, twigs, etc). Utilization monitoring can be used to identify use patterns, help establish cause-and-effect relationships, and aid in making adjustments to the grazing strategy (USDI 1999). Implementation monitoring is often used to adjust annual operating instructions.

The North End Allotment consistently meets utilization standards prescribed for the allotment (Range Report). These monitoring results indicate that the North End Allotment is in compliance with the implementation standards found in the Umatilla National Forest Land and Resource Management Plan.

Interpreting Indicators of Rangeland Health

Interpreting Indicators of Rangeland Health (IIRH) is a method to assess rangeland heath defined in Technical Reference 1764-6 as: "The degree to which the integrity of the soil, vegetation, water, and air, as well as the ecological processes of the rangeland ecosystem is balanced as sustained" (Pellant et al. 2005). This assessment is accomplished with an interdisciplinary team, and is an attempt to look at how well ecological processes in a site are functioning within a normal rate of variability. The following three parameters are rated:

1. Soil and Site Stability, which is defined as "the capability of an area to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water".
2. Hydrologic Function, which is defined as "the capability of an areas to capture, store, and safely release water from rainfall, run-on, and snowmelt (where relevant), to resist a reduction in this capacity, and to recover this capacity when a reduction does occur".
3. Biotic Integrity, which is the "capability of the biotic community to support ecological processes within the normal range of variability expected for the site, to resist a loss of capacity to support these processes, and to recover this capacity when losses do occur. The biotic community includes plants, animals, and microorganisms occurring both above and below ground"

Ratings reflect the degree of departure from expected levels or the reference condition as follows:

Extreme to Total Departure	5
Moderate to Extreme Departure	4
Moderate Departure	3
Slight to Moderate Departure	2
None to Slight Departure	1

For the North End Allotment, qualitative indicators were rated from one to five. Indicators related to soils and/or hydrologic function included compaction, surface resistant to erosion, surface loss or degradation, wind scours/deposition, litter movement, pedestals/terraces, bare ground, water flow patterns, degrees of rills, gullies, and plant composition relative to infiltration.

Indicators relate to the biotic community included surface resistant to erosion, surface loss or degradation, compaction, functional/structural groups, plant mortality/decadence, litter amount, annual production, invasive plants, and reproductive capability of perennial plants.

IIRH Results

The monitoring conducted using the IIRH indicates that the North End Allotment is meeting the vegetation objective in Umatilla National Forest Land and Resource Management Plan (page 4-63).

Field crews inspected some of the grassland sites to identify existing plant communities and to determine locations for the application of IIRH. During this assessment, it was confirmed that these plant communities are primarily dominated by variations of Idaho fescue, bluebunch wheatgrass, and Sandberg's bluegrass. During the field seasons of 2008 and 2009, data was collected at five sites using the IIRH method, one per pasture. Monitoring was not completed in the Jarboe Pasture because it was not being used. Results represent the current resource conditions at the time of the assessment. This allows for an interpretation of how past and current management are affecting the ecology of allotment area. Table 16 represents a summary of the IIRH site ratings.

Table 16: Interpreting Indicators of Rangeland Health.

	Departure from Reference Conditions		
Pasture	**Soil & Site Stability**	**Hydrologic Function**	**Biotic Integrity**
Phillips Creek	None to Slight	None to Slight	None to Slight
Swamp Creek	None to Slight	None to Slight	None to Slight
Spout Springs	None to Slight	None to Slight	None to Slight
Middle Ridge	None to Slight	None to Slight	None to Slight
English Springs	None to Slight	None to Slight	None to Slight

The assessment looked at the 17 indicators of soil, hydrologic and biotic function, and the preponderance of evidence showed none to slight departure from reference conditions. This assessment indicates that the grassland communities on the North End Allotment are similar to the desired condition or reference condition. Annual grasses that tend to increase with disturbance are absent or are present in trace amounts. Idaho fescue and bluebunch wheatgrass dominate the grass communities, and closely resemble reference site conditions. The soil and hydrologic function is what would be expected for these vegetative conditions. Bunchgrass dominated communities show little signs of rill, gully, or wind erosion.

These results represent those bunchgrass plant communities located away from roads, dispersed camp sites, and where off road travel has occurred. This was intended to isolate grazing from other impacts to help assess livestock management in relation to vegetation conditions. Lower seral plant communities likely exist where other disturbances occur (i.e. dispersed camp sites, off road vehicle sites, campgrounds, trails, landings, roads, skid trails, corrals, and ponds). Areas of past disturbances, such as landings and clearcuts, have often been seeded with nonnative species. Though these conditions occur, they represent a small portion of the allotment and landscape. These localized areas may need active restoration efforts to improve vegetative conditions.

The monitoring conducted using the Interpreting Indicators of Rangeland Health (Pellant et. al. 2005) indicates that bunchgrass vegetation closely resembles reference conditions. Reference conditions would meet the vegetation objective in Umatilla National Forest Land and Resource Management Plan (4-63).

Condition and Trend Plots

Two Condition and Trend plots were analyzed in 1993 and again in 2008. Both plots were located within native bunchgrass plant communities. A comparison of species composition measurements and the photo record between the two years of collected data showed that conditions closely resemble the site potential for these sites (Figure 14). In comparing the data and the photo record between 1993 and 2008, there were no apparent changes in species composition or soil characteristics (amount of bare soil or erosion). As a result, it was determined that the current trend at these sites is stable or static. A review of these condition and trend plots indicates that open grasslands are meeting the vegetation objectives in the Umatilla National Forest Land and Resource Management Plan (page 4-63).

Figure 14. Condition and trend plot photographs in 2008 (top) and 1993 (bottom).

In summary, utilization monitoring has shown that the management of the North End Allotment has consistently met Forest Plan utilization standards. Open grassland communities were assessed using the Interpreting Indicators of Rangeland Health protocol and it was determined that these plant communities are in a similar state as reference conditions. Two Condition and Trend plots were assessed. Both sites were determined to be in a stable trend and were in a satisfactory condition as defined in the Forest Plan. In reviewing this information, it was determined that the current management of the North End Allotment is consistent with the Forest Plan standards and objectives for range.

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

Vegetation

Upland Habitats

All action alternatives have been prescribed the same design criteria, grazing strategy, and similar stocking rates. As a result, direct and indirect effects to upland habitats are expected to be similar. Based on past management and monitoring, it is expected that plant communities in mid to late seral stages would be maintained. Plant communities in low seral stages occur in small localized areas within the allotment (roadsides, landings, rock pits, dispersed campgrounds, corrals, etc). These areas within the allotment may need active restoration efforts to improve vegetative conditions. All action alternatives are consistent with the Forest Plan objective for range in all action alternatives.

Sheep grazing has and would continue to primarily occur on upland habitats within the allotment in all action alternatives. Grassland communities, open ponderosa pine and Douglas fir communities, and managed mixed conifer stands would continue to provide much of the forage for sheep within the allotment, and this is where effects would most likely occur. Upland water sources in the form of constructed ponds and spring developments would provide most of the water for domestic sheep, focusing grazing in the uplands versus riparian areas.

Idaho fescue and bluebunch wheatgrass plant communities are the prominent communities on open grassland habitats within the area. These plant communities are normally dominated by bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass, and prairie junegrass. Lupine, yarrow, balsamroots, buckwheat, phlox, and other species are usually present. Shrubs are usually absent in these community types within the allotment, though they can be found in small isolated pockets within the allotment and usually are present with less than 10 percent cover. Fire normally promotes bunchgrass species.

Overgrazing by ungulates usually causes a decrease in bunchgrass species, while annual bromes and forbs usually increase. Vegetation risks include expansion of annual grasses and weeds (Johnson, et al 1992). Early season grazing can be detrimental to bunchgrass species if continued over several grazing seasons (Johnson et al. 1992). Early seral or degraded conditions of these communities often show increases in annual brome species and some forbs (Johnson et al. 1992).

Monitoring has shown that open grassland communities in this allotment are generally in mid to late seral status. Native bunchgrass species dominate these plant communities and annual bromes and other annual invasive grass species are normally absent, both indicators of healthy conditions. Hydrologic and soil conditions were found to be similar to desired conditions for these range sites. These communities are grazed under the current management of the North End Allotment indicating that the current management is meeting desired conditions for the allotment.

Figure 15: Photographs of a typical range site on North End Allotment (Idaho fescue dominated plant communities).

Small areas within the allotment are in lower seral stages, though these areas represent a very small portion of the allotment and usually are associated with other disturbances such as roads, recreational areas, landings, etc. (see existing conditions).

None of the action alternatives allow for a consistent rest rotation strategy as was applied in the past. Instead, deferment and small areas to be rested would be incorporated into routing schedules, and monitoring would be an important task to ensure that management continues to result in meeting objectives.

The stocking rates on the North End Allotment have been very light compared to other allotments on the Forest. Management of the allotment has also been to rest large areas within the allotment each year, which is also not a common management practice on the Forest. Past management of the allotment has resulted in meeting the prescribed utilization standards. Monitoring shows that shrub use is slight to light use, which indicates that grazing is not adversely impacting shrub communities. Upland and riparian standards (utilization and stubble heights) have also been consistently met. Localized areas of higher utilization levels may occur at bed grounds, next to developed water sources, or at corrals. Adjustments in routing schedules would be used to minimize affects to vegetation near these localized areas.

All action alternatives have lower stocking rates than past management for any particular grazing season, therefore utilization by sheep on shrubs and herbaceous vegetation are expected to continue to meet the prescribed standards. Utilization standards have been established to meet individual plant needs to ensure that long term plant community health is maintained or trending towards desired conditions.

Sheep grazing would continue to occur in forested communities within the allotment. The amount of grazing within a particular forested stand depends on the amount of forage production as well as how accessible a particular stand is for sheep. Over-grazing, along with fire suppression, has been identified as a contributing factor in the decline in forest health (an increase in fire sensitive and disease susceptible species) over the last 100 years (Belsky et. al. 1997). Over-grazing can affect the long term health of forested communities by reducing understory vegetation that competes with tree seedlings and reducing fine fuels that carries wildfire (Belsky et. al. 1997). These grazing impacts that contributed to the

decline in forest health primarily occurred in the early 1900's (Borman 2005). During this time, grazing in the Blue Mountains and the project area was unregulated. The numbers of sheep in Umatilla County approached 250,000 during the early 1900's, compared to 8,000 in 2009. Historic over-grazing likely contributed to overstocked forested stands in the project area.

Livestock management practices have significantly changed since the early 1900's in the project area. The most fundamental change is the number of livestock allowed to graze a particular area and the length and timing of the grazing season. Sheep grazing would occur in forested communities within the allotment in all action alternatives. The amount of sheep use in a particular forested stand is mostly dependent on the amount of forage the stand produces and how accessible it is for sheep. Managed timber stands, normally called transitory rangeland, generally provide available forage and good access for sheep grazing to occur. These areas were often seeded with nonnative species. As canopy cover increases, the amount of forage and accessibility normally decreases. The prescribed utilization standard prescribed for all action alternatives in forested communities is 45 percent. This utilization standard was prescribed to ensure individual plant needs to ensure long term health of individual plants and the plant community as a whole.

Due to the lighter stocking rates, shorter season of use, range readiness standards, and utilization standards, all action alternatives are unlikely to affect the long term condition of forested stands within the project area.

Riparian Habitats

Each band of sheep is required to have a herder present at all times, allowing for sheep to be herded away from riparian areas. Many of the streams within the allotment would have a 300 ft. buffer on either side of the stream to protect ESA listed fish species. This buffer applies to most of the main streams within the allotment and includes the majority of the perennial streams within the allotment. Sheep would be herded away from this buffer except at designate crossings to minimize effects to fish habitat. As a result, effects to riparian vegetation are limited to headwaters of streams and isolated wetlands. Sensitive areas such as aspen stands can be avoided by herding sheep around those sites when a there is a need to improve vegetation condition to meet specific objectives.

As a result of the management requirements to herd sheep away from sensitive areas, the direct/indirect effects to riparian vegetation would be limited to the headwater areas of the streams and isolated meadows, springs, and seeps within the allotment. Utilization standards prescribed in the Forest Plan and in each alternative would minimize effects to riparian vegetation. As a result, all action alternatives would be consistent with the Forest Plan for vegetation objectives.

Sheep grazing does not occur on many riparian communities within the allotment. Utilization monitoring has shown 0 percent use along many of the streams within the allotment due to the prescribed no grazing buffer (Range Report). Utilization standards would be prescribed for all action alternatives consistent with the Forest Plan. The utilization standard of 30 percent would be prescribed for all riparian shrub species and 45 percent on herbaceous species. This prescription would limit effects to riparian vegetation.

Direct and Indirect Effects Unique to Alternative 1

Vegetation

This alternative eliminates approximately 30,860 acres from the existing allotment (Figure 2). Domestic livestock grazing would no longer effect vegetation within this 30,860 acre area. Plant community succession would occur absent of livestock grazing. Other effects to plant communities would continue to occur such as wild ungulate grazing, fire, timber and fuels management activities, recreation activities, roads, etc.

The direct and indirect effects to vegetation are the same for all action alternatives, except that a different number of acres are affected. Alternative 1 is the largest in size with about 101,000 acres. It includes an area north of Lookingglass Creek that is approximately 19,000 acres in size. Alternative 1 is the only alternative that proposes grazing within this area.

Upland Habitats

The direct and indirect effects to upland habitats within this 19,000 acre area unique to Alternative 1 would be similar to the effects within all areas proposed to be grazed in all alternatives. Prescribed utilization standards would be met and vegetation conditions would meet objectives in the Forest Plan.

Riparian Habitats

Grazing would no longer be authorized within the Jarboe pasture and portions of the Swamp Creek pasture. Streams in this area include Jarboe Creek, Sheep Creek, Little Lookingglass Creek, Buzzard Creek, Fry Meadow Creek, and their tributaries. Utilization of vegetation by domestic sheep would no longer occur in the headwater areas of these areas.

Mottet Creek and Swamp Creek are within the 19,000 acre area. A 300-foot no grazing buffer would be applied on either side of these creeks. Sheep may still be herded up the road along Mottet Creek, but would not spend enough time in this area to affect the long term condition of riparian vegetation. Grazing would be authorized in the headwaters of these streams, though utilization standards and other design criteria would allow riparian vegetation objectives to be met.

Direct and Indirect Effects Unique to Alternative 2

Vegetation

Alternative 2 eliminates approximately 50,500 acres from the existing allotment (Figure 3). Domestic livestock grazing would no longer affect vegetation within this area. Plant community succession would occur absent of livestock grazing. Other effects to plant communities would continue to occur such as fire, timber and fuels management activities, recreation activities, roads, etc.

Upland Habitats

Grazing would occur within an 81,500 acre allotment. Within this area, the direct and indirect effects to upland vegetation would be similar to all action alternatives. Prescribed

utilization standards would be met and vegetation conditions would meet objectives in the Forest Plan.

Riparian Habitats
The direct and indirect effects to riparian communities are expected to be similar in all action alternatives. The change in allotment size would eliminate livestock grazing in the following drainages: Swamp Creek, Lost Creek, Summer Creek, Mottet Creek, and the tributaries of the South Fork Walla Walla River. These are in addition to the riparian areas listed in Alternative 1. Utilization of vegetation would no longer occur in the headwaters of these areas.

Direct and Indirect Effects Unique to Alternative 3

Alternative 3 would eliminate the same 50,500 acres as Alternative 2, plus grazing would be eliminated from the North Fork Umatilla Wilderness (-31,000 acres) (Figure 4). In addition, grazing would be allowed in portions of an adjacent closed allotment known as the Goodman Allotment (+29,000 acres). The overall size of the allotment would be slightly different from Alternative 2, with 79,500 acres. Both Alternatives 2 and 3 would provide forage for three bands of sheep.

Capability
The Goodman Allotment has not been grazed by domestic sheep since the 1950's. Much of the area consists of drier forested sites and open grasslands suitable for grazing. The majority of the fully capable lands are found on the ridge tops and gentle slopes near Goodman, Little Goodman, Shimmiehorn, and Bobsled ridges. There are approximately 12,552 fully capable acres within the Goodman area. Those areas considered less than fully capable (14,548 acres) include low production areas, slopes over 60 percent, and forest stands with over 60 percent canopy closure.

The capacity analysis determined that forage could be provided for 1000 sheep (1 band). However, access to this area can be difficult in the spring. Snow plowing would likely be required to allow herders and sheep into the area early in the grazing season. Otherwise, use of the Goodman area would be deferred until the road opens up. Full use would not be authorized until an adequate number of water sources are developed.

Vegetation

Upland Habitats
There would no longer be any grazing effects in the North Fork Umatilla Wilderness Area. Plant community succession would occur absent of livestock grazing. Other effects to plant communities would continue to occur such as wild ungulate grazing, fire, timber and fuels management activities, recreation activities, roads, etc.

Stocking rates for the Goodman area were based on the North End Allotment and adjusted for differences in the amount of forage. As a result, utilization levels should be similar to what has been experienced on the North End Allotment. Utilization on upland vegetation should consistently meet prescribed utilization standards consistent with the Forest Plan.

Open grasslands and managed forested stands would supply most of the forage for sheep. Since management practices would be the same as what has been applied on the North End Allotment and the plant communities are similar, effects to vegetation are expected to be similar to Alternatives 1 and 2. Grazing in the Goodman area would meet the objectives identified in the Forest Plan for vegetation.

Existing and proposed water developments are also located in upland areas.

Riparian Habitats
In addition to stream systems listed in Alternatives 1 and 2, there would no longer be any grazing effects in the North Fork Umatilla Wilderness. The following riparian areas would no longer be within the allotment: North Fork Umatilla River, Buck Creek, the north side of Thomas Creek, Bear Creek, Lick Creek, Coyote Creek, Woodward Creek, and Johnson Creek. The uppermost headwaters of some of these creeks would remain within the allotment.

The main stream systems in the Goodman area are the South Fork Umatilla River, Spring Creek, Shimmiehorn Creek, and Hellhole Creek. Most of these streams and their associated riparian vegetation are not accessible to sheep because they are located in the bottom of large canyons. Sheep would not be herded down into these reaches. Streams that contain steelhead and bull trout would have a 300 ft. no grazing buffer on both sides. As a result, effects to riparian vegetation on streams with the Goodman area would be limited to the headwaters of these systems. These conditions and resulting effects are similar to Alternative 1 and Alternative 2. Direct/indirect effects would be limited to the riparian vegetation in the headwaters of streams and small, isolated meadows, springs, and seeps.

Utilization standards would be prescribed consistent with all action alternatives and consistent with the Forest Plan. Routing schedules would be used to ensure that utilization on herbaceous riparian vegetation and shrubs do not exceed the prescribed standards. Sheep grazing in the Goodman area would be expected to result in meeting vegetation objectives identified in the Forest Plan.

Direct and Indirect Effects Unique to Alternative 4

Vegetation

Alternative 4 is the smallest size allotment being considered, with about 52,600 acres. Effects would be similar to Alternative 3 except that the Goodman area would not be included (Figure 5). There would be no grazing in the North Fork Umatilla wilderness.

A total of 79,400 acres would no longer be grazed by domestic livestock from what is currently be grazed. Domestic livestock grazing would no longer affect vegetation in upland or riparian habitats within this area. Plant community succession would occur absent of livestock grazing. Other effects to plant communities would continue to occur such as wild ungulate grazing, fire, timber and fuels management activities, recreation activities, roads, etc.

Upland Habitats
The direct/indirect effects to upland vegetation would be the same for all action alternatives within the remaining area to be grazed.

Riparian Habitats
The direct/indirect effects to riparian vegetation would be the same for all action alternatives within the remaining area to be grazed.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Vegetation

There would no longer be any effects to upland or riparian plant communities from domestic livestock grazing. Plant community succession would occur absent of livestock grazing. Wild fire, prescribed fire, insects, wild ungulate grazing, and other disturbances would continue to occur affecting the condition of plant communities. Plant communities in low seral stages (unsatisfactory condition) occur in small localized areas within the allotment (roadsides, landings, rock pits, dispersed campgrounds, corrals, etc). These areas within the allotment may need active restoration efforts to improve vegetative conditions regardless of whether livestock grazing occurs or not.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Past Actions
The result of past actions is evident in the existing conditions of vegetation on the allotment. Current conditions on grassland communities are currently in mid to late seral stages. Low seral conditions are present, but represent a small portion of the grassland communities in the allotment. Low seral conditions often occur where other disturbances have occurred such as along roads, rock pits, dispersed camps, campgrounds, landings, recent wildfires, etc. These conditions are the result of past actions. Utilization standards are identified in the Umatilla Forest Plan and are a part of the prescribed management for all action alternatives to reduce livestock grazing use where unsatisfactory conditions occur. The action alternatives are unlikely to cumulatively affect these sites with adherence to management requirements (utilization standards, stocking rates, season of use, and routing schedules).

Current and Reasonable Foreseeable Actions
This section addresses potential cumulative effects of Alternatives 1, 2, 3, and 4 along with current and reasonably foreseeable future actions. Since all action alternatives have the same prescribed management, cumulative effects should be the same proportionate to the area proposed to be grazed.

Maintenance and use of recreational areas will continue to occur with the allotment area. Developed recreation areas within the alternatives have been identified and herders would be required to route sheep away from these sites. The exception is in Alternative 1 where sheep may be used to manage vegetation on Spout Springs Ski area. Due to prescribed management, it is unlikely that the action alternatives would result in cumulative effects on vegetation or allotment management at recreational areas.

Current and future harvest and fuel reduction activities will occur within or adjacent to the allotment (Loon, Tollgate, and High Buck). Harvest and fuel reduction activities focus on the retention of large trees and thinning small diameter trees to meet desired stand conditions. These activities can create transitory range conditions by increasing forage for ungulates as well as improving access for domestic and wild ungulates. Creating transitory range may improve livestock distribution; however, stocking rates (number of sheep) would not be increased as a result of these activities. In the long term, it is likely that the transitory range created by harvest activities would again become unavailable as succession occurs. As a result, there would be no cumulative effects on vegetation.

Historic over-grazing has often been considered a reason why forested stands have departed from historic stand conditions (Belsky et al. 1997). However, prescribed grazing in all action alternatives is much less than what historically occurred in the Blue Mountains in terms of intensity, stocking rates, or season of use.

Prescribed burning and wildfires will continue to occur within the allotment area. Prescribed burning is normally used as a tool to improve vegetation conditions or to meet desired conditions for a particular area. Prescribed burning normally allows plant communities to become more resilient to deal with wildfires and other natural events. Allotment management activities may be modified to allow areas burned (prescribed fires or wildfires) to recover to a state where livestock grazing can again occur without causing cumulative effects to vegetation health. This may include rest for a period of time to allow plants to recover from fire before grazing is allowed.

Invasive plant treatments currently occur within the allotment and will continue to occur. Treating invasive plants is a tool used to manage for healthy plant communities with preference toward native species. Prescribed grazing management, based on past monitoring, has been designed to manage for desired plant communities. The action alternative should not affect the ability of plant communities to out-compete invasive plants.

Forest Plan Compliance

Each alternative was evaluated to determine if the Forest Plan Goal was met "to manage the forage resources for an upward trend in areas in less than "Fair" condition and an upward or stable trend for areas in "Fair" or better condition, while providing for forage productivity and making suitable range available for livestock grazing."

Forest Plan range standards and guidelines were also reviewed for each Management Area in the allotment (Appendix A). Monitoring indicates that standards are being met under the current allotment management, and the proposed alternatives in this EIS were designed to have the same or less effects (Range Report).

All action alternatives would be compliant with the Forest Plan by using a partial rest, deferred rotation management system, and by abiding by the project design criteria outlined in Chapter 2.

Invasive Plants

Scale of Analysis

This analysis will consider known infestations of invasive plants within or adjacent to the North End Allotment. The Walla Walla Ranger District annually monitors and inventories invasive plants within the project area. This analysis will focus on known invasive plants in the allotment and the potential for other weeds to be transported into the allotment.

Methodology and Assumptions

Invasive plants, as defined by the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, are non-native plants whose introduction do or are likely to cause economic or environmental harm or harm to human health. This analysis focuses on those species that are listed on the Oregon Department of Agriculture noxious weed list. The terms invasive plants and noxious weeds are used interchangeably.

Invasive plants will be discussed based on inventoried weed sites as well as known weed species that occur in the analysis area that are not inventoried. Known noxious weed sites, soil disturbance, and the potential spread of invasive plants will be the foundation of the analysis. In rating the priority of noxious weeds for treatment and inventory, the Forest classification will be used.

This analysis is tiered to the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program (USDA-FS 2005), hereby referred to as the R6 Weed EIS. The R6 Weed EIS Record of Decision amended the Umatilla National Forest Plan by adding management direction relative to invasive plants. This project is intended to comply with the new management direction. The portions applicable to the North End Allotment include the prevention standards, which are detailed in Chapter 2.

Existing Conditions

There are currently 4,730 acres of inventoried invasive plant populations within the current boundary of the North End Allotment (132,000 acres) (Table 17). Many of these species overlap. Approximately 3.5 percent of the allotment area is infested with invasive plants. Approximately 2,770 acres of the 4,730 acres (59 percent) with invasive plants are located along roads and right of ways. The other 41 percent are typically found within managed timber stands and are generally low priority species such as mullein, bull thistle, and St. Johnswort.

High Priority Species

The high priority species of most concern within the allotment are: spotted knapweed; diffuse knapweed; Canada thistle; sulfur cinquefoil; leafy spurge; yellow hawkweed; Dalmatian toadflax, and yellow toadflax. The largest infestations of high priority species within the allotment are diffuse knapweed, spotted knapweed and Canada thistle.

There are currently 34 of spotted knapweed infestations covering 287 acres, and 285 diffuse knapweed infestations that cover approximately 1,591 acres within the allotment. Knapweed is primarily found along roads and right of ways. There are established biological control populations on knapweed within and adjacent to the allotment. The

effectiveness of the biological control agents is not known at this time, though success has occurred in other areas.

There are currently 76 infestations of Canada thistle that occupy approximately 1,436 acres within the allotment. Canada thistle is an aggressive nonnative species that forms colonies from deep and extensive horizontal roots (Whitson, 1992). Biological control agents are available for this species, but have not been released within the project area.

Sulfur cinquefoil can be found at 12 sites totaling about 23 acres. Sulfur cinquefoil has an extensive root system that tends to form colonies of infestations. Roadsides, disturbed areas, and dry meadow types tend to be vulnerable to this species (Whitson, 1992).

There are 3 infestations of leafy spurge within the allotment that total only approximately 1 acre in size. These three infestations are found near Forest Service Road 3715 and are located within the English Springs pasture. Leafy spurge is a high priority aggressive invasive. It has an extensive and deep root system that makes it difficult to control (Whitson, 1992).

Table 17. Existing invasive plants within the existing North End Allotment boundary.

Species	Common Name	Number of Sites	Acres
Centaurea biebersteinii	spotted knapweed	34	287
Centaurea diffusa	diffuse knapweed	285	1591
Cynoglossum officinale	houndstongue	41	460
Potentilla recta	sulfur cinquefoil	12	23
Cirsium arvense	Canada thistle	76	1436
Euphorbia esula	leafy spurge	3	1
Hieracium caespitosum	yellow hawkweed	8	74
Linaria vulgaris	yellow toadflax	1	1
Centaurea solstitialis	yellow starthistle	1	4
Senecio jacobaea	tansy	24	66
Linaria dalmatic	dalmatian toadflax	1	22
Low Priority Species	listed in text	54	769

Medium Priority Species
Houndstongue and yellow toadflax are considered medium priority species. Houndstongue infests about 460 acres within the allotment at 41 locations. Houndstongue can be easily spread by livestock and wildlife as the seeds cling to animals (Whitson, 1992). Currently there is one known yellow hawkweed site that affects 1.5 acres within the allotment.

Low Priority Species
These weed species are typically less invasive and/or persistent than high priority species and give way to or do not pose as high a risk of outcompeting desirable vegetation. Low priority "established" invasive plants are generally so extensive Forest-wide that they are not generally inventoried and treatment options are normally limited. The low priority weeds within the allotment include ventenata, St. Johnswort, bull thistle, mullein, teasel, and chicory. These weed species can be found within the North End Allotment at relatively low densities along road corridors and in past logging units. Biological control agents are currently being released in the analysis area to help control existing populations.

Treatment Efforts

Current treatment efforts are limited to those sites covered under the Environmental Assessment for the Management of Noxious Weeds for the Umatilla National Forest signed in April of 1995. Most of the invasive plant infestations within the allotment have become established or were found after 1995. As a result, treatment options within the project area are extremely limited. Biological control agents that are available are being released within the area.

The Umatilla National Forest is currently analyzing the current invasive plant infestations on the Forest in the Umatilla National Forest Invasive Plants Treatment Environmental Impact Statement, which proposes treatment of all invasive plant infestations within the North End allotment. The Record of Decision was signed on July 8th. Any future treatments allowed under this new weed EIS would reduce the threat of invasive plants within the North End Allotment and reduce the potential spread of invasive plants by sheep grazing.

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

Livestock grazing has the potential to influence weed establishment and spread through vegetation consumption, seed transport, and soil disturbance. Livestock grazing can affect the ability of native plant communities to out-compete and prevent invasive species from becoming established and spreading. Invasive plants can compete and out-compete native species resulting in a decline in native species diversity and affect plant community condition and succession. Ground disturbing activities may increase the potential for invasive plants to become established, however many invasive species can become established without disturbance.

Livestock grazing can also be a vector for the dispersal of invasive plant seeds. Sheep are hauled onto National Forest Land each year around June 1st. There is a potential for sheep to bring invasive plant seeds onto the allotment during this time. If sheep graze in existing noxious weed sites on the allotment, there is a risk of spread as they move around.

Areas where sheep are concentrated can result in soil disturbance that may lead to the establishment and spread of invasive plants. These areas include corrals, water

developments, and bed grounds and are considered high risk areas for soil disturbance. There are known weed sites within 100 feet of eight improvements in the allotment (common to all action alternatives). Most of these are not associated with the range improvement. The establishment of invasive plants as a direct result of concentrated sheep at range improvements has not been a common occurrence on this allotment.

All action alternatives have prescribed utilization standards, relatively low stocking rates, and a rest/deferred grazing system that are designed to reduce negative effects to plant community health. This in turn would reduce the risk of the establishment and spread of invasive species. The following prevention standards and management requirements have been prescribed for all of the action alternatives to reduce the risk of the spread and establishment of invasive plants:

- Utilization standards for upland and riparian vegetation (Umatilla National Forest LRMP).
- Permitted numbers and season of use (term grazing permit).
- If hay is used for livestock, certified weed free hay will be required (Prevention Standard #4 R6 FEIS 2005).
- Native plant material will be the first choice for rehabilitation or restoration work. (Prevention Standard # 13, R6 FEIS 2005).
- Equipment used outside of the road prism (maintenance of range improvements) will be required to be cleaned prior to entering National Forest land. (Prevention Standard #2 R6 FEIS 2005).
- The invasive plant coordinator and range managers will work closely together to make adjustments to the annual routing schedule of sheep in relation to invasive plant populations (Management Requirement).
- Maps in the Allotment Management Plans would show current, inventoried, high priority, noxious weed infestations to be avoided and/or monitored. (Prevention Standard #6 R6 FEIS 2005).

In general, the risk of weed establishment and spread from livestock grazing is proportionate to the area grazed (Figure 16). Alternative 4 (other than the no grazing alternative) poses the lowest amount of risk to existing infestations (Table 18).

Roadside infestations account for over 50 percent of the infestations within all action alternatives. The roadside infestations within the allotment are primarily knapweed species. Sheep grazing has been used throughout the west to control knapweed infestations. A study conducted by Colorado State University determined that grazing knapweed twice in the spring decreased seed set by 50 percent, and reduced tumbling-offsite by 15 percent (Beck 2008). Grazing sheep on knapweed sites before seed set may reduce seed production, however grazing after seed maturity poses a risk of spreading seeds. Annual routing schedules would be adjusted to avoid high priority infestations after seed maturity.

Sheep and goats have been increasingly used to control invasive plants on public lands (Beck 2008). In order to use sheep to effectively control invasive plants, an intensive

management plan must be implemented to ensure that objectives are met. Though this EIS does not propose a comprehensive plan in the use of sheep to control invasive plants, the invasive plant coordinator and range managers would work closely together to identify opportunities to use sheep in the control of some weed species, as well as adjust the annual routing schedules of sheep through the allotment to help prevent the spread of seeds.

Figure 16. Number of acres grazed by alternative

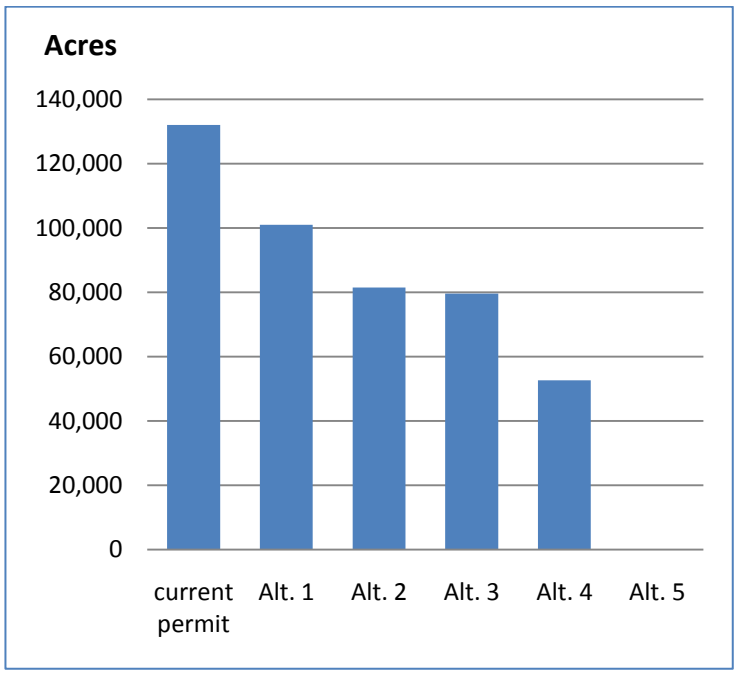


Table 18. Invasive plant occurrence by alternative.

Alternative	Weed sites	Weed Acres
1	429	3672
2	313	3200
3	325	3226
4	278	2713
5	0	0

Direct and Indirect Effects Unique to Alternative 1

Alternative 1 would eliminate grazing on approximately 31,000 acres. This alternative would reduce the risk of the establishment and spread of noxious weeds caused by sheep. Domestic sheep would no longer affect soils or vegetation within this 31,000 acre area, reducing the potential establishment and spread of invasive plants. Within this 31,000 acre area, there are currently 1,530 acres of invasive plants. Livestock grazing would no longer be a concern within or adjacent to these 1,530 acres of invasive plants.

Sheep grazing would continue to occur on 101,138 acres, and 3,962 sheep would be authorized to graze from June 1st to October 9th within the new allotment boundary.

There are a total of 3,672 acres of inventoried invasive plant populations within the boundary of Alternative 1 (Table 18). About 1,950 acres of these are located along roads and right of ways. The other 47 percent of the infestations are typically found within managed timber stands and are generally low priority species such as mullein, bull thistle, and St. Johnswort.

Direct and Indirect Effects Unique to Alternative 2

Alternative 2 would eliminate grazing on 50,500 acres and the number of sheep authorized to graze this area would be reduced by 962. This alternative would reduce the risk of the establishment and spread of noxious weeds caused by sheep as compared to what is currently authorized. Domestic sheep would no longer affect soils or vegetation within this 50,500 acre area, reducing the potential establishment and spread of invasive plants.

Sheep grazing would continue to occur on 81,500 acres. Within this area, there are currently 3,200 acres with inventoried weeds. This is approximately 470 less total weed acres that could be affected by sheep grazing than Alternative 1.

Of the 3,200 acres of infestations within Alternative 2, 54 percent are found along roads. The remaining 46 percent are primarily found in managed timber stands.

Direct and Indirect Effects Unique to Alternative 3

Alternative 3 proposes to graze approximately 79,600 acres. This alternative would eliminate grazing on 79,400 acres of the current allotment; however it would authorize grazing on an additional new 27,000 acres in the Goodman area. This alternative would reduce the risk of the establishment and spread of noxious weeds caused by sheep as compared to what is currently authorized.

There are a total of 325 infestations that total approximately 3,226 acres within Alternative 3. This includes about 500 acres in the Goodman area. The species of most concern within this alternative are diffuse and spotted knapweed.

Direct and Indirect Effects Unique to Alternative 4

Alternative 4 poses the smallest amount of risk to the establishment and spread of invasive plants among the action alternatives. Alternative 4 would result in the fewest amount of acres grazed and would authorize the fewest number of sheep. Only 52,600 acres would be grazed by 2,000 sheep.

There are a total of 278 invasive plant sites that total approximately 2,713 acres of infestations within the allotment boundary of Alternative 4. Compared to all other action alternatives, this is the smallest number of existing weed sites that would be within the proposed area to be grazed.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Alternative 5 would not authorize livestock grazing within the North End Allotment. If this alternative is chosen, there would be no environmental effects concerning invasive plants as a result of livestock grazing. This alternative provides the lowest amount of risk to the spread of existing or new infestations within the project area.

Ponds, troughs, and corrals would be restored, removed, or abandoned from the allotment. Livestock would no longer concentrate at these areas, therefore soil disturbance and potential weed spread would be greatly reduced at these sites.

The potential for noxious weed establishment or spread by other means will continue. New noxious weed infestations will likely continue to be found along roads, trails, and campgrounds.

Treatment efforts will continue to occur within the project area consistent with NEPA decisions regarding weed control. Low priority species will most likely continue to spread to some extent due to a lack of treatment efforts, while high priority infestations will likely be controlled through treatment efforts.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Roads are the highest risk area for invasive plants within the project area. Over half of the existing infestations are found along roads. Maintenance of road systems within the project area will continue to occur. Sheep grazing primarily occurs away from roads, though roads are used to trail sheep throughout the allotment. There is a potential for cumulative effects with road maintenance and sheep grazing to cause the establishment and spread of invasive plants.

Recreational use within the allotment will also continue to be a vector for the establishment and spread of invasive plants. High risk areas include trail heads, developed recreation sites, roads, and dispersed camps. Sheep would not be authorized to graze developed recreation sites, resulting in no cumulative effects at these locations.

Harvest and fuels reduction activities will continue to occur within the allotment area. These treatments normally focus on removing small diameter trees to meet forest stand health objectives. Weed prevention standards are required during these activities, reducing the risk of invasive plant infestations. Harvest and fuel reduction activities create transitory rangeland that sheep would use.

Prescribed burning and wildfires will continue to occur within the allotment. Adjustments to routing schedules for sheep would be required to ensure that sheep grazing does not occur within burned areas until such time as conditions have improved to a level suitable to allow grazing again (Range Report). This may include rest for a period of time to allow plants to recover from fire before grazing is allowed. As a result, the cumulative effects of burning and sheep grazing on weed spread would be minimal.

Forest Plan Compliance

All action alternatives include the prevention standards described in the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program signed in 2005. All alternatives have been designed to be consistent with the Umatilla Land and Resource Management Plan as amended b the R6 FEIS 2005 Record of Decision for Invasive Plants.

Botanical Resources

Botanical Areas

There are four Special Interest Botanical Areas within the North End Allotment and the Goodman area. These areas are either established in the Forest Plan, or are proposed to be added to the upcoming revision of the Forest Plan. Grazing is not allowed in these areas, as indicated in the Management Requirements in Chapter 2. The following table outlines these areas and their spatial relationships to the boundaries of the alternatives.

Table 19. Special Interest Botanical Areas.

Area Name	Size in Acres	Reason For Establishment	Present Status	Alternative
Farr's Meadow	50	sensitive willow species (*Salix farriae*) / other sensitive taxa	proposed in new forest plan	1/2/3/4
Ruckel Junction	5	population of Sabine's lupine (*Lupinus sabinianus*)	established in existing forest plan	1/2/3/4
Shimmiehorn Canyon	140	unusual suite of fern species	established in existing forest plan	3
Woodward Campground	15	coralroot orchid (*Coralorhiza sp.*) population / bracted lousewort (*Pedicularis bracteosa*)	proposed for removal in the new forest plan as the taxa of concern have been delisted	1/2

Spalding's catchfly *(Silene spaldingii)*

Silene spaldingii is listed as Threatened under the Endangered Species Act and is known to occur on the Umatilla and the adjacent Wallowa-Whitman National Forest. *Silene spaldingii* occurs primarily in open grasslands on deep loess-derived Palousian soils. There is no suitable habitat for Spalding's catchfly within any of the proposed alternatives for the North End Allotment. All known occurrences of the species are many miles distant. Therefore this species is not expected to occur in the area and will not be discussed further.

Sensitive Plant Species

There are four vascular plant taxa listed on the Regional Forester's sensitive list that have been found in the area: Cordilleran sedge (*Carex cordillerana),* native sedge (*Carex vernacula*), Farr's willow (S*alix farriae),* and persistent sepal yellowcress (*Rorippa columbiae).*

There are additional species that are currently being considered for inclusion on the Regional Forester's sensitive list and/or strategic list. Bolander's bruchia moss (*Bruchia bolanderi*), a bryophyte, is the only species known in the area that is currently on the strategic list. Information about other species can be found in the Botanical Resources Report for the North End Allotment.

Cordilleran sedge (*Carex cordillerana*)
Carex cordillerana is present in the North Fork Umatilla River area. Palatable to livestock and very easily uprooted, this *Carex* species is extremely sensitive to any disturbances from grazing pressure. It is surmised that historical grazing pressure in the region may have been a driving factor in greatly reducing population sizes and overall abundance (Wilson et al. 2008).

Native sedge (*Carex vernacula*)
Native sedge is recorded in Oregon from 10 sites in the Cascades, Wallowa Mountains., and on Steens Mountain, where it occupies the borders of small water bodies or wet subalpine meadows. This species is present in the Middle Ridge grazing unit.

Farr's willow (*Salix farriae*)
Known from 5 locales in Oregon, this subalpine/alpine clonal willow species is present in a few small patches in the Farr's Meadow Botanical Area. The area also contains a population of a rare bryophyte, Bolander's bruchia moss (*Bruchia bolanderi).*

Persistent sepal yellowcress (*Rorippa columbiae)*
This rare mustard is only known from the wetted margins of lakes, ditches and perennial stream and river systems. It requires a narrow hydrologic setting in which it is fully inundated for at least a portion of the growing season. It has been found in Lookingglass Creek.

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

Although Botanical Areas would not be fenced off, the grazing permit would include language that excludes grazing from these areas. Accurate location information (maps) would be made available to the permittee's on-the-ground staff so sheep bands can be directed accordingly.

Grazing would not be allowed in the immediate area of the known occurrences of sensitive plants. In addition, the management requirements for riparian areas would provide protection for these sites. The chances that grazing would occur in these areas is small. If livestock were to get into these areas, the loss of individuals could occur. It is not expected that this would result in population extirpation or significant species decline. Therefore,

the determination for all sensitive and strategic plants is **may impact individuals or habitat**, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Indirectly, the spread of invasive plants and soil compaction can cause effects to sensitive plant species and other botanical resources. These factors can result in degraded habitat poorly suited or no longer ecologically capable of supporting sustainable populations of species of interest. Management requirements to reduce the potential for weed spread are in place. All alternatives would affect fewer weed sites than what has occurred in the past (Invasive Plants Report).

There are no effects unique to Alternatives 1 or 2

Direct and Indirect Effects Unique to Alternative 3

The Shimmiehorn Canyon Botanical Area would be within the new allotment boundary. Grazing would not be allowed in the botanical area and therefore no effects are expected.

Direct and Indirect Effects Unique to Alternatives 3 and 4

The Woodward Botanical Area would no longer be within the allotment boundary; therefore no effects from grazing would be expected.

The cordilleran sedge area would no longer be within the allotment boundary, therefore there would be **no impact to cordilleran sedge**.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Elimination of grazing on the North End Allotment would eliminate potential grazing impacts to sensitive plant species.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Historical uses of the area include intensive sheep grazing that has had profound effects on the character of the vegetation – particularly the shallow soil scabland areas. Owing to this period of grazing, much of this habitat contains vegetation that differs from what would be expected historically.

Historical intensive predator management also has led to landscape scale modifications – most notably in the character of the vegetation. Elk in particular have increased in abundance. Their presence has been a strong driver of changes in the mix and abundance of numerous native plant species. Likewise, a significant history of disturbance via timber management has occurred. This includes logging, thinning and plantation style conifer plantings; all with associated road building activities that have left ongoing landscape legacies.

Other ongoing modifications to the landscape include special uses such as summer homes, rock quarrying (e.g. Swamp Creek pit), and range improvements such as fencing, corrals and water developments. Recreational uses are numerous and include hiking, trail building and associated maintenance, snowmobile trails, downhill skiing at the Spout Springs Ski Area, dispersed and developed camping activities and OHV usage. OHV usage may be contributing to landscape-scale modifications. Future activities in the area may include wind power developments.

The addition of a tightly-managed sheep grazing strategy for the North End allotment to historical, ongoing and future land usages is not considered likely to be a significant modifier to the existing vegetation on the landscape. Sheep grazing as a vector for inroads by invasive species is, however, a concern that must receive attention in the permitting process in order to limit future effects. Management requirements to reduce the potential for weed spread are in place. All alternatives would affect fewer weed sites than what has occurred in the past (Invasive Plants Report).

Forest Plan Compliance

Adherence to forage utilization standards established for wetland and riparian areas in the Forest Plan would minimize impacts to rare plants in these areas. Grazing would not occur within forest plan management areas set aside as Special Interest Botanical Areas.

Wildlife Species and Habitats

Analysis Procedures

The assessment of wildlife species and habitat was done with field reviews, literature reviews, district records, and Geographic Information System (GIS) data. The best available science was used to determine effects to wildlife species in a manner appropriate for the circumstances. Generally the scale of analysis for wildlife is the project planning area, however for some species a larger area was considered and those scales are identified in the appropriate sections. The wildlife section is organized into the following categories: Management Indicator Species; Neotropical and other Bird Species; and Threatened, Endangered and Sensitive species. The bighorn sheep section was moved to the beginning of Chapter 3.

Management Indicator Species

This section addresses the following wildlife management indicator species from the Forest Plan: pileated woodpecker, northern three-toed woodpecker, and other primary cavity excavators; American marten; and Rocky Mountain elk.

Cavity Excavators

Nesting and foraging habitat for pileated woodpecker, northern three-toed woodpecker, and other cavity nesting birds would not be affected by sheep grazing or associated activities. Sheep grazing as prescribed is not expected to change the species composition, distribution, or abundance of primary cavity excavators or their habitat. Therefore, further discussion of effects to each of these species is not necessary. More detailed information is available in the Wildlife Specialist Report.

American Marten

The American marten was selected as an indicator species in the Forest Plan to represent complex mature and old growth stands. Preferred habitat for the marten consists of high elevation (> 4000') stands of dense conifer and down wood often associated with streams. The population density and distribution of marten is unknown, but historically they probably occurred in the area in low numbers. Marten tracks were found in 2006 in the northern part of the allotment. Although past timber harvest likely removed and/or fragmented marten habitat, there are large tracts available in the wilderness and roadless areas. Smaller blocks of marten habitat are distributed throughout the allotment, with good connectivity in the northern areas and less connectivity in the drier southern areas.

Direct, Indirect, and Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Sheep grazing would have little to no impact to American marten habitat. Generally the sheep are not utilizing areas with dense conifer and down wood. There would be a slight disturbance to individual marten if they happen to be in the same area that sheep are

currently grazing. Sheep herding and guarding dogs could also cause marten to curtail hunting activities. Such effects would be short lived as the sheep herd generally does not stay in one place for more than a day or two. These effects would be less than the current grazing situation because less marten habitat would be part of the allotment. These minimal potential effects would not cause cumulative effects in relation to other ongoing and proposed activities in the area.

There are no other effects unique to Alternatives 1, 2, 3, or 4.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

The slight chance that grazing activity would disturb marten would be eliminated. There would be no indirect or cumulative effects to marten individuals or habitat.

Rocky Mountain Elk

Rocky Mountain elk serve as an indicator of the quality of general forest and winter range habitat for elk and deer on the Umatilla National Forest. The Allotment area is used by elk primarily as summer range, but important calving and wintering areas are also present in or adjacent to the allotment. Critical big game winter range occurs on less than one percent of the allotment.

This area is within the Mt. Emily and Wenaha Game Management Units. Winter counts indicate that the elk numbers are well below the objectives set by Oregon Department of Fish and Wildlife (ODFW) in both of these units. Reasons for this are unclear. A mountain lion study is in progress to help determine the extent that predation is depressing the elk population.

Forage quality and quantity influences elk nutrition and therefore health and productivity. Stubble height standards and Forest Plan utilization standards for upland and riparian vegetation have consistently been met in the North End allotment, which indicates that forage quantity is not likely a limiting factor in elk production.

Several invasive plant species are documented within the allotment. If left unchecked, invasive plants can displace native bunchgrasses and other plants that elk eat. The largest infestations of high priority species are diffuse knapweed, spotted knapweed, and Canada thistle. Other high priority species present include sulfur cinquefoil, leafy spurge, yellow hawkweed, and dalmation toadflax. Effective control of these weeds is limited to sites covered in the 1995 weed EA (USDA-FS 1995). Most weed sites in the North End Allotment were found after 1995, so treatment options are currently limited to hand pulling and biological controls.

Most of the roads used previously for timber removal in the allotment are now closed year round. Open road densities are low (< 2 mi/mi^2) throughout the allotment. This is within the desired condition of an average of 2 miles per square mile or less Forest-wide (USDA-FS 1990a). Although timber harvest has occurred within the allotment, there is generally an adequate ratio of cover to forage.

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

Because all grazing alternatives would reduce the size of the allotment, there would be less direct disturbance to elk and less competition for forage. There would also be a reduction of potential weed establishment and spread with a smaller allotment (Invasive Plants Report).

Where sheep grazing would continue, the potential grazing impact is small given the abundance of forage and the once-over grazing system utilized for sheep. Stubble height standards and Forest Plan utilization standards for upland and riparian vegetation have consistently been met in the allotment. Shrubs have had slight to light utilization (up to 40 percent current year growth browsed), which indicates that grazing is not adversely impacting shrub communities or significantly reducing grass and forb cover (Range Report). Livestock stocking rates have been prescribed to ensure that standards and objectives for vegetation are met in a similar manner that has occurred in the past (Range Report).

Open road densities and cover habitat (hiding and thermal) would not be affected by the presence or use by sheep.

Direct and Indirect Effects Unique to Alternative 1

The allotment would be about 23 percent smaller but have the same number of permitted sheep (4 bands). This alternative reduces flexibility for resting areas because of the acre reduction (Range Report). There would be less direct disturbance to elk and less widespread competition for forage, but potentially more intense competition for forage on the remaining allotment. Because the allotment encompasses mainly elk summer range, which is plentiful on the district, this effect would be relatively small. Livestock stocking rates have been prescribed to ensure that standards and objectives for vegetation are met in a similar manner that has occurred in the past (Range Report), and Forest Plan range and wildlife standards would continue to be met.

Direct and Indirect Effects Unique to Alternative 2

The allotment would be 38 percent smaller and have three bands of sheep instead of four. There would be an equivalent reduction in direct disturbance to elk and competition for forage.

Direct and Indirect Effects Unique to Alternative 3

The allotment would be 40 percent smaller than its current size, and have three bands of sheep. An additional 26,000 acres in the Goodman area would be added to the allotment.

The Goodman addition was designed to avoid critical elk winter range, although it is immediately adjacent to elk calving and winter range. Displacement would not be expected because game animals would primarily use the area in the winter and spring, while sheep grazing would occur late in the season. However, the addition of sheep grazing in the Goodman area would slightly reduce the amount of forage available during the elk use period. The potential grazing impact is still considered small given the abundance of forage and the once-over grazing system utilized for sheep, and the manner in which the allotment is managed. Forest Plan range and wildlife standards would continue to be met.

Direct and Indirect Effects Unique to Alternative 4

The allotment would be 60 percent smaller than its current size, and have two bands of sheep. This alternative would cause the least amount of competition for forage between elk and domestic sheep. It would also reduce the amount of displacement that may occur due to the presence of sheep, dogs, and humans.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Eliminating livestock grazing in the area would result in more forage available for elk, less disturbance from sheep herds and people, and the lowest risk of invasive plant spread. More food would be available for elk, especially in the spring as snow recedes near the winter range.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

The potential for weed invasion will likely continue along all travel routes independent of livestock activities. Weeds could be spread by natural mechanisms (wind, water, wildlife and wildfire), and public and administrative activity on roads and trails. Known and reported sites will continue to be monitored and treated. Ongoing and proposed projects such as the Luger rock pit expansion and Swamp pit road decommissioning require the use of native seed to restore areas of ground disturbance, which helps reduce weed spread.

Habitat enhancement projects will improve elk habitat both within and outside of the allotment. The proposed Ryan Creek burn will increase the palatability and nutritional value of forage on nearby elk calving and wintering areas. Future aspen enhancement will help to maintain and restore aspen habitat for elk and other wildlife species.

Ongoing and proposed fuel reduction and timber harvest could cause temporary disturbance of individual elk, as well as long term habitat changes within the allotment. Many other factors influence elk such as weather, predation, and forage nutrition quality on land owned by various entities. A mountain lion study is in progress to help determine the extent that predation is depressing the elk population. The cumulative effect of these projects and factors in combination with sheep grazing is not expected to cause long term changes in elk behavior or population size.

Neotropical Migratory Birds

Neotropical migratory birds are those that breed in the U.S. and winter south of the border in Central and South America. Continental and local declines in population trends for migratory and resident landbirds have developed into an international concern. Roughly one half of all birds occurring on the forest are Neotropical migrants. Many of these species are associated with old forest, riparian areas, or unique features such as aspen, shrubs, and meadows.

Partners in Flight (PIF) led an effort to complete a series of Bird Conservation Plans for the entire continental United States to address declining population trends in migratory

landbirds. These plans are used to address the requirements contained in Executive Order (EO) 13186 (January 10, 2001), Responsibilities of Federal Agencies to Protect Migratory Birds.

The Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman 2000) identifies the priority habitat types, habitat features, and focal species. The North End Allotment contains some of these priority habitat features, but not all are affected by livestock grazing (Table 20).

Table 20. Priority bird habitat features and potential for grazing effects in the North End Allotment. N/A = habitat not present; No = habitat may be present, but sheep grazing would not likely affect this feature; Yes = sheep grazing may affect this feature.

Habitat Type	Habitat Feature/Conservation Focus	Focal Species	Potential Grazing Effects?
Dry Forest	Large patches of old forest with large trees and snags	White-headed woodpecker	No
	Old forest with large trees & snags interspersed with grassy openings and dense thickets	Flammulated owl	**Yes**
	Open understory with regenerating pines	Chipping sparrow	No
	Patches of burned old forest	Lewis' woodpecker	N/A
Mesic Mixed Conifer	Large snags	Vaux's swift	No
	Overstory canopy closure	Townsend's warbler	No
	Structurally diverse; multi-layered	Varied thrush	No
	Dense shrub layer in the forest understory or forested openings	MacGillivray's warbler	**Yes**
	Edges and openings created by wildfire	Olive-sided flycatcher	No
Riparian	Large snags in riparian woodland	Lewis' woodpecker	No
	Riparian woodland canopy foliage and structure	Red-eyed vireo	No
	Riparian woodland understory foliage and structure	Veery	No
	Shrub density Willow/alder shrub patches	Willow flycatcher	No
Unique (special) Habitats	Subalpine Forest	Hermit thrush	No
	Montane meadow	Upland sandpiper	**Yes**
	Steppe shrubland	Vesper sparrow	Yes
	Aspen	Red-naped sapsucker	**Yes**
	Alpine	Gray-crowned rosy finch	N/A

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

In the context of the North End Allotment, the effects to birds and bird habitat would be minor. Grazing would occur at low stocking levels (Range Report). Any grazing effects would be less than the current situation because the permitted grazing area would be smaller, and stocking rates would be equal to or less than the current stocking rate.

Focal bird species that rely on habitat components such as snags and tree canopy would likely be unaffected by grazing (Wales 2001). There would be limited, localized effects to birds that use ground and shrub vegetation for nesting, foraging, and perching. These effects could include disturbance, direct mortality from crushing, or degradation of habitat.

Because sheep are herded, grazing effects to vegetation and soil are less than would occur with cattle grazing. As sheep are herded through the subunits of the allotment, they only use certain areas where forage is available and terrain is navigable, therefore effects are not widespread. Many areas are left ungrazed. Stubble height standards and Forest Plan utilization standards for upland and riparian vegetation have consistently been met in the allotment. Shrubs have had slight to light utilization (up to 40 percent current year growth browsed), which indicates that grazing is not adversely impacting shrub communities or significantly reducing grass and forb cover (Range Report).

Since sheep are herded to ponds and troughs, the amount of grazing in riparian areas is very low. Streams are avoided by the herders because of restrictions for listed fish species. Much of the utilization monitoring has shown 0 percent use of riparian vegetation along many of the streams within the allotment (Range Report). Therefore, effects to riparian habitat for birds would be very minor.

There are no effects unique to Alternatives 1, 2, 3, or 4.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Habitat conditions would be expected to slightly improve over time, particularly for birds that utilize grasses and shrubs to forage and nest. There would be no potential for displacement or mortality from sheep presence and associated livestock management activities. Although minor effects from recreation activities, timber management, and road management may continue, implementation of Alternative 5 would not cause cumulative effects on migratory birds.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Past, ongoing, and proposed timber sales create larger and longer lasting impacts to birds in this area, and grazing would add only slightly to these effects. For the area covered by Alternative 1, about 6,000 acres of timber harvest has taken place in the past 10 years, and several thousand more are being planned for harvest in the near future (Tollgate and High Buck projects).

In light of the very minor effects expected from sheep grazing, and because the permitted grazing area would be between 23 and 60 percent smaller depending on the alternative, the

continuation of sheep grazing of the North End allotment should not adversely impact birds of conservation concern or their habitats.

Threatened, Endangered, and Sensitive Wildlife

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 there is a significant current or predicted downward trend in population numbers or density, or there is a significant current or predicted downward trends in habitat capability that would reduce a species existing distribution.

The Forest Service Region 6 Sensitive Animal List (dated 2008) and the federal endangered species list were reviewed for species that may be present. Based on District records, surveys, and monitoring, as well as published literature about distribution and habitat utilization, species that might occur in or near the planning area include: **Canada lynx, gray wolf, California wolverine, big-eared bat, bald eagle, Lewis' woodpecker, white-headed woodpecker, inland tailed frog, and Columbia spotted frog.**

The peregrine falcon, upland sandpiper, northern leopard frog, and painted turtle are not expected to occur in the allotment. These species and their habitat would not be affected by the proposed activities; therefore, no further discussion is necessary. Other species identified as potentially occurring on the Umatilla forest are sensitive only in the State of Washington. Since this project is entirely within the state of Oregon, these species do not need to be addressed.

Canada lynx (Threatened)

The Umatilla Forest is currently considered "unoccupied" by Canada lynx (USDA-FS 2006a). Based on the lack of reproduction records, limited verified records of lynx, low frequency of occurrences, and correlations with cyclic highs with populations in Canada, the U.S. Fish and Wildlife Service concluded that lynx occur in Oregon as dispersers that have never maintained resident populations (USFWS 2003). There is no lynx critical habitat designated in the state of Oregon (USFWS 2009a).

Potential lynx habitat on the Umatilla Forest is primarily subalpine fir potential vegetation types where lodgepole pine is a major seral species. This is generally between 4,100 and 6,600 feet in elevation. There are about 47,000 acres of potential lynx habitat within the allotment, of which 25,000 acres are currently suitable for lynx denning or foraging.

Direct, Indirect, and Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Changes to the allotment boundaries would result in less overlap with lynx habitat. There would be 25 percent less lynx habitat potentially affected in Alternative 1, 55 percent less

in Alternative 2, and 70 percent less in Alternatives 3 and 4.

No predator control activities have taken place on this allotment for many years, so this is not expected to be an issue for lynx. If a lynx moved into or traveled through the allotment during the summer, sheep, dog, and human presence could cause temporary avoidance of the area but should have no effect to lynx populations.

The proposed Tollgate Fuels project and the ongoing snowmobile trail grooming would have the biggest effect to lynx, however no cumulative effects are expected because it is unlikely that lynx frequent the area. Overall, there would be **no effect to Canada lynx**, because the Blue Mountains are considered 'unoccupied' by resident lynx (USDA-FS 2006a).

There are no other effects unique to Alternatives 1, 2, 3, or 4.

Effects Unique to Alternative 5 – No Grazing

Elimination of sheep grazing in the North End Allotment could result in an improvement of habitat conditions for lynx prey such as snowshoe hare. However, because lynx are not expected to occupy the area, there would be **no effect to Canada lynx.**

Gray wolf (Endangered)

The gray wolf is a habitat generalist inhabiting a variety of plant communities typically containing a mix of forested and open areas with a variety of topographic features. Although wolves were once considered extirpated from Oregon (Wisdom et al. 2000), occasional observations of single wolves have been reported on the forest over the past 20 years. Wolves have the capacity to disperse over long distances, and due to the successful re-introduction of wolves in central Idaho, more wolves are venturing into Oregon.

The U.S. Fish and Wildlife Service (FWS) recently completed an analysis of the Northern Rocky Mountain wolf population, and determined that recovery goals have been met for the overall population (USFWS 2009b). In the past 2 years, the gray wolf has been removed from the endangered species list twice, and courts have vacated the delisting twice. On August 5, 2010 a judge issued an order that restored gray wolf to the Endangered Species List. The state of Oregon will continue to manage gray wolf as a state endangered species until several packs are established (ODFW 2005).

One wolf pack is now confirmed on the Walla Walla Ranger District, but wolf activity has not been reported within the North End Allotment boundary. If there is future wolf activity within the allotment, the Oregon Wolf Conservation and Management Plan (ODFW 2005) contains a coordinated response strategy between federal and state agencies, which includes a process for monitoring and responding to problem incidents.

Direct, Indirect, and Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Key things to consider when evaluating effects to wolves include direct disturbance, prey availability, and the potential for wolf/human interactions.

If a wolf den or rendezvous site is identified prior to or during sheep grazing activities, the Blue Mountain Programmatic Informal Section 7 Consultation Process (April 25, 2007) will be followed. For example, if in the future we find that project activities are within one mile of a den site, seasonal restrictions would likely be put in place. Because these sites are difficult to locate and can change from year to year, this will need to be assessed on an ongoing basis.

Based on the analysis of elk habitat (discussed previously in this chapter), prey availability in the area is not expected to change as a result of the proposed activities. Livestock grazing would continue to occur on spring, summer, and fall range of elk and mule deer. Any reduction in forage could potentially impact these prey species for wolves. However, the extent of potential grazing impact is small given the abundance of forage and the once-over grazing system utilized for sheep.

The potential for wolf /human interactions which may lead to mortality from accidental or illegal shooting would not increase. All roads that are closed to the public would remain closed; therefore open road densities would not change.

No predator control activities have taken place on this allotment for many years, but if they do in the future, Wildlife Services would work closely with ODFW to avoid incidental take of wolves during the control of other species (USDA 2010).

If wolves begin to frequent the allotment, and are present at the same time and place as domestic sheep, and conflicts begin to occur, the permittee would work with ODFW and USDA Wildlife Services to resolve complaints. Suspected wolf depredation on livestock would be investigated and an appropriate response determined to prevent further losses. ODFW would work with the permittee to minimize potential negative impacts to both livestock and wolves (ODFW 2005).

All proposed alternatives would create a wider distance between the permitted grazing area and the current area of wolf activity. The chances that wolves might prey on domestic animals would decrease, thereby reducing the potential for conflicts and potential lethal control of wolves.

Because wolves are currently not known to be in the allotment, and no dens or rendezvous sites are known, the proposed alternatives would have **no effect to gray wolf**.

There are no effects unique to Alternatives 1, 2, or 4.

Effects Unique to Alternative 3

The addition of the Goodman area to the allotment would move the allotment boundary closer to important elk winter range and calving grounds. The potential for conflict with wolves in this area could be higher than that predicted for other alternatives. However, since no wolves are known to be using the area currently, this alternative would have **no effect** to gray wolf.

Effects Unique to Alternative 5 – No Grazing

There would be no direct or indirect effects to wolves if proposed actions were not implemented. Existing habitat conditions, prey base, and potential for wolf/human conflict would not change. Natural processes over the long term such as growth in vegetation and potential wildfires would not affect wolf behavior or ability to survive. Therefore, taking no action would have **no effect** to gray wolf.

California wolverine (Sensitive)

Wolverines typically inhabit high elevation conifer forest where sufficient food is available and human activity is low. Denning habitat is usually open rocky talus slopes where snow depths remain over 3 feet into spring. They tend to forage over large areas and travel long distances. The majority of the allotment is suitable for wolverine foraging, but no potential denning areas are known or suspected. Wolverines are not documented within the allotment, but have been reported on the district. Wolverine may pass through undetected and/or stay for short periods. There are no indications that wolverine do more than pass through on a rare occasion. Occasional sightings may represent extreme dispersal events rather than self-sustaining populations (Aubry et al. 2007).

Direct, Indirect and Cumulative Effects Common to All Alternatives

If wolverine they happen to be in the area, the presence of sheep and related human activity could cause them to temporarily avoid the area. None of the other ongoing or proposed activities would alter prey availability or cause long term movements; therefore, this project will not cause a trend toward Federal listing and there will be **no impact to wolverine**.

There are no effects unique to Alternatives 1, 2, 3, 4, or 5.

Townsend's big-eared bat (Sensitive)

The big-eared bat occurs in a wide variety of habitats including coniferous forests (Gruver and Keinath 2000). Bat occurrence is strongly correlated with the availability of caves or cave-like roosting habitat such as mines adits and buildings (Perkins and Schommer 1992). These sites are highly sensitive to disturbance and human interference. Individuals or small groups (3-5 individuals) of bats may day roost in hollow and creviced trees and snags for a limited time, but tend to stay within a few miles of colonial roosts (Perkins and Schommer 1992).

This bat species is not known to occur within the allotment, but is known to reside in buildings within 1 mile of the western border. Potential habitat in the allotment consists of out buildings, rocky areas with deep crevices, hollow trees, and snags near water.

Direct, Indirect and Cumulative Effects Common to All Alternatives

Sheep grazing and associated activities would not affect caves, buildings, or mine adits that attract big-eared bats. Since there are no historic or recent records of this species within

the allotment, and activities would not affect habitat, there would be **no impact to big-eared bat**.

There are no effects unique to Alternatives 1, 2, 3, 4, and 5

Northern bald eagle (Sensitive)

Northern bald eagles are occasionally seen at Langdon Lake and Jubilee Lake. They also winter along parts of the Umatilla River. There are no active roost or nest sites within the allotment.

Direct, Indirect and Cumulative Effects Common to All Alternatives

Since no nesting or roosting sites have been identified, and sheep grazing would not alter prey or habitat resources, there would be **no impact to northern bald eagle**.

There are no effects unique to Alternatives 1, 2, 3, 4, or 5.

White-headed woodpecker and Lewis' woodpecker (both Sensitive)

White-headed woodpeckers are most commonly found in large stands of mature ponderosa pine. There are two known locations of white-headed woodpeckers within the allotment. Several other potential areas were surveyed and no white-headed woodpeckers were found. Lewis' woodpecker also prefers more open pine, and is attracted to burned old forest, which is lacking in the allotment.

Direct, Indirect and Cumulative Effects Common to All Alternatives

Nesting and foraging habitat for white-headed woodpecker and Lewis' woodpecker would not be affected by sheep grazing or associated activities. Cumulative effects from this project are not expected to change the species composition, distribution, or abundance of any primary cavity excavators.

There are no effects unique to Alternatives 1, 2, 3, 4, or 5.

Columbia spotted frog - Great Basin population (Sensitive)

Recent research indicates that Columbia spotted frogs in northeast Oregon are part of the Northern population, which ranges from British Columbia southeast into Washington, northeast Oregon, northern Idaho, and Montana (Funk et al. 2008). The Northern population is not considered imperiled, and is not listed as sensitive by the Regional Forester. However, since the study did not include samples from the Umatilla National Forest, there is still a chance that the Great Basin spotted frogs may occur here.

Spotted frogs have been located in several areas within the North End Allotment, but not at typical livestock watering sites such as rock pit ponds and springs with troughs. They are more likely to be present in marshy areas, quiet meandering streams, or side channels.

Direct, Indirect, and Cumulative Effects Common to Alternatives 1, 2, 3, and 4

If present, it is unlikely that spotted frogs would be impacted. Livestock would enter the allotment after eggs have hatched (June 1), and research in Eastern Oregon indicates that there is no significant difference in the abundance of recently metamorphosed Columbia spotted frogs between grazed and ungrazed ponds (Bull and Hayes 2000). Adult frogs are highly mobile and able to avoid livestock trampling.

Removal of riparian vegetation (grasses and shrubs) through grazing may increase the susceptibility of spotted frogs to predation by reducing hiding cover. Generally, sheep are kept away from riparian areas. Utilization standards prescribed in the Forest Plan would continue to be used to achieve desired riparian conditions. Any grazing effects that have been occurring would be less because the permitted grazing area would be smaller, and stocking rates would not increase.

Sheep grazing combined with timber harvest activity, recreation use, and habitat restoration projects would not likely have any effect to spotted frogs because there would be little to no impacts to spotted frog habitat. Therefore, implementation of any of these alternatives would have **no impact to Columbia spotted frog.**

There are no effects unique to Alternatives 1, 2, 3, or 4.

Effects Unique to Alternative 5 – No Grazing

The discontinuation of sheep grazing is not expected to cause any changes to habitat conditions for the Columbia spotted frog. Overall there would be **no impact to Columbia spotted frog.**

Inland tailed frog (Sensitive)

Tailed frogs occur in cold, fast flowing streams. Eggs are laid under rocks, and generally hatch in late summer. Hatchlings and tadpoles spend most of their time clinging to rocks. They are slow to develop and spend several years as tadpoles. The current distribution of tailed frogs is uncertain, but they have been observed recently in the Lookingglass Creek drainage.

Direct, Indirect, and Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Livestock grazing has the potential to remove riparian ground vegetation that provides hiding cover for amphibians. In this allotment, sheep are kept away from most riparian areas. Sheep cross streams at headwater areas where water is intermittent, and cross other streams at designated crossings such as on roads or dry channels. The effects of these alternatives would be less than what has occurred in the past, because the permitted grazing area would be smaller.

Sheep grazing combined with timber harvest activity, recreation use, and habitat

restoration projects would not likely have any effect to tailed frogs because there would be no effects to habitat. Therefore, implementation of any of these alternatives would have **no impact to inland tailed frog.**

There are no effects to tailed frog unique to Alternatives 1, 2, 3, and 4.

Effects Unique to Alternative 5 – No Grazing

The discontinuation of sheep grazing is not expected to cause any changes to habitat conditions for the inland tailed frog. Overall there would be **no impact to the tailed frog.**

Biological Evaluation Summary

Table 21. Summary of Effects for Threatened, Endangered, and Sensitive wildlife species*

Species	Status	Species Occurrence / Habitat Suitability	Alternative				
			1	2	3	4	5
Canada lynx *Lynx canadensis*	T	Potential	NE	NE	NE	NE	NE
Gray wolf *Canis lupus*	E	Documented	NE	NE	NE	NE	NE
California Wolverine *Gulo gulo*	S	Potential	NI	NI	NI	NI	NE
Townsend's big-eared bat *Corynorhinus townsendii*	S	Potential	NI	NI	NI	NI	NE
Northern bald eagle *Haliaeetus leucocephalus*	S	Documented	NI	NI	NI	NI	NE
Peregrine falcon *Falco peregrinus*	S	No Habitat	NI	NI	NI	NI	NE
White-headed woodpecker *Picoides albolarvatus*	S	Documented	NI	NI	NI	NI	NE
Lewis' woodpecker *Melanerpes lewis*	S	Potential	NI	NI	NI	NI	NE
Upland sandpiper *Bartramia longicauda*	S	No Habitat	NI	NI	NI	NI	NE
Columbia spotted frog *Rana luteiventris*	S	Documented	NI	NI	NI	NI	NE
Inland tailed frog *Ascaphus montanus*	S	Documented	NI	NI	NI	NI	NE
Northern leopard frog *Rana pipiens*	S	No Habitat	NI	NI	NI	NI	NE
Painted turtle *Chrysemys picta*	S	No Habitat	NI	NI	NI	NI	NE

*Key to abbreviations T = Threatened, E = Endangered S= Sensitive

NI	No Impact to R6 sensitive species individuals, populations, or their habitat.
MI	May impact, but will not likely lead to federal listing as threatened or endangered.
NE	No effect on a proposed or listed species.
NLAA	May affect, but is not likely to adversely affect a listed species.

Forest Plan Compliance

Forest Plan wildlife standards within all of the management area allocations within the allotment would be met. Adherence to forage utilization standards in the Forest Plan would minimize impacts to wildlife species. Grazing would not occur within forest plan management areas that contain unique wildlife habitat, such as Dedicated Old Growth, Research Natural Areas, and Special Interest Botanical Areas.

Soils

The scale of analysis for soil resources is the allotment boundary, including the Goodman area, expanded or subdivided by pasture or specific use areas if any notable difference is evident. Effects are measured by considering current or potential risk of accelerated erosion (exposed mineral soil compared to presumed potential) and effects on soil condition or quality (compaction, displacement, or organic matter).

Land and Soil Characteristics

The Blue Mountain National Forest Landtype Association (LTA) mapping and description (USDA-FS 2006b) is used for characterization of this allotment as it is more appropriate to the size and scale of the project area and analysis intensity. LTA mapping units for the allotment are available in the Soil Report.

Table 22. Land Type Associations (LTAs) of the North End Allotment.

LTA Symbol	Potential natural vegetation zones - geology group - basic landform	Slope Group
116	Moist Forest - Basic Igneous - Gentle Slopes	0-30%
117	Moist Forest - Basic Igneous - Steep Slopes	30-60%
118	Moist Forest - Basic Igneous - Canyons	60-90%
218	Dry Forest - Basic Igneous - Canyons	60-90%
244	Dry Forest - Lacustrine Interlay - Land Slide	0-60%
317	Dry Non-Forest - Basic Igneous - Steep Slopes	30-60%
318	Dry Non-Forest - Basic Igneous - Canyons	60-90%
418	Moist Non-Forest - Basic Igneous - Canyons	60-90%

The Terrestrial Ecological Unit Inventory (TEUI) is nearly complete for the North End Allotment area, but the detail of this inventory is generally too great for application on such a large area. It could be used for more focused areas of intensive use. A few named soil series from the TEUI were selected for this project as the common representatives in order to utilize soil description and interpretations generating capability available via the National Resource Conservation Service's (NRCS) National Soil Information System (NASIS) and Soil Data Mart http://www.or.nrcs.usda.gov/pnw_soil/index.html. Soil series chosen for characterization are: Anatone, Bocker and Fivebeaver for the non-forested sites; Limberjim (deep), Syrupcreek (mod. deep) for the uplands; and Bandarrow and Melloe for the drainageways, deep or very deep, poorly drained soil with clay loam subsoil, formed in alluvium (Table 23). More detailed descriptions are contained in the Soils Report.

Table 23. Representative Soils of the North End Allotment.

Map Unit Symbol TEUI	Soil Series	Depth Class	Surface Texture	Subsurface Texture	Plant Association/Ecosite
5809AO Anatone—Bocker-Fivebeaver complex, 0 to 15% slopes	Anatone	shallow 10-20 in.	very stony ashy Silt Loam	very cobbly Silty Clay Loam	Bluebunch wheatgrass-Sandberg's bluegrass; Mountain Shallow 13+ PZ
	Bocker	very shallow 4-10 in.	extremely cobbly ashy Silt loam	very cobbly Silt loam	Bluebunch wheatgrass-Sandberg's bluegrass-onespike oatgrass; Mountain Very Shallow 13+ PZ
	Fivebeaver	Shallow 10-2- in.	Gravelly ashy Silt loam	Extremely cobbly ashy Silt loam	Ponderosa pine-common snowberry
5776AO Limberjim-Syrupcreek complex, 0 to 15% slopes	Limberjim	deep, 40-60 in.	Ashy silt loam	Very cobbly clay loam	Grand fir- big huckleberry
	Syrupcreek	Moderatel y deep, 20-40 in.	Ashy silt loam	Very stony clay loam	Grand fir- big huckleberry
0031AW Moist Meadow: Bandarrow-Melloe	Bandarrow	Very deep 60+ in.	Silt loam	Very gravelly loamy sand	Cusick's sedge
	Melloe	Very deep 60+ in.	Loam	Clay loam; very cobbly sandy clay loam	Cusick's sedge

The area includes a section of a relatively level, geomorphic bench above the Grande Ronde River. This area includes some of the bedded lacustrine (water-lain) deposits found in this part of the Blue Mountain uplift block. Soils in this allotment on forested sites are typically deep or moderately deep on gentle slopes, with relatively high clay subsoil in slightly concave to level, poorly drained areas where the streams, springs or moister drainages are located. The upland soils are moderately deep, well drained formed in a volcanic ash mantle over gravelly residual soils developed in basalt and andesite.

Grazing limitations for these soil types are few. Soils in the wet to moist meadows are among the most productive for forage on the Forest. The poorly drained soils in the wet meadow areas stay wetter into the summer longer than better drained soils and are therefore susceptible longer to puddling from hooves. Soils in the dry meadows are moderately productive although many have had surface soil loss from un-regulated historical grazing. When dry they are very firm and resist puddling, displacement and compaction but can be susceptible to puddling from hoof action when saturated (most common in early spring conditions).

Vascular plants dominate in these ecological sites (soil and vegetation). Biotic soil crusts are a minor component as there is little unoccupied soil surface available and are not of concern in this allotment. Crusts are in generally good condition in this allotment.

Existing Condition

The North End allotment is relatively less impacted from historical grazing activities than other parts of the Blue Mountains. Current conditions still reflect, to varying degrees, the impacts of overly heavy grazing by sheep and horses from late 1800s to mid 1930s. While the current condition is certainly changed from natural (pre-European) conditions, soil erosion and physical impacts have stabilized with a generally positive trend in soil quality relative to grazing effects. Soils are typically deeper in this portion of the Forest, and topography more gently sloping where the sheep graze and are herded.

Grazing impacts to soils typically pertain to increased erosion potential (due to loss of vegetative protection and surface disruption), and puddling and displacement from hoof-action. In the North End Allotment, a few, very small areas around watering sites, bedding areas and heavily used trails receive compaction sufficient to reduce short-term productivity. Each affected area is several hundred square feet (less than an acre) and often linear. Less than 1 percent of the total 132,000 acre allotment is exceeding the criteria for detrimental soil conditions.

Current pasture management is effective in minimizing or eliminating adverse effects to soil productivity or erosion hazard. Pastures are generally stable without active accelerated upland erosion due to grazing activity. The potential concentration of animals in areas near springs or streams is discussed in the hydrology and fisheries sections. Areas of reduced soil quality due to displacement (or bank erosion) from current riparian grazing (trampling or calving of banks) is intermittent and measurable in hundreds of square feet (rather than acres).

Direct and Indirect Effects Unique to Alternative 1

As compared to the current grazing activity allowed in the 1986 Allotment Management Plan, the reduction in grazing acreage and livestock numbers would allow for an increase in ground cover height and ground cover percentages, such that erosion risk would be reduced further and soil quality would continue to improve on the discontinued pastures (Jarboe and part of Swamp). The inability to provide for a rested pasture in the rotation would slightly increase the risk of accelerated erosion in the remaining pastures.

Direct and Indirect Effects Unique to Alternative 2

As compared to the Proposed Action, the further reduction in acreage (elimination of all of the Jarboe and Swamp pastures) and livestock numbers would reduce the potential for increased erosion hazard on that portion of the Swamp pasture that would otherwise be utilized.

Direct and Indirect Effects Unique to Alternative 3

This alternative would remove the North Fork Umatilla Wilderness, and add the Goodman area to the grazing plan. There would be a similar amount of land within the allotment, but in different areas than Alternative 2. Stocking rates would also be similar. Erosion hazard would increase slightly in the Goodman area, which has not been grazed by livestock for over 40 years.

Direct and Indirect Effects Unique to Alternative 4

This alternative would provide a similar grazing intensity as the others, but would affect the smallest amount of area. There would be correspondingly less potential for effects to soils overall.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Effects of any kind from permitted livestock would be eliminated. The existing slight potential for increase of erosion hazard and risk of soil quality effects would be eliminated.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

In addition to historical grazing discussed earlier, past activities including homesteading, haying, ditch development, clearcutting and roading, have altered the landscape. Intensive logging and roading are unlikely to occur in the foreseeable future and over time. Fuels reduction projects are planned, but will occur on the forested portions of the allotment where grazing pressure is slight. Each alternative in sequence reduces the size of the allotment, thereby reducing the overall cumulative potential for soil effects on the landscape. Grazing pressure would be light enough that erosion hazard increase or soil quality decrease would be difficult to measure.

Forest Plan Compliance

The proposed action and all alternatives would meet standards and guidelines in the Umatilla National Forest Land and Resource Management Plan for soil resource condition (soil quality) and erosion risk or hazard.

Hydrology and Water Quality

Analysis Methods

The existing allotment includes portions of four subbasins and eight watersheds (Table 24); however, all portions of the allotment in the Lower Grande Ronde Subbasin have been dropped from consideration in this EIS. For this evaluation, the Clean Water Act is discussed by watershed and subwatershed (HUC 5 and HUC 6). Localized effects to developed water sources and perennial surface waters are evaluated.

Table 24. Subwatershed Acres by Alternative.

		Current	Alt. 1	Alt. 2	Alt. 3	Alt. 4
HUC 6	**Subwatershed Name**	**Acres**	**Acres**	**Acres**	**Acres**	**Acres**
LOWER GRANDE RONDE RIVER SUBBASIN						
Grande Ronde River-Grossman Creek Watershed						
170601060101	Sheep Creek	6008	0	0	0	0
170601060102	Grande Ronde River-Clear Creek	1013	0	0	0	0
170601060104	Grande Ronde River-Bear Creek	183	0	0	0	0
Wenaha River Watershed						
170601060301	Upper South Fork Wenaha River	756	0	0	0	0
170601060302	Lower South Fork Wenaha River	36	0	0	0	0
UPPER GRANDE RONDE RIVER SUBBASIN						
Willow Creek Watershed						
170601040801	Dry Creek	7020	7020	7020	7020	7020
Lookingglass Creek Watershed						
170601041001	Upper Lookingglass Creek	14429	14349	3245	470	470
170601041002	Little Lookingglass Creek	20246	3563	0	0	0
170601041003	Jarboe Creek	6175	0	0	0	0
170601041004	Lower Lookingglass Creek	7023	7023	5316	5300	5300
Grande Ronde River-Cabin Creek Watershed						
170601041101	Phillips Creek	16958	16958	16958	16976	16976
170601041102	Gordon Creek	4200	4200	4200	4200	4200
170601041104	Cabin Creek	5080	5080	5080	5080	5080
WALLA WALLA RIVER SUBBASIN						
Upper Walla Walla River Watershed						
170701020101	Upper SF Walla Walla River	17	17	0	0	0
170701020102	Middle SF Walla Walla River	3277	3277	0	0	0
UMATILLA SUBBASIN						
Upper Umatilla River Watershed						
170701030101	Thomas Creek	8334	8337	8337	9926	6030
170701030102	South Fork Umatilla River	0	0	0	14980	0

		Current	Alt. 1	Alt. 2	Alt. 3	Alt. 4
HUC 6	**Subwatershed Name**	**Acres**	**Acres**	**Acres**	**Acres**	**Acres**
170701030103	Buck Creek	8559	8560	8560	2800	2800
170701030104	North Fork Umatilla River	18474	18474	18474	3614	3614
170701030105	Ryan Creek	0	0	0	2240	0
170701030106	Bear Creek	3190	3190	3190	6	0
Meacham Creek Watershed						
170701030204	North Fork Meacham Creek	1101	1101	1101	3872	1100
170701030205	Camp Creek	0	0	0	3080	0
170701030206	Boston Canyon	0	0	0	125	0

Existing Condition

Water quality and other hydrologic conditions were not identified as issues for this allotment. This is primarily due to past and ongoing management controls that have kept effects to a minimum. Due to the topography of the area and the way sheep are routed through the allotment, there is little riparian utilization (Range Report). Sheep bands are accompanied by herders who keep sheep away from stream channels. Utilization of riparian or stream side vegetation is managed by measuring stubble heights and shrub utilization. If utilization is close to or exceeding Forest Plan standards, sheep are moved (Range Report).

Sheep grazing, use of water sources, bedding sites, and stream crossings are closely controlled. Stream crossings are primarily on roads, and otherwise are closely managed to minimize channel disturbance. Three intermittent channels are crossed when they are dry: Dry Creek, East Fork Coyote Creek, and Finley Creek. These channels are protected by having sheep cross at designated sites that have naturally rocky banks so that bank stability can be maintained.

Sheep use of livestock watering sites could affect water quality and hydrologic function. Springs, ponds, and troughs make up nearly all livestock water sources. Developed water sources were identified based on records and recent surveys (Range Report). These water sources are generally located near ridge tops in or near headwater draws. Rock pit ponds occur in areas with no soil or vegetation and have little or no potential to influence surface waters or the functioning of groundwater.

Developed water sources in the North End Allotment include rock pit ponds and springs that rise and fall on NFS lands, exempting them from requirements for state-based water rights. Springs have low flow volumes; some are connected to the channel network, others not. There are numerous existing livestock water rights in the allotment area. Water rights and uses will be assessed as water sources are maintained, redeveloped, or newly developed.

Nine spring sources were also inventoried during a spring inventory protocol pilot program (Johnson and Clifton 2008). The volume of water flow ranged from .0004 to .005 cubic feet per second, or 0.1 to 2.4 gallons per minute. Channels associated with these springs, called

spring brooks, ranged from 0 to about 800 meters in length (0.5 mile), with median length of 50 meters. Eight of these nine springs had one or more identified sources of disturbance. Grazing was noted as a disturbance factor for three springs, and diversion was noted as a factor for two springs. Most diversions would have occurred to develop water sources for grazing. Other disturbance types identified were recreation at five springs, and logging or roads at two springs.

Specific management requirements and Best Management Practices have been identified to control development of water sources and to reduce risks to springs and water quality (see Chapter 2). Water developments no longer inside the allotment would be assessed to determine if they need to be removed and restored, abandoned and allowed to recover naturally, or maintained for other purposes such as wildlife or road maintenance.

Clean Water Act

The State of Oregon Department of Environmental Quality (ODEQ) is responsible for implementing the Clean Water Act. The Clean Water Act requires that water quality standards be developed to protect beneficial uses and a list be developed of water quality impaired streams (303d list). ODEQ has identified Beneficial Use Designations (Table 25) and has recently revised its water quality standards based on life stages of fishes.

Table 25. Beneficial Uses for Streams in the Grande Ronde, Walla Walla, and Umatilla Basins. (Source: http://www.deq.state.or.us/wq/standards/uses.htm)

Aquatic Life Uses	Bull trout, salmon and trout spawning and rearing, migration
Recreation Uses	Fishing, Boating, Water Contact Recreation
Water Supply Uses	Domestic, Industrial, and Agricultural
Miscellaneous Uses	Wildlife & Hunting, Hydro Power, Aesthetic Quality

The Forest Service's responsibilities under the Clean Water Act are defined in a Memorandum of Understanding between Oregon Department of Environmental Quality and the Forest Service, completed in 2002 and updated in 2007 (USDA-FS and ODEQ 2007). The MOU designates the Forest Service as the management agency responsible for meeting the Clean Water Act on NFS lands and recognizes best management practices (BMPs) as the primary mechanism to control nonpoint source pollution on NFS lands. There is further recognition that BMPs are developed by the Forest Service as part of the planning process and includes a commitment by the US Forest Service to meet or exceed standards.

State of Oregon Water Quality Standards

Sedimentation: The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.

Water Temperature standards are based on life stages of fishes and measured with 7-day-average maximums. For the North End Allotment the following standards apply:

Gordon Creek, Cabin Creek, Phillips Creek and Dry Creek:

- Salmon and steelhead spawning; may not exceed 13.0 degrees Celsius (55.4 degrees Fahrenheit) January 1 – May 15.
- Salmon and trout rearing and migration use; may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit)

Lookingglass Creek, Little Lookingglass Creek, Swamp Creek, South Fork Walla Walla River, North and South Fork Umatilla River, Buck Creek, Thomas Creek, Ryan Creek, Bear Creek, North Fork Meacham Creek, Camp Creek and Boston Canyon:

- Bull trout spawning and juvenile rearing; may not exceed 12.0 degrees Celsius (53.6 degrees Fahrenheit).

Oregon Water Quality Standards may be found at:
http://arcweb.sos.state.or.us/rules/OARs_300/OAR_340/340_041.html

Total Maximum Daily Load (TMDL)

The State of Oregon has completed TMDLs for the Upper Grande Ronde River Subbasin (May 2000), the Umatilla River Subbasin (May 2001), and the Walla Walla Subbasin (September 2005). There are no water temperature or sediment 303d (water quality impairment) listed streams inside allotment boundaries in any action alternatives for the North End Allotment EIS. Current 303d listed water quality impairments may be found at: http://www.deq.state.or.us/wq/assessment/rpt0406/search.asp .

Water Quality Management Plans (WQMP)

These plans are developed to restore impaired waters. Forestry WQMPs rely on current laws, management plans, and Best Management Practices (BMPs) to provide the basis for improving water quality in the forested landscape. In addition to BMPs, All federal land management activities must follow standards and guidelines (S&Gs) found in the Umatilla National Forest Plan, as amended by PACFISH (USDA-FS and USDI 1995). PACFISH provides management direction in the form of interim Riparian Habitat Conservation Areas (RHCAs) and Standards and Guides for Key Watersheds.

WQMPs covering Forest Service lands are in place in the Upper Grande Ronde Sub-Basin and the Umatilla River Basin. The WQMP for the Walla Walla Subbasin is in draft.

The various basin WQMPs expect current policies, regulations, BMPs, and adaptive management techniques to minimize unwanted sedimentation from forestry related activities. Habitat conditions are expected to be improved through implementation of BMPs developed for the temperature TMDL which promote riparian conditions that improve channel stability and reduce erosion and promote the protection and recovery of channel morphology to the most stable forms.

Most streams in the allotment area do not have identified impairments. These waters are protected by the same laws, management plans, and BMPs as discussed above to prevent their degradation.

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

Compared to the existing allotment, effects would be reduced in all alternatives because the allotment would be smaller and fewer water sources would be used.

Springs provide the perennial water that support developed water sources. These springs have low volumes of flow, are generally located in headwater areas, and have nearly no connectivity with the drainage network. The potential for off-site effects of their use as water sources would be negligible.

There would be a potential for local effects to developed water sources and the areas around them. Trampling, especially in areas with wet soil, could reduce vegetative cover, damage soils, and reduce the potential of vegetation to recover. Local effects would be mitigated by application of Best Management Practices (BMPs) listed in Chapter 2. For example, proper construction and maintenance would prevent or correct muddy conditions around water sources; fencing around springs would protect their hydrologic and biologic integrity; and adequate spillways would reduce the risk of pond or berm failure and would control overflow. These practices would be implemented as funding became available. Stabilization or removal of abandoned water sources would reduce risks of erosion from these sources.

Control of access to water sources by herders provides ongoing monitoring of their condition and allows for quick reporting of problems. As water development BMPs are implemented for maintenance, development, or abandonment, local site conditions would improve.

Riparian vegetation and channel condition would be protected by prescribed grazing patterns, utilization standards, and designation of stream crossings (Range Report). Effects to channel morphology and riparian condition would be expected to be negligible.

Direct and Indirect Effects Unique to Alternative 1

Changes to the allotment boundary would remove sheep from pastures containing Jarboe Creek, Sheep Creek, Little Lookingglass Creek, Buzzard Creek, Fry Meadow Creek, and their tributaries. Mottet Creek and Swamp Creek would remain inside the proposed allotment, but no grazing would be permitted within 300 feet of these streams because ESA listed fish species are present. Twelve developed water sources would no longer be needed (Table 26). No off-site water quality or hydrologic effects would be expected from reducing the size of the allotment.

Direct and Indirect Effects Unique to Alternative 2

The change in allotment boundaries would remove sheep from pastures drained by Swamp Creek, Lost Creek, Summer Creek, Mottet Creek, and the tributaries of the South Fork of the Walla Walla River. Twenty developed water sources would no longer be needed. This would reduce the potential for localized effects to springs below that of Alternative 1.

Table 26. Developed Water Sources by Alternative.

	Springs & Ponds	Rock Pits
Existing Allotment	78	5
Alternative 1	66	5
Alternative 2	58	4
Alternative 3	60	4
Alternative 4	48	4
Alternative 5	0	0

Direct and Indirect Effects Unique to Alternative 3

In this alternative, the North Fork Umatilla Wilderness would be removed from the allotment and the Goodman Area would be added. The North Fork Umatilla River, Coyote Creek, Woodward Creek, Lick Creek, Bear Creek, Buck Creek, Swamp Creek, Lake Creek, Johnson Creek, and their tributaries would no longer be in the allotment. Ten additional developed water sources would no longer be needed. There would be correspondingly less potential for localized effects to springs.

The main stream systems in the Goodman area are the South Fork of the Umatilla, Spring Creek, Shimmiehorn Creek, and Hellhole Creek. Most of these streams and their associated riparian vegetation are not accessible to sheep because they are located in the bottom of steep canyons. Sheep would not be herded down into these reaches. A 300 foot no-grazing buffer would be applied to each side of streams that contain populations of steelhead and bull trout. As a result, effects in the Goodman area would be limited to the headwaters of these systems. These conditions and resulting effects are similar to those described for Alternative 1 and 2.

New water sources for grazing would be required in the Goodman area. Twelve locations for water developments have been identified. Ten of those are new or complete reconstructions and two are existing developments that need little maintenance. These water developments are located in upland areas. Management requirements used for water developments would be implemented as described in Chapter 2, and would occur before grazing could begin in the Goodman area.

Best Management Practices for spring development and maintenance would be implemented before grazing began in the Goodman area. Damage to springs and areas around springs would be controlled and minimized by BMPs. Hydrologic function and water quality would be protected at these sites. The potential for local disturbance near water sources in the existing allotment areas would be the same as described in Alternative 2. Improvements to those water sources would occur as funding became available. No offsite

water quality or hydrologic effects would be expected from grazing and related use of the allotment.

Direct and Indirect Effects Unique to Alternative 4

Effects would be similar to Alternative 3, except that the Goodman Area would not be grazed. This alternative would cover the smallest amount of area. There would be correspondingly less potential for localized effects to springs. No offsite water quality or hydrologic effects would be expected.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Under this alternative livestock grazing would be discontinued in the North End Allotment and the existing grazing permit would be cancelled. Developed water sources would not be needed by permitted livestock and would either be decommissioned, stabilized, or maintained for other uses. Seven developed springs would be restored by removing the trough, pipe, fences, and spring boxes. There would be no potential for localized effects to water quality and hydrologic function due to livestock use of developed water uses.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Local site conditions would improve as water sources receive maintenance. No off site water quality or hydrologic effects would be expected from grazing and related activities proposed in these alternatives. There would be no potential for cumulative effects with past, ongoing, or future foreseeable actions in the area such as recreation use, fuels reduction projects, etc.

Forest Plan Compliance

Implementation of management requirements and best management practices as described above and PACFISH grazing Standards and Guides would constitute compliance with the Umatilla National Forest Land and Resource Management Plan for hydrologic and water quality components.

Fish and Aquatic Habitat

Existing Condition

The existing boundaries of the North End and Goodman Allotments include portions of 4 subbasins and 8 watersheds that drain to both the east and west faces of the Blue Mountains. The North End Allotment drains into the Upper and Lower Grande Ronde River subbasins and into the Umatilla and Walla Walla River subbasins, while the Goodman Allotment drains into the Umatilla subbasin. Although a portion of the current North End allotment lies within the Lower Grande Ronde subbasin, effects to that portion of the existing allotment will only be analyzed under the No Grazing alternative since those acres would be excluded from any of the action alternatives.

Table 24 in the Hydrology section above displays the subwatersheds involved, by alternative. This scope enables analysis of both direct and indirect effects to ESA listed and Forest Service sensitive fish species present inside and/or within a reasonable distance downstream of the allotment boundary, for purposes of indirect and cumulative effects analysis. One or more listed or sensitive fish species are present in each watershed and subwatershed in which the allotment is located.

The North End allotment includes some rugged river and stream drainages like the North Fork Umatilla River, but much of the allotment is gentle or rolling uplands. Domestic sheep have primarily used the ridges tops, rolling upland hills, and the headwaters of streams. Over the years, over 70 developed water sources (ponds and troughs) have been constructed to improve livestock distribution within the allotment. The majority have been constructed since the early 1980's and are supplied by perennial springs. Sheep are herded and are not expected to use undeveloped spring sources on this allotment. Nearly all of the springs associated with developments occur in headwater locations, have low flow volumes and very few flow directly into the stream network (Hydrology Report).

Fish Species

This section provides a description of the legal status, species distribution, and habitat conditions for the fish species of concern in this analysis area. Distribution and status are derived from: stream survey data; Federal Register notices listing the several Threatened Species present in the allotment; and Federal Register notices proposing or designating Critical Habitat for those listed species.

Sensitive species are those identified on the Regional Forester's Sensitive Species list as suspect or documented on the Umatilla National Forest.

Table 27 displays presence and status for each species relative to the current allotment, the potential Goodman addition, and the analysis area subwatersheds. Figure 17 is a map of fish distribution.

Table 27. Fish presence relative to current North End Sheep and Goodman Allotment boundaries.

Species, ESUs* and Listed Habitats	**Status****	**Location Relative to Analysis Area**		
		Within North End Allotment	Within Goodman Allotment	Within analysis area sub-watersheds
Snake River Basin (SRB) steelhead	T	Yes	No	Yes
Critical Habitat, SRB steelhead	D	Yes	No	Yes
Mid-Columbia (Mid-C) steelhead	T	Yes	Yes	Yes
Critical Habitat, Mid-C steelhead*	D/EFH	Yes	Yes	Yes
SRB spring/summer Chinook salmon	T	Yes	No	Yes
Critical Habitat, SRB spring/Summer Chinook salmon (and Essential Fish Habitat)	D/EFH	Yes	Yes	Yes
SRB fall Chinook salmon	T	No	No	No
Critical Habitat, SRB fall Chinook salmon (and Essential Fish Habitat)	D/EFH	No	No	No
Columbia River bull trout	T	Yes	Yes	Yes
Critical Habitat, Columbia River bull trout (2010 Rule)	D	Yes	Yes	Yes
Margined sculpin	S	No	No	Yes
Redband trout	S	Yes	Yes	Yes
Westslope cutthroat trout	S	No	No	No

*The separate listings for the anadromous species are considered Evolutionarily Significant Units, or ESUs. Mid-C steelhead and SRB steelhead are listed separately under the Endangered Species Act. SRB spring/summer Chinook salmon are listed, while Mid-C Chinook are not listed. SRB fall Chinook salmon are listed separately from SRB spring/summer Chinook salmon.

**T=Threatened, D=Designated Critical Habitat, S=Region 6 Forest Service Sensitive Species, EFH=Essential Fish Habitat. EFH is terminology from the Magnuson-Stevens Act, a separate act protecting habitat for commercially important anadromous species such as salmon.

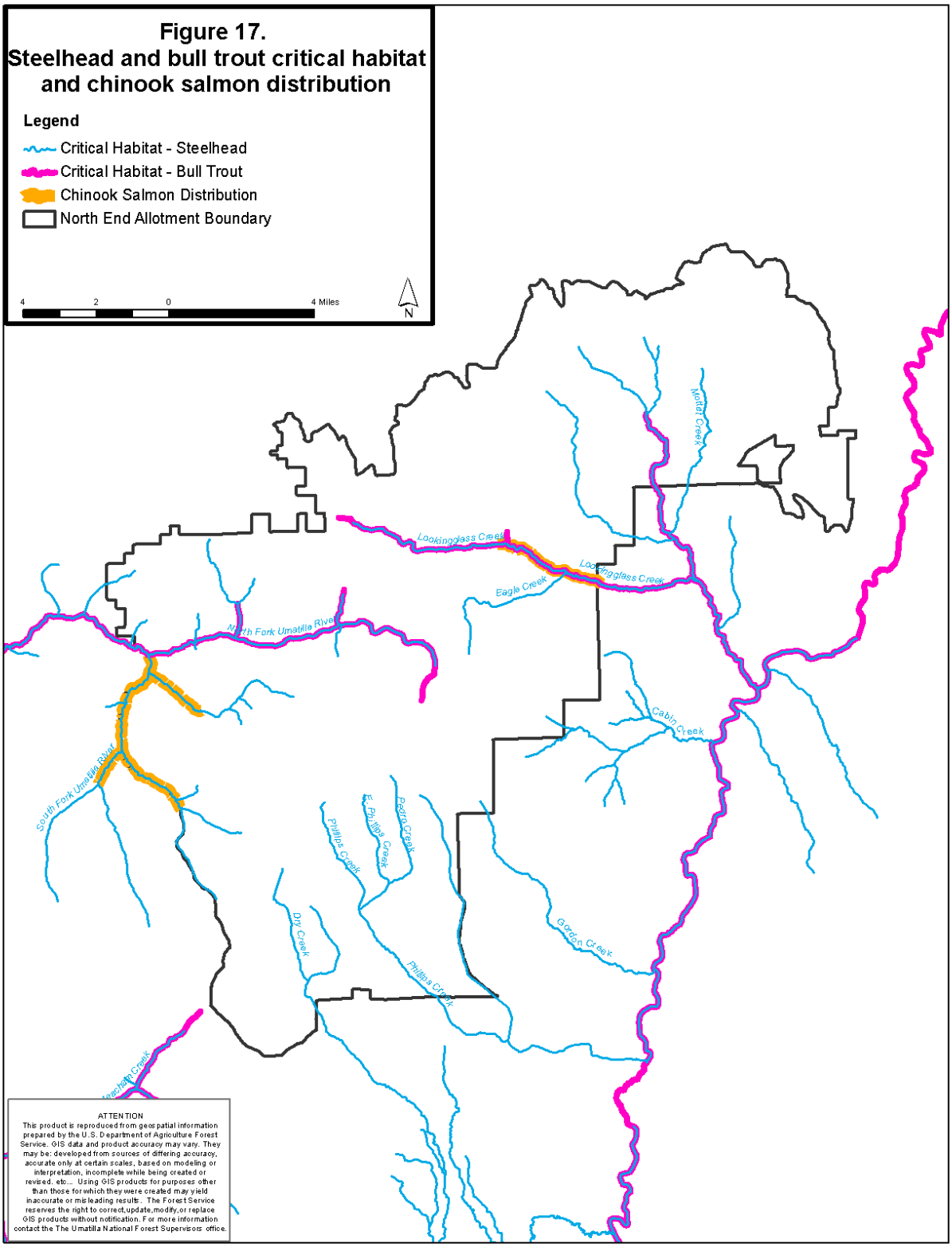


Figure 17.
Steelhead and bull trout critical habitat and chinook salmon distribution
Legend
Critical Habitat - Steelhead
Critical Habitat - Bull Trout
Chinook Salmon Distribution
North End Allotment Boundary
4
2
0
4 Miles
N
Lookingglass Creek
Eagle Creek
North Fork Umatilla River
South Fork Umatilla River
Cabin Creek
Phillips Creek
E. Phillips Creek
Pedro Creek
Dry Creek
Gordon Creek
Mottet Creek
ATTENTION
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Snake River Basin steelhead are found in analysis area subwatersheds draining to the Grande Ronde River. Snake River steelhead were listed as Threatened under the Endangered Species Act (ESA) on October 17, 1997 and the listing was reaffirmed on January 6, 2006 (NMFS 2006). Critical Habitat was designated in 2005 (NMFS 2005).

Adult summer steelhead leave the Pacific Ocean and enter the Columbia River from June through September. They proceed up the Columbia and Snake Rivers until reaching tributary watersheds and subwatersheds between September and May. Spawning takes place from March through April in the lower elevation tributaries, and March through May in the higher elevation tributaries. Egg incubation and emergence from gravels occurs from March through mid July, depending on time of spawning and water temperatures.

Mid-Columbia River steelhead (Busby et al. 1996) are found in several subwatersheds draining into the Umatilla and South Fork Walla Walla Rivers or into major tributaries to the Umatilla River, such as Meacham Creek. The Mid-Columbia Steelhead Evolutionarily Significant Unit was listed by the National Marine Fisheries Service (NMFS) as a threatened species in March of 1999 (NMFS 1999a).

Designated Critical Habitat for Mid-Columbia steelhead within the Umatilla and Walla Walla River subbasins includes all river and stream reaches accessible to steelhead below long-standing natural barriers (NMFS 2005). The accessible stream reaches in the Mid-Columbia steelhead portion of the North End allotment alternatives are synonymous with steelhead distribution (Figure 17).

Mid-Columbia River steelhead start to enter the Umatilla and Walla Walla Rivers with rising stream flow that typically occurs in late November and December. Spawning takes place from March through May. Egg incubation occurs from March through mid July (depending on time of spawning and water temperatures). Fry typically emerge from the gravel in June and July. Mid-Columbia River steelhead show about a 50/50 split between age-1-ocean and age-2-ocean returning adults (Busby et al. 1996).

> Note: The National Marine Fisheries Service adopted a Final Recovery Plan for Mid-Columbia River steelhead on September 30, 2009. The plan acknowledged implementation of Forest Service Forest Plan-level PACFISH policy as one of the primary mechanisms by which recovery is being achieved on National Forest System lands within the Recovery Plan area in Oregon. PACFISH includes Riparian Management Objectives for stream bank stability and sediment, establishes special riparian management zones adjacent to streams called Riparian Habitat Conservation Areas (RHCAs), and provides standards and guidelines for grazing that when implemented, are intended to ensure no adverse effects to listed fish, and that would avoid retarding near-natural rates of recovery for fish habitat. No draft or final Recovery Plan has yet been completed for Snake River steelhead or salmon in Oregon, but PACFISH policy is applied throughout the Umatilla National Forest, not just within the Mid-Columbia River portion of the Forest.

Snake River spring/summer Chinook salmon are present within the lower portion of Lookingglass Creek within the analysis area. They were first listed as Threatened in 1992.

The listing was reaffirmed on June 28, 2005 (Federal Register Vol. 70 (123). **Critical Habitat** was first designated in on May 22, 1992 and revised on October 25, 1999 (NMFS 1999b).

Adult spring/summer Chinook salmon leave the Pacific Ocean and enter the Columbia River from February through May. They proceed up the Columbia and Snake Rivers. They reach the Grande Ronde River and Lookingglass Creek in June and July. They spawn from early August through September 30. Egg incubation and emergence from gravels occurs from August 15 through the end of February. After emerging, juvenile fish typically remain in fresh water for one year before migrating to the ocean from March through June. Adults will typically return to the spawning grounds after three to six years in the ocean.

Snake River Fall Chinook salmon are not present in any of the subwatersheds associated with the North End Sheep allotment.

Mid-Columbia Spring/summer Chinook salmon had been extirpated from the Umatilla and Walla Walla systems until recently, when the Confederated Tribes of the Umatilla Indian Reservation reintroduced the species using hatchery stock. This stock is not a Regional Forester's Sensitive species and is not listed under the ESA. They are only considered in this analysis for purposes of compliance with the Magnuson-Stevens Act which requires an assessment of Essential Fish Habitat (EFH) for Pacific salmon.

Mid-C Chinook salmon habitat in this project area includes the headwaters of the Umatilla River, and the Upper Walla Walla and Meacham Creek watersheds. Designated Critical Habitat for Mid-C steelhead is used as a surrogate to consider effects to Mid-C Chinook.

Adult spring/summer Chinook salmon leave the Pacific Ocean and enter the Columbia River from February through May. They proceed up the Columbia. They spawn from early August through September 30 in the Umatilla and Walla Walla rivers. Egg/alevin incubation and emergence from gravels occurs from August 15 through the end of February. After emerging, juvenile fish typically remain in fresh water for one year before migrating to the ocean from March through June. Adults will typically return to the spawning grounds after three to six years in the ocean.

Columbia River bull trout

The US Fish and Wildlife Service (USFWS) published a final rule listing the bull trout in the Columbia River Distinct Population Segment as a threatened species under the Endangered Species Act (USFWS 1998). **Bull trout** subpopulations in the Wenaha and Lookingglass watersheds are two of thirteen subpopulations remaining in the Grande Ronde system (Buchanan et al. 1997). Other subpopulations are present in the Umatilla and Walla Walla River subbasins.

A draft recovery plan for Columbia River bull trout (USFWS 2002b) identified the following objectives for bull trout in the Grande Ronde and Umatilla-Walla Walla Recovery Units:

- Maintain the current distribution of bull trout within the core areas and reestablish bull trout in previously occupied habitats.

- Maintain stable or increasing trends in abundance of bull trout in both the Umatilla-Walla Walla and the Grande Ronde Recovery Units.
- Restore and maintain suitable habitat conditions for all bull trout life history stages and strategies.

Two distinct bull trout life history forms occur in the project area: fluvial and resident (Pratt 1992, Buchanan et al. 1997). Fluvial forms rear in natal tributaries for one to four years before moving to larger rivers to mature. Fluvial bull trout may use a wide range of habitats ranging from second to sixth order streams and varying by season and life stage. They live for another two to four years in these larger systems, growing to much larger sizes than resident forms, before returning to natal tributaries to spawn.

Migratory fish move seasonally from spawning and rearing areas into overwintering habitat in downstream reaches of larger basins. This is the fluvial life history, which is still present in the Grande Ronde River populations including those in Wenaha and Lookingglass watersheds. Fluvial fish are still present in the Walla Walla watershed and in the Umatilla watersheds as well (Buchanan et al 1997). The resident form may be restricted to headwater streams throughout life. Both forms may exist together in some areas, but migratory fish may dominate populations where corridors and sub adult rearing areas are in good condition (Rieman and McIntyre 1993).

Migratory/fluvial bull trout typically migrate from May through the end of December and typically spawn in tributaries from September 1 through the end of October. Hatching may occur in winter or early spring, but alevins may stay in the gravel for an extended period after yolk absorption. Emergence from gravels occurs at the end of April. Growth, maturation, and longevity vary with environmental conditions. First spawning is often noted after age six, with individuals living 10 or more years (Rieman and McIntyre 1993). Rearing occurs year-round in the analysis area.

Bull trout Critical Habitat was designated in 2005. At that time, no Critical Habitat was designated on National Forest System lands. More recently, a Final Rule for Designated Critical Habitat was published (USFWS 2010) which went into effect on November 17, 2010. The new designation now includes National Forest lands as well as non-federal lands in the action area. Affected subwatersheds in the analysis area are managed under PACFISH direction.

Inland redband trout are the same species as steelhead (*Onchorhynchus mykiss*) and juveniles cannot be distinguished phenotypically. Redband and steelhead are also considered Management Indicator Species in the Umatilla National Forest Land and Resource Management Plan.

Isolated populations of *O. mykiss* above longstanding natural passage barriers (and barring hatchery introductions) are presumed to be resident redbands. There are known natural barriers (waterfalls), on Lookingglass and Mottet creeks, which prevent steelhead and bull trout access to the uppermost reaches. *O. mykiss* upstream of the barriers are presumed to be of hatchery origin due to stocking of headwater lakes above the barriers. No other isolated resident populations are known to exist in the North End allotment project area.

Oncorhynchus mykiss may be resident, and spend their entire life in freshwater, or anadromous, and migrate to the ocean before returning to freshwater to spawn as an adult. Offspring of resident forms are known to have become anadromous, and offspring of anadromous forms are known to have failed to migrate and become residents. The anadromous form, known as steelhead, may spend up to seven years (typically 2 years) in fresh water before smoltification. Juveniles migrate to the ocean from early April through September. Adults will return to the spawning grounds after one to three years (typically one year) in the ocean. A limited number of adult steelhead will spawn a second time but most spawn only once. The number of possible combinations of these life history factors gives *Oncorhynchus mykiss* one of the largest suites of life history patterns of any of the salmonids (Busby et al. 1996).

Margined sculpin are a localized endemic species limited to the Walla Walla River portion of the analysis area. They are not found in other drainages of the analysis area. Sculpin are small bottom-feeding fish with small home territories. They are closely associated with the streambed, and require clean gravel-cobble and bigger substrate with low embeddedness, as they shelter from the current and predators, as well as feed on macro invertebrates on the stream bottom.

Westslope cutthroat trout are very localized on the Umatilla National Forest, only being found in the North Fork John Day subbasin. They are not present in any of the four subbasins associated with the North End allotment, and would not be affected by grazing in the allotment. Therefore westslope cutthroat trout will not be discussed further.

Aquatic Habitat Conditions

The hydrologist's report has determined that there would be no direct or indirect effects on stream temperature for any fish bearing streams within various alternative boundaries. This analysis was considered when selecting separate analysis criteria for fish and will not be repeated here. The following indicators were selected to evaluate alternatives relative to concerns for sheep management based on the alternatives developed: stream bank stability; fine sediment effects on spawning substrate quality; and the risk of redd trampling.

Proper Functioning Condition (PFC) is a minimum level condition that provides the necessary attributes to maintain riparian stability, but may not result in conditions that provide high quality waters. Systems are functioning appropriately when adequate vegetation, landform, or large woody debris is present to: dissipate stream energy, reduce erosion and improve water quality; filter sediment; improve flood-water retention; develop root masses that stabilize stream banks; and develop ponds and channel characteristics to provide fish habitat. There are three PFC classes: Functioning, Functioning at Risk, and Nonfunctioning (Table 28). A more detailed account of this information can be found in the Fish Specialist Report.

Table 28. Watershed Conditions.

Watershed	stream bank stability	spawning substrate
Walla Walla	Functioning	Functioning
Umatilla / Meacham	No data	Functioning (steelhead) Functioning At Risk (bull trout)
Lookingglass	Functioning	Functioning (steelhead) Functioning At Risk (bull trout)
Phillips/Gordon/Cabin/Dry	Functioning	Functioning At Risk
Wenaha	Functioning	Functioning
Grande Ronde – Rondowa	No data	Not Functioning (Grande Ronde River only, no data on tributaries)

Walla Walla Watershed - The South Fork Walla Walla River is in a special Forest Plan Management Area which manages for unroaded conditions and no scheduled timber harvest. Sheep grazing barely touches into this watershed and there are no active cattle allotments. Recreational use is light and mainly on trails.

Umatilla/Meacham Watersheds - Sheep grazing in the upper Umatilla and Meacham Creek watersheds under current management is having very little effect on riparian plant communities, which are probably at or near their natural potential (USDA-FS 1998b).

Bull trout habitat distribution is more limited in the Umatilla and Meacham watersheds than steelhead habitat. Surveys indicate that bull trout reaches ranged from 5 to 35 percent embeddedness in the North Fork Meacham Creek subwatershed, and 17 percent in the North and South Fork Umatilla subwatersheds (USDA-FS 1998b). Ideal bull trout habitat is less than 20 percent embedded; more than 30 percent embeddedness creates unacceptable substrate conditions for both steelhead and bull trout habitat according to both U.S. Fish and Wildlife Service and National Marine Fisheries criteria.

Lookingglass Watershed - Sheep grazing is having very little effect on riparian plant communities which are probably at or near their natural potential. Most fish bearing streams on the Forest Service managed portion of the Lookingglass Watershed are in roadless areas or steep inaccessible canyons.

Phillips/Gordon/Cabin/Dry – stream inventory data indicates that much less than 10 percent of stream banks are unstable. Data on substrate is limited, but based on the combination of dominant particle size, percent cobble embeddedness, personal knowledge of the area (Crabtree, pers. comm.), and best professional judgment, substrate conditions in these subwatersheds can be categorized as Functioning at Risk.

Wenaha - Estimates by Pomeroy and Walla Walla District biologists are that stream bank stability is greater than 90 percent on all streams within these watersheds. Recent surveys of the Wenaha River indicate fines are less than 8 percent and embeddedness is less than 20 percent.

Grande Ronde-Rondowa Watershed - No data is available on bank stability for tributary streams within the Grande Ronde River-Rondowa watershed.
Tributary streams were affected by 1996 - 1997 flood events, and riparian vegetation has been altered.

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

It would be highly unlikely that any of these alternatives would cause direct effects to any species of fish in the allotment. The risk of redd trampling is practically zero because sheep are closely managed by a herder and dogs. Prescribed management requirements would ensure that a buffer of 300 feet would be maintained between sheep bands and fish-bearing streams during critical spawning periods. Sheep would primarily water upstream of fish bearing reaches and critical habitats, using spring developments which are predominantly spatially disjunct from perennial channels. Stream headwaters are often dry or intermittent when sheep move through, and sheep watering sites are provided at troughs and ponds.

Risk of indirect effects to fish downstream from upstream disturbance would also be near zero. Designated stream crossings have been designed to cause the least possible impacts to fish and riparian habitat. Sheep would cross streams when dry, outside of critical spawning periods, and on roads where available. The risk of sediment introduction to fish bearing streams would therefore be negligible and discountable.

Riparian utilization standards would apply and ensure that stream bank vegetation and physical stream bank conditions are maintained or improved. These conditions have been consistently maintained in the past, particularly due to the 300 foot buffers maintained between herded sheep and fish-bearing reaches and Critical Habitats.

The project hydrologist has also determined that any downstream indirect effects to water quality from sheep watering at developed headwater springs would be negligible, even where connectivity to perennial channels downstream exists.

Direct and Indirect Effects Unique to Alternative 1

The proposed reconfiguration of the allotment boundary removes several streams with listed species and critical habitat from the allotment, particularly streams containing Snake River steelhead, as well as a portion of Mottet and Little Lookingglass Creeks which support bull trout populations. The risk of redd trampling and sediment introduction to fish bearing streams and Critical Habitats would no longer exist in those areas.

In comparison to other action alternatives, this alternative contains the most miles of Designated and Proposed Critical Habitat (for all species combined) of any of the action alternatives (Figure 17).

Direct and Indirect Effects Unique to Alternative 2

The allotment would be smaller and therefore less stream habitat would be potentially affected than under Alternative 1. The change in allotment boundaries would remove sheep from pastures drained by Swamp Creek, Lost Creek, Summer Creek, Mottet Creek, and the tributaries of the South Fork Walla Walla River. The risk of redd trampling and sediment introduction to fish bearing streams and Critical Habitats would no longer exist in those areas.

Direct and Indirect Effects Unique to Alternative 3

Relative to existing management and Alternative 1, risk to fish bearing streams and unoccupied Critical Habitats within the Grande Ronde subbasins would be reduced similar to what would occur in Alternative 2.

The addition of the Goodman pasture would add fish bearing streams and unoccupied critical habitat to the North End Allotment. The main stream systems in the Goodman area are the South Fork Umatilla River, Spring Creek, Shimmiehorn Creek, and Hellhole Creek. Most of these streams and their associated riparian vegetation are not accessible to sheep because they are located in the bottom of steep canyons. Sheep would not be herded down into these reaches, thus risks to fish habitat would be avoided.

Given the use of project management requirements, effects in the Goodman area would be limited to the headwaters of these systems. The risk to listed and sensitive fish and critical habitats within the Goodman allotment portion of the alternative would be negligible and discountable for the same reasons as they would be for the other action alternatives. (See effects common to Alternatives 1-4).

Direct and Indirect Effects Unique to Alternative 4

Due to the small size of the allotment, even fewer streams would be potentially affected by grazing. The North Fork Umatilla River, Coyote Creek, Woodward Creek, Lick Creek, Bear Creek, Buck Creek, Swamp Creek, Lake Creek, Johnson Creek, and their tributaries would no longer be in the allotment.

Compared to Alternative 3, habitat that is currently ungrazed in the Goodman allotment area would continue to be ungrazed, and would continue to entirely avoid the risk of grazing impacts to steelhead and bull trout streams in that area.

Overall, the fewest fish-bearing streams would be contained within the Alternative 4 allotment boundary relative to the other action alternatives.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Alternative 5 would remove even the slightest possibility of direct, indirect or cumulative effects to fish and fish habitats from sheep grazing within the analysis area, because no sheep would be present.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Current fish and fish habitat conditions are reflective of all past management activities on widely distributed anadromous and fluvial fish populations. Anadromous species such as steelhead and salmon are impacted by dams on the main stem rivers, commercial and recreational fishing in freshwater and saltwater habitats, hatchery genetic impacts on wild stocks, and impacts to spawning and rearing freshwater habitats on forest lands. Fluvial species such as bull trout, have also been impacted by habitat changes on National Forest System lands and on private, state and other federal lands downstream, as well as impacted by interbreeding with introduced species such as brook trout, which were historically stocked for recreational fishing opportunities, such as in Langdon Lake at the head of Lookingglass Creek.

Continued grazing of the North End Allotment is not expected to cumulatively affect fish or fish habitat when added to the effects of past and ongoing management actions on current conditions in the subwatersheds associated with North End Allotment, especially since fewer fish-bearing streams would be contained within the allotment boundary.

Cumulative Effects Unique to Alternative 3

Although the long-inactive Goodman allotment would add to the area grazed, this alternative would not increase cumulative effects to fish or fish habitat relative to Alternative 2, since the risk of effects to fish and fish habitat are already considered negligible and discountable under these other alternatives.

Cumulative Effects Unique to Alternative 4

Continued grazing of the North End Allotment on a smaller scale is not expected to cumulatively affect fish or fish habitat when added to the effects of past and ongoing management actions on current conditions in subwatersheds influenced by sheep grazing. Fewer fish-bearing streams would be contained within the allotment boundary relative to the current allotment area. This would reduce the possibility of cumulative fish effects relative to the effects of current management.

Effects determinations

Effects determinations by alternative are detailed below (Table 29). The North End allotment in its current configuration was previously consulted as 'Not Likely to Adversely Affect' Snake River Chinook, Snake River steelhead, Mid Columbia steelhead and bull trout. Consultations were consecutive for each of the species listings.

Table 29.
Effects Determinations for ESA Threatened and R6 Sensitive Fish and Fish Habitats*

Stock	Alternative				
	1	2	3	4	5
Snake River Basin (SRB) steelhead	NLAA	NLAA	NLAA	NLAA	NE
SRB steelhead Critical Habitat	NLAA	NLAA	NLAA	NLAA	NE
SRB spring/summer Chinook salmon	NLAA	NLAA	NLAA	NLAA	NE
SRB spring/Summer Chinook salmon Critical Habitat (and Essential Fish Habitat)	NLAA	NLAA	NLAA	NLAA	NE
SRB fall Chinook salmon	NE	NE	NE	NE	NE
SRB fall Chinook salmon Critical Habitat (and Essential Fish Habitat)	NLAA	NLAA	NLAA	NLAA	NE
Mid-Columbia (Mid-C) steelhead	NLAA	NLAA	NLAA	NLAA	NE
Mid-C steelhead Critical Habitat	NLAA	NLAA	NLAA	NLAA	NE
Columbia River bull trout	NLAA	NLAA	NLAA	NLAA	NE
Columbia River bull trout Critical Habitat (2010 Rule)	NLAA	NLAA	NLAA	NLAA	NE
Redband trout	MIIH	MIIH	MIIH	MIIH	NI
Margined sculpin	NI	NI	NI	NI	NI
Westslope cutthroat trout	NI	NI	NI	NI	NI

*NLAA=May Affect, Not Likely to Adversely Affect. For Critical Habitat, this level of effect is equivalent to "No Adverse Effect" to Essential Fish Habitat under the Magnuson-Stevens Act. No Effect (NE) is equivalent under both statutes. NI = No Impact, MIIH = May Impact Individuals or Habitat but will not likely lead to federal listing.

Rationales

Under any alternative, sheep will be watered away from perennial fish bearing streams, using upland developed spring sources. Sheep will cross dry and intermittent channels upstream of perennial fish bearing channels and will cross perennial flow on roads where available. Sheep bands will be herded along the ridge tops and will not graze in the steep canyons where fish habitat is located. Therefore, adverse effects to Designated Critical Habitat, listed fish, and Sensitive fish or their habitats are not likely for any fish species.

Because there is not likely to be any adverse effects to Designated Critical Habitat for any listed species in any of the watersheds associated with North End allotment, there is also not likely to be any adverse effects to Essential Fish Habitat in any of the watersheds.

All alternatives are consistent with the Recovery Plan for Mid-Columbia River steelhead and the draft Recovery Plan for Columbia River bull trout, based on implementation of PACFISH standards and guidelines and design features for grazing management in the allotment. Bull trout habitat is likely to continue improving and fish distribution will not be affected.

Fish listed as Sensitive occur in many of the same reaches as do listed fish, and their habitats overlap. Grazing outside RHCAs high on the ridge tops, using spring sources for water, and crossing streams in locations least likely to disturb fish or result in stream bank or red trampling, would result in minimal impacts to fish. Therefore, sheep grazing in North End allotment May Impact individual sensitive fish species, but is not likely to trend towards listing.

Forest Plan Compliance (including PACFISH amendment)

Implementation of management requirements and best management practices as described in Chapter 2 and PACFISH grazing Standards and Guides (USDA-FS and USDI 1995) would constitute compliance with the Umatilla Forest Plan direction and objectives for hydrologic and water quality components within the allotment boundaries and analysis subwatersheds.

The same practices ensure that sheep grazing under any of the alternatives would be managed to avoid adverse effects to listed fish, and to maintain or improve fish habitat. Due to the low risk of effects to redband trout and margined sculpin from streambed trampling, fine sediment inputs or stream bank stability, sheep grazing is not likely to result in a trend towards listing for any sensitive species under any alternative.

Sensitive Invertebrates

The Regional Forester's Sensitive Species (USDA-FS 2008) lists the following invertebrate species as potentially occurring on the Umatilla National Forest: **western ridged mussel, shortface lanx, Hells Canyon land snail, fir pinwheel, and meadow fritillary**.

Other invertebrate species identified on the Regional Foresters Sensitive Species list as suspect or documented on the Umatilla NF will not be discussed, as they are either Strategic species not requiring surveys, or are Sensitive only in the state of Washington. The project area is located entirely in the state of Oregon.

Two surveys for invertebrate species have occurred on the Walla Walla Ranger District. Springs and small spring fed streams were surveyed in 2007 (Groves 2007), and a search for several terrestrial snail species was completed in 2010 (Jepsen 2010). These surveys were designed to locate other invertebrate species, i.e. they were not specifically looking for the five species of interest here. Of these 5 species, only the fir pinwheel was documented by these surveys, but outside of the allotment.

Western ridged mussels (*Gonidea angulata*) have been documented within the allotment. Records indicate that they have been present in the North and South Fork Umatilla River and Thomas Creek (Jepsen 2009). This species is associated with well oxygenated substrates, shallow water, and constant flow, but is absent from areas with continuously turbid water (Jepsen 2009).

Freshwater mussels are filter feeders that consume microscopic organisms in the water. Threats to the species include loss of host fish, channel modification, water pollution, sedimentation, and livestock grazing in riparian areas (Jepsen 2009).

Shortface lanx (*Fisherola nuttalli*) is an aquatic snail that has experienced habitat loss caused by dams, water removal, and pollution. They feed by scraping algae and diatoms from the surface of rocks and boulders in larger perennial streams and rivers. A small population has been noted in the Grande Ronde River (Mazzacano 2008). Threats to this species include water diversions, sedimentation, and riparian habitat degradation.

Although the Grande Ronde River provides shortface lanx habitat, the smaller tributaries that are associated with the North End allotment do not appear to contain the habitat components required, such as large cobble-boulder substrate and high flow velocities.

The Hells Canyon land snail (*Cryptomastix populi*) is a species known from basalt talus of the Snake, Salmon, and lower Clearwater Rivers (Frest and Johannes 1995). The nearest known population was extirpated west of Clarkston, WA due to road construction and maintenance. They do not likely occur on the Umatilla National Forest.

The **fir pinwheel** (*Radiodiscus abietum*) is hermaphroditic, terrestrial snail (Duncan 2008). This species is generally found in moist and rocky Douglas-fir forest with a rich understory of shrubs, forbs and bryophytes (Frest and Johannes 1995). Moist valley, ravine, gorge, or talus sites are preferred, near water or where moisture is persistent (Frest and

Johannes 1995). They are often in or near rock talus or under fallen logs (Duncan 2008). Their habitat may be degraded by logging, grazing, and roads (Frest and Johannes 1995).

The fir pinwheel has been observed on or near the Walla Walla Ranger District at the following locations: Touchet River area; Tiger Canyon area; and above the town of Weston (Duncan 2008, Jepsen pers. comm). Although not documented, the species could be present within the North End Allotment.

The **meadow fritillary** *(Boloria bellona*) is a widely distributed montane butterfly, but is locally endemic (confined to small specific areas). A few historic colonies in the Blue Mountains have apparently disappeared. One colony known from the Lehman Springs area on the Umatilla National Forest has not been seen since 1984 (Fleckenstein 2006).

Meadow fritillary have typically been found in open, moist meadows. The caterpillar phase feeds solely on violets (Opler and Wright 1999). Several species of violet are present on the forest (USDA-Forest Service 2004), but the extent and distribution are unknown. Although known populations of meadow fritillary may have been extirpated, undiscovered populations on the Umatilla forest may yet exist (Fleckenstein 2006). Drainage of wet areas, overgrowth of woody vegetation in meadows, and livestock overgrazing may cause habitat loss (Miller and Hammond 2007).

Sensitive Invertebrates Direct, Indirect, and Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Effects on the stream-dwelling invertebrate species, if present, are not likely to occur, since sheep do not graze within RHCAs. Livestock only cross streams on roads, at designated crossings when dry, and where streams are intermittent in the headwaters.

Effects to sensitive terrestrial invertebrate species could occur if those species are present. Fir pinwheel and meadow fritillary have not been documented in the affected area, but could be present. Fir pinwheel live in areas that generally would not be affected by sheep grazing, such as rock talus and under logs. Meadow fritillary live in moist meadow habitat, which grazing sheep typically avoid and are herded away from.

Continued grazing of the North End Sheep allotment is not expected to cumulatively affect invertebrates when added to the effects of past and ongoing management actions on current conditions. If these species are present, BMPs and other management requirements would make it unlikely that effects would occur.

Therefore, sheep grazing on the North End Sheep Allotment **may impact individuals of some sensitive invertebrate species, but is not likely to result in a trend towards listing** (Table 30).

Table 30. Effects Determinations for Sensitive Invertebrates

Species	Alternative				
	1	2	3	4	5
Western ridged mussel	MIIH	MIIH	MIIH	MIIH	NI
Shortface lanx	NI	NI	NI	NI	NI
Hells Canyon land snail	NI	NI	NI	NI	NI
Fir pinwheel	MIIH	MIIH	MIIH	MIIH	NI
Meadow fritillary	MIIH	MIIH	MIIH	MIIH	NI

NI = No Impact, MIIH = May Impact Individuals or Habitat, but is not likely to result in a trend toward listing.

Western ridged mussels and **shortface lanx** are dependent on perennial flow and are typically found in larger perennial streams and rivers. Although sheep crossing on the road across Lookingglass Creek could occur under some alternatives, the probability of mussels being present and sheep straying into the water off the road and impacting individual mussels is very low. Therefore there would be **No Impact on Western ridged mussels** and **shortface lanx**.

The **fir pinwheel** may be present in RHCAs within the North End allotment, but since these snails tend to inhabit talus and the moist undersides of logs in moist habitats, sheep grazing in the North End allotment M**ay Impact individuals, but is not likely to result in a trend towards federal listing.**

There would likely be **No Impact on the Hells Canyon landsnail.** This species is not likely present on the allotment, based on: the extreme distance relative to nearest known distribution; its limited ability to travel across wide stretches of dry ground; and its preferences for lower elevation large canyon river bottom riparian areas. Travel would likely follow river corridors.

Meadow fritillary populations once detected on the forest appear to no longer be present. Because sheep graze preferentially on forbs, including violets when available, sheep may impact availability of food plants for fritillary caterpillars if present. Because the Blue Mountains are on the fringe of the species' broad geographic range, and the species as a whole is not known to be threatened (Fleckenstein 2006), sheep grazing in the North End allotment **May Impact individuals but is not likely to result in a trend towards listing**.

Sensitive Invertebrates Direct, Indirect, and Cumulative Effects Unique to Alternative 5

Under the no grazing alternative, there would be no direct, indirect or cumulative effects on invertebrates or any of their habitats.

Forest Plan Compliance

Adherence to forage utilization standards in the Forest Plan as well as Management Requirements set forth in this document would minimize impacts to sensitive invertebrates. Invertebrate habitats such as wet meadows, rock talus, and down logs in ravines would not likely be affected. Riparian areas are generally protected from grazing. Grazing would also not occur within special forest plan management areas such Special Interest Botanical Areas, Dedicated Old Growth, and Research Natural Areas.

Recreation and Wilderness

The analysis area for effects to recreation and wilderness includes the area within the existing North End allotment boundary. The potential for grazing to affect recreation facilities, use, and opportunities is addressed.

Existing Condition

The existing boundary of the North End Allotment covers a large area of the Walla Walla Ranger District. It includes high recreation use areas such as Jubilee Lake and the Tollgate area. Highway 204 is the main access across the Blue Mountains from Weston to Elgin and runs through the allotment.

Sense of Place

Sense of place is defined as the identity of a place created by people's social meanings and attachments, including valued scenery and recreation settings, cultural and spiritual values, economic, social and biophysical characteristics. Grazing is and has been a part of this landscape for generations and is recognized as a part of the sense of place.

Recreation opportunities in this area include developed facilities such as campgrounds, recreation residences, OHV and snowmobile routes, hiking trails, scenic viewpoints, and boating. Spout Springs Ski Area and Jubilee Lake Campground are popular areas within the allotment. Recreation in less developed areas include dispersed camping, hunting, fishing, huckleberry picking, horn hunting, and other gathering activities.

Wilderness

The North End Allotment includes the 20,280 acre North Fork Umatilla Wilderness. The majority of use in the wilderness is hunting, hiking, and horseback riding.

The North Fork Umatilla Wilderness was added to the National Wilderness Preservation System by the Oregon Wilderness Act of 1984 (Public Law 98-328, June 26, 1984). The Wilderness Act states that "the grazing of livestock, where established prior to the effective date of this Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture" (Sec. 4 (d)(4)(2).

Livestock grazing has been occurring in the Analysis Area since the early 1900's. Because permitted livestock grazing was established in the Analysis Area well before Congress designated the North Fork Umatilla Wilderness area in 1984, livestock grazing is an allowable use of this wilderness area (also see Chapter 1, section 1.7). Livestock grazing in the wilderness has been conducted in accordance to the guidelines of the 1964 Wilderness Act and Forest Plan standards and guidelines for wilderness areas.

Potential Wilderness Areas
Grazing would occur in roadless areas to varying degrees with all action alternatives (Table 31). Because livestock grazing would not cause any areas to be less suitable for future wilderness designation, an in-depth analysis of potential wilderness areas is not necessary in this EIS.

Table 31. Comparison of Recreation Impacts by Alternative.

Alternative	1	2	3	4	5
Wilderness acres grazed	20,520	20,520	0	0	0
Roadless acres grazed	7,500	5,300	13,800	3,860	0
Recreation	Occasional contact / minor effects	Occasional contact / minor effects	Occasional contact / minor effects	More opportunities in un-developed areas than Alternatives 1-3	

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

None of the alternatives would be expected to result in significant direct, indirect, or cumulative effects to the recreation resource, trail system or wilderness designation within the analysis area.

Grazing in this allotment in recent years has resulted in very minimal conflict with recreation users and resources. It has been uncommon for forest visitors to encounter domestic sheep, but occasionally the recreation experience could be affected by the sight,

sound, and smell of sheep. A visitor may encounter droppings, odors, bleating, working dogs, sheep herders, and herder camps.

In all action alternatives, there could be an improvement in the chances that bighorn sheep herds would stabilize and/or increase (Wildlife Report). This would result in an increased opportunity for recreational hunting and viewing of bighorn sheep.

Within the allotment, sheep grazing would change the appearance of vegetation, which could affect the recreation setting. Grazed vegetation is discernible from an onsite experience rather than from a distance. Grazing tends to keep some grasses from becoming mature, seeding out and curing. This annual practice can create a cleaner, more managed appearance to the understory. This could be perceived by some as a less primitive setting.

Livestock grazing is a historical use of the area, and portions of the allotment within wilderness and potential wilderness areas have exhibited only short-term, minor impacts to vegetation and other resources. These minor impacts have not significantly impaired wilderness characteristics nor diminished the opportunity for future use as wilderness.

Direct and Indirect Effects Unique to Alternative 1

People who utilize the undeveloped areas east of road 63 would have a greater opportunity to experience the area without encountering a band of sheep.

Direct and Indirect Effects Unique to Alternative 2

People who utilize the undeveloped areas outside of the new allotment boundary would have a greater opportunity to experience the area without encountering a band of sheep. There could be a noticeable effect to the surrounding areas of the lesser developed sites north of Looking Glass Creek: Burnt Cabin trailhead (TH), Target Meadows Campground (CG), Bald Mountain Viewpoint, Dusty Spring CG, Rough Fork TH, Mottet CG, Timothy Springs TH, Luger Springs TH, Bone Springs CG, and Fry Meadow Cabin. Visually there would be increasing grasses and forbs, maturing, seeding out and curing near these areas.

Direct and Indirect Effects Unique to Alternative 3

In addition to removal of grazing near developed sites identified in Alternative 2, areas near the following developed sites would no longer be affected: Woodward CG, Spout Springs Ski Resort, Umatilla Breaks Viewpoint, Woodland CG, Coyote Ridge TH, Zig Zag Spring TH, Corporation CG, Buck Creek CG, and Buck Creek TH. Visually there would be increasing grasses and forbs, maturing, seeding out and curing.

There would be no grazing in the North Fork Umatilla Wilderness. The absence of grazing would eliminate any minor effects that have been occurring in the wilderness, such as the sight, sound, and droppings of livestock.

Although the wilderness would not have grazing, the addition of the Goodman area would add grazing in the Hell Hole Roadless Area. The Goodman area has not been grazed for

many years, and people who frequently camp here (mainly for hunting) would likely notice the changes caused by sheep grazing. Some dispersed camps would be used temporarily by the sheep herder, and some previously natural springs would be developed to provide water troughs for sheep.

There are no developed recreation sites in the Goodman area that would be affected.

Direct and Indirect Effects Unique to Alternative 4

Effects to Recreation would be similar to Alternative 3, except that Goodman would not be grazed. Of all action alternatives, this alternative provides the greatest opportunity to recreate in undeveloped areas without seeing any effects of grazing.

The absence of grazing would eliminate any minor effects that have been occurring in the wilderness, such as the sight, sound, and droppings of livestock.

Of all action alternatives, this alternative offers the best chance that bighorn sheep herds would stabilize and/or increase (Wildlife Report). This would result in an increased opportunity for recreational hunting and viewing of bighorn sheep.

Direct and Indirect Effects Unique to Alternative 5 – No Grazing

Elimination of the allotment would result in a higher degree of recreation opportunity than is currently occurring. This alternative provides the greatest opportunity to recreate in undeveloped areas without seeing livestock or their effects on the landscape.

The absence of grazing would eliminate any minor effects that have been occurring in the wilderness, such as the sight, sound, and droppings of livestock.

This alternative offers the best chance that bighorn sheep herds would stabilize and/or increase (Wildlife Report). This would result in an increased opportunity for recreational hunting and viewing of bighorn sheep.

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Effects from continued livestock use when combined with past, present and future activities are limited and well below the level of significance. Wilderness character will be maintained throughout the North Fork Umatilla Wilderness Area as a whole.

Forest Plan Compliance

Implementation of Management Requirements described in Chapter 2 would constitute compliance with the Umatilla Forest Plan direction and objectives for recreation resources within the allotment. Domestic sheep were authorized to graze within the North Fork Umatilla Wilderness prior to its designation on June 26, 1984. There will not be an increase in grazing levels within the wilderness area, and grazing levels are compliant with the Forest Plan.

Climate Change

Soil Carbon and Greenhouse Gas Emissions (GHG)

The scale for this analysis is the North End Allotment, its relative contribution and impact on the global carbon cycle and global climate change associated with greenhouse gas emissions. It is impossible to assess the impact of global climate change on rangeland ecosystems without high quality, consistent, assessable soil and vegetation data and models that describe how changes occur in response to stress and disturbance (SRM 2008). Quantitatively or even qualitatively determining the relative effects of the different alternatives for livestock grazing from the North End Allotment on climate change or the effects from climate change on proposed project is speculative.

Direct and Indirect Effects Common to Alternatives 1, 2, 3, and 4

Grazing lands are estimated to contain 10 to 30 percent of the world's soil organic carbon. (Schuman et al. 2002). Grazing results in redistribution of carbon on the landscape (Stavi 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 EPA 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 (NRCS 2007) and represents a potential long-term soil carbon gain (Fellman et al. 2008).

Studies based on modeling and remotely sensed data indicate that proper grazing can improve ecosystem production as measured by soil carbon storage (Li, et al. 2007, Steinfeld and Wassenaar 2007, Reeder et al. 2001, Schuman et al. 2002). Additional studies similarly conclude that certain levels of grazing may increase carbon sequestration (Hellquist et al. 2007, Derner et al. 2005, LeCain et al. 2001, Ganjegunte et al. 2005, and Manley et al. 1995).

Several studies indicate that light to moderate levels of grazing have no overall effect on total carbon sequestration (Hellquist et al. 2007, XiuZhi et al. 2005, Ingram et al. 2008, Derner et al. 2005, Stavi et al. 2008, Owensby, et al. 2006, Shrestha and Stahl 2007, Ingram et al. 2007), 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).

Rotational grazing appears to be a viable option for green house gas (GHG) reduction and carbon sequestration credits (Bosch et al. 2008, Steiguer et al. 2008, NRCS 2007, Li et al. 2007, Ingram et al. 2008, Sharrow 2008).

Cumulative Effects Common to Alternatives 1, 2, 3, and 4

Projected climate change impacts from cumulative effects of all activities releasing GHG around the globe include air temperature increases; sea level rise; changes in the timing, location, and quantity of precipitation; and increased frequency of extreme weather events

such as heat waves, droughts, and floods. These changes would vary regionally and affect renewable resources, aquatic and terrestrial ecosystems, and agriculture. While uncertainties would remain regarding the timing, extent, and magnitude of climate change impacts, the scientific evidence predicts that continued increases in GHG emissions will lead to increased climate change (USDA-FS 2009b).

The ongoing and future effects of livestock grazing from this particular allotment on global or regional climate change or the effects of global or regional climate change on the North End Allotment, regardless of how the allotment is managed, are speculative. It is doubtful whether any meaningful or measurable effects are assessable and therefore are not likely to be significant.

Cultural Resources

An assessment of grazing on heritage resource values was conducted according to the regional interagency guidelines for grazing permit reauthorization. All of the North End Sheep Allotment has been previously surveyed over the years through small and large scale landscape heritage surveys. Existing records for known sites within the proposed allotment boundary indicate that there are approximately 70 sites that have been located and documented. Slightly less than half are comprised of pre-contact sites, consisting largely of lithic scatters. The remaining historic sites are associated with grazing activities and early Forest Service administration. These sites are either eligible for inclusion on the National Register of Historic Places (NRHP) under existing Programmatic Agreements, or have not been evaluated but are treated as eligible until a determination can be made. None of the completed site forms indicate impacts due to livestock grazing.

Direct, Indirect, and Cumulative Effects Common to Alternatives 1, 2, 3, and 4

After reviewing all known field information and evaluating the potential effects on known cultural resources within the North End Sheep Allotment boundary, a monitoring report and determination of No Adverse Effect for the proposed project was completed and sent to both the Oregon SHPO and the Cultural Resource Program departments for the CTUIR and Nez Perce Tribe for opportunity to comment.

Changes in the grazing strategy, range improvement projects, and/or surface disturbing projects, will be subject to the standard Section 106 and tribal consultation processes. If subsequent monitoring reveals impacts to any historic property, appropriate protection mitigation measures will be developed and implemented.

Forest Plan Compliance

All Forest Plan requirements regarding inventory, evaluation, and protection of cultural resources have been met.

Legal Disclosures

Applicable laws and regulations were considered in this EIS. The proposed activities in all alternatives are consistent with Federal, State, and local laws and requirements for the protection of the environment.

Other Jurisdictions

The Environmental Protection Agency has a responsibility to ensure that environmental quality standards are being met. The Oregon Department of Environmental Quality sets standards for water quality.

The Oregon Department of Fish and Wildlife (ODFW) is responsible for the management of fish and wildlife populations, whereas the Forest Service manages habitat for these species.

The U.S. Fish and Wildlife Service and the National Marine Fisheries Service are responsible for the recovery of species listed under the Endangered Species Act. Consultation with these agencies regarding the North End Allotment has occurred and updates are being prepared. Consultation will be completed prior to implementation of proposed activities.

National Environmental Policy Act

This EIS is the result of an environmental analysis, public scoping, documentation, and policies and procedures related to NEPA.

National Forest Management Act (NFMA)

The analysis and proposed activities in this EIS are consistent with direction in the Forest Plan, as amended. The Forest Plan was developed per guidance from the NFMA. Forest Plan compliance statements are provided under each resource.

Multiple-Use Sustained Yield Act

Alternatives 1-4 meet the intent of the Multiple Use Act, in that they ensure that recreation, fish and wildlife, water, timber resources, and range are available for current and future generations. The no grazing alternative would meet all of these needs, except that range would not be available for grazing on the North End Allotment.

Endangered Species Act

Biological Evaluations were completed for those species currently listed as sensitive on the Regional Forester's Sensitive Species List. Determinations were made that the proposed project would not adversely affect, contribute to a trend toward Federal listing, nor cause a loss of viability to sensitive species.

Silene spaldingii is listed as Threatened under the Endangered Species Act and is known to occur on the Umatilla Forest. All known occurrences of the species are many miles distant from the proposed alternative footprints of the North End Allotment. There is no suitable

habitat within any of the proposed alternatives for *Silene spaldingii*. The proposed grazing allotment alternatives comply with present federal regulations pertaining to the management of Threatened, Endangered, and Sensitive plant species.

Consultation for Snake River Chinook, Snake River steelhead, Middle Columbia River steelhead, and Columbia River bull trout was completed in the late 1990's and early 2000's under multiple Biological Assessments. The National Marine Fisheries Service and U.S. Fish and Wildlife Service concurred with our determinations that sheep grazing on the North End Allotment would not likely adversely affect any of these species.

A final rule to designate critical habitat for Columbia River bull trout was published in the Federal Register October 18, 2010 (50 CFR Part 17), with an effective date of November 17, 2010. As required when critical habitat is listed under Section 7 of the ESA, the forest has re-initiated consultation on the North End Allotment with the U.S. Fish and Wildlife Service. For document consistency, the forest has also re-initiated consultation with the National Marine Fisheries Service for ESA listed anadromous species.

Canada lynx (*Lynx canadensis*) is listed as Threatened and gray wolf (*Canis lupus*) is listed as Endangered under the Endangered Species Act. Consultation is not necessary since a determination was made that the alternatives would have no effect to Canada lynx and gray wolf.

Magnuson-Stevens Fishery Conservation and Management Act, Essential fish habitat.

Essential fish habitat applies only to habitat for commercially important fish species. For the Umatilla National Forest these are Chinook salmon. Most named streams downstream of longstanding natural barriers in the analysis area watersheds would be counted as Essential Fish Habitat. The proposed North End Allotment project would have no effect on Magnuson-Stevens Act Essential Fish Habitat, and consultation with National Marine Fisheries Service is not required.

Migratory Bird Treaty Act and Executive Order 13186

Activities comply with the Fish and Wildlife Service Directors order #131 related to applicability of the Migratory Bird Treaty Act to federal agencies and requirements for permits for "take". In addition, the permit is compliant with Executive Order 13186 because the analysis meets our obligation as defined under the January 16, 2001 Memorandum Of Understanding between the U.S. Forest Service and U.S. Fish and Wildlife Service designed to complement Executive Order 13186. The purpose of this Memorandum of Understanding is to strengthen migratory bird conservation through enhanced collaboration between the Forest Service and the Fish and Wildlife Service, and with state, tribal, and local governments. As required, management practices that could affect high priority species have been identified, and conservation measures to minimize impacts to birds have been considered.

Invasive Species, Executive Order 13112

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

Clean Water Act

The action alternatives in the North End Allotment EIS protect water quality by management requirements and Best Management Practices (listed in Chapter 2). The topography of the allotment and management of grazing routes keeps sheep high in the watershed, away from most perennial streams. In addition, no-grazing buffers of 300 feet are maintained on streams with known endangered fish species. The Range Specialist's report contains implementation monitoring data from this allotment and includes a vegetation analysis, both of which demonstrate that grazing in this allotment has had negligible impacts to streamside riparian areas. Channel morphology and bank stability are maintained by BMPs at the three sites where sheep cross dry streams. Protection and maintenance standards for developed water sources are identified in Chapter 2. The use of developed water sources poses a negligible risk to water quality due to the location of these sources being high in the watershed, the low volume of flow, and the limited connectivity to perennial streams. Based on these factors the action alternatives in the North End Allotment EIS comply with the Clean Water Act.

Floodplains, Executive Order 11988

Executive Order (EO) 11988 requires the Forest Service to avoid "to the extent possible the long and short term adverse impacts associated with the occupation or modification of floodplains…" The proposed alternatives would avoid effects to floodplains by managing vegetation utilization and maintaining integrity of channels, and is consistent with this EO.

Wetlands, Executive Order 11990

Executive Order (EO) 11990 requires the Forest Service to "avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands." The proposed alternatives would prescribe and implement management requirements and best management practices at developed water sources to protect and minimize effects to wetlands. The action alternatives are consistent with this EO.

Safe Drinking Water Act

The North Fork of the Umatilla River was designated as the municipal water supply for the City of Pendleton by the Oregon State Legislature in 1941. In 1984 the area was subsequently designated as a wilderness area and the city has since transferred its water intake to a point on the Umatilla River near the City of Pendleton. The City of Pendleton uses membrane filtration for water treatment.

The 1996 amendments to the Safe Drinking Water Act require Federal agencies that manage lands which serve as drinking water sources to protect these source water areas. Source Water Area delineation has been completed and a source water assessment has been conducted for the City of Pendleton. High to moderate risks have been identified. Grazing was not identified as an activity on National Forest Lands in the assessment. Disturbances such as timber harvest, road building, and road use in the same location were considered low risk, because potential contamination source in the upper reaches of the watershed "represent a very low risk to the City's source water."
[http://www.deq.state.or.us/wq/dwp/docs/swasummary/pws00613.pdf]

The North End Allotment boundary is nearly 50 river miles upstream of the City of Pendleton. Management requirements and best management practices have been identified to prevent or minimize damage to soils, water sources, and stream channels. Those and other BMPs identified for this project are discussed above. All action alternatives in the North End Allotment EIS comply with the Safe Drinking Water Act because no effects to the surface water system of Pendleton would occur from proposed actions.

Government-to-Government Consultation, Executive Order 12875

Executive Order 12875 clarifies government-to-government relations with American Indian governments. In accordance with this order, scoping letters asking for comment were sent to the Tribal Chairmen of the Confederated Tribes of the Umatilla Indian Reservation and of the Nez Perce Tribe. The North End Allotment is within ceded lands of both tribes.

National Historic Preservation Act and Treaty Resources

The Confederated Tribes of the Umatilla Indian Reservation as well as the Nez Perce Tribe were consulted on the Proposed Action**.**. The Oregon State Historic Preservation Office (SHPO) was also consulted with in accordance with the terms of the 2004 Programmatic Agreement among the USFS R6, ACHP and SHP0, dated June 2004.

Civil Rights, Women, and Minorities

Environmental Justice, Executive Order 12898

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-include populations.

Hispanic or Latino occupies the largest sector of the minority populations in all counties, Union (3.2 percent), Umatilla (19.3 percent), and White Pine Nevada (12 percent) (U.S. Census Bureau). See Economics Report for more information.

Females are listed as the primary operator in 43.6 percent of the farms in White Pine County, as compared to 50.9 percent in Union and 48.7 percent in Umatilla County. The Forest Service does not maintain records on the minority status of permit holders and does not discriminate in the permitting process. The permit for this allotment is held by a corporation.

This project does not appear to generate a disparate impact on minority or low income populations, women, or minorities. The project alternatives, given the size of potential social and economic effects, are also not likely to result in civil rights impacts to Forest Service employees or customers of its programs.

Climate Change

The North End Analysis considered the effects of livestock grazing on both hydrologic function and climate change. Insufficient data are available to determine the extent to which grazing on North End Allotment may contribute to Climate Change, but the probability is that any contributions are immeasurable and insignificant. See full discussion above in the effects to climate change section.

Incomplete and Unavailable Information

Knowledge is, and always will be, incomplete regarding many aspects of terrestrial and aquatic species and their habitats, geology of specific areas, and the economy. However, the North End Allotment and the issues surrounding it have been studied for many years, and a substantial amount of credible information is known. The alternatives were evaluated using the best available information at the time. No missing information was deemed to be essential to a reasoned choice among alternatives being considered.

Irreversible and Irretrievable Commitments of Resources

There are no irreversible or irretrievable commitments of resources associated with implementing this project that are not already identified in the FEIS for the Forest Plan (USDA-FS 1990b).

Prime Farm Land, Range Land and Forest Land

The actions proposed would have no effect on park lands or prime farmlands, rangeland, and forest land as defined in FSH 1909.15 section 65.2. These kinds of land allocations or land capability either do not exist in the Analysis Area**Error! Bookmark not defined.** or would be unaffected by the proposed activities in the alternatives.

Unavoidable Adverse Impacts

Implementation of any of the alternatives would inevitably result in some adverse environmental effects. The severity of the effects can be minimized by adhering to the management requirements outlined in Chapter 2 of this document.

Short-term Uses and Long-Term Productivity

Short term uses are generally those that determine the present quality of life for the public. In this area, these uses include recreation, transportation, fish and wildlife habitat, livestock grazing, timber harvest, and utility corridors. Long term productivity refers to the land's capability to support sound ecosystems producing a continuous supply of resources and values for future generations. Short term uses could reduce the productivity of some portions of the National Forest. The long term productivity of the North End Allotment would be protected from unacceptable degradation by the standards and guidelines in the Forest plan, specific project design, and monitoring measures.

Public Health and Safety

There are no adverse effects expected to public health or safety under any of the alternatives. Sheep guard dogs are used to protect domestic sheep herds and can be aggressive towards people, but people rarely come into contact with the sheep herds on this allotment. The sheep herder is required to keep control of guard dogs at all times. Information about sheep guard dogs will be posted at information boards.

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Chapter 4 – Agencies and Persons Consulted

Recipients of the Draft EIS

The following is a list of agencies, organizations, and individuals receiving a copy the Draft North End Environmental Impact Statement or notification of web availability. The list includes those who requested copies or responded to the scoping efforts; the allotment permittee affected by the proposal, and required agencies.

Individuals and Organizations

Confederated Tribes of the Umatilla Indian Reservation
Double U Livestock, LLC
Forest Capital Partners, LLC
Forest Service Employees for Environmental Ethics
Gillespie Grazing
Harlow Sheep Co.
Hells Canyon Preservation Council
Idaho Wool Growers Association
John Day - Snake Resource Advisory Committee
Marie Bulgin
Morgan Olson
Nez Perce Tribe
Northwest Power Planning Council
Oregon Foundation for North American Wild Sheep
Oregon Wild
Packy Burns
Rick Isaacson

Agencies

Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Department of Forestry
Oregon Department of Land Conservation and Development
Oregon Department of Parks and Recreation
Oregon Department of Water Resources
Oregon Division of State Lands
Oregon Economic and Community Development
Oregon State Economist
Oregon State Geologist
Oregon State Governor's Natural Resource Policy Director
US Advisory Council on Historic Preservation
US Army Corp of Engineers, Northwest Division
US Coast Guard, Marine Environmental and Protection Division
US Environmental Protection Agency, Region 10

USDA APHIS, Environmental Analysis and Documentation
USDA APHIS, Policy and Program Development
USDA National Agricultural Library
USDA Natural Resources Conservation Service
USDA Office of Civil Rights
USDI Bureau of Land Management
USDI Office of Environmental Policy and Compliance
USDOC NOAA National Marine Fisheries Service, Habitat Conservationists Division
USDOC NOAA Office of Policy and Strategic Planning
USDOE Office of NEPA Policy and Compliance
USDOT Federal Aviation Administration, Northwest Mountain Region
USDOT Federal Highway Administration
Washington Department of Fish and Wildlife

Preparers and Contributors

The following agency personnel participated in the preparation of this Draft EIS.

Michael L. Rassbach, District Ranger
Contribution: Line Officer

Bradley A. Lathrop, Range Conservationist
Contribution: Rangeland Resources, Project Leader

Holly Harris, Wildlife Biologist
Contribution: Wildlife Specialist Report, Writer-Editor

Jill Bassett, Archaeologist
Contribution: Cultural Resources

Stacia Peterson, Hydrologist
Contribution: Hydrology Specialist Report

Craig Busskohl, Soil Scientist
Contribution: Soils Specialist Report

Katherine Ramsey, Fish Biologist
Contribution: Fisheries Specialist Report

Mark Darrach, Botanist
Contribution: Botanical Resources Specialist Report

Donna Mattson, Landscape Architect
Contribution: Recreation Specialist Report

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Appendices

Appendix A. Forest Plan Management Area goals and related range standards and guidelines.

Acres are based on existing allotment boundary. Acres by alternative are provided in a table below this section.

A2—OHV Recreation (3230 acres)

Goal: Provide motorized recreation in a predominantly natural or natural appearing environment with a moderate degree of isolation from sights and sounds of human activity.

Range Standard and Guideline: A moderate level of grazing is permitted. Improvement maintenance and development are permitted. Improvement development is not to detract from the Semi-primitive setting. The full range of management strategies[1] (B to D) could apply.

A3—Viewshed 1 (9400 acres)

Goal: Manage the area seen from a primary travel route, use area, or water body, where the forest visitors have a major concern for the scenic qualities (sensitivity level 1) as a natural appearing landscape.

Range Standard and Guideline: A moderate level of livestock grazing is permitted. Openings created by management of timber stands should be available for management as transitory range. Development and maintenance of range improvements are permitted. Range utilization standards, management practices, and improvements are to be designed and managed to meet visual quality objectives.

A4—Viewshed 2 (3800 acres)

Goal: Manage the area seen from a travel route, use area or water body where some forest visitors have a major concern for the scenic qualities (sensitivity level 2) as a natural appearing to slightly altered landscape.

Range Standard and Guideline: A moderate level of livestock grazing is permitted. Openings created by management of timber stands should be available for management as transitory range. Development and maintenance of range improvements are permitted. Range utilization standards, management practices, and improvements are to be designed and managed to meet visual quality objectives.

[1] Forest Plan range management strategy B is minimal use, C is extensive use, and D is intensive use. A maximum percent of annual utilization by big game and livestock is defined for each strategy. Refer to page 4-64 of the Forest Plan.

A5—Roaded Natural (1415 acres)

Goal: Provide dispersed recreation opportunities in an area characterized by a predominantly natural to near natural appearing environment with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment.

Range Standard and Guideline: Livestock grazing is permitted; all range management strategies are available consistent with visual and recreation goals. Openings created by management of timber stands are available for management as transitory range.

A6—Developed Recreation (1650 acres)

Goal: Provide recreation opportunities that are dependent on the development of structural facilities for user conveniences where interaction between users and evidence of others is prevalent.

Range Standard and Guideline: Domestic livestock grazing will ordinarily be excluded from developed sites. It will be allowed on certain sites at specified periods (i.e., sheep grazing on ski area slopes in summer) on a controlled basis to reduce fire hazard, and to maintain or improve the vegetation.

A8—Scenic Area (6 acres)

Goal: Protect or enhance the unique natural characteristics of landscapes notes for their scenic beauty.

Range Standard and Guideline: Light grazing is permitted with a B range management strategy. The emphasis for forage allocation is wildlife. Where range improvements are needed, design and implement improvements to be compatible with scenic area objectives.

A9—Special Interest Area (650 acres)

Goal: Manage, preserve, and interpret areas of significant cultural, historical, geological, botanical, or other special characteristics for educational, scientific, and public enjoyment.

Range Standard and Guideline: Domestic livestock may be permitted to utilize existing forage without changing overall natural characteristics or conflicting with the purpose of the area. Structural improvement, development, and maintenance is permitted where livestock use is allowed; structural improvements may be used to exclude domestic livestock.

B1—Wilderness (20,280 acres)

Goal: Manage to preserve, protect, and improve the resources and values of the forest wilderness, as directed by the Wilderness Act of 1964.

Range Standard and Guideline: Grazing of domestic livestock is permitted at places and approximate levels established prior to the effective date of wilderness classification. A level "B" or "C" strategy for range can apply. Sustained livestock grazing may be reduced if damaging to the resource. Existing livestock management improvements may be maintained. Structural range improvements may be built only when necessary to protect the resource (not to increase capacity).

C1—Dedicated Old Growth (3190 acres)

Goal: Provide and protect sufficient suitable habitat for wildlife species dependent upon mature and/or overmature forest stands, and promote a diversity of vegetative conditions for such species.

Range Standard and Guideline: Moderate levels of livestock grazing are permitted; however, forage in general will be limited to that which is normally present under densely forested canopies. Bedding by domestic sheep in dedicated old growth units will not normally be permitted. Maintain existing range improvement structures. Additional structural improvements are generally not permitted.

C2—Managed Old Growth (350 acres)

Goal: Provide and protect sufficient suitable habitat for wildlife species dependent upon mature and/or overmature lodgepole pine forest stands, and promote a diversity of vegetative conditions for such species.

Range Standard and Guideline: Moderate levels of livestock grazing are permitted; however, forage in general will be limited to that which is normally present under densely forested canopies. Bedding by domestic sheep in dedicated old growth units will not normally be permitted. Maintain existing range improvement structures. Additional structural improvements are generally not permitted.

C3—Big Game Winter Range Error! Bookmark not defined. (870 acres)

Goal: Manage big game winter range to provide high levels of potential habitat effectiveness and high quality forage for big game species.

Range Standard and Guideline: Domestic livestock grazing is permitted at Range Management Strategy C. All available range and livestock management practices with the primary management goal of maintaining or enhancing the big game winter ranges may be used. Structural improvements are permitted to the extent they are compatible with big game winter ranges. This may entail the use of let-down fences, etc.

C4—Wildlife Habitat (35,300 acres)

Goal: Manage forest lands to provide high levels of potential habitat effectiveness for big game and other wildlife species with emphasis on size and distribution of habitat components (forage and cover areas for elk, and snags and dead and down materials for all cavity users). Unique wildlife habitats and key use areas will be retained or protected.

Range Standard and Guideline: Domestic livestock grazing is permitted at Range Management Strategy C. All available range and livestock management practices may be used as long as consistent with the primary management goal of maintaining or enhancing the big game and all other species wildlife habitat. Structural improvements are permitted to the extent they are compatible with big game winter ranges. This may entail the use of let-down fences, etc.

C5—Riparian (Fish and Wildlife) (4720 acres)

Goal: Maintain or enhance water quality, and produce a high level of potential habitat capability for all species of fish and wildlife within the designated riparian habitat areas while providing for a high level of habitat effectiveness for big game.

Range Standard and Guideline: Intensive range management, including superior grazing systems, such as periodic rest, will be practiced to protect and improve riparian vegetation and anadromous fish and wildlife habitats. Periods of extended rest may be utilized in some situations where it is necessary to allow re-establishment of desired shrub communities. Meet forage utilization standards for riparian areas, found in the Range portion of Forest-wide-Standards and Guidelines. Range Management techniques that control livestock distribution and timing of use will be used to meet riparian habitat goals. Range improvements that maintain or enhance riparian habitat goals will be permitted. Improvements should be located to encourage livestock use away from the riparian areas. Grazing systems utilizing riparian pastures may be required to maintain water quality and protect riparian vegetation. Riparian corridor fencing should be considered on a limited basis for special applications.

C8—Grass-Tree Mosaic (820 acres)

Goal: On areas known as Grass-Tree Mosaic (GTM), provide high levels of potential habitat effectiveness, high quality forage for big game wildlife species, visual diversity, and protect erosive soils.

Range Standard and Guideline: Domestic livestock grazing is permitted at level C management strategy. All available range and livestock management practices may be used consistent with the primary management goals of maintaining or enhancing the big game winter ranges and summer ranges, and providing sufficient residual forage for big game species during the winter use period. Structural improvements are permitted to the extent they are compatible with big game management.

E2—Timber and Big Game (40,300 acres)

Goal: Manage forest lands to emphasize production of wood fiber (timber), encourage forage production, and maintain a moderate level of big game and other wildlife habitat.

Range Standard and Guideline: Manage range and livestock at Range Management Strategy C and D with improved management systems. The full range of development and maintenance of structural and nonstructural improvements is permitted. Seeding of forage species is permitted where tree establishment and growth are not restricted. Prescribed burning may be practiced to improve range forage conditions and trend.

F3—High Ridge Evaluation Area (880 acres)

Goal: To provide an administrative study area to evaluate the effects of timber harvesting activities on water quality and stream flow regimes.

Range Standard and Guideline: Livestock grazing will be permitted after timber operations are completed as long as grazing meets the objectives of the study.

F4—Walla Walla River Watershed (26 acres)

Goal: Provide high quantity and quality of water and elk habitat effectiveness while sustaining or enhancing other resource values. Management activities will not substantially change the level of water discharge from the National Forest during the May 1 through September 30 use period.

Range Standard and Guideline: Domestic livestock grazing is permitted at Range Management Strategy C. All available range and livestock management practices may be used where consistent with the primary management goal of maintaining or enhancing water quality and quantity and big game and other species' habitats. Meet the forage utilization standards for riparian and upland areas, as found in the Range portion of Forest-wide Standards and Guidelines. Structural improvements are permitted to the extent they are compatible with the management goal.

Walla Walla Ranger District
Figure 17. North End Allotment Management Areas

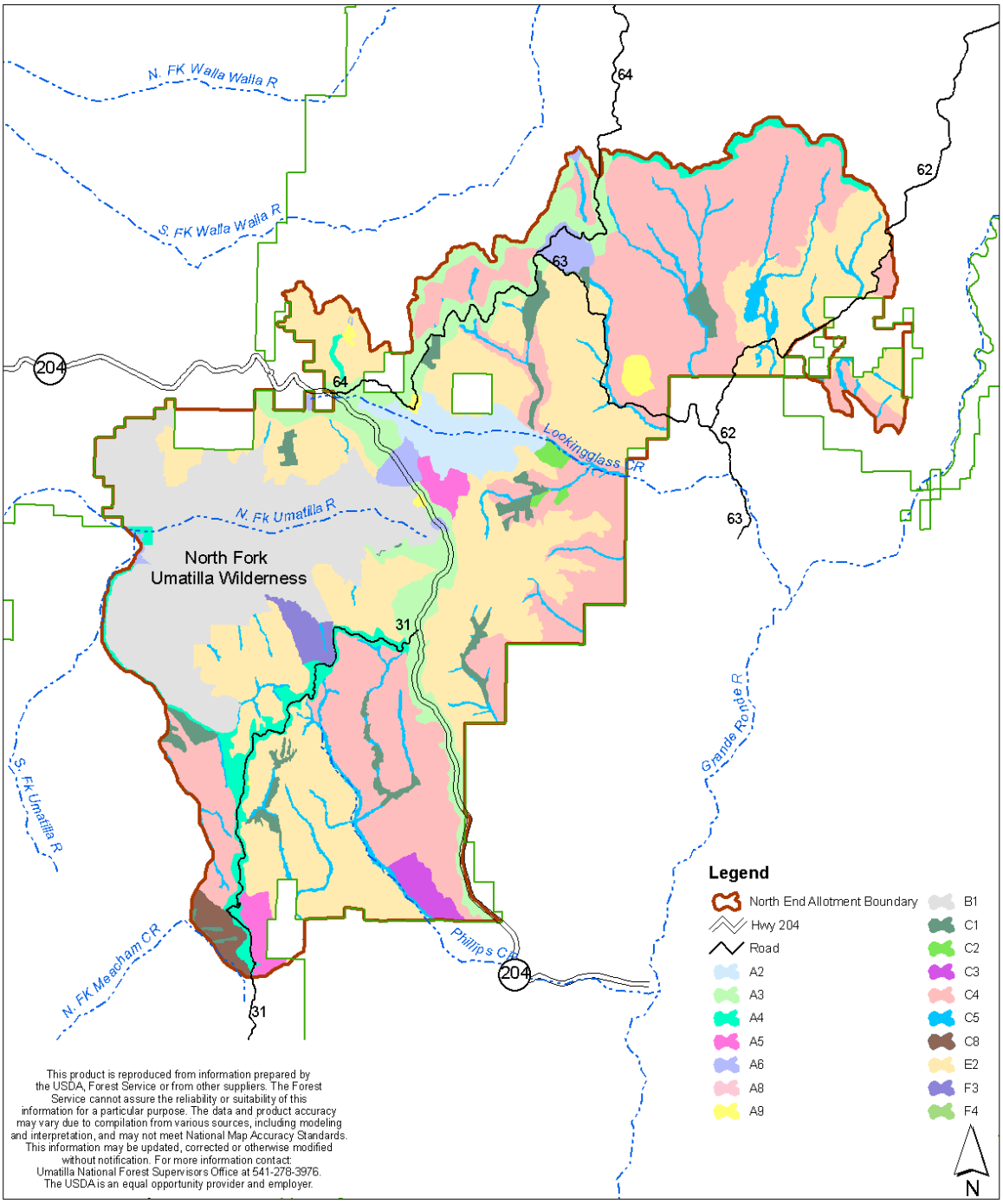

Table 32. Management Area acres by Alternative.

Management Area	Current Allotment	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
A2	3226	3226	1713	275	275	0
A3	9404	7841	4524	3332	3332	0
A4	3794	2936	2828	2471	2432	0
A5	1415	1415	1415	960	960	0
A6	1654	849	825	68	68	0
A8	6	0	0	0	0	0
A9	649	233	70	205	9	0
B1	20276	20246	20246	0	0	0
C1	3186	2756	2111	2487	1925	0
C2	349	349	345	345	345	0
C3	873	873	873	873	873	0
C4	35292	18841	15983	37048	15976	0
C5	4722	2627	2225	2657	2174	0
C8	820	820	820	5563	819	0
E2	40311	33744	24358	21554	21554	0
F3	881	881	881	881	881	0
F4	26	26	0	0	0	0
Other Ownership	5192	3470	2258	958	958	0
Total	132,075	101,138	81,478	79677	52581	0
Rounded	**132,000**	**101,000**	**81,500**	**79,600**	**52,600**	**0**

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Appendix B. Glossary of Terms and Acronyms.

AMP	Allotment Management Plan
AOI	Annual Operating Instructions
ATV	All-Terrain Vehicle
BA	Biological Assessment
BLM	Bureau Of Land Management
BMP	Best Management Practice
BO	Biological Opinion
CG	Campground
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
CWA	Clean Water Act
DEIS	Draft Environmental Impact Statement
DFC	Desired Future Condition
DSC	Detrimental Soil Conditions
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionary Significant Units
FEIS	Final Environmental Impact Statement
FR	Federal Register
FS	U.S. Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Geographic Information System
HCNRA	Hells Canyon National Recreation Area
HRV	Historic Range Of Variability
HUC	Hydrologic Unit Code
IDFG	Idaho Department Of Fish And Game
IIT	Interagency Implementation Team
IMPLAN	Impact Analysis for Planning (trademark name)
MA	Management Area
MOU	Memorandum Of Understanding
NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
ODEQ	Oregon Department of Environmental Quality

ODFW	Oregon Department of Fish And Wildlife
OWRD	Oregon Water Resources Department
PACFISH	Interim strategies for managing anadromous fish–producing watersheds in eastern Oregon, Washington, Idaho, and portions of California
PFC	Proper Functioning Condition
PL	Public Law
RAC	Resource Advisory Council
RHCA	Riparian Habitat Conservation Area
RMO	Riparian Management Objectives
RN	Roaded Natural
ROD	Record Of Decision
ROS	Recreation Opportunity Spectrum
RPA	Forest and Rangeland Renewable Resources Planning Act
SHM	Sheep Head Month
SHPO	State Historic Preservation Organization
SMS	Scenery Management System
SWS	Subwatershed
TMDL	Total Maximum Daily Load
TH	Trailhead
TR	Technical Reference
USC	United States Code
USDA	U.S. Department of Agriculture
USDC	U.S. Department of Commerce
USDI	U.S. Department of The Interior
USFWS	U.S. Fish And Wildlife Service
WDFW	Washington Department of Fish And Wildlife
WQMP	Water Quality Management Plan

Administrative site: All Forest Service owned buildings, building equipment, or space.

Affected environment: The natural, physical and human-related environment that would be sensitive to changes from implementation of the alternatives.

Allotment Management Plan (AMP): A long-term operating plan for a grazing allotment document prepared in consultation with the permittees involved that specifies the program of action for implementation of the forest plan as related to livestock grazing activities. Each allotment on National Forest System lands is required to have an Allotment Management Plan.

Allotment: Rangeland and /or forestland area designated for the use of a prescribed number and kind of livestock under a specific plan of management

Allowable utilization: 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 level of management. A baseline utilization percentage established in a Forest Plan.

Alternative: A mix of management prescriptions applied to specific land areas to achieve a set of goals and objectives. Each alternative represents a different way of achieving a set of similar management objectives.

Analysis area: One or more capability areas combined for the purpose of analysis in formulating alternatives and estimating various impacts and effects.

Annual Operating Instructions (AOI): A set of instructions developed by the US Forest Service and given to the Grazing Permittee on an annual basis, that explains the specific pastures to be used, and adjustments to the Allotment Management Plan for the current year.

Biotic community: The assemblage of native and exotic plants and animals associated with a particular site or landscape, including microorganisms, fungi, algae, vascular and herbaceous plants, invertebrates, and vertebrates. These assemblages and their biotic and abiotic relationships serve landscape and watershed functions by promoting soil properties supporting water infiltration and storage, energy and nutrient fixation, recycling and transfer, species survival, and sustainable population dynamics.

Aquatic : within water.

Available forage: That portion of the forage production that is accessible for use by a specified kind or class of grazing animal.

Bankfull: A specific location on a stream bank that corresponds to the water level with a recurrence interval of two years or less. Bankfull discharge largely controls the form of the watercourse. It is at this discharge level that stream waters just begin to flow over the banks and into the floodplain.

Bare Ground: All soil surfaces not covered by vegetation, rock or litter.

Beneficial uses: Different ways in which natural waters are used by humans and nature. Human uses include drinking water, bathing, recreation, agricultural, and industrial water supplies. Natural uses include growth and propagation of fish and associated aquatic life, wildlife, and furbearers.

Best Management Practices (BMP): A practice or combination of practices that are the most effective and practical means of achieving resource protection objectives (primarily water quality protection) during resource management activities.

Big game: Those species of large mammals normally managed as a sport hunting resources.

Bighorn sheep: A member of the species *Ovis canadensis* found throughout the mountains of western North America.

Biological Assessment: An assessment or study required by the Endangered Species Act of 1973 to determine the potential effects of a proposed management action on threatened and endangered species or their habitats. The U.S. Fish and Wildlife Service review Biological Assessments and requests that all threatened, endangered, proposed threatened or endangered, and Category 1 “candidate species be addressed.

Biological Evaluation: The legal record of finding for Pacific Northwest Regional Forester sensitive species.

Biotic integrity: is the capacity of the biotic community (plants, animals, and microorganisms occurring both above and below ground) to support ecological processes within the normal range of variability expected for the site, to resist a loss of capacity to support these processes, and to recover this capacity when losses do occur.

Browse: Leaf and twig growth of shrubs, woody vines, and trees available for use by animals. Also, to search for or consume browse.

Bryophytes: a division of nonflowering plants characterized by rhizoids rather than true roots and having little or no organized vascular tissue, such as mosses and liverworts.

Buffer zone (bighorn sheep): a defined and delineated space on a landscape established by wildlife managers to prevent contact and disease transmission between wild and domestic sheep and goats across a geographic space.

Buffer (PACFISH): a defined distance that sheep must stay from the stream.

Canopy cover: The percentage of ground covered by a vertical projection of the outermost perimeter of the natural spread by foliage of plants. Canopy cover is measured along a line intercept transect. Small openings within the canopy are included. The sum of canopy cover of several species may exceed 100 percent. (syn. Crown Cover).

Capability: is defined as the potential of an area to produce resources under an assumed set of management practices at a given intensity.

Channel morphology: Form and structure of stream bank which is that portion of the channel bank cross section that controls the lateral movement of water. Includes channel dimensions, patterns, and profile.

Close management: A specific management prescription that requires intensive monitoring of animals in a population whose long-term persistence is at risk.

Community type: An aggregation of all plant communities with similar structure and floristic composition.

Connectivity: Creating or maintaining networks of habitat that connect fragmented habitats, thus linking population segments of wildlife. Connectivity allows gene flow and enhances long-term species survival.

Consultation (Endangered Species Act): A process between a Federal agency and the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service that determines whether a proposed Federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Formal consultation is required if a proposed Federal action may affect a listed species or designated critical habitat, unless the Services concur in writing that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR §402.14].

Contact: Direct contact or close proximity between body parts of two animals during which a disease might be transmitted from one to another. In this document, "contact" typically refers to sheep nose-to-nose or face-to-face interaction that may lead to the transmission of respiratory disease via secretions or aerosols.

Cover: The area covered by the combined aerial or basal parts of plants and mulch expressed as a percent of the total area, percentage of ground area covered by aerial parts of live plants, litter, gravel and rocks.

Critical habitat: As defined under the Endangered Species Act, Critical Habitat is the area determined necessary for a listed species to make a successful recovery. Within the geographical area constituting critical habitat are the physical or biological features essential for the conservation of a species.

Cultural resource: Archaeological and cultural places of prehistoric and historic human activity including aboriginal mounds, forts, buildings, earth works, village locations, burial grounds, ruins, caves, petroglyphs, pictographs or other locations which are the source or prehistoric cultural features and specimens.

Cumulative effect: The impact on the environment resulting from the incremental impact of the action added to other past, present or future actions. They can also result from individually minor but collectively significant actions taking place over a period of time.

CWT: a centum weight, which is exactly 100 pounds.

Deferment: Delay of livestock grazing on an area for an adequate period of time, to provide for plant reproduction, establishment of new plants, or the restoration of vigor in existing plants. Generally defined as delay of grazing until the seed of the key forage species is mature.

Deferred grazing: The use of deferment in grazing management.

Deferred rotation: Any grazing system that provides for a systematic rotation of deferment among pastures. Moving grazing animals to various parts of a range in succeeding years or seasons to provide for seed production, plant vigor, and for seedling growth.

Density: The number of individuals per unit area. It is not a measure of cover.

Management Requirements. Actions intended to reduce or prevent undesirable effects to rangeland resources by livestock grazing and/or provide for the progression of existing conditions toward desired conditions.

Desired condition: The future condition of a landscape that meets management objectives. Desired condition is based on ecological (such as desired plant community), social, and economic considerations during the land and resource management planning process. Desired condition is usually expressed as ecological status or management status of vegetation (species composition, habitat diversity, age and size classes of species) and desired soil qualities (conditions of soil cover, erosion, compaction, loss of soil productivity).

Die-off: A large scale mortality event that impacts many animals from a population and may have significant demographic consequence to the long-term persistence of that population.

Direct effect: Effects on the environment that occur at the same time and place as the initial cause or action.

Disease: transmission of and exposure to infectious agents or congenital defects which interfere with normal functions of an animal.

Dispersal: the process where individuals leave one habitat or landscape to seek another habitat or landscape in which to live.

Diversity: The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan (National Forest Management Act Planning Regulation).

Drought: An extended period of below normal precipitation which causes damage to crops and rangelands; diminishes natural stream flow; depletes soil and subsoil moisture; and because of these effects, causes social, environmental, and economic impacts. To further define drought in quantitative terms that can be used to trigger the onset of drought, the use of the Society for Range Management's definition is recommended: "Prolonged dry weather when precipitation is less than 75% of the average amount."

Ecological process: an action that involves a series of stages that lead to an end result and involve interplay between organisms and their environment.

Ecological site: A kind of land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in its ability to produce vegetation and to respond to management.

Ecological status: The present state of vegetation of an ecological site in relation to the potential natural community for the site. Described in ecological terms, which are early seral, mid seral, and late seral.

Ecosystem: Organisms together with their biotic and abiotic environment, forming an interacting system and inhabiting an identifiable space.

Effective separation: spatial and/or temporal separation between wild sheep and domestic sheep or goats, resulting in (at most) a minimal risk of potential respiratory disease transmission (WAFWA 2010).

Effects: The results expected to be achieved from implementation of actions relative to physical, biological, and social (cultural and economic) factors resulting from the achievement of outputs. Examples of effects are tons of sediment, pounds of forage, person-years or employment, and income. There are direct effects, indirect effects, and cumulative effects.

Effects determinations (Endangered Species Act consultation):

Likely to Adversely Affect (LAA): a determination made when adverse effects to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial.

May Affect, Not Likely to Adversely Affect (NLAA): a determination made when any effects to listed species or designated critical habitat may occur, but are deemed discountable, insignificant, or beneficial.

No Effect (NE): A determination of NE is applicable if (a) there are no listed or proposed species or designated or proposed critical habitat occurring in the area, or (b) the project will have no direct or indirect effect whatsoever on listed or proposed species.

Endangered species: Any animal or plant species in danger of extinction throughout all or a significant portion of its range, as designated by the U.S. Fish and Wildlife Service or National Marine Fisheries Service under provisions of the Endangered Species Act.

Environment: The aggregate of physical, biological, economic, and social factors affecting organisms in an area.

Environmental Analysis: An analysis of alternative actions and their predictable long and short-term environmental effects. Environmental analyses include physical, biological, economic, social, and environmental design factors and their interrelations.

Environmental Consequences: A situation that naturally or logically follows as a result of an action. Commonly used in environmental impact statements for discussions about how the human environment, which includes the natural and physical environment and the relationship of people with that environment, is influenced by government actions.

Environmental Impact Statement (EIS): The documentation of environmental effects and action required for major Federal actions under Section 102 of the National Environmental Policy Act (NEPA), and released to the public and other agencies for comment and review. It is a formal document that must follow the requirements of NEPA, the Council on Environmental Quality (CEQ) guidelines, and directives of the agency responsible for the project proposal.

Ephemeral (stream): streams that flow only during and immediately after precipitation.

Erosion: The wearing away of the land's surface by water, wind, ice, or other physical processes. It includes detachment, transport, and deposition of soil or rock fragments.

Exclosures: generally structures areas designed to exclude animals from a specific area.

Floodplain: The area adjacent to the active stream channel which is inundated during flows that exceed bankfull level. The floodplain acts as an energy dispersion zone during flood flows, and functions as an area of deposition.

Flow: see stream flow

Foliage: The green or live leaves of plants.

Forage production: Weight of forage produced within a designated period of time on a given area.

Forage: Browse and herbage which is available to and may provide food for grazing animals or be harvested for feeding, to search for or consume forage.

Forb: Any broad- leafed, herbaceous plant other than those in the Poaceae (grass) Cyperaceae (sedge) and Juncaceae (rush) families.

Frye: Newly hatched, active feeding post larval fishes; may include all fish stages from hatching to fingerling

Functioning Appropriately (proper functioning condition)**:** Riparian-wetland areas are functioning appropriately when adequate vegetation, landforms, or large woody debris is present to (1) dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; (2) filter sediment, capture bed load, and aid floodplain development; (3) improve flood-water retention and ground-water recharge; (4) develop root masses that stabilize stream bank against cutting action; (5) develop diverse ponding and channel characteristics to provide the habitat and water depth, duration and temperature necessary for fish production, waterfowl breeding, and other uses, and (6) support greater biodiversity (USDI Bureau of Land Management 1995). See also Proper Functioning Condition.

Functioning at Risk (proper functioning condition)**:** Riparian-wetland areas that are in a functional condition but an existing soil, water, or vegetation attribute categorizes them with a reversible loss in capability and increased vulnerability to irreversible degradation based upon evaluation of current conditions and processes. See also Proper Functioning Condition.

Geographic Information System (GIS): A computer software platform designed to facilitate the assembly and analysis of diverse data sets pertaining to specific geographic areas using spatial locations of the data as the basis for the information system

Goal: The desired state or condition that a resource management policy or program is designated to achieve. Narrower and more specific than objectives, goals are usually not measurable and may not have specific dates by which they must be reached. Objectives are developed by first understanding one's goals.

Grass: Plants of the Gramineae family, usually herbaceous plants with narrow, parallel-veined, two-ranked leaves.

Grassland: Lands on which the vegetation is dominated by grasses, grasslike plants, and/or forbs.

Grazing: Consumption of native forage from rangelands or pastures by livestock or wildlife.

Grazing allotment: An area where one or more livestock operators graze their livestock. An allotment generally consists of federal land but may include parcels of private or state-owned land.

Grazing management: The manipulation of grazing animals to accomplish desired results when considering of animal, plant, land, or economic responses.

Grazing permit: Official written permission to graze a specific number, kind, and class of livestock for a specified time period on a defined rangeland.

Grazing season: (1) On public land, an established period for which grazing permits is issued. (2) The time interval when animals are allowed to utilize a certain area.

Grazing system: A specialization of grazing management, which defines the periods of grazing and non-grazing. Grazing system should consist of at least the following: the number of pastures; number of herds; length of grazing period; length of non- grazing periods for any given unit in the system. Examples are Deferred Rotation and Rest Rotation.

Greenline: The first perennial vegetation from the water's edge. Riparian areas that are in high seral status with stable stream banks will exhibit a continuous line of vegetation at the bankfull discharge level. Rocky stream types may have a significant amount of rock causing breaks in the vegetation. This rock is considered part of the green line. Other breaks may occur in the first perennial band of vegetation (watercourses or bare ground). The amounts of these (perennial vegetation, rock, and bare ground) should be recorded.

Ground cover: The percentage of material, other than bare ground and erosion pavement, covering the land surface. It may include live vegetation, standing dead vegetation, litter, cryptograms, and rock over ¾ inch. Ground cover plus bare ground would total 100 percent.

Habitat type: The collective area which one plant association occupies or will come to occupy as succession advances, based on the vegetation and its associated environment.

Head month: Tenure of one herbivore on National Forest for a period of one month.

Headwaters: the most extreme upstream areas of a watershed.

Herbaceous: Vegetation growth with little or no woody components, such as graminoids and forbs.

Herding: A strategy for managing livestock where the manager maintains the animals in a "herd" and moves them from area to area as a group.

Hydrologic function: The ability of a stream to transport water and sediment in a balanced condition. The degree and rate of transport is the result of the natural watershed characteristics, including precipitation, geology, landforms, and vegetation. These characteristics have defined over time, average conditions of stream flow, quantity and character of sediment moving through the system, and composition of the materials forming the bed and banks of the channels. Stream systems that are in a balanced condition exhibit a relatively stable channel structure with only minor annual changes. Also, the ability to safely capture, store and release water in a system.

Impacts: The effect of one thing upon another. Impacts may be beneficial or adverse. See "Effects" and "Environmental Consequences."

Indicator species: A species selected because its population changes indicate effects of management activities on the plant and animal community. A species whose condition can be used to assess the impacts of management actions on a particular area.

Indirect effects: Secondary effects which occur in locations other than the initial action, significantly later in time, or to one resource that in turn, affects another resource. i.e.: effects to vegetation that may reduce prey species for a raptor.

Infiltration rate: Rate of absorption and downward movement of water into the soil layer.

Interaction: Direct contact or close proximity between two or more entities. As related to sheep, interaction typically refers to nose-to-nose or face-to-face interaction that may lead to the transmission of respiratory disease via secretions or aerosols. Synonymous with "Contact".

Interested public: An individual, group or organization that has submitted a written request to the authorized officer to be provided an opportunity to be involved in the decision making process for the management of livestock grazing on specific grazing allotments or has submitted written comments to the authorized officer regarding the management of livestock grazing on a specific allotment.

Intermittent stream: A stream that does not flow year-round, but does interact with a water table to receive groundwater outflow during part of the year.

Interpreting Indicators of Rangeland Health: A qualitative approach to analyze the health of the biotic, hydrologic and soils of a rangelands using 17 indicators, a team of professional ecologists, and references to pristine rangeland conditions for the site evaluated.

Introduced species: A non-native species that has been intentionally or unintentionally released into an area as a result of human activity.

Invasive plant: An alien plant species whose introduction does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13122, 2/3/99). Used interchangeably with "noxious weed."

Invasive species: A non-native species introduced into an ecosystem as a result of human activities.

Issue: An "issue" is defined as a point of discussion, debate, or dispute about the environmental effects of the proposed action. It may represent an "unresolved conflict."

Key area: A relatively small portion of rangeland which because of its location, grazing or browsing value, and/or use, serves as a monitoring and evaluation site. (A key area guides the general management of the entire area of which it is a part, and will reflect the overall acceptability of current grazing management over the range.)

Key issue: relevant issues most important to the decision at hand.

Landscape scale: A scale of ecological evaluation that includes multiple habitats, ecosystems, and land uses.

Listed species: Any species of fish, wildlife, or plant determined to be endangered or threatened and listed under Section 4 of the ESA.

Litter: The uppermost layer of organic debris on the soil surface, essentially the freshly fallen or slightly decomposed vegetal material.

Macroinvertebrate: An invertebrate animal (animal without a backbone) large enough to be seen without magnification.

Management Indicator Species (MIS): see "Indicator Species."

Meta-population: An assemblage of populations, or a system of local populations (demes) connected by movement of individuals (dispersal) among various population segments.

Migration or **migratory**: A term used to refer to the movement of individuals or genes (gene flow) across a landscape; typically refers to movements from one seasonal habitat to another, or between breeding and non-breeding habitats.

Mitigation measures: Planning actions taken to avoid an impact altogether, to minimize the degree or magnitude of the impact, reduce the impact over time, rectify the impact, or compensate for the impact (40 CFR 1508.20). Mitigation is defined as "measures designed to reduce or prevent undesirable effects" and is used to reduce adverse environmental effects below the "significance" level and resolve issues and concerns.

Monitoring: (Grazing Activities) The practice of tracking the utilization rates and overall effects of grazing over time, through repeated collection of data. Food plants are examined and measured to determine what percentage has been eaten, trampled, or lost to other causes. Other plants in the area (e.g., willows and other woody species) are examined, and observations are recorded regarding trampling or other damage. Records are maintained of livestock stocking rates (number of cattle per unit of area per unit of time), and all changes are recorded. Significant climatological events are noted (e.g., hard freezes, heavy rains, floods, droughts, high temperatures).

National Environmental Policy Act (NEPA): The Act which declared a National policy to encourage productive and enjoyable harmony between humans and their environment, to promote efforts that will prevent or eliminate damage to the environment and biosphere, to stimulate the health and welfare of humans, to enrich our understanding of the ecological systems and natural resources important to our Nation; and to establish a Council on Environmental Quality.

NEPA analysis: Analysis conducted during the preparation of documents required under the National Environmental Policy Act, particularly environmental assessments and environmental impact statements.

National Forest Management Act (NFMA): A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act, which requires the development of Regional and Forest plans and the preparation of regulations to guide that development.

National Forest System (NFS): All National Forest land reserved or withdrawn from the public domain of the United States; all National Forest lands acquired through purchase, exchange, donation, or other means; the National Grasslands and land utilization projects administered under Title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 U.S.C. 1010-1012); and other lands, waters, or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system.

Native species: Species that are a part of the original fauna or flora of an area.

Neotropical migratory birds: Birds that breed in the United States and Canada and later migrate south to Central and South America, Mexico, and the Caribbean islands. These birds include almost half of the bird species that breed in the United States and Canada.

Non Point Source pollution (NPS): pollution caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water. These pollutants include: excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas; oil, grease, and toxic chemicals from urban runoff and energy production; sediment from improperly managed crop and forest lands, and eroding stream banks; salt from irrigation practices and acid drainage from abandoned mines; bacteria and nutrients from livestock, and other animal wastes.

Noxious weed: a plant designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof." (FSM 2080.5)

Objective: The planned results to be achieved within a stated time period. Objectives are subordinate to goals, narrow in scope, and shorter in range. Objectives must specify time periods for completion, and products or achievements that are measurable.

Overgrazed: Continued heavy grazing that exceeds the recovery capacity of the community and creates a deteriorated range.

PACFISH: Interim strategies for managing anadromous fish-producing watersheds in Eastern Oregon and Washington, Idaho, and portions of California.

Palatability: The relish an animal shows for a particular plant as forage. This varies with succulence, fiber content, nutrient and chemical content, and morphological features such as spines or thorns. Palatability and preference are sometimes incorrectly used interchangeably.

Pasture: a subdivision of area within an allotment usually delineated by topographical features or fences. In this allotment, pastures are not fenced.

Perennial (plants)**:** One with a life cycle of three or more years.

Perennial (stream): Perennial stream means a well-defined channel that contains water year round during a year of normal rainfall with the aquatic bed located below the water table for most of the year. Groundwater is the primary source of water for a perennial stream, but it also carries storm water runoff. A perennial stream exhibits the typical biological, hydrological, and physical characteristics commonly associated with the continuous conveyance of water.

Permittee (Range Permittee): an individual who has been granted a Federal permit to graze livestock for a specific period on a range allotment

Plant association: A kind of climax plant community consisting of stands with essentially the same dominant species in corresponding layers.

Plant community: An assemblage of plants occurring together at any point in time, thus denoting no particular ecological status.

Plant composition: The proportions of various plant taxa in relation to the total on a given area. It may be expressed in terms of cover, density, or weight.

Potential for contact (sheep): a relative measure based on distance, topography, vegetation, roads, past straying, bighorn sheep radio telemetry and movements, and local knowledge. See also "contact".

Preferred alternative: The alternative that is disclosed by the selecting official as the alternative that is most likely to be selected for implementation, when a Draft Environmental Impact Statement is submitted to the public.

Prescribed fire: Prescribed fire (Rx fire) is defined as fire applied in a knowledgeable manner to forest fuels on a specific land area under selected weather conditions that produce the fire behavior and fire characteristics required to attain planned fire treatment and resource management objectives to accomplish predetermined, well-defined management objectives.

Prescription: Management practices selected to accomplish specific land and resource management objectives.

Project area: Area of analysis for this proposal.

Project file: An assemblage of documents that contain all the information developed or used during an environmental analysis, and is summarized in an Environmental Impact Statement. The file is part of the administrative record.

Proper Functioning Condition (PFC): Refers to riparian or wetland areas. A riparian or wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to: 1) dissipate stream energy; 2) filter sediment, capture bed load, aid in floodplain development; 3) improve flood-water retention and ground-water recharge; 4) develop root masses that stabilize stream banks; 5) develop diverse ponding and channel characteristics to provide habitat for wildlife; and 6) support greater biodiversity.

Proposed action: In terms of the National Environmental Policy Act, the project, activity, or action that a Federal agency proposes to implement or undertake. The proposed action is sent to the public, and interested agencies for their review and comment. Comments are then used to develop alternatives to the proposed action.

Public land: Land owned by the federal government with multiple uses and intended for public use.

Range allotment: A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System lands and associated lands administered by the Forest Service.

Range condition: A generic term relating to present status of a unit of range in terms of specific values or potentials. Specific values or potentials must be stated. Also defined as the present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site.

Rangeland health: The status or stage of condition of an area based on what is expected of the area. The condition is based in biotic, hydrologic and soil factors.

Range improvement. Any activity or program on or relating to rangelands which is designed to improve production of forage; change vegetative composition; control patterns of use; provide water; stabilize soil and water conditions; and provide habitat for livestock and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical means to accomplish the desired results (Public Rangelands Improvement Act of 1978, 43 U.S.C. 1902). The following types are included:

Range improvement (Nonstructural): Practices and treatments undertaken to improve range or facilitate livestock management, excluding structural improvements, such as seeding, spraying, and chaining.

Range improvement (Structural): Improvements requiring construction or installation to improve the range or facilitate livestock management, such as fences, wells, reservoirs, pipelines, and stock tanks.

Range management: The science and art of planning and directing rangeland use in order to obtain maximum sustained economic livestock production consistent with the conservation and/or improvement of the related natural resources: soil, water, vegetation, wildlife and recreation. Scientific range management stands on the premise that the range resources can be improved and grazed perpetually by domestic stock and, at the same time, produce high-quality watershed, wildlife, recreation and, where suitable, forest products.

Range of variability: The range of sustainable conditions in an ecosystem which is determined by time, processes (such as fire), native species, and the land itself. For instance, ecosystems that have a 10 year fire cycle have a narrower range of variation than ecosystems with 200-300 year fire cycle. Past management has placed some ecosystems outside their range of variability. (Also called the historic range of variability or natural range of variation.)

Range or rangeland: All land-producing or capable-of-producing native forage for grazing and browsing animals and lands that have been revegetated naturally or artificially to provide a forage cover that is managed like native vegetation. It includes all grasslands, shrublands, and those forest lands which continually or periodically, naturally or through management, support an understory of herbaceous or shrubby vegetation that provides forage for grazing or browsing.

Rangeland project decision. A project level NEPA decision. Refer to FSH 2209.13, section 93.

Reach (stream): An expanse of a stream channel.

Record of Decision (ROD): A concise public document separate from but associated with an environmental impact statement that publicly and officially discloses the responsible (decision making) official's decision (and rationale for the decision) about the alternatives assessed in the environmental impact statement, and the alternative chosen to implement.

Recovery plan: A document drafted by the US Fish & Wildlife Service or other knowledgeable individual or group, that serves as a guide for activities to be undertaken by Federal, State, or private entities in helping to recover and conserve endangered or threatened species. Recovery plans typically include a listed species life history and current status, habitat requirements and availability, factors which limit the species survival, conservation measures currently in place, and specific management objectives that will facilitate recovery of the species.

Redds: Most salmonids deposit their eggs in nests called redds, which are dug in the streambed substrate by the female. Most redds occur in predictable areas and are easily identified by an experienced observer by their shape, size, and color (lighter than surrounding areas because silt has been cleaned away). Spawning surveys utilize counts of redds and fish carcasses to estimate spawner escapement and identify habitat being used by spawning fish. Annual surveys can be used to compare the relative magnitude of spawning activity between years.

Rest rotation: A system in which one part of the range is ungrazed for an entire grazing year or longer, while other parts are grazed for a portion, or perhaps all, of a growing season.

Rest: Leaving an area ungrazed, thereby foregoing grazing of a forage crop. Normally, rest implies absence of grazing for a full growing season.

Rill: A very small steep sided channel carrying water. This landscape feature is intermittent and forms for only a short period of time after a rainfall.

Riparian area: Area with distinctive soils and vegetation located between a stream or other body of water and the adjacent upland. It includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation. Riparian ecosystems are distinguished by the presence of free water within the common rooting depth of native perennial plants during at least a portion of the growing season. Riparian ecosystems are normally associated with seeps, springs, streams, marshes, ponds, or lakes. The potential vegetation of these areas commonly includes a mixture of water (aquatic) and land (phreatic) ecosystems.

Riparian soils: Soils that occur in land types and valley bottoms that have the potential to support wetland and riparian vegetation. These soils are flooded, ponded, or saturated with water for usually a week or more during the period when soil temperatures are above biologic zero (41° Fahrenheit).

Riparian vegetation: Plant communities dependent upon the presence of free water near the ground surface (high water table).

Salting : (1) Providing salt as a mineral supplement for animals. (2) Placing salt on the range in such a manner as to improve distribution of livestock grazing.

Scoping: The Council on 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" (40CFR 1501.7). Among other things, the scoping process is used to invite public participation, to help identify public issues, to obtain public comment at various stages of the analysis process, and to determine the range of actions, alternatives, and impacts to be addressed; identification of significant issues related to a proposed action; and the depth of environmental analysis needed.

Season of use: The time during which livestock grazing is permitted on a given range area, as specified in the grazing permit.

Sediment: Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site or origin by air, water, gravity, or ice.

Sedimentation: The process of depositing solid fragmented material, such as silt and sand, which is transported and deposited by water, ice, or wind.

Sensitive species: All species that are under status review, have small or declining populations, or live in unique habitats. In the Forest Service, sensitive species are designated by Regional Foresters.

Separation effectiveness: see effective separation

Seral Stages: The developmental stages of an ecological succession.

Seral: Pertaining to the successional stages of biotic communities.

Sheep Head Month (SHM): Tenure of one sheep (ewe/lamb pair) on National Forest for a period of one month.

Shrub: A plant with persistent, woody stems and relatively low growth. Generally produces several basal shoots (stems) and many branches.

Soil and site stability: The capacity of an area to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water.

Soil compaction: A physical change in soil properties that results in a decrease in porosity and an increase in soil bulk density and soil strength.

Soil productivity: the capacity of a soil, in its normal environment, to support plant growth.

Spatial separation: A defined physical distance between animal populations.

Spawning: the production or depositing of eggs by aquatic organisms. Depending on the species many fish spawn in different methods and at different times of the year.

Species composition: Proportions of various plant species in relation to the total on a given area. Proportions may be expressed in percentages based on weight, cover, density, etc.

Stability: The ability of the channel banks and bottom to resist the erosive powers of flowing water. Inherent stability refers to the potential stability of a riparian system.

Stable: The condition of little or no perceived change in plant communities that are in relative equilibrium with existing environmental conditions; describes persistent but not necessarily culminating stages (climax) in plant succession. Implies a high degree of resilience to minor perturbations.

Stray: A domestic sheep or goat physically or temporally separated from its associated flock or band.

Stream bank: Sides of the stream channel.

Stream channel: Long trough-like depression that is normally occupied by the water in a stream.

Stream discharge: A river or stream's rate of flow over a particular period of time. Usually measured and expressed in cubic feet per second. Stream discharge depends on the volume and velocity of the flow.

Stream flow: The rate at which water travels in a river or stream channel.

Stream substrate: The mineral and/or organic material that forms the bed of the stream. The composition of the streambed (substrate) is an important factor in understanding how a stream functions. It influences channel form and hydraulics, erosion rates, sediment supply, and habitat conditions for fish and other aquatic organisms. Simply put, steep mountain streams with beds of boulders and cobbles will act differently than low-gradient streams with beds of sand or silt. Therefore, measurement of every sample point should include a basic characterization of bed material.

Stressor: A specific action or condition that causes an animal to experience stress and the subsequent physiological results of that stress.

Structure: How the parts of ecosystems are arranged, both horizontally and vertically. Structure might reveal a pattern, or mosaic, or total randomness of vegetation.

Stubble height: Residual vegetation/stubble height is that measure of the herbaceous vegetation remaining at the end of the growing season just prior to winter dormancy. Stubble height is the average height measured from the soil surface to the height of actively growing leaves. A 4-inch stubble height is a direct measurement indicating that a forage plant is clipped off or broken at 4 inches above the ground. Stubble height can serve as an indirect indicator of trampling, soil compaction, stream bank damage, and shrub browsing, as well as a direct measure of herbaceous plant defoliation.

Substrate: Inorganic materials that comprises the bottom and banks of a watercourse. See stream substrate.

Succession (plant)**:** the gradual supplanting (replacement) of one community of plants by another in a particular ecosystem or landscape following a disturbance.

Seral stage: Seral stages are described as early, mid, or late in relation to the potential natural community that would occur over a long period of time absent of disturbance.

Suitability: The appropriateness if 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 (passed). A unit of land may be suitable for a variety of individual or combined management practices.

Suitable habitat: Landscape that has all necessary habitat requirements to sustain a population through time.

Summer range: Range that is grazed during the summer months.

Temporal separation: Segregating animal populations over time to prevent contact, such that they may occupy the same physical space but at different times.

Term grazing permit: Official written permission to graze a specific number, kind, and class of livestock for a specified time period (usually for a ten-year term) on a defined rangeland, in which the land (allotment) contains only federal land.

Terrestrial: Living on land.

Threatened and Endangered Species (TES): Species identified by the Secretary of Interior in accordance with the 1973 Endangered Species Act, as amended.

Threatened species: Any plant or animal species likely to become endangered within the foreseeable future throughout all or a part of its range as designated by the U.S. Fish and Wildlife Service or National Marine Fisheries Service under the Endangered Species Act. See Endangered Species.

Total Maximum Daily Load (TMDL): The sum of the individual waste load allocations for point sources and load allocations for both nonpoint sources and natural background sources established at a level necessary to achieve compliance with applicable water quality standards [75-5-103(32) MCA]. In practice, TMDLs are water quality restoration targets for both point and nonpoint sources that are contained in a water quality restoration plan or in a permit.

Trailing: The planned ambulatory movement of domestic sheep across a landscape or within a corridor to reach a destination where grazing or use will be allowed.

Transmission (disease)**:** The physical transfer (direct or indirect mechanisms) of a disease agent from one animal to another, either within an animal population or between animal populations. In some instances, transmission can lead to full expression of disease in individuals or populations.

Trend: The direction of change in a plant community or a measured attribute of that plant community as observed over time. The change in direction could be in vegetation, ground cover, or noxious plants, non-native invasive plant species features over time. Most of the time trend should be described as "meeting", "moving toward", or "not meeting" a desired plant community.

Unoccupied habitat: Suitable habitat in which an animal population does not currently exist.

Unsatisfactory range condition: Unsatisfactory Range Condition exists when the desired condition is not being met and short term objectives are not being achieved to move the range toward the desired condition.

Unsuitable habitat: Landscape that does not provide all necessary habitat requirements to sustain an animal population through time.

Uplands: Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the foot slope zone of the hill slope continuum.

Use: (1) The proportion of current year's forage production that is consumed or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole, degree of use. (2) Utilization of range for a purpose such as grazing, bedding, shelter, trailing, watering, watershed, recreation, forestry, etc.

Utilization standards: Standards established to guide the use and removal of forage and measured in terms of the percent of the plant that is removed.

Vector: Literally 'a carrier'. An animal, vehicle, wind, water course, etc. carrying seeds of noxious weeds.

Vegetation management: Activities designed primarily to promote the health of forested and non-forested vegetation for multiple-use purposes.

Vegetation type: A plant community with distinguishable characteristics.

Vegetation: Plants in general, or the sum total of the plant life above and below ground in an area.

Vegetative: Relating to nutritive and growth functions of plant life, in contrast to reproductive functions. Should not be confused with vegetation.

Viability: The demographic and genetic status of an animal population whereby long term persistence is likely.

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.

Water quality: The physical, biological and chemical components of stream or lake waters and the degree to which their combined characteristics support beneficial uses.

Watershed: A topographically discrete unit or stream basin that includes the headwaters, main channel, slopes leading to the channel, tributaries and mouth area. The land area from which surface runoff drains into a stream, channel, lake, reservoir, or other body of water; also called a drainage basin.

Weed: Any unwanted or undesirable plant, whether grass, forb, shrub or tree.

Wet meadow: A meadow where the surface remains wet or moist throughout the growing season, usually characterized by sedges and rushes.

Wild ungulate: Hoofed animals such as deer, elk, moose, and big horn sheep

Winter range: Range that is grazed during the winter months.