United States
Department of
Agriculture

Forest Service

Pacific Northwest
Region

Colville National Forest

Three Rivers Ranger
District

Kettle Falls, WA

Aladdin Allotment Complex

Environmental Assessment

March 2005

ALADDIN ALLOTMENT COMPLEX

ENVIRONMENTAL ASSESSMENT

Three Rivers Ranger District
Colville National Forest
Stevens and Pend Oreille Counties, Washington

March 2005

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CHAPTER 1. PURPOSE AND NEED FOR ACTION

Summary

The Colville National Forest proposes to authorize continued livestock grazing on the Aladdin, Meadow Creek, and Smackout Creek Allotments (the Aladdin Allotment Complex) under the Aladdin, Meadow Creek, and Smackout permit. The project planning area is located approximately ten miles northeast of Colville, Washington. It is within the Three Rivers Ranger District and within three watersheds: North Fork Deep Creek, South Fork Deep Creek, and the North Fork Mill Creek (see Figure 1-1).

The proposed action (Alternative 3, discussed in detail in Chapter 2) would adjust livestock use that affects resource-sensitive areas around streams, streambeds, and wet meadows. Redistributing the livestock presence would be accomplished by providing alternative water sources (troughs) to reduce the use of streams; sensitive areas would be protected (armoring stream crossings, creating barriers, constructing a temporary fence).

This action is needed because there is an ongoing demand for grazing on these allotments, and because the existing management needs to comply with the Forest Plan, as amended. If grazing is to continue, changes need to be made to grazing practices to improve unsatisfactory resource conditions on Smackout Creek, specifically water quality and riparian[1] habitat, caused by livestock grazing.

Two central needs initiated the development of this environmental assessment (EA):

- The National Environmental Policy Act (NEPA) requires a specific process to be followed before proposed Federal actions can be implemented. The process includes analysis of the proposed actions and any alternatives to the proposed actions, as well as disclosure of environmental effects of the alternatives.
- The 1995 Rescission Act requires that all allotment management plans (AMPs) on National Forests be placed on a 15-year schedule for updating. The Aladdin Allotment Complex AMPs are outdated and do not comply with the Forest Plan, as amended.

Two of the purposes of this document are:

- To provide the decision-maker with a basis for comparing the alternatives that have been developed for the Aladdin Allotment Complex project.
- To disclose potential environmental effects associated with each of the alternatives to assist the decision-maker in making an informed decision about future forest management within the Aladdin Allotment Complex planning area.

This EA also serves as the AMP for these three allotments (see below).

[1] "Riparian" refers to a zone of direct interaction between land and water environments; it includes a perennial or ephemeral stream channel, a zone within the flood plain dominated by water-loving plants and an upland area where vegetation and microclimate are influenced by perennial or intermittent water tables and the ability to store water (Obedzinski et al 2001).

The Forest Service also evaluated the following alternatives:

- A no-change alternative: grazing would continue unchanged and existing AMPs would remain in place. Permits would not be modified; existing improvements would be maintained; new improvements would not be constructed.
- A no-grazing alternative: all grazing would end; grazing permits would be cancelled; and existing range improvements would not be maintained.

Based on a consideration of the effects of the alternatives, the responsible official will decide whether grazing should continue on the three allotments and, if so, what mitigation measures and monitoring requirements would be necessary.

Introduction

The Aladdin Allotment Complex contains lands suitable for domestic livestock grazing. Where consistent with other multiple-use goals and objectives, there is Congressional intent to allow grazing on suitable lands[2]. It is Forest Service policy to make forage available to qualified livestock operators, consistent with land management plans (Forest Plans) (Forest Service Manual 2203.1). On the Colville National Forest, National Forest System (NFS) lands that are suitable for livestock grazing are identified in the Land and Resource Management Plan, Colville National Forest (Forest Plan) (USDA FS 1988c, pages 4-69 – 4-122).

Livestock grazing on NFS lands is authorized and managed by allotment management plans (AMPs), grazing permits, and specific annual operating instructions (AOIs). The AMP is based on the site-specific objectives, management practices, and range improvements that have been identified in an environmental analysis of the area and documented in an environmental assessment (EA).

" . . . [the AMP] integrates the actions needed to manage rangeland resources for livestock grazing and soil protection. It also integrates resource objectives, standards, guidelines, and management requirements for soil and water for watershed protection, wildlife and fisheries, recreation, timber, and other resources on lands within a range allotment or on a wild horse or burro territory. An allotment management plan is the primary document which guides implementation of forest plan direction for rangeland resources and, as such, must conform to, and be consistent with, the management direction contained in the forest plan" (Forest Service Manual 2200.98.2).

The actual grazing of livestock is authorized through grazing permits. A grazing permit is a written authorization issued to a specified party to graze a specified number of livestock on a defined parcel of National Forest System land (usually a grazing allotment) for a specified season of use. The terms and conditions in the permit further define the requirements for holding the permit.

[2] Multiple-Use Sustained Yield Act of 1960; Forest and Rangeland Renewable Resource Planning Act of 1974; Federal Land Policy and Management Act of 1976; National Forest Management Act of 1976.

The permit is issued for a term of ten years. During the term, the permit may be periodically amended with management actions that are needed to ensure compliance with the AMP, the Forest Plan, and other laws and regulations. When the permit expires, it can be renewed or terminated. If it is renewed, the permit's terms may be changed. If there is a significant change in environmental effects, a new environmental analysis would be required.

The permittee and the Forest Service agree on the AOI, which is reviewed annually and modified as needed. The AOI defines how the range will be managed for that grazing season. It typically includes on-off dates, the total number of livestock allowed that season, required range improvements, pasture rotation sequence and timing, and other items. The AOI is reviewed annually, and becomes part of the grazing permit.

About This Document

This environmental assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA), as amended; NEPA regulations (36 CFR 1500-1508), Forest Service guidelines for implementing NEPA (Forest Service Manual 1950, Forest Service Handbook 1909.15; the Seeding and Planting Guide for the Colville National Forest (April 18, 2000); procedures for notice, comment, and appeal for National Forest System projects (36 CFR 215); and other related statutes and orders.

The Aladdin Allotment Complex AMP EA tiers to the following documents:

1. The Final Environmental Impact Statement, Land and Resource Management Plan, Colville National Forest (USDA FS 1988a), as amended by INFISH. Chapter 4 of the Forest Plan addresses management direction for livestock grazing on National Forest System land.
2. The Record of Decision (ROD) for the Forest Plan FEIS records the decision to continue livestock grazing at current levels on public lands within the Colville National Forest (USDA FS 1988a, pages 10, 19).
3. In 1995, an amendment to the Forest Plan set out the Inland Native Fish Strategy (INFISH),[3] which requires the modification of grazing practices that retard or prevent attaining riparian management objectives (RMOs), or are likely to adversely affect native fish (USDA FS 1995). It also requires that facilities inside riparian habitat conservation areas (RHCAs) be relocated if RMOs cannot be met or where fish are being adversely affected. RCHAs are to be managed for riparian-dependent resources. RHCAs include riparian corridors, wetlands, intermittent streams, and other areas that maintain the integrity of aquatic ecosystems. INFISH also identifies Best Management Practices (BMPs)[4] that apply to the grazing of livestock on National Forest System lands (see Appendix A, pages A-2 and A-9). These BMPs are designed to prevent activities that retard

[3] Officially titled *Decision Notice and Finding of No Significant Impact for the Inland Native Fish Strategy.* U.S. Department of Agriculture, Forest Service. Missoula, MT; Ogden, UT; Portland, OR.

[4] Best management practices (BMPs) are methods, measures, or practices chosen to meet non-point pollution source control needs or to mitigate potential adverse effects to soil and water. They are the primary mechanisms for achieving water quality standards. BMPs may be taken directly from the Pacific Northwest Region's General Water Quality Best Management Practices, or they may be modified to better meet the direction of the Forest Plan or to better apply to site-specific conditions on the allotment.

or prevent the attainment of RMOs.

Incorporated by reference are:

1. Colville National Forest Integrated Noxious Weed Treatment EA (USDA FS 1998). This EA addresses preventing the introduction and spread of noxious weeds; it includes prevention activities that are essential to slowing the spread of noxious weeds by cattle.
2. Biological Opinion for the Effects to Bull Trout from Continued Implementation of Land and Resource Management Plans as Amended by INFISH. This document seeks to ensure the viability and recovery of the listed bull trout and monitoring of the bull trout. The document contains terms and conditions that identify monitoring requirements for grazing programs. The direction is non-discretionary. This covers implementation monitoring of grazing activities.

This Aladdin Allotment Complex AMP EA discloses the direct, indirect, and cumulative environmental effects that are expected to result from the proposed action and alternatives. This EA has several sections:

- **Chapter 1**: Introduction; Purpose and Need for Action. This chapter includes fundamental information about the project, the purpose and need for the project, the agency's proposal for reaching objectives, and a discussion of the key objectives. It also indicates how the Forest Service informed the public of the proposal and how the public responded during scoping and alternative development.
- **Chapter 2**: Alternatives. This chapter provides a more detailed description of the proposed action and the alternative methods for reaching the stated objectives. Alternatives were developed to respond to key topics raised by the public, the interdisciplinary team, and other agencies. Monitoring and mitigation measures are also included.
- **Chapter 3**: Environmental Effects. This chapter includes brief descriptions of the affected environments and summaries of specialists' reports on the environmental effects of implementing the proposed action and alternatives. The complete specialists' reports are available from the project analysis file.
- **Chapter 4**: Agencies and Persons Consulted. This chapter lists the preparers of this EA, agencies consulted, and members of the public who provided comments during the development of this EA.
- **Bibliography**: This section provides information for locating the works cited used in this EA. The specialists' reports in the project analysis file have more extensive references lists. Additional information is included in each report in the project analysis file.
- **Appendices**: Appendices include the full text of the BMPs for this project.

This project responds to the goals and objectives stated in the Forest Plan, and helps move this project area toward desired conditions. It does so by ensuring that use of available forage is not over-grazed in heavily used areas.

1.1. Purpose and Need for Action

This chapter describes the actions proposed, the need for those proposed actions, and objectives that the proposed actions aim to address. Project objective indicators (measures) will be used to indicate how effectively the proposed action is moving toward the stated objectives.

1.1.1. Proposed Action

The District Ranger of the Three Rivers District, Colville National Forest, proposes the following actions for the Aladdin Allotment Complex. Chapter 2 describes the proposed action (Alternative 3, continued grazing with modifications) in detail.

1. Continue grazing livestock within the Aladdin Allotment Complex. As conditions permit, maintain the current numbers and season of use.
2. Graze the three allotments using the prescribed grazing systems.
3. Manage the three allotments under updated management practices, standards, and mitigations that arise from the analysis of each allotment and are based on current laws, regulations, and policies of the Forest Service.
4. Modify the existing 10-year grazing permits to include the new practices, standards, and mitigations. Use the AOI to adaptively manage on a year-to-year basis and in response to monitoring results.
5. Maintain the existing range improvements.
6. Implement range improvement projects that have been identified through past monitoring and during analysis for this EA.

Adaptive management, as proposed for the Aladdin Allotment Complex, means that changes in livestock management on the three allotments would be made based on the results of monitoring. In other words, livestock management would respond to changes occurring to the resources on the allotments. These management adjustments would stay within the limits set by the management standards, BMPs, and mitigation measures identified in Chapter 2 of this EA.

Examples of adaptive management for these allotments include changing salting and herding patterns, delaying turnout or early removal, or reducing livestock numbers or overall season of use. (For these three allotments, adaptive management does not include increasing numbers or extending season of use outside of the established use period.)

1.1.2. Objectives (Purpose) of Proposed Action

The objectives of the proposed action are to:

- Provide for **livestock forage** found on National Forest System lands within the Smackout, Meadow Creek, and Aladdin allotments (the Aladdin Allotment Complex), as authorized by Federal laws and regulations.
- Protect or enhance **ecosystem values** affected by grazing, including streams and water quality, fisheries habitat, riparian areas, sensitive plant species, vegetation, and recreation sites.

1.1.3. Need for Proposed Action

The current AMPs for the Aladdin Allotment Complex allotments were written in 1979 and in 1981, before the Forest Plan was signed in 1988. The grazing permits for these allotments have been modified to include Forest Plan requirements. However, the current AMPs do not reflect Forest Plan requirements. Specifically, they do not address water quality or sufficiently include use standards indicated in the Forest Plan (pages 4-44 – 4-47).

The proposed actions are needed to achieve the stated objectives for the following reasons:

- **Livestock grazing of forage** needs to be managed under practices, standards, and mitigations that comply with the Forest Plan, as amended, and with site-specific direction for each allotment. Current AMPs do not include use standards as stated in the Forest Plan; because the AMPs were written before water quality on Smackout Creek became an issue, they do they adequately address **water quality**.
- **Riparian plant communities** in Smackout Creek need to be maintained or improved to help improve and maintain improved water quality.
- Localized bank trampling and riparian vegetation damage needs to be improved on Byers Creek, Meadow Creek, North Fork Mill Creek, and Smackout Creek, and these streams protected from further damage. Smackout Creek in the Aladdin Allotment Complex is currently on the 1998 Washington State **303(d) list**[5] of threatened and impaired water bodies.
- Specific populations of **sensitive plants** need to be protected. (These are identified in the Sensitive Plants Biological Evaluation in the project analysis file.) Under the current AMPs, sensitive species are being trampled by cattle.

Chapter 2 identifies specific management standards, range management practices, BMPs, and mitigation measures that result from these needs and would be included in the proposed action.

[5] 303(d) List – Section 303(d) of the federal Clean Water Act (CWA) requires Washington State to periodically prepare a list of all surface waters in the state for which beneficial uses of water, such as for drinking, recreation, aquatic habitat, and industrial use, are impaired by pollutants. These water quality limited estuaries, lakes, and streams that fall short of state surface water quality stands, and are not expected to improve within the next two years.

The federal Environmental Protection Agency (EPA) allowed states to skip the year 2000 303(d) list due to the ongoing development of new federal rules affecting the listing process and the TMDL (Total Maximum Daily Load) program. The CWA has been amended and now requires state 303(d) lists to be revised every four years instead of two. The next list is due in October 2002/2004. As of February 2005, the list was still in draft form. The State of Washington Department of Ecology (DOE) is also proposing revisions to the current state surface water quality standards and to the policy the guides 303(d) assessment. Even though changes are being proposed, DOE assumes that the current water quality standards will still be applicable when the new list is revised in 2002/2004. Consequently, existing data will be evaluated against current water quality standards.

1.1.4. Key Objectives and Indicators

Typically, environmental analysis is an issue-driven process. Issues are gathered, discussed, and analyzed by the interdisciplinary team; significant issues (those that are used to develop alternatives) are approved by the responsible official. Issues may be based on review of similar actions, knowledge of the area involved, discussions with interested and affected persons, community leaders, organizations, tribal, state, and local governments, and consultations with experts and other agencies familiar with such actions and their direct, indirect, and cumulative effects (Forest Service Handbook, Environmental Policy and Procedures Handbook 1909.15, section 11.51).

For the Aladdin Allotment Complex project, issues are referred to as objectives. The objectives were derived from:

1. Knowledge of the area involved
2. Comments gathered during the scoping period
3. Issues and concerns raised during scoping and analysis

Key Objectives

The following objectives, identified for the Aladdin Allotment Complex, arose repeatedly from the proposed action and during scoping and Aladdin Allotment Complex interdisciplinary team meetings. These are of the greatest site-specific concern. (Analyses of the key objectives can be found in Chapter 3; the specialists' reports are in the project analysis file.)

For this project, the key objectives concerned the topics of 1) water quality, and 2) the condition of riparian areas.

- If grazing is authorized as described in the proposed action, the proposed action would reduce fecal coliform levels enough to meet Washington state **water quality** standards.
- If grazing is authorized as described in the proposed action, the desired rate of improvement of **riparian condition** on Smackout Creek would be most likely to be met.

Water Quality: Fecal coliform bacteria (fecals)

Background. Fecal coliform bacteria are derived from the feces of humans and other warm-blooded animals. Fecal organisms enter stream systems through direct discharge from mammals and birds; from agricultural and storm runoff containing mammal and bird wastes; and from sewage discharge. Though fecal coliform bacteria are not pathogenic, they occur along with pathogenic organisms. Their presence, then, suggests the occurrence of disease-causing organisms. The risk to human health is based on the frequency of use and the degree of direct contact with contaminated waters.[6] In forested areas, high levels of coliform bacteria usually will be associated with inadequate waste disposal by recreational users, the presence of livestock or other animals in the stream channel or riparian zone, and/or poorly maintained septic systems (MacDonald 1991).

[6] Bacterial diseases may include: Legionnaire's disease, cholera, typhoid, and gastrointestinal illnesses. Aquatic organisms may also spread viral diseases (polio, hepatitis, and gastrointestinal illnesses), and parasitic diseases (amoebic dysentery, flukes, and giardiasis).

Rationale. Based on site visits, inadequate waste disposal by recreational users does not appear to be a major contributor of fecal coliform. The presence of livestock appears to be the primary source of management-related fecal coliform bacteria in the planning area. The amount of fecal material being contributed by wildlife is unknown. According to the Washington Department of Ecology 2002-2004 draft of the 303(d) list, Meadow Creek is being removed from the latest 303(d) list for fecals because of recently improved water quality. Except for Smackout Creek, no other streams in the planning area are listed. The portion of the analysis dealing with fecals will focus on livestock grazing in Smackout Creek.

Riparian Condition

Background. Activities such as livestock grazing, logging, road construction, mineral extraction, and recreation can affect the vegetation, landforms, soils, and hydrology of riparian and wetland areas. A method of assessing the condition of these areas was developed by the U.S. Department of the Interior Bureau of Land Management in 1993 and is commonly referred to as the "properly functioning condition (PFC) process" (USDI 1993). This process was adopted by the Forest Service in 1996 as way of "assessing the status and physical health of our riparian areas on NFS lands." PFC surveys are conducted by an interdisciplinary team of resource specialists.

Rationale. Most riparian areas in the Aladdin Allotment Complex are in a PFC, based on informal surveys of high-risk riparian sites. The riparian area that currently does not meet Forest Plan standards for these criteria is located along Smackout Meadow where the creek was artificially channeled during the homestead era. The specialist report will refer to and analyze only the condition of this stream reach on Smackout Creek, which is one-quarter of a mile long.

Key Objective Indicators

Key objective indicators are used to compare alternatives and provide the decision-maker with a basis for the final decision. The potential effects of these key objectives will be used for further analysis and alternative design. Other effects will be described in the analysis, but only these two are considered important enough to be described as major objectives: water quality in relation to levels of fecal coliform bacteria, and the condition of riparian areas.

Indicators for water quality: A water quality compliance indicator will be used to rank the effects of fecals within each alternative. Analysis will concentrate on Smackout Creek because it is the only stream currently listed for fecals.

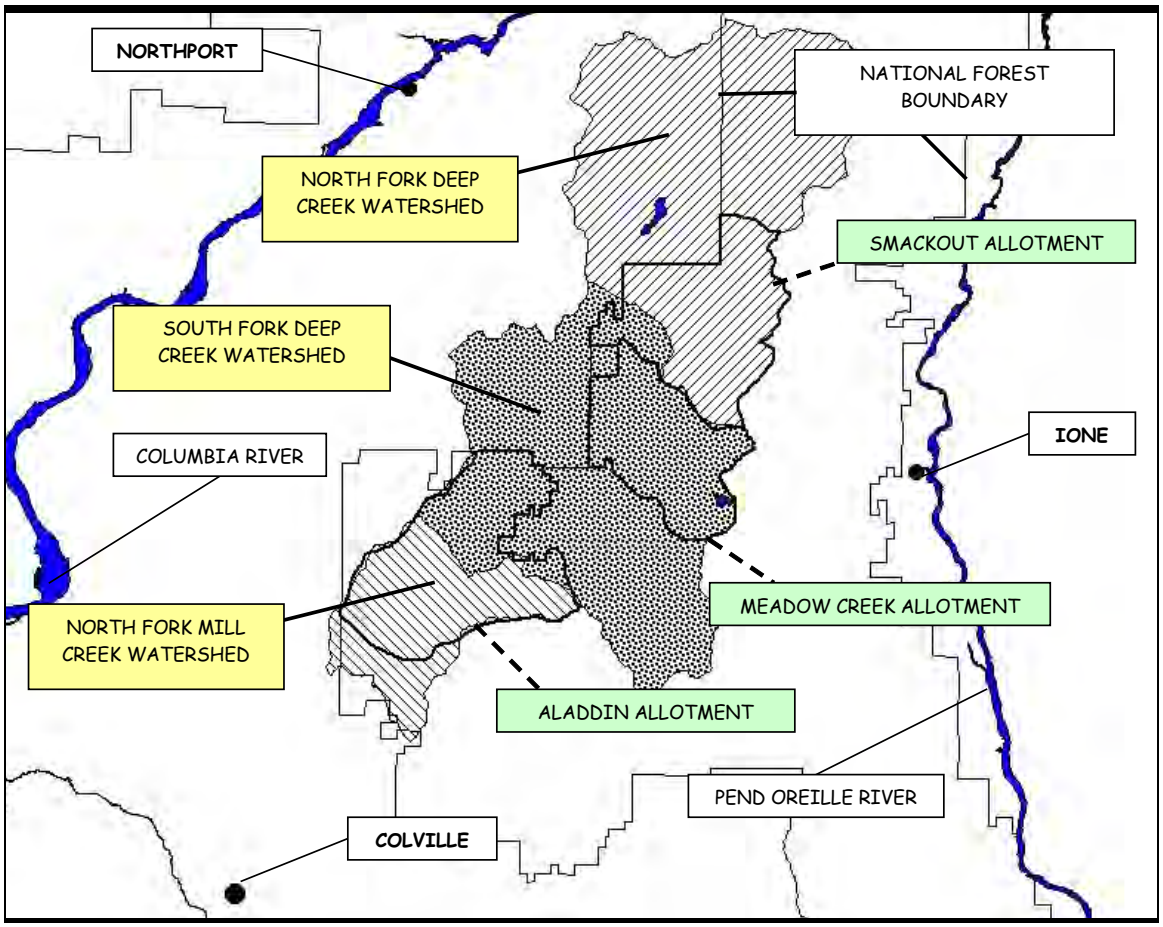
Indicator for riparian area condition: PFC classifications will be used as the indicator of riparian condition as it refers to Smackout Creek.

1.4. Location

The southern boundary of the Aladdin Allotment Complex is located approximately 10 miles northeast of Colville, Washington. The northern boundary is approximately 10.5 miles from Northport, Washington. Access from Colville is by Stevens County roads

9435 (Aladdin Highway). See Figure 1-1 for a vicinity map of the allotments and main watersheds.

Figure 1-1. Vicinity Map: Aladdin Allotment Complex



1.5. Decisions to Be Made

The decisions to be made by the District Ranger will be based on the interdisciplinary analysis documented in this EA. Those decisions are:

- Should livestock continue to graze on the allotments within the Aladdin Complex?

If grazing is to continue:

- What specific management standards, range management practices, BMPs, and mitigation measures are necessary to protect or enhance streams, fisheries habitat, riparian areas, sensitive plant species, vegetation, and recreation sites?
- Which range improvement projects will be implemented?
- Should grazing take place under the current AMP or new management standards and practices?
- What kind of and how much monitoring will be needed?

If the decision is to allow livestock grazing to continue, the project would be scheduled for implementation after the NEPA process has been completed.Until the decision is made, livestock grazing will continue under previous decisions and the existing AMPs.

1.6. Scoping, Public Involvement, and Issues

The Aladdin Allotment Complex was first listed in the Colville National Forest's Schedule of Proposed Actions (SOPA), mailed in the winter of 2000. It has continued to appear, with updated information, in each quarterly SOPA mailing since that time.

A scoping letter identifying this proposed project was mailed November 19, 2003, to the Forest and the Three Rivers Ranger District general scoping mailing lists, adjacent landowners, and grazing permittees on the Three Rivers Ranger District. Responses were received from six individuals or groups, listed in Chapter 4.

Topics

The following topics were raised by the public or the interdisciplinary team. These are not key objectives because they did not drive the development of alternatives and will not be among the primary factors used to make the decision. However, effects of implementing the proposed action may be considerations in making the decision. These effects were assessed and are summarized in Chapter 3 of this EA; specialist reports are located in the project analysis file.
Effects on:

- Economic condition of the permittees, the Forest Service, and the local community, including Stevens County
- Fire and fuels
- Fisheries habitat components (Riparian Management Objectives: RMOs) and fish populations, including Threatened and Sensitive species
- Forest trees
- Heritage resources
- Noxious weed spread
- Range management (forage, permit management)
- Sensitive plants
- Soils
- Water quality, flow regime, and channel morphology
- Wildlife, including all MIS and TES species
- Visual quality and recreation

Other Topics Considered and Analyzed

The topics and concerns listed below were also raised, but are considered outside of the scope of the proposed action:

- Water rights of permittees: the term grazing permit does not convey any water rights to the permittee. Water rights are regulated by the state.
- Inventoried roadless areas: the management of livestock grazing permits does not alter or affect the status of any inventoried roadless areas.

1.2. Legal Locations and Management Areas

The Aladdin Allotment Complex is located approximately ten miles northeast of Colville, Washington, primarily within Stevens County, with some of the eastern portions of Smackout and Meadow Creek Allotments in Pend Oreille County.

Table 1-1 shows the general legal locations of the three allotments, along with acreage by ownership. Although state and private lands lie within the boundaries of the grazing allotments, these lands are not included in management of the allotments. Some of these lands are excluded by fencing done by the landowners.

Table 1-1. Ownership Acreage and General Legal Locations for the Aladdin Allotment Complex[7]

Allotment	Acreage			Townships Involved
	Forest Service	State	Private	
Aladdin	14,294	647	3,307	T. 37 N., R. 40 E. T. 37 N., R. 41 E. T. 36 N., R. 40 E.
Meadow Creek	10,085	941	654	T. 38 N., R. 41 E. T. 38 N., R. 42 E. T. 37 N., R. 41 E. T. 37 N., R. 42 E.
Smackout	13,675	54	993	T. 39 N., R. 42 E. T. 38 N., R. 41 E. T. 38 N., R. 42 E.

The Smackout Allotment is located in the Smackout Creek watershed, with portions also in the Currant Creek and Little Smackout Creek watersheds. The Smackout Allotment can be accessed from Stevens County Road 4708 and by Pend Oreille County Road 2714. The Meadow Creek Allotment, located south of the Smackout Allotment, is in the Meadow Creek watershed. This allotment can be accessed from Stevens County Road 4702 and Pend Oreille County Road 2695. The Aladdin Allotment is located in the headwaters of the Deep Creek watershed and the North Fork Mill Creek watershed. Stevens County Road 9435 and adjacent private lands transect the allotment. This allotment is accessed from National Forest System roads 7015, 7000-140, and 7000-500.

[7] Acreage generated from GIS coverages in October 2001. Numbers are rounded to nearest whole number.

1.2.1. Forest Plan Management Areas

The Forest Plan allocates land use of the Colville National Forest by management areas (MAs). In 1995, the INFISH amendment to the Forest Plan set out RCHAs, which are to be managed for riparian-dependent resources. These areas include riparian corridors, wetlands, intermittent streams, and other areas that maintain the integrity of aquatic ecosystems. In the Aladdin Complex planning area there are approximately 4,000 acres of Riparian Habitat Conservation areas along streams and in wetland areas in the three allotments.

Figures 1-2, 1-3, and 1-4 show the three allotments. Table 1-2 summarizes, by allotment, acreage of the MAs within the Aladdin Allotment Complex.

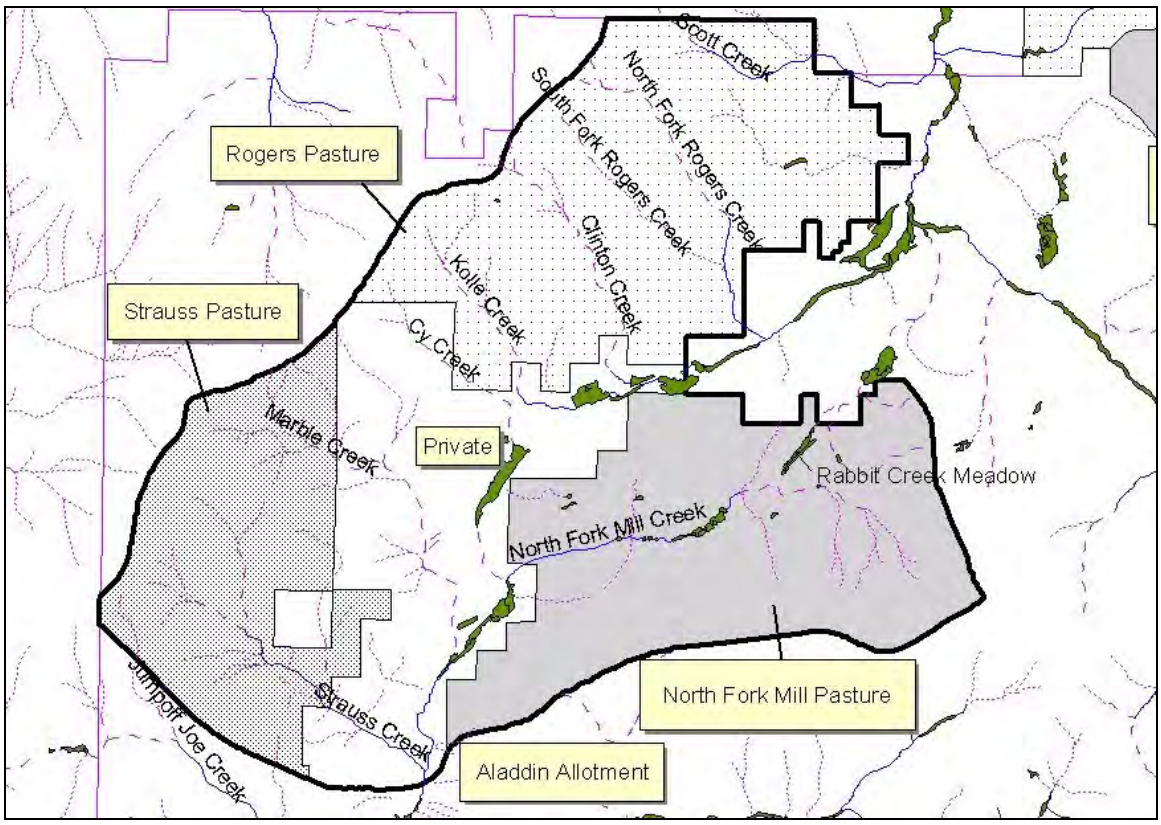
Table 1-2. Management Area Summary for the Aladdin Allotment Complex[8]

Management Area	Emphasis		Pasture Acreage			
		Aladdin Non-Pasture	Aladdin	Meadow Creek	Smackout	Total
MA 1	Old Growth Dependent Species Habitat	0	357	275	519	1,149
MA 3A	Recreation	0	0	1,447	0	1,447
MA 5	Scenic and Timber	215	5,308	1,216	1,261	7,785
MA 6	Scenic and Winter Range	214	1,939	561	927	3,427
MA 7	Wood and Forage	9	5,520	5,706	8,201	19,428
MA 8	Winter Range	2	731	880	759	2,370
MA 11	Semi-Primitive, Non-Motorized Recreation	0	0	0	2,007	2,007
Total		440	13,855	10,085	13,674	37,613

[8] Acreage generated from GIS coverages in October 2001.

The Aladdin Allotment (Figure 1-2) covers a total area of roughly 18,000 acres and is managed on a two pasture (Strauss/Rogers and North Fork Mill) rotation[9] grazing system.

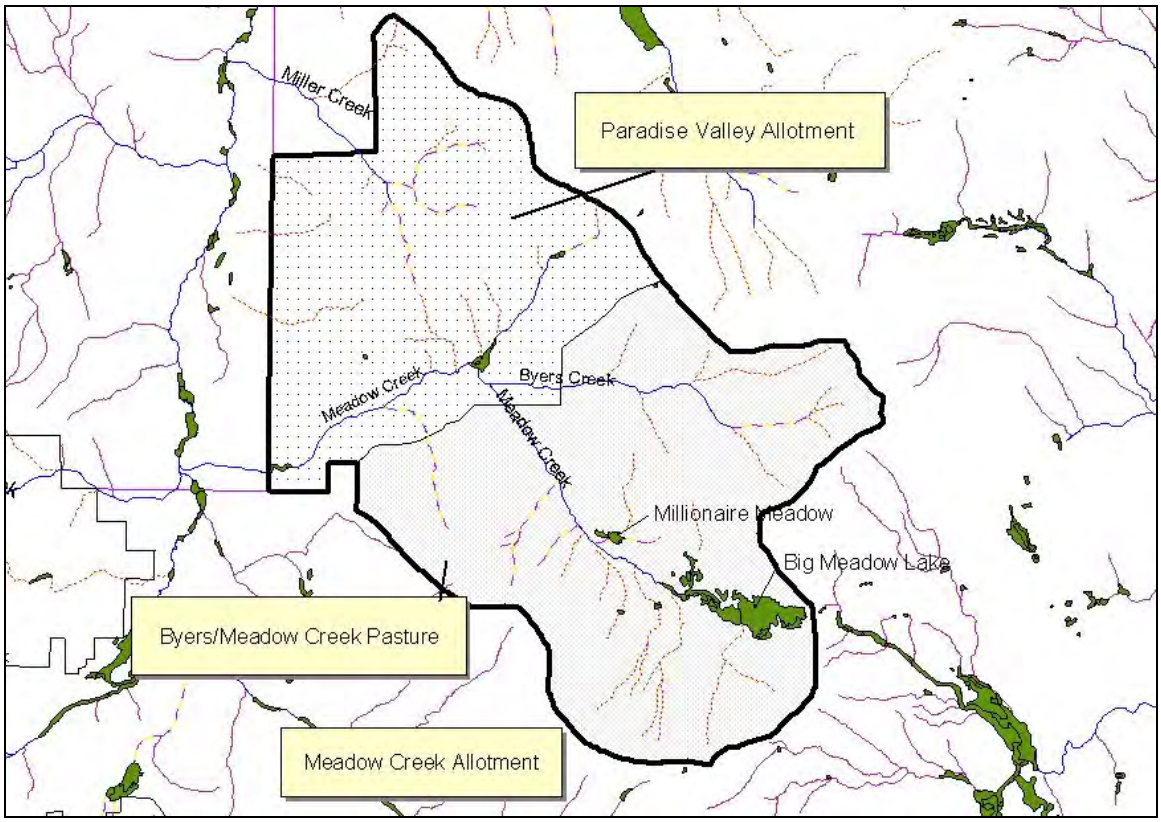
Figure 1-2. Aladdin Allotment Map



[9] A rest-rotation grazing system involves two or more pastures. One of the pastures is not used (it is rested) each grazing season. From year-to-year, the pasture to be rested is rotated, either on a set schedule. In adaptive management, the choice of which pasture to be rested is based on on-the-ground conditions seasonally or over a period of time.

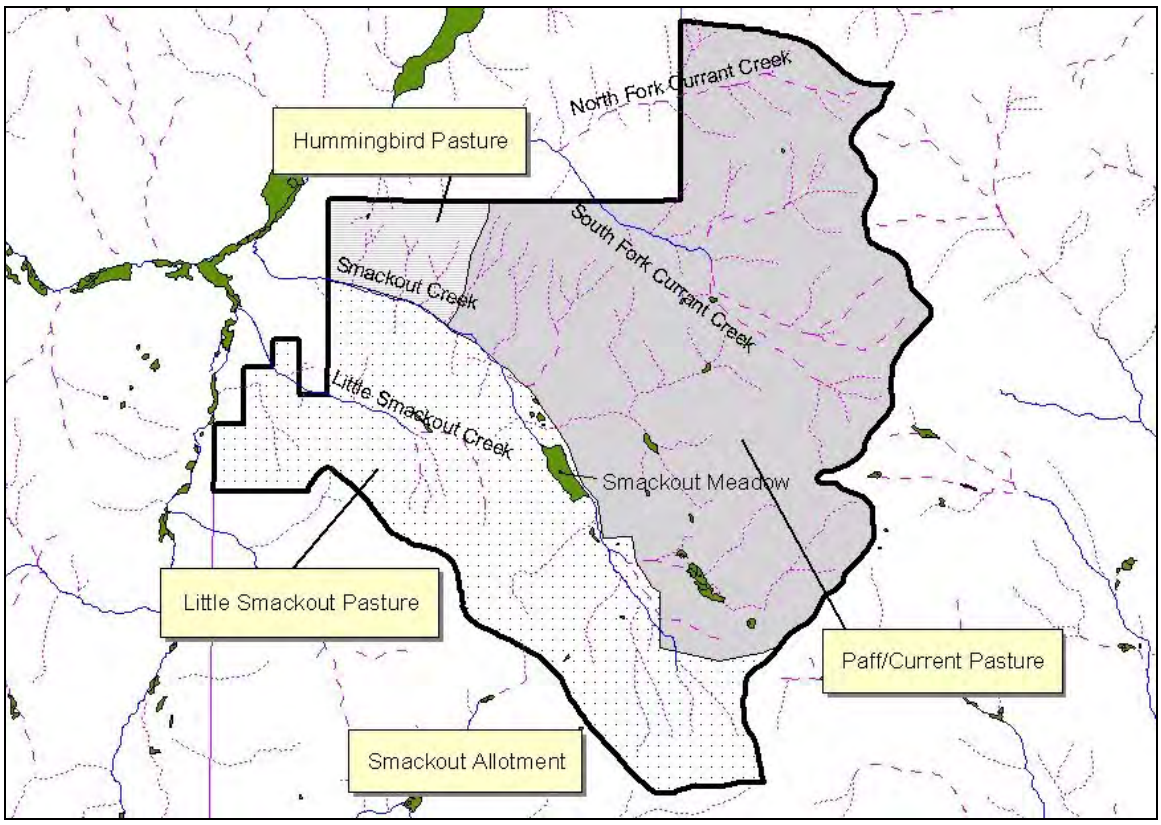
The Meadow Creek Allotment (Figure 1-3) is roughly 12,000 acres and is divided into two pasture areas: Paradise Valley which also has the fenced Paradise Meadow, and Byers/Meadow Creek. These are grazed on a rotation system.

Figure 1-3. Meadow Creek Allotment Map



The Smackout Allotment (Figure 1-4) contains approximately 15,000 acres divided into eight pastures or grazing areas under a rest rotation type system. The grazing areas are the Smackout Meadow area (four pastures), Paff, Current, Hummingbird, and Little Smackout.

Figure 1-4. Smackout Allotment Map



Livestock grazing has taken place on the Aladdin Allotment Complex since the early 1940s. The current term permits on the Smackout and Aladdin Allotments are held by John and Melva Dawson. The current term permit on the Meadow Creek Allotment is held by Jeff and Shannon Dawson.

1.3. Works Cited

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resource management plans as amended by the interim strategy for managing fish-producing watersheds in Eastern Oregon and Washington, Idaho, Western Montana, and portions of Nevada (INFISH) and the interim strategy for managing anadromous fish-producing watersheds in Eastern Oregon and Washington, Idaho and portions of California (PACFISH). Portland, OR.

CHAPTER 2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 Overview of Alternatives

This chapter describes the alternatives that were analyzed and their achievement of the previously-stated objectives. It also briefly describes alternatives that were eliminated from further analysis and reasons for their elimination. Alternatives give the decision-maker a reasonable range of possibilities to choose from, as required by the Forest Service Handbook (FSH) 1909.15, Chapter 10, Section 14. Chapter 3 summarizes the environmental effects of these alternatives; more detailed information is available in the specialists' reports in the project analysis file.

Mitigation measures and monitoring were incorporated into the development of the alternatives. Eight alternatives were developed; two were retained for further analysis, along with the proposed action.

The key objectives (water quality and riparian condition) within the scope of the analysis directly affect the decisions to be made. For this project, the key objectives concerned the topics of 1) water quality, and 2) the condition of riparian areas.

1. If grazing is authorized as described in the proposed action, the proposed action would reduce fecal coliform levels enough to meet Washington state **water quality** standards.
2. If grazing is authorized as described in the proposed action, the desired rate of improvement of **riparian condition** on Smackout Creek would be most likely to be met.

The alternatives discussed below are:

- Alternative 1: No Change
- Alternative 2: No Grazing
- Alternative 3: Continue Grazing with Adjustments [Proposed Action]

2.2. Description of Alternatives to Be Analyzed in Detail

This section describes the alternatives considered for the Aladdin Allotment Complex project. It also briefly describes alternatives that were considered but eliminated from further analysis and the reasons for eliminating them. Maps of each allotment are included at the end of this chapter.

2.2.1. Alternative 1: No Change

The objective of the No Change alternative is to continue current grazing with no changes to AMPs or practices. This alternative would:

1. Continue grazing livestock in the Aladdin Allotment Complex. Tables 2-1 and 2-2 show the current allotments, livestock numbers, and extent of the grazing season for each allotment.

Table 2-1. Alternative 1 (No change): Allotment Numbers and Use

Allotment	Livestock Numbers	Extent of Season of Use
Aladdin	33 cow/calf pairs	from June 1 until October 15
Meadow Creek	61 cow/calf pairs	from June 1 until October 15
Smackout	156 cow/calf pairs	from[10] June 1 until October 15

Table 2-2. Alternative 1 (No Change): Grazing Systems, by Allotment

Allotment	Alternative 1 Grazing System
Aladdin	Deferred rotation in general Forest areas
Meadow Creek	Deferred rotation in general Forest areas with controlled use[11] of Paradise Meadow
Smackout	Rest-rotation[12] with Smackout Meadows pastures #1 thru #4 followed by deferred rotation[13] in general Forest areas

2. Continue to manage the three allotments using existing AMPs.
3. Do not modify the existing 10-year grazing permits. Use AOIs to manage on a year-to-year basis within the intent of existing AMPs.
4. Maintain existing range improvements.

2.2.2. Alternative 2: No Grazing

This alternative would:

1. End grazing livestock on the three Allotments. Place all three allotments in vacant status.
2. Discard the existing AMPs.
3. Cancel existing 10-year term grazing permits. Do not authorize or permit any livestock grazing on the three allotments.
4. End maintaining existing range improvements; remove existing fencing. Do not construct any new range improvements.

[10] "From" and "until" mean that grazing starts on June 1 and stops on October 15. These are approximate dates of use; actual dates are determined annually by growth conditions.

[11] Controlled use of Paradise Meadows is separate from the overall grazing system for the Meadow Creek Allotment. This fence around the meadow allows inclusion or exclusion in the general forest grazing. While livestock are in the portion of the general forest under the deferred rotation, the meadow is initially available for livestock use. When use in the meadow has reached the standards, livestock are excluded. The meadow may also be rested during the grazing season and used for gathering instead.

[12] A rest-rotation grazing system involves two or more pastures. One is not used (it is rested) each grazing season. From year-to-year, the pasture to be rested is rotated on an annual basis. In adaptive management, the choice of which pasture to be rested is based on on-the-ground conditions seasonally or over a period.

[13] A deferred rotation system involves two or more pastures. Each year, a different pasture is used first.

2.2.3. Alternative 3: Proposed Action

The objectives of Alternative 3 are to address riparian habitat problems and water quality by redistributing livestock and encouraging alternative water sources for cattle. This alternative includes

- Activities
- Projects
- Standards and Practices
- Monitoring Items

The tables below provide detailed descriptions of these four parts of the alternative. Mitigation measures are incorporated into the alternative.

Activities for Alternative 3

<table>
<tr><th>1 Activity</th><th>1 To comply with Forest-wide Standard & Guideline (S&G # and Forest Plan page #)</th><th>1 Aladdin Monitoring Item #</th></tr>
<tr><td>1 Activity 1. Continue the grazing of livestock in the Aladdin Allotment Complex. The allotments, livestock numbers, and extent of the grazing season for each allotment in the Aladdin Allotment Complex are shown in Table 2-3.

2 Table 2-3. Allotment Numbers and Use
<table>
<tr><th>1 Allotment</th><th>1 Livestock Numbers</th><th>1 Extent of Season of Use</th></tr>
<tr><td>2 Aladdin</td><td>2 33 cow/calf pairs</td><td>2 Between[14] June 1 and October 15</td></tr>
<tr><td>3 Meadow Creek</td><td>3 61 cow/calf pairs</td><td>3 Between June 1 and October 15</td></tr>
<tr><td>4 Smackout</td><td>4 156 cow/calf pairs</td><td>4 Between June 1 and October 15</td></tr>
</table>
1
2</td><td>2 Range 3, p. 4-45</td><td>2 1a
3 1b</td></tr>
<tr><td>3 Activity 2. These practices and standards for Alternative 3 include BMPs[15] from the</td><td>3 Range 1, 5, pp. 4-44 – 4-45</td><td>4</td></tr>
</table>

[14] "Between" means that grazing starts no earlier than June 1 and stops no later than October 15. Actual start and stop dates are determined through adaptive management as described later in this section.

<table>
<tr><th>Activity</th><th>To comply with Forest-wide Standard & Guideline (S&G # and Forest Plan page #)</th><th>Aladdin Monitoring Item #</th></tr>
<tr><td>Pacific Northwest (Region 6) BMPs and those developed for this project and are described in the three following subsections of this chapter.</td><td></td><td></td></tr>
<tr><td>Activity 3. Use the AOIs to adaptively manage on a year-to-year basis within the intent of the new AMPs and in response to monitoring results.

Table 2-4. Prescribed Grazing Systems for Aladdin Complex
<table>
<tr><th>Allotment</th><th>Prescribed Grazing System</th></tr>
<tr><td>Aladdin</td><td>Deferred rotation in general Forest areas.</td></tr>
<tr><td>Meadow Creek</td><td>Deferred rotation in general Forest areas with controlled use[16] of Paradise Meadow</td></tr>
<tr><td>Smackout</td><td>Rest-rotation[17] with Smackout Meadow pastures #1 through #4, followed by deferred rotation in general Forest areas.</td></tr>
</table></td><td>Range 1, p. 4-44</td><td>5</td></tr>
<tr><td>Activity 4. Monitor according to the monitoring plan (see Table 2-8) described in this chapter.</td><td>5</td><td>6</td></tr>
<tr><td>Activity 5. Maintain the existing range improvements. Implement projects that have been identified through past monitoring and during analysis for this EA. (Some projects would be implemented initially, while some projects would be implemented as funding arose.)</td><td>6</td><td>7 2a
8 2b</td></tr>
</table>

[15] Best management practices (BMPs) are methods, measures, or practices chosen to meet non-point pollution source control needs or to mitigate potential adverse effects to soil and water. They are the primary mechanisms for achieving water quality standards. BMPs may be taken directly from the Pacific Northwest Region's General Water Quality Best Management Practices, or they may be modified to better meet the direction of the Forest Plan or to better apply to site-specific conditions on the allotment.

[16] Controlled use of Paradise Meadows is separate from the overall grazing system for the Meadow Creek Allotment. The fence around the meadow allows for inclusion or exclusion into the general forest grazing. When livestock are in the portion of the general forest under the deferred rotation, the meadow is initially available for livestock use. When use within the meadow has reached the standards, livestock are excluded. The meadow may also be rested during the grazing season and used for gathering instead.

17 A deferred rotation system involves two or more pastures. Each year, a different pasture is used first.

1 Activity	1 To comply with Forest-wide Standard & Guideline (S&G # and Forest Plan page #)	1 Aladdin Monitoring Item #
Table 2-5 shows these projects, by allotment. 7		

Proposed Projects for Alternative 3

Project #	Allotment	Brief Project Description	Implementation[18]	Addresses Forest-Wide Standards and Guidelines
Project A-1	Aladdin	Armor stream crossings where livestock uses, and other use, are detrimental to stream condition or fish habitat.	2008-2010	• Fisheries 2, 3, 4, 7, pp. • GM[19] 1 • Range 1, p. 4-44 • Wildlife 1, p. 4-38
Project A-2	Aladdin	Provide off-stream watering (water troughs) in Aladdin Allotment to reduce use of North Fork Mill Creek.	2008-2010	• Fisheries 7, p. • GM 2 • Range 1, p. 4-45 • Soils and Water 7, p.4-52 • Wildlife 1, p. 4-38
Project MC-1	Meadow Creek	Provide off-stream watering (water troughs) in Meadow Creek Allotment to reduce use of Byers Creek near the crossing of National Forest system road 1700-255 and Byers Creek (NE quarter of sec 35).	2007 and 2008	• Fisheries 7, p. • GM 2 • Range 1, p. 4-44 • Riparian 2, p. 4-53 • Soils and Water 1, 3, 5, pp. 4-50 – 4-52 • Wildlife 1, p. 4-38
Project S-1	Smackout	Provide off-stream watering (water troughs) in Smackout Allotment to reduce use of Smackout Creek in pastures #1, #2, and #4 in Smackout Meadows.	2006 and 2007	• Fisheries 7, p. • GM 2 • Riparian 2, p. 4-52 • Range 1, p. 4-44 • Soils and Water 1, 3, 5, pp. 4-50 – 4-52

[18] Implementation will be based on actual budget received during any given year and coordination with the permittee. Implementation year helps determine the priority of each project within each alternative by allotment.

[19] GMs are practices or standards set out in INFISH (US FWS 1998). For the complete text of the GMs, see Appendix D.

1 Project #	1 Allotment	1 Brief Project Description	1 Implementation[18]	1 Addresses Forest-Wide Standards and Guidelines
				• Wildlife 1, p. 4-38 1
6 Project S-2	6 Smackout	8 Construct a temporary seasonal electric fence in pasture 4, between pastures 1 and 4, along riparian area to exclude livestock use of stream. The fence would be removed when the riparian areas are sufficiently recovered.	6 2006	• Fisheries 7, p. • GM 1 • Range 1, p. 4-44 • Riparian 2, p. 4-52 • Soils and Water 1, 3, 5, 6, pp. 4-50 – 4-52 • Wildlife 1, 2, 3e, 3g, pp. 4-38 – 4-40 1
7 Project S-3	7 Smackout	9 Construct a livestock crossing in Smackout Allotment on Smackout Creek so that livestock can be moved between pastures #1 and #4 without damaging the stream and adjacent wet meadow. 10	7 2007 and 2008	• Fisheries 2, 3, 4, 7, p. • GM 1, GM 2 • Riparian 2, p. 4-52 • Soils and Water 1, 3, 5, pp. 4-50 – 4-52 • Wildlife 1, p. 4-38 1

2.2.3.1. Management Practices and Standards for Alternative 3

Tables 2-6 lists practices and standards that are included in Alternative 3. They include BMPs and mitigations; some are site-specific, developed by the Aladdin interdisciplinary team for this project. The modified BMPs for the Aladdin Allotment Complex are identified below. See Appendix A for the full text.

- **PRM-2**[20] Controlling Livestock Numbers or Season of Use
- **PRM-3** Controlling Livestock Distribution within Allotment
- **PRM-4** Rangeland Improvements

[20] The acronym in the title of each BMP is prefaced with a letter "P." This indicates this BMP refers to a specific project level of analysis, in this case the Aladdin Complex. The next letters in the acronym refer to the resource addressed in the specific BMP. "RM" stands for range management. The number following the letters is a sequential number to identify each BMP.

These practices and standards include site-specific practices prescribed by BMPs. Standards that are more stringent than current Forest Plan standards supercede Forest Plan standards and guidelines.

Table 2-6. Management Practices and Standards for Alternative 3

Management Practice or Standard	To Comply With	Addresses Forest-Wide Standard & Guidelines	Aladdin Monitoring Item #
MPS-1. Move livestock when, or before, management standards are reached in any given area due to livestock and other ungulate-related activities, but especially in any of the critical areas identified on the maps in Figures 2-1 and 2-2. Completely remove livestock from fenced meadow pastures within one day and close gates. Remove at least 95 percent of livestock from large area pastures within two days. Monitor closely for stragglers, and remove any stragglers within two days of the initial move day.	• BMP PRM-3 • Aladdin Hydrologist Report • GM 1, GM 3	• Range 5, p. 4-45 • Riparian, p. 4-52 • Soils and Water 1, 3, 5, pp. 4-50 – 4-52 • Wildlife 1, 2, 3e, 3g, 6, 7, pp. 4-38 – 4-40	• 1a • 1b • 6a • 6b
MPS-2. Locate permanent water access points along streams where floodplains cannot be detrimentally affected by loss of streambanks; for example, where streambanks are at least moderately confined.	• BMP PRM-4 • GM 2	• Range 1, p. 4-44 • Riparian 1, 2, p. 4-52 • Soils & Water 1, 3, 5, pp. 4-50 – 4-52	• 2a • 2b • 3a • 3b • 5
MPS-3. Develop off-stream water developments to draw livestock away from areas where they are causing unacceptable levels of damage (management standards dealing with bank trampling, sedimentation, width/depth ratio or fecal levels) by trailing or watering in streams. Locate water developments at least 300 feet away from sensitive plant populations. Locate off-stream water developments in areas that receive little use	• Aladdin Threatened, Endangered, and Sensitive Plants Report • BMP PRM-4 • GM 2, GM 3	• Fisheries , p. • Range 1, p. 4-44 • Riparian 1, 2, p. 4-52 • Soils & Water 1, 3, 5, pp. 4-50 – 4-52 • Wildlife 1, 2, 3e, 3g, 6, 7, pp. 4-38 – 4-42	• 1a • 1b • 2a • 2b • 4a • 4b • 5 • 6a • 6b • 7

1 Management Practice or Standard	1 To Comply With	1 Addresses Forest-Wide Standard & Guidelines	1 Aladdin Monitoring Item #
compared to areas where livestock concentrate. Consult the District or Forest botanist, hydrologist, and, if applicable, fisheries biologist about each proposed off-stream water development in regard to stream, riparian, and sensitive plant concerns. **9**			
10**MPS-4.** Harden (armor) livestock watering or trailing sites to reduce bank damage and sedimentation. During the first two years, identify and prioritize sites needing hardening, based on sediment risk potential. Harden sites, as funding becomes available. Use suitably sized, washed aggregate. Until sites harden, use management practices to reduce impacts at watering sites. **11**	• BMP-PRM4 • GM 2, GM 3	• Fisheries • Range 1, p. 4-44 • Riparian 1, 2, p. 4-52 • Soils and Water 1, 3, 5, pp. 4-50 – 4-52 • Wildlife 1, 7, p. 4-38 – 4-42 1	• 1a • 1b • 2a • 2b • 4a • 4b • 5 • 7 1
12**MPS-5.** Armored crossings, ford construction and rehabilitation should take place during dry soil, low stream flow conditions to reduce downstream sedimentation. Use washed/sorted gravel of an appropriate size. 13	• Aladdin Hydrologist Report • GM 2	• Fisheries, p. • Range 1, p. 4-44 • Riparian 1, 2, p. 4-52 • Soils and Water 1, 3, 5, pp. 4-50 – 4-52 • Wildlife 1, p. 4-38 1 2	• 1a • 1b • 2a • 2b • 4a • 4b • 5 • 7 1
14**MPS-6.** Use herding[21] and salting to achieve the management standards, including discouraging livestock use near or in the area of the heritage sites. The frequency of herding will vary depending on riparian and upland soil and forage conditions throughout the season	• BMP PRM-3 • GM 3	• Cultural 6, p.4-38 • Fisheries, p. • Range 1, p. 4-44 • Riparian 1, 2, p. 4-52 • Soils & Water 1, 3, 5, pp.	• 1a • 1b • 2a • 2b • 4a

[21] Herding refers to the moving of livestock. It does not occur continually, but seasonally.

1 Management Practice or Standard	1 To Comply With	1 Addresses Forest-Wide Standard & Guidelines	1 Aladdin Monitoring Item #
of use. Herding is likely to be needed more frequently during periods of wet or during hot, dry conditions. 15 16Salt and supplements should be at least one-quarter of a mile from riparian zones to avoid concentrating cattle use in riparian areas. Consultation with the District Hydrologist or fish biologist may be necessary to find a suitable location in narrow pasture configurations where compliance is difficult to obtain. **17**		4-50 – 4-52 • Wildlife 1, 2, p. 4-38 1 2	• 4b • 5 • 7
18**MPS-7.** No salting within one-fourth of a mile of plantations or other regeneration units where the seedlings are less than five feet in height. 19	• Aladdin Silviculture Report	• Timber 5, 8, p.4-48	• 1a • 2a • 7
20**MPS-8.** Use prevention and early treatment methods for newly invading species and populations of noxious weeds. Prevention includes not using hay or straw on National Forest system lands and keeping vehicles, including stock trucks, free of noxious weeds and soil material that may contain noxious weed seed. Early treatment includes hand pulling individual plants and small populations, and biological releases on populations that are beyond hand pulling or are not along the travel corridors. **21**	• Aladdin Noxious Weeds report; • Colville National Forest Weed Prevention Plan; • Colville National Forest Integrated Noxious Weed Treatment Environmental Assessment	• IPM 2, p. 4-60 • Range 4, p. 4-45 • Wildlife 1, 2, 3, 6, 7, pp. 4-38 – 4-42	• 6a • 6b
22**MPS-9.** Treat existing populations of noxious weeds, especially along the travel corridors, as identified in the projects section of the Colville National Forest Integrated Noxious Weed Treatment Environmental Assessment (USDA FS 1998b). These projects, including biological releases and chemical treatment, are identified and analyzed in the 1998 EA.	• Aladdin Noxious Weeds report; • Colville National Forest Integrated Noxious Weed Treatment Environmental	• IPM 2, p. 4-60 • Range 4, p. 4-45 • Wildlife 6, 7, page • Range 4, page 4-45	• 6a • 6b

1 Management Practice or Standard	1 To Comply With	1 Addresses Forest-Wide Standard & Guidelines	1 Aladdin Monitoring Item #
23	Assessment 1		
24**MPS-10.** Maintain stream reaches in proper functioning condition or, if functioning at risk, in an upward trend according to Riparian Area Management: A Process for Assessing Proper Functioning Condition (USDI 1993). **25**	• Aladdin Hydrology Report	• Riparian 1, 2, 3, p. 4-52 – 4-53 • Wildlife 1, 2, 3, pp. 4-38 – 4-42 1	• 1b • 2b • 4a • 4b • 5 1
26**MPS-11.** Do not exceed five percent livestock related bank disturbance (bare soil, bank caving, sloughing, and compaction directly related to ungulate hoof action) in critical areas. Critical areas are defined and identified through BMP PRM-3 in Appendix A. See Figures 2-1 and 2-2 for the critical area maps. **27**	• BMP PRM-3	• Range 1, p. 4-44 • Riparian 1, 2, page 4-53 • Soils and Water 1, 3, 5, pp. 4-50 – 4-52	• 1b • 2b
28**MPS-12.** Maintain viable sensitive plant populations. Populations are not to decline more than 15 percent. If the 15 percent threshold is found to be insufficient to maintain population viability, the threshold will be adjusted. **29**	• Aladdin Threatened, Endangered, and Sensitive Plants Biological Evaluation	• Wildlife 6, 7, p. 4-42	• 2b • 6a • 6b

2.4. Alternatives Considered but Eliminated from Further Analysis

The following alternatives were considered but not analyzed. Reasons for their elimination are briefly described below.

Alternative 4. This alternative is identical to Alternative 3 (Proposed Action), but with removal of the fence between Pastures #1 and #4 in Smackout Meadows on the Smackout Allotment. Grazing management would be the same as in Alternative 3 (Proposed Action) for Smackout, Meadow Creek, and Aladdin Allotments. The idea was to prevent livestock from "kegging up" against a fence line parallel to Smackout Creek. Instead, they would have free movement across Smackout Creek.

This alternative would have the potential to spread the use of livestock in Pasture #1 and #4 within Smackout Meadows. However, it creates increased access to Smackout Creek during the period when livestock are in the combined Pasture #1 and #4. Currently, when livestock are in Pasture #1, they do not have access to Smackout Creek. Livestock would still concentrate in sensitive areas along Smackout Creek, potentially for longer periods because of an increased amount of forage available in the combined Pastures #1 and #4. Loss of the fence between pastures #1 and #4 also causes the loss of the ability to use the upland forage in Pasture #4 while excluding the use of the wetland area of Pasture #1. This alternative was dismissed because it fails to meet the purpose and need; specifically, it fails to address water quality concerns and to improve the riparian plant community in Smackout Creek.

Alternative 5-6.[22] This alternative was very similar to Alternative 3. Many of the projects listed for Alternative 5-6 are the same as for Alternative 3, except the implementation year changes or implementation is based on the results of monitoring. Smackout Creek would be rested until defined conditions are reached. Because this alternative included activities that have become either unnecessary or were incorporated into Alternative 3, the alternative was not pursued. This alternative included removing a fence in Smackout Meadow, the construction of a temporary fence, and planting trees for shade in pasture #4 of Smackout Allotment. The alternative was dismissed because the fence in Smackout Meadow is currently being removed, the construction of a temporary fence was included in Alternative 3, and it was determined that reduced grazing will allow shoots to heal (which makes tree-planting unnecessary).

Alternative 7. Remove all internal pasture fencing within the Smackout Allotment. Meadow Creek and Aladdin Allotments would be managed the same as in Alternative 3 (Proposed Action). Smackout Allotment would be managed under a dispersed grazing system[23].

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[22] Alternative 5-6 was based on two concepts for short-term protection of Smackout Creek within Smackout Meadows. Originally, the two concepts were listed as Alternative 5 and Alternative 6. The two concepts would achieve the same results, and instead of two alternatives, they became two choices for the same project in the same alternative, called Alternative 5-6.

[23] A dispersed grazing system focuses on achieving a more equitable distribution of cattle throughout a grazing unit during the grazing season with emphasis on reduction of use in riparian areas. In this case, the grazing unit is the Smackout Allotment. Information about dispersed grazing systems can be found in Science Findings, Issue 17, August 1999, Pacific Northwest Research Station.

This alternative would have the potential to distribute livestock use throughout the entire Smackout Allotment. Without fencing, livestock would tend to concentrate in Smackout Meadows because of the ease of terrain, desirable or readily accessible forage, and water. Livestock would have access to Smackout Creek throughout the season. Loss of the fencing within the Smackout Allotment would cause the loss of the ability to use or exclude all or parts of Smackout Meadows and Smackout Creek to livestock. Greater management requirements would be placed on the grazing permittee to herd and salt in order to reduce livestock grazing pressure on the riparian areas of Smackout Creek and the meadow forage in Smackout Meadows. This alternative was dismissed because it fails to meet the purpose and need; specifically, it fails to address water quality concerns and to improve the riparian plant community in Smackout Creek.

Alternative 8. Remove all fencing within Smackout Meadows, but leave the Smackout Meadows perimeter fence. Smackout Meadows would be one pasture, and the general forest would remain as two pastures. Use of Smackout Meadows would be based on the moisture content of soils in the meadow, the stage of general Forest forage, the condition of the forage in Smackout Meadows, and the condition of the riparian area of Smackout Meadows. Meadow Creek and Aladdin Allotments would be managed as described in Alternative 3.

This alternative would have the potential to distribute livestock use throughout the Smackout Pasture while keeping the ability to defer or exclude Smackout Meadows and Smackout Creek to livestock. Livestock would still concentrate in hot spots along Smackout Creek, potentially for a longer period because of the increased amount of forage availability in the meadow. Loss of the fences between pastures removes the ability to use the upland forage in some pastures, while excluding the use of the wetlands area of other pastures. More management requirements would be placed on the grazing permittee to herd and salt during use of Smackout Meadows to reduce livestock pressure on the riparian areas of Smackout Creek and the meadow forage in Smackout Meadows. This alternative was dismissed because it fails to meet the purpose and need; specifically, it fails to address water quality concerns and to improve the riparian plant community in Smackout Creek.

Alternative 9. On the Smackout Allotment, create a different subset of pastures by removing and rearranging the fencing within Smackout Meadows. Grazing management would be the same as described in Alternative 3 (Continued grazing with modifications), the proposed action, for all three allotments.

This alternative generates similar concerns as Alternative 8, depending on which fences are removed or rearranged. The various configurations that were considered did not meet the levels of control of uplands, wetlands, and riparian areas that are available under the current configuration, along with moving of the fence between Pasture #1 and #4 as prescribed in Alternative 3, the proposed action, within Smackout Meadows. Also, there would be the cost of additional real property investments in constructing or moving fences. This alternative was dismissed because it fails to meet the purpose and need; specifically, it fails to address water quality concerns and to improve the riparian plant community in Smackout Creek

2.5. Comparison of Alternatives That Were Analyzed in Detail

Table 2-7 compares how each alternative bears on stated objectives, in terms of the key objectives identified in Chapter 1.

Table 2-7. Comparison of Alternatives for the Aladdin Allotment Complex Project

Key Objective	Alternative 1 (No change)	Alternative 2 (No grazing)	Alternative 3 (Proposed action)
Provide livestock grazing to help meet multiple-use mandates	Meets	Does not meet	Meets
Manage and monitor grazing under AMPs that comply with the Forest Plan, as amended	Does not meet	Does not meet	Meets
Reduce effects of grazing on riparian and fish habitats	Does not meet	Best meets	Meets
Comply with Clean Water Act and Washington state water guidelines	Does not meet	Meets	Likely to meet
Reduce effects of livestock grazing on water quality and improve condition of meadows	Does not meet	Best meets	Meets
Protects sensitive plant populations	Does not meet	Best meets	Meets

2.6. Monitoring Plan

This section describes monitoring for the two action alternatives, Alternatives 1 and 3. Forest Plan monitoring is discussed in Chapter 5 of the Forest Plan and in the Monitoring Guide for the Land and Resource Management Plan, Colville National Forest.

2.6.1. Alternative 1 Monitoring

Monitoring activities for Alternative 1 (No change) are required to those specified in the existing AMPs and AOIs. Several of the Forest Plan Monitoring Actions for range (USDA FS 1988, p. 5-13)[24] would continue, as well as any other monitoring items that are required for other resources affected by grazing. Monitoring activities include monitoring requirements from the Bull Trout Biological Opinion (US FWS 1998).

[24] Range improvements; forage use; riparian and range resources conditions (Forest Plan, Monitoring Actions, p. 5-13.)

2.6.2. Alternative 3 Monitoring

Monitoring activities for Alternative 3 (Continued grazing with modifications), shown in Table 2-8, include monitoring requirements from the Bull Trout Biological Opinion (USFWS 1998). These monitoring items will take place in conjunction with the monitoring identified in the Forest Plan Monitoring Guide (USDA FS 1990).

The allotments have been surveyed for areas that have the potential for damage; are damaged or are currently below the desired riparian condition; or were heavily impacted at some point. These critical areas will be the focus of monitoring and restoration, and will serve as the baseline for determining if other areas need monitoring. See Figures 2-1 and 2-2- for the critical areas.

Monitoring will be carried out to ensure that the selected alternative has been implemented correctly and that the management practices, BMPs, and mitigation measures are achieving management standards. Monitoring results will be available to interested and affected parties.

Table 2-8. Monitoring Plan for Alternative 3 (Proposed Action), Aladdin Allotment Complex

Monitor. Item #	Measure	Procedure	Frequency	Area to be monitored	Standard or objective to be met	Responsibility
1a.	Use of forage (Forest Plan Monitoring Actions, Forest Plan, p. 5-13; BMP PRM-2)	Use stubble height measurements and ocular estimates	Each allotment once every four years	Key upland areas and suitable riparian areas	Ensure proper stocking levels and use to Forest-Wide Standard and Guidelines for Range 5 (p. 4-45)	District Rangeland Management Specialist
1b.	Use of riparian vegetation	Use stubble height measurements and ocular estimates for grasses and grass-like species. Measure woody plant use for shrub species.	Monitor pasture grazing use throughout the grazing season.	Representative riparian zones in identified critical areas (See Fig. 2-1 and 2-2)	Aladdin EA MPS-10	Grazing permittee and District Rangeland Management Specialist
2a.	Range improvement condition (Forest Plan Monitoring Actions, Forest Plan, p. 5-13)	Inspect range improvements	Yearly inspect 10 percent of improvements District wide and all new improvements	All range improvements	Ensure compliance with standards in FSH 2209.22 Supplement No. 12 and performance of maintenance	District Rangeland Management Specialist and Permittee
2b.	Range fences	Inspect fences	Annually before pasture is used	Critical areas in Fig. 2-1 and 2-2	Forest-Wide Standards and Guidelines (p. 4-45); Aladdin EA MPS-12	District Rangeland Management Specialist

Monitor. Item #	Measure	Procedure	Frequency	Area to be monitored	Standard or objective to be met	Responsibility
3a.	Riparian and range condition and trend (Forest Plan Monitoring Actions, Forest Plan, p. 5-13; BMP PRM-2)	Use condition and trend transects, ocular estimates, or photo points	Follow the Forest schedule, as modified by Regional Direction	Representative sample of all units within each allotment	Ensure that range types are in satisfactory condition (at least fair with upward trend)	District Rangeland Management Specialist
3b.	Range readiness (BMP PRM-2)	Observations of soil moisture and vegetation condition prior to grazing season	Conduct randomly about 2 weeks before grazing season starts. Repeat weekly if necessary to determine when range is ready.	Critical area map sites; areas known to have a high water table or high soil moisture in wet years; and areas where forage may be limited in dry years.	Aladdin EA 3; BMP PRM-2	District Rangeland Management Specialist
4a.	Water quality (fecal coliform)	Use Washington State water sampling protocol	Follow Washington State water sampling protocol	303 (d) listed streams	Aladdin EA MPS-3	Forest Hydrologist
4b.	Water quality (fecal coliform)	Use Washington State water sampling protocol	Periodically, based on fund availability	Non-303 (d) listed streams	Aladdin EA MPS-3	Forest Hydrologist
5.	Proper functioning condition (PFC)	Conduct PFC evaluations using	Every five years	All critical area map sites	Aladdin EA MPS-10	IDT led by District

Monitor. Item #	Measure	Procedure	Frequency	Area to be monitored	Standard or objective to be met	Responsibility
		TR 1737-9 (USDI, BLM 1993)				Hydrologist
6a.	Sensitive plant populations (Forest Plan Monitoring Actions, p. 5-12)	Use procedures identified in the Forest Plan Monitoring Guide	As needed	Sample populations	Forest-Wide Standard and Guideline Wildlife 7 (p. 4-42)	Forest Botanist
6b.	Sensitive plants	Conduct field surveys	Before construction of water developments, fences, or other projects	All sites where projects are planned.	Forest Plan Standard and Guideline Wildlife 7 (p. 4-42); Aladdin EA MPS-12	Forest Botanist
7.	Management effectiveness	Review allotment inspection notes and photos, and results of other monitoring items	Yearly, before developing AOIs	Data from all three allotments		District Rangeland Management Specialist

Figure 2-1. Critical Area Map for the Smackout Allotment

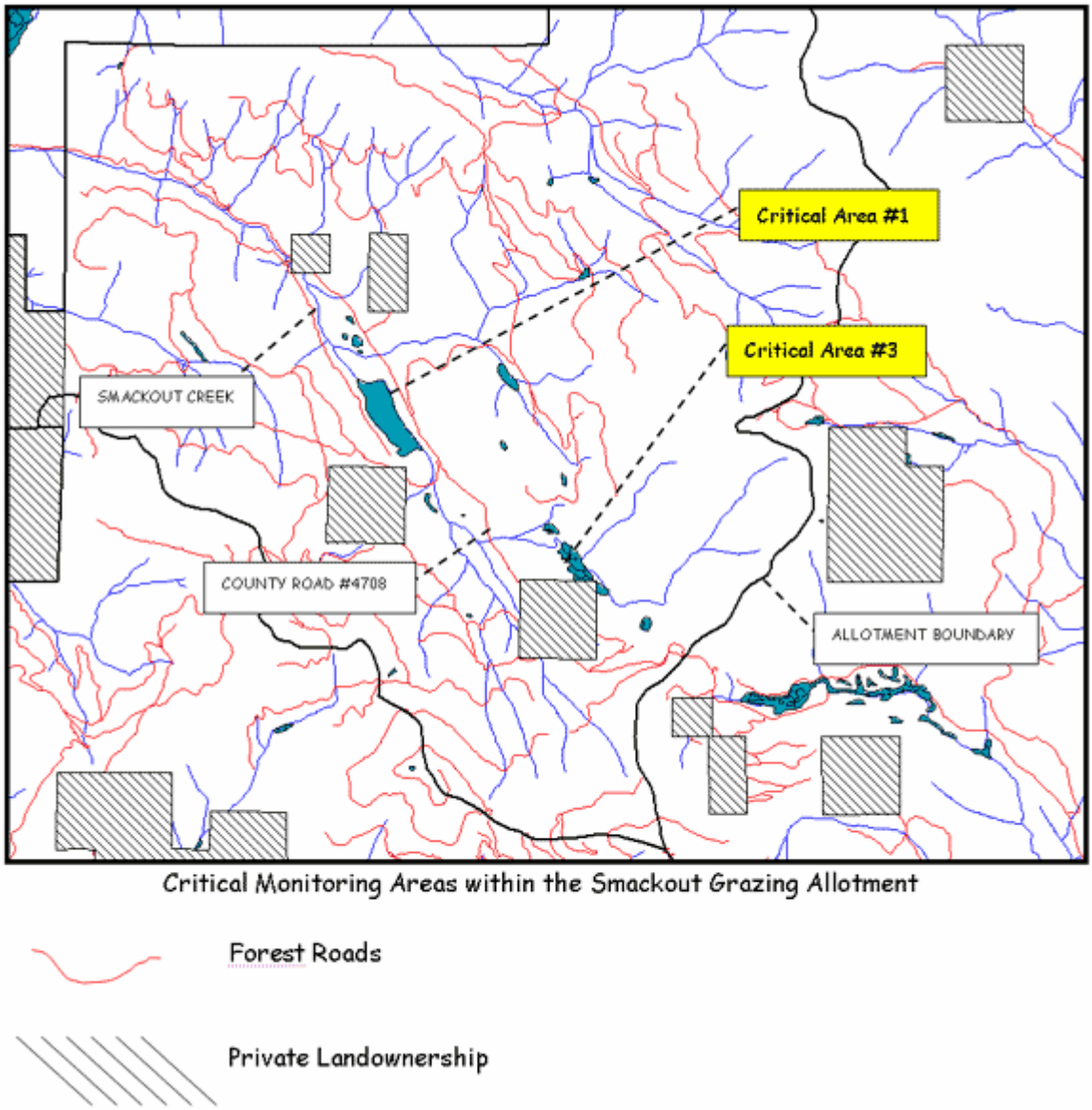
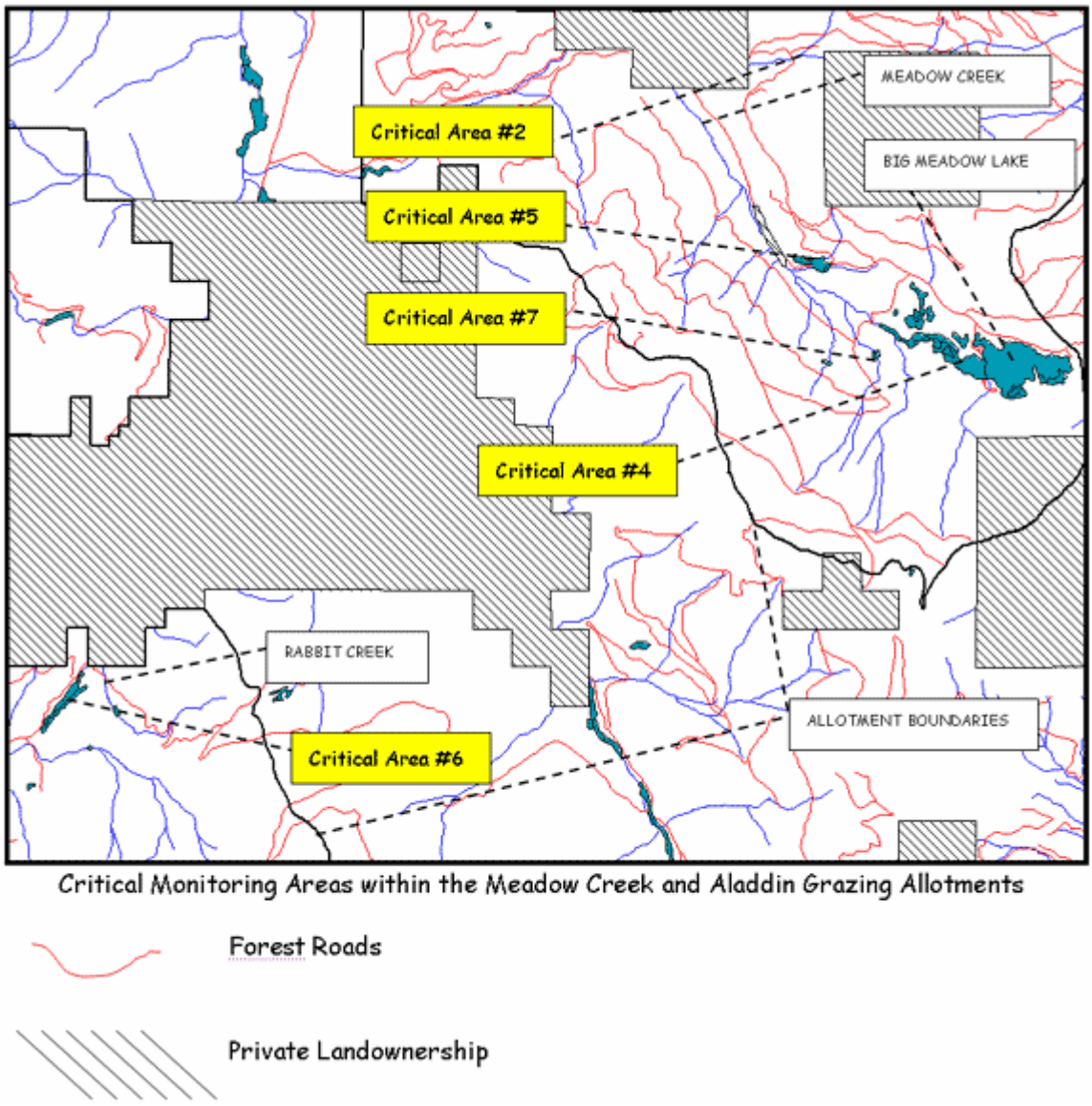


Figure 2-2. Critical Area Map for the Aladdin and Meadow Creek Allotments



2.7. Works Cited

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CHAPTER 3. ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing conditions of the environment that could be affected by each of three alternatives under consideration, as well as the potential effects of those alternatives. Information about existing conditions provides a basis for evaluating the environmental consequences of implementing each alternative. It summarizes effects that the three alternatives are expected to have on specific resource areas:

1. Culture and heritage
2. Fire and fuels
3. Fisheries
4. Forest trees
5. Noxious weeds
6. Range and grazing
7. Sensitive plants
8. Soils and water
9. Visuals and recreation
10. Wildlife, including management indicator species and neotropical migratory birds
11. Other required analysis

Environmental effects are described in terms of direct, indirect, and cumulative affects that are reasonably foreseeable. Direct effects are effects, caused by the action, that occur at the same time and place as the actions. Indirect effects are caused by the action later in time or farther removed in distance, but are still reasonably predictable. For more detailed information, see the specialist' reports located in the project analysis file.

Concurrent Activities

Routine road maintenance activities (blading and roadside vegetation management) will continue at current levels on Stevens County and National Forest roads within the project area. The Rocky Creek grazing allotment is vacant and there are no plans to activate it in the future. Land management activities (logging, grazing, and farming) on adjacent private lands and state land are anticipated to continue at current levels. Recreation activities on National Forest lands will continue.

Direct, Indirect and Cumulative Effects associated with Reasonably Foreseeable Future Projects

Activities associated with the proposed future South Deep Timber Sale (TS) project, could have direct, indirect or cumulative affects on the Aladdin allotments. Approximately 20,177 acres of the proposed 38,346 acre South Deep TS project analysis area overlap the boundaries of the Aladdin analysis area. The South Deep TS area includes the Little Smackout Creek drainage of the Smackout Allotment, as well as all of the Meadow Creek Allotment, and a portion of the Aladdin Allotment from Kolle Creek north to the Forest boundary. The South Deep TS is currently being analyzed by an

interdisciplinary team. The Environmental Impact Statement (EIS), Final EIS and Record of Decision are anticipated to be completed in 2005.

The South Deep TS project activities being analyzed include commercial and non-commercial timber harvest, road construction, road reconstruction, and natural fuel treatments. Several alternatives including the no action alternative are being developed and analyzed. Because the South Deep TS project is still in the development phase, the management activities and the location of those activities are conjecture at this time. As a result, it is not possible to evaluate the affects of the South Deep TS on the Aladdin allotments other than in general terms in this analysis. The direct, indirect, and cumulative affects of South Deep TS on the Aladdin range allotment complex will be evaluated in detail in the South Deep TS EIS.

Table 3-1 shows the activities within the area of the Aladdin allotment complex identified in the proposed action for South Deep TS. The proposed action for a given project is initially developed by the IDT as a means to meet the purpose and need for that project. A range of alternatives are then identified and analyzed based on issues and concerns associated with the proposed action. The proposed action may or may not be the alternative selected by the deciding official.

Table 3-1. Foreseeable Future Activities in the Aladdin Complex Analysis Area Associated with the Proposed South Deep Timber Sale Project

Allotment	Acres Common to Both Aladdin and South Deep Analysis Areas	Acres of Commercial Timber Harvest (acres)	Pre-Commercial Harvest (acres)	Natural Fuels Treatment (acres)	South Deep Road Construction/ Reconstruction (miles)
Aladdin	6,383	2,561	187	0	27.6
Meadow Creek	11,674	1,908	1400	986	20.2
Smackout	2,210	390	407	351	6.6
Total	20,177	4,859	1,994	1,336	54.4

3.1. Cultural and Heritage

Descriptions in this section rely on local information derived from GIS inventories and field surveys.

3.1.1. Affected Environment

The forty-nine identified historic properties within the Aladdin Allotment Complex area have not been evaluated for their eligibility to the National Register of Historic Places. By legal direction, unevaluated historic properties must be treated as if eligible to the National Register. Eligible historic properties must be evaluated for effects.

3.1.2. Potential Effects: Culture and Heritage

Current grazing has the potential to affect these historic properties through concentrated use at water sources, along stockways, and near historic properties. Evaluation for effects of historic properties within the Aladdin Allotment Complex was performed by Forest Service cultural specialists.

Effects Common to All Alternatives

All alternatives are "No Effect" undertakings.

Alternative 2 (No grazing)

Historic properties would not be affected under this alternative because there would be no cattle. Properties would continue to gradually deteriorate over time, subject primarily to natural forces.

Alternative 1 (No change)

Under this alternative, there would be no effects because field monitoring indicates that current conditions do not affect historic properties in the allotments.

Alternative 3 (Continued grazing with modifications)

Under this alternative, there would be no effects; field monitoring indicates that current conditions do not affect historic properties in the allotments.

3.1.3. Mitigation

No mitigation is required for historic properties under any of the alternatives.

3.1.4. Potential Cumulative Effects

Foreseeable future activities are associated with the proposed South Deep Timber. In general, no cumulative effects to culture and heritage resources associated with the South Deep TS project are anticipated.

As stated above, by legal direction, unevaluated historic properties must be treated as if eligible to the National Register. Eligible historic properties must be evaluated for effects. Historic properties will be evaluated in the South Deep TS.and potential impacts would be mitigated.

There is a potential that a new historic site be located during project activities. There could be an initial impact to the site when first discovered; however, in the case of timber sales the contract requires the contractor cease work at the site, protect the site and inform the Forest Service. If a new site is located adaptive grazing techniques such as fencing the site or moving the livestock would be temporarily used to protect the site until a long-term solution for protecting the site could be developed and analyzed

3.2. Fire and Fuels

Descriptions in this section rely on local information derived from field reconnaissance done in the planning area. Information was also obtained from meetings with agency specialists, related project and resource specialist reports, including the South Deep Planning Area Fire History Study. The Meadow Creek allotment is fully within the South Deep planning area; Aladdin and Smackout allotments are partially within that boundary. Allotment areas outside the boundary are represented by the same vegetation types.

3.2.1. Affected Environment

The planning area is typical of many of the mesic forest types in eastern Washington: it contains a wide variety of overstory and understory species mixes (Agee 1990, 1993). There is currently a mix of fire-intolerant[25] and fire-tolerant species. Previous lack of fire has allowed the area to develop significant components of fire-intolerant species to establish and grow high enough to create a fuel ladder to any existing overstory. Current vegetation is connected horizontally and vertically across the landscape, predisposing this area for fires that are of greater severity than those that occurred during the past several centuries. The current condition represents a low frequency, mixed severity fire regime. Across the watershed, there is a high variability of fire frequency and severity.

3.2.2. Potential Effects: Fire and Fuels

The three alternatives listed would have minimal impact on the Fire and Fuels resource. This is mostly due to the low number of livestock and where they are grazing. Livestock are not having an affect on a large enough scale to impact ground fuels, ladder fuel, ignition, wildland urban interface (WUI), and public safety.

Alternative 2 (No grazing)

Under this alternative, cattle grazing would not occur. In the three allotments cattle have typically grazed along roadsides, regeneration cuts, wet areas, and in old homestead meadows. Some grazing has occurred in the forested areas but because of crown closure there is not a lot of food available for livestock. Because of the small numbers of livestock grazed in the Aladdin Allotment Complex the effect of this alternative would be minimal. Grasses and shrubs would continue to grow along the roadsides, wet areas, and plantations. Vegetation density would increase naturally in homestead meadow. Because the number of cow/calf pairs is not significant, the increase in the amount of ground fuel would not affect the allotments.

The effects of no livestock grazing in the allotments are minimal on:

- **Ignition:** The effect on ignition is minimal because the acreage of meadows within all allotments is small. Another reason effects are minimal is because the fire occurrence in the allotments is very low. Between the years of 1943 and 2003 there were 73 ignitions, 45 by lightning and 28 human-caused. Most of the natural

[25] Fire-intolerant species in the area include grand fir, lodgepole pine, spruce, western red cedar, western white pine, and hardwoods such as aspen, birch, and cottonwood. Fire-tolerant species include Douglas-fir, larch, and ponderosa pine.

starts are high on ridge-tops, while most of the meadows are down low in valleys.

- **Ground Fuels:** This alternative would have a moderate effect on ground fuels in the meadows and plantations. The livestock do keep the ground fuels low in meadows, road corridors, wet areas, and plantations, but these areas make up a small percent of the overall acreage in the allotments. Meadows, especially Smackout Meadow, can provide opportunities for fuelbreaks during fire suppression. There would be minimal effects on ladder fuels because cattle graze only the grass component.
- **Ladder fuels:** Livestock have minimal effect on ladder fuels because they are grazing on the grass component in the forested areas. This would be a bigger issue if there was more ponderosa pine habitat in the allotments. The open stands allow access and have food for livestock.
- **WUI and Public Safety:** There is minimal effect to the wildland urban interface (WUI) and public safety if the allotments are not grazed. Livestock are neither increasing nor decreasing the effects of large damaging wildfire. It is true that there will be some fuel accumulations along road corridors, meadows, wet areas, and plantations. However, most of the National Forest land adjacent to private property is forested where livestock are having no effect on fuels.

Alternative 1 (Continued grazing)

Currently, the grazing in the Aladdin, Meadow Creek, and Smackout allotments is having a minimal effect on Fire and Fuels Management. The number of cow/calf pairs spread throughout the allotments have minimal or no effect on ground fuels, ladder fuels, fire spread and intensity, and impacts to WUI and public safety because:

- The livestock numbers are not significant enough to affect fuel loading at a landscape or allotment level. Grazing is being limited to road corridors, meadows, open stands, and wet areas. The forested areas within the allotments are contiguous and contain a majority of ground fuels.
- The acres of meadows are not significant enough throughout the allotment complex to say that grazing is having an effect on reducing fine fuel loading on a landscape scale. However, it may have an effect on ignition, fire spread and intensity in the immediate area of the meadow. The larger meadows, like Smackout Meadow, can be used as fuelbreaks during fire suppression. Ignition would be more difficult in meadows due to the grass being grazed. Fire spread and intensity would also be reduced in meadows due to grazing.
- Cattle are not grazing in areas that have ladder fuels.

This alternative meets the Forest Plan Standards and Guidelines for Fire and Fuels Management.

Alternative 3 (Continued grazing with modifications)

The effects are common for Alternatives 1 and 3. Redistributing livestock presence will have a minimal effect on ground fuels, ladder fuels, WUI or public safety. Livestock numbers do not change in this alternative. This alternative meets the Forest Plan Standards and Guidelines for Fire and Fuels Management.

3.2.3. Potential Cumulative Effects

There have been no activities in the allotments which have had a cumulative effect on fire and fuels resources.

The proposed South Deep Timber Sale project described in the introduction to this chapter is a foreseeable activity which could have cumulative fire and fuels effects in the area. For all alternatives a person-caused or natural wildfire in the area could necessitate the movement or removal of livestock from the area for safety reasons during fire suppression and post-fire rehabilitation work. Depending on the fire severity and rate of vegetation recovery there could be a short-term delay of up to one or two years before allowing livestock to graze burned areas.

If an action alternative is selected for South Deep TS there would likely be some level of treatment of activity fuels. No cumulative effects associated with fuels treatment is anticipated.

3.2.4 Works Cited

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3.3. Fisheries

Descriptions in this section rely on local information derived from visits by the fishery biologist, population sampling, and surveys done in the planning area from 1991 – 2004. From 2000 – 2004 all of the streams in the analysis area were visited by the Forest fisheries biologist, whose observations are included in this section. Information was also obtained from meetings with agency specialists and related resource specialist reports. For more detailed information, see the specialist's report in the project analysis file.

3.3.1. Affected Environment

The three allotments in the Aladdin Allotment Complex contain several streams. Beyers, Meadow Creek, North Mill, Rogers, and Smackout Creeks were surveyed for physical habitat condition, using the Hankin-Reeves survey protocol from 1991 – 2001 (USDA FS 1991-2001). The Forest Fisheries Biologist visited the streams in the project area; those observations are included in the specialist report in the project analysis file.

The allotments were surveyed for critical areas: areas that have the potential for damage, are damaged, are currently below the desired riparian condition, or were heavily affected. These areas would be the focus of monitoring and restoration. They are also the baseline for determining if other areas need monitoring. Smackout Meadow is the main critical area. Table 3-2 lists the critical areas and the corresponding map site numbers. Critical area maps are in Chapter 2.

Table 3-2. Critical Area Descriptions, Map Site Numbers, and Allotments

Critical Area Description	Map and Site Number	Allotment
Smackout Meadow	Figure 2-1, site 1	Smackout
A clearcut on Byers Creek	Figure 2-2, site 2	Meadow Creek
Smackout Creek	Figure 2-1, site 3	Smackout
A wetland below Big Meadow Lake	Figure 2-2, site 4	Meadow Creek
A wetland next to the Big Meadow Lake Road	Figure 2-2, site 5	Meadow Creek
Rabbit Creek Meadow	Figure 2-2, site 6	Aladdin
Tributaries to Meadow Creek and Smackout Creek (two sites)	Figure 2-2, site 7	Meadow Creek

The interdisciplinary team used the rating process developed by the Bureau of Land Management (USDI 1993) to assess riparian conditions in the three allotments. The process assesses whether riparian condition is adequate to fulfill such functions as water and sediment storage, flood moderation, maintenance of streambank stability, supply of large wood, and shading. It ranks areas in categories of proper functioning condition (PFC).

Threatened and Sensitive Fish Species

Bull trout (*Salvelinus confluentus*): All watersheds in the Aladdin Complex drain into the Deep Creek or the Mill Creek watersheds. These watersheds were sampled for fish presence from 1992-1998. No bull trout have been found; there is no historical documentation of bull trout in these watersheds.

Westslope cutthroat trout (*Onocorhynchus clarki*): Populations are present in Rogers, Smackout, and Byers Creeks. The fish in each stream are very limited in distribution, but appear to be reproducing.

Interior redband trout, also referred to as coastal rainbow trout, (*Oncorhynchus mykiss gairdneri*): Present in Meadow Creek and in Strauss Creek. The subspecies of rainbow trout in Meadow and Strauss Creeks appear to be reproducing.

Habitat and Fish Population Descriptions

The descriptions below include information about the planning area in relation to threatened and sensitive fish species. The planning area is described according to streams within each allotment.

Private land--South Fork of Deep Creek. Many of the streams drain into the South Fork. The South Fork contains brook trout, rainbow trout, and cutthroat trout. The South Fork is on private land and not within the boundaries of the allotments. However, it is the cumulative effects reach for this project. Habitat conditions vary because of private land practices.

Private land--Mill Creek. The North Fork of Mill Creek, and Rabbit, Strauss, and Jump Off Joe Creeks drain into Mill Creek. Mill Creek contains brook trout, rainbow trout, and cutthroat trout. Mill Creek is on private land and not within the boundaries of the allotments. However, it is the cumulative effects reach for this project. Habitat conditions vary because of private land practices. Temperatures exceed state standards, due mostly to private land practices.

Smackout Allotment

The Smackout Allotment is located south of Deep Lake and contains the Little Smackout Creek, Smackout Creek, and Current Creek subwatersheds. Smackout and Current Creeks flow into the North Fork of Deep Creek south of Deep Lake. Little Smackout Creek flows into the South Fork of Deep Creek. All streams in the allotment eventually flow into the Columbia River (Lake Roosevelt) south of the town of Northport, Washington. Only Smackout Creek is fish-bearing.

Smackout Creek is a tributary to the North Fork of Deep Creek. The main stream was surveyed for physical habitat characteristics in 2001 (USDA FS1991-2001). The main stream is fish bearing, containing brook trout. Water temperatures taken in July 2001 indicate that maximum water temperatures reached 15 Degrees C. These temperatures do not exceed state standards; they are adequate to support trout populations.

Smackout Creek is a riffle-dominated step pool system for the first two miles above the Forest boundary. Streambank stability is excellent and riparian vegetation is continuous with good crown closure along these lowest two miles on National Forest System lands. This portion of the stream has a high frequency of pools within what can be expected for the type of channel. There is an abundance of large instream woody debris (pieces per mile). Embeddedness[26] is low within a streambed substrate dominated by gravel-sized material. Very steep terrain at the lower portion of this watershed makes access for livestock very poor.

The upper portion of the stream lies within a wide valley form. Homesteaders in the arly part of the last century straightened the stream channel and built a ditch to drain the wettest portions of the valley. The stream is slowly returning to a meandering pattern and the ditch is in disrepair. Riparian vegetation along the upper portion of Smackout Creek has been severely affected by homesteaders and most recently by concentrated livestock grazing within a series of pastures in the valley. Riparian crown closure is spotty with many openings with shade provided only by overhanging grasses and/or sedges.

The main critical area is located in Smackout Meadows between pastures 1 and 4. It would likely be classed as PFC functional-at risk (USDI 1983).

Meadow Creek Allotment

The Meadow Creek Allotment is located in the eastern portion of the South Fork of Deep Creek watershed, and contains several smaller nested subwatersheds: Miller, Byers, and Upper and Lower Meadow Creeks, and small unnamed first order subwatersheds. These streams flow into the South Fork of Deep Creek and eventually into the Columbia River (Lake Roosevelt).

Big Meadow Lake is located along the eastern boundary of this allotment. It is approximately 72 acres and contains the only developed campground in the three allotments. The campground and the riparian area below the dam were originally fenced to exclude cattle; however, reduced Forest Service budgets resulted in the termination of fence repair and maintenance. This area and a wet meadow below Big Meadow Lake are listed as critical areas (see Figure 2-2). Meadow Creek, Byers Creek and Big Meadow Lake are the fish-bearing portions of this allotment. Big Meadow Lake is stocked with rainbow trout fingerlings.

In the Meadow Creek Allotment, cattle grazing occurs primarily in Paradise and Millionaire meadows, along roadsides, and in transitory range in past clearcut units. Primary cattle use of the riparian areas occurs at road crossings, in some Byers and Aladdin clearcuts, and in Paradise meadow.

[26] Embeddedness – a condition where large material in a streambed; i.e., gravel sized rock or larger, is infiltrated or surrounded by finer material such as sand and/or silt. The higher the level of embeddedness, the less space available for hiding cover for smaller fish and the poorer the ability of water to bring oxygen to and flush metabolic wastes from developing fish eggs in the streambed.

The interdisciplinary team found the riparian areas of Meadow and Byers Creeks to be in PFC or PFC at risk. A portion of the tributary of Miller Creek that flows through Paradise Meadow (PFC at risk) is in poor condition from bank sloughing caused by overuse of the riparian vegetation.

Meadow Creek and Byers Creek
Meadow Creek is a tributary to the South Fork of Deep Creek. This stream and Byers Creek, a major tributary, have been surveyed for physical habitat characteristics. Meadow Creek is fish bearing (coastal rainbow and brook trout). Byers Creek is also fish bearing (westslope cutthroat and brook trout). Water temperatures taken in 2000 indicate that the maximum water temperature reached 14.5 degrees C. in the upper end of this watershed. These temperatures, which do not exceed state standards, are adequate to support trout populations.

Streambank stability is excellent where riparian vegetation is continuous with good crown closure. Very steep terrain on the lower reaches of Meadow Creek makes livestock access poor. However, in the upper end of the watershed, previous clearcut harvesting has created transitory range and removed the riparian vegetation along both Meadow (see Figure 2-2, site 5) and Byers Creeks (see Figure 2-2, site 2). Primary livestock access occurs where roads intersect the streams and in harvest units adjacent to the streams. The riparian vegetation along these clearcuts is recovering and streambanks are becoming more stable.

The streams have a low frequency of pools for their type of channels. Soil movement from the road system (county and forest) into the streams can fill pool habitat; this is a main contributing factor. Another factor is the limited streambank erosion caused by cattle's overuse. There is an abundance of large instream woody debris (179 pieces per mile) for Meadow Creek and (213 pieces per mile) for Byers Creek. Embeddedness is high within a streambed substrate dominated by sandy material in both Byers and Meadow creeks.

Aladdin Allotment

The Aladdin Allotment is located in the southern part of the South Fork of Deep Creek watershed and northern part of the Mill Creek watershed. Clinton/Kolle, Rogers, Scott, Kenny, and Rabbit Creeks drain north into the South Fork of Deep Creek and eventually into the Columbia River. Cy, Marble, and Strauss Creeks, and the North Fork of Mill Creek drain south into the Mill Creek watershed. Mill Creek is a tributary of the Colville River that flows into the Columbia River near the town of Kettle Falls, Washington. The North Fork of Mill Creek and Jump Off Joe, Strauss, and Rogers Creeks are fish-bearing.

Clinton Creek
This stream is a tributary to the South Fork of Deep Creek. It has not been surveyed for physical habitat characteristics, but it was field reviewed by Colville National Forest fisheries staff. The Forest Fisheries Biologist visited the streams in the project area; those observations are included in the specialist report in the project analysis file. A majority of this watershed on National Forest land has poor access for livestock, because of a lack of roads and very steep terrain. Riparian vegetation is fully functional and continuous.

Water temperatures taken in July 2000 indicate that maximum water temperature reached 13 degrees C. at the upper portion of Clinton Creek, reaching a high of 12 degrees C. in the upper South Fork. These temperatures do not exceed state standards; they are adequate to support trout populations.

Primary livestock access is on private land where the stream flows through pasture land. This stream is perennial, non-fish bearing on National Forest lands, due to a gradient barrier. Brook trout are distributed on the lower portion of the stream on private lands.

Jump Off Joe Creek
A small portion of this stream is in the allotment. It is a tributary to the North Fork of Mill Creek which flows into the Colville River. It has not been surveyed for physical habitat characteristics. However, the stream was field reviewed by Colville National Forest Fisheries staff. A majority of the watershed has poor access for livestock. Riparian vegetation is fully functioning and continuous throughout its length on National Forest System lands. Cattle use occurs primarily at one road crossing and along a closed Forest road along the eastern edge of the riparian vegetation. This road has failed at two locations and slumped into the riparian vegetation, which is sufficient for intercepting a majority of the soil movement. Cattle use has not affected these sites. Stream temperatures are sufficiently cold (12 degrees C. on July 25, 2000) to support both westslope cutthroat and brook trout. Overhead canopies are continuous except at road intersections.

Kolle Creek
This stream is a tributary to the South Fork of Deep Creek which joins the North Fork to form Deep Creek. Deep Creek flows into the Columbia River. It has not been surveyed for physical habitat characteristics, but it was field reviewed by Colville National Forest Fisheries staff. The riparian vegetation is fully functional and continuous. A majority of this watershed has poor access for livestock (lack of roads and very steep terrain). Portions of the stream become intermittent during the summer months. It is non-fish bearing on National Forest lands. Primary livestock access is at one road intersection with the stream near the mouth where some limited bank sloughing and compaction is occurring.

North Fork of Mill and Rabbit Creeks
North Fork of Mill Creek was surveyed from the confluence of Cy Creek for four miles upstream. The first two miles pass through a canyon and then old beaver dams. The last reach was a series of beaver dams and marshes. The stream has a low frequency of pools, within what can be expected for the type of channel. There is an abundance of large instream woody debris (74-100 pieces per mile). Embeddedness is high. Lack of roads and very step terrain makes poor livestock access for a majority of this watershed.

Rabbit Creek is a small non-fish bearing tributary to Rocky Creek. It has a large meadow, which was enhanced by a Forest Service project. Cows do affect the edge of the meadow. This meadow is on the critical areas map (see Figure 2-2, map site 6).

Rogers Creek

This stream is a tributary to the South Fork of Deep Creek. The main stream has been surveyed for physical habitat characteristics. The main stream is fish bearing (westslope cutthroat and brook trout). Neither species is present in the two forks (gradient barriers). Water temperatures taken in July 2000 indicate that maximum water temperature reached 15 degrees C. at the Aladdin highway intersection near the mouth of Rogers Creek, while reaching a high of 12 degrees C. in the upper South Fork of Rocky Creek. These temperatures do not exceed state standards and are adequate to support trout populations.

Rogers Creek streambank stability is excellent; riparian vegetation is continuous with good crown closure. This portion of the stream has a low frequency of pools but is within what can be expected for the type of channel. There is an abundance of large instream woody debris (327 pieces per mile). Embeddedness is low within a streambed substrate dominated by gravel-sized material. Lack of roads and very steep terrain gives a majority of this watershed poor access for livestock. Primary livestock access is where one road intersects the South Fork of Rogers Creek.

Scott and Kenny Creeks
These streams are tributaries to the South Fork of Deep Creek. Because of their intermittent nature on National Forest land, these were surveyed using the Hankin-Reeves survey protocol from 1991 – 2001 (USDA FS 1991-2001). A majority of this watershed on National Forest land has poor access for livestock due to very steep terrain. Riparian vegetation is fully functional and continuous although narrow in width. Primary livestock access is on private land.

Strauss Creek
This stream is a tributary to the North Fork of Mill Creek. The Forest Fisheries Biologist visited the stream; those observations are included in the specialist report in the project analysis file. A majority of this watershed has poor access for livestock. Access is mainly along the road system where it lies within the riparian areas or intersects the stream. Riparian vegetation is fully functioning and continuous throughout it lengths on National Forest lands. The portion of stream on private lands has not been walked but riparian vegetation appears to be continuous as well on this ownership. The stream supports both rainbow and brook trout. Overhead canopies are continuous except at road and power line intersections. Cattle use occurs primarily at three road crossings.

Summary of Indicators and Riparian Management Objectives

Riparian Management objectives (RMOs) and definitions of Riparian Habitat Conservation areas (RHCAs) were developed for the Inland Native Fish Strategy (INFISH) environmental assessment, which amended the Forest Plan. RMOs are criteria used to measure progress toward riparian goals. The INFISH RMOs are:

- Water temperature
- Pool frequency
- Large woody debris
- Bankfull width to depth ratio

Other effects to fisheries are measured by:

- Embeddedness
- Riparian vegetation

Together the six indicators give a determination of the effects on the fish populations. The potential environmental effects of the three alternatives also discussed below according to these six measures or indicators. The following section summarizes the current status, in the planning area, of each indicator.

Water Temperature. Many miles of stream within the Aladdin Allotment Complex allotments have fully functioning riparian areas that provide excellent overhead shading and currently meet the RMO for water temperature. During high temperatures, the streams in the allotment provide refuge for trout. The South Fork of Deep Creek and Mill Creek are on the state 303d Water Quality list for temperature; however, these portions are not on Forest Service administered property. The streams in the allotments provide a refuge for trout during high temperatures

Pool Frequency. Pool frequency is not a problem in most of the planning area. Many streams do not meet the RMO for pools, but that is typical of these streams and does not reflect a management-caused problem. Pool filling is causing some problems in Smackout Creek, a result of cattle-caused damage and cumulative effects of roads and other resource management activities.

Large Woody Debris. Many miles of stream in the three allotments have fully functioning riparian areas that provide excellent large woody debris recruitment. However, meadows affect the amount of available wood. Through browse and trampling damage, cattle have slowed achievement of this RMO in meadows.

Bankfull Width to Depth Ratio. Bank damage and stream widening is uncommon throughout the analysis area. However, cattle have caused damage to localized spots by widening the channel and increasing the width-depth ratio (see Figures 2-1 and 2-2, sites 1-7).

Embeddedness. High levels of embeddedness exist in a majority of the reaches surveyed within the allotments. A major factor affecting the level of embeddedness is the existing amount of soil movement from sloughing stream banks. This is primarily occurring in the pastures where cattle use is highest.

Riparian Vegetation. Except for a few meadows, such as Smackout Meadows and Millionaire Meadows, the riparian vegetation is intact throughout the planning area.

Fish Population. The fish populations have small numbers of fish (eastern brook trout, rainbow trout, and cutthroat trout). The main effects to fisheries are the cumulative effects of sedimentation and temperature on the South Fork of Deep Creek.

3.3.2. Potential Effects: Fisheries

This section addresses potential effects of the alternatives to both the INFISH RMOs and to fisheries. The INFISH RMO indicators are: water temperature, pool frequency, large woody debris, and bankfull width to depth ratio. To measure the effects to fisheries, embeddedness and riparian vegetation were added to these four indicators. Together the indicators give a final determination of the effects to the fish populations. The cumulative effects area is the South Fork of Deep Creek and Mill Creek.

Effects Common to Alternatives 2 (No grazing) and 3 (Continued grazing with modifications)

The effects of Alternatives 2 and 3 are similar: both result in riparian recovery. Alternative 2 achieves this by removing grazing from the three allotments. Alternative 2 reduces effects so standards can be reached.

Alternative 3 proposes to achieve riparian recovery by adjusting the distribution and timing of grazing, relocating water sources, and installing fencing to keep livestock out of certain riparian areas. Alternative 3 is not as effective as Alternative 2. Localized areas will still be affected. Effectiveness monitoring and improvements are needed to assure that cattle impacts are kept to a minimum.
The cumulative effects areas are the South Fork of Deep Creek and Mill Creek.

Table 3-3. Effects of Alternative 2 (No grazing) and Alternative 3 (Continued grazing with modifications)

RMO or indicator	Effects	Cumulative Effects (the South Fork of Deep Creek and Mill Creek)
Water temperature	Changes to riparian temperature will be within the natural variability and not be detectable (see the hydrology specialist's report). The RMO for this indicator will be maintained within Washington State Standards.	Any reduction in temperatures would be undetectable in the South Fork of Deep Creek and Mill Creek because they would be so small, and temperature exceedances in these two streams most likely result from private land practices.
Pool frequencies	The level of sediment accumulation within pools is expected to decrease. Pool frequency will increase slightly in Smackout and North Fork Mill Creeks. Pool numbers are expected to remain stable in stream habitat where riparian grazing has not damaged stream banks. The current level of soil movement from the stream banks of creeks where overgrazing has occurred is expected to decrease as areas of compacted soils and sloughing banks revegetate.	Alternatives 2 and 3 are not expected to affect the quantity and quality of pool habitat of the South Fork of Deep Creek and Mill Creek. Any reduction in sediment as the streams heal is likely to be immeasurable compared to the background level of erosion and other contributors in the larger South Fork of Deep Creek and Mill Creek watersheds.

RMO or indicator	Effects	Cumulative Effects (the South Fork of Deep Creek and Mill Creek)
	Pools numbers will possibly increase. For these reasons, Alternatives 2 and 3 are anticipated to move towards achieving this RMO.	
Large woody debris	Large in-stream wood numbers would slowly increase on all three allotments. Where over-grazing has occurred, riparian vegetation would increase if areas of compacted soils and sloughing banks revegetate. As woody riparian vegetation matures and dies, current numbers of in-stream wood are expected to increase. Current numbers of large wood in surveyed streams would continue to meet this RMO except for the part of Smackout Creek in the fenced meadows and Byers Creek in the former clearcut. Alternatives 2 and 3 would increase the numbers of in-stream wood and possibly increase pool numbers in reaches where livestock overuse has diminished the function of riparian vegetation. For these reasons, A-2 and A-3 move toward achieving this RMO.	Effects on the South Fork of Deep Creek and Mill Creek are expected to be negligible because most large wood in the allotment streams does not reach this creek.
Bankfull width/depth ratio	Current bankfull width/depth ratios are expected to remain stable on most reaches of streams. Current riparian vegetation would increase in vigor and numbers if areas of compacted soils and sloughing banks revegetate with deep rooted species. Revegetation would occur by decreasing grazing pressure in areas currently over-grazed. As bank integrity increases and sediment loading decreases in reaches with high width/depth ratios, the ratio should decrease slowly.	One factor that affects the bankfull width/depth ratio is the amount of sediment transported from the tributaries of the South Fork of Deep Creek and Mill Creek that is deposited in its channel. The effects of the sediment reduction under Alternatives 2 and 3 is likely to be immeasurable when compared to the background level of erosion and other contributors in the larger South Fork of Deep Creek and Mill

RMO or indicator	Effects	Cumulative Effects (the South Fork of Deep Creek and Mill Creek)
	For these reasons, Alternatives 2 and 3 would move toward achieving this RMO in stream portions where channels are too wide and shallow. This is expected to be a long-term goal where woody species are in low vigor or absent from the riparian stands. For these reasons, Alternatives 2 and 3 will move towards achieving this RMO.	Creek watersheds.
Embeddedness	Embeddedness levels will decrease in Smackout Creek and North Fork of Mill Creek under Alternatives 2 and 3. Existing riparian vegetation is expected to increase in vigor and numbers as areas of compacted soils and sloughing banks revegetate with deep-rooted species. Current level of soil movement from the stream banks of creeks, particularly portions of Byers and Smackout Creek where overgrazing occurred, would decrease. Areas of compacted soils and sloughing banks would start to recover as a result of changes in the allotment management. As bank vegetative cover and stability increase, the level of soil erosion into the stream systems is anticipated to decrease. This could directly reduce the level of embeddedness of the streambed substrate over time. This alternative will decrease the level of in-stream sediment, but sites along County Road 4708 (because of subsurface drainage, shallow infertile soils, and slope gradient) would continue to remain a source of soil erosion. Alternatives 2 and 3 are expected to improve substrate condition in the analysis area.	Alternatives 2 and 3 would contribute to the overall reduction of the level of embeddedness of the South Fork of Deep Creek and Mill Creek. The effects of this potential reduction are likely to be immeasurable compared to the background level of erosion and other contributors in the larger South Fork of Deep Creek and Mill Creek watersheds. Sediment introductions from timber harvest and road construction will impact pool, spawning, and rearing habitat in the South Deep Watershed. The Aladdin Complex project will reduce sediment input from critical areas. Therefore the Aladdin Complex will not add cumulatively to the effects from the South Deep EIS.

RMO or indicator	Effects	Cumulative Effects (the South Fork of Deep Creek and Mill Creek)
Riparian vegetation	Under Alternatives 2 and 3, current stream and riparian habitat conditions in the analysis area are expected to improve where past livestock overuse in riparian areas occurred. Riparian function is expected to improve by the increased stability, filtering ability, and soil protection provided by additional root mass and groundcover that would return after grazing pressure is removed. Current levels of soil movement from the creeks' streambanks, particularly overgrazed portions of Byers and Smackout Creek, would decrease. Areas of compacted soils and sloughing banks would start to recover. However, where roads have limited the width of existing riparian vegetation, riparian areas are not functioning properly as filters of sediment and contributors of large in-stream wood. The existing condition of these sites is expected to remain unchanged by Alternatives 2 and 3.	Alternatives 2 and 3 are not expected to have an effect on the riparian vegetation of the South Fork of Deep Creek or Mill Creek because this area is out of the direct impact of cattle on vegetation.
Fish populations	Livestock overuse in the riparian areas has degraded channel and riparian habitat. This degraded in-stream habitat would begin recovering after grazing pressure is decreased. Alternatives 2 and 3 would decrease sediment input and degradation of spawning and rearing habitat in the allotment streams. Summer water temperatures would decrease. This beneficial effect to fish and fish habitat would be seen in the Smackout Creek watershed because of reduced cattle pressure in Smackout valley. This would allow riparian vegetation along this creek to reestablish. Recovery is expected in damaged riparian areas of Smackout and Byers Creek.	Alternatives 2 and 3 would positively affect fish populations of the South Fork of Deep Creek and Mill Creek by reducing sediment-laden waters from subwatersheds, which should reduce the embeddedness of the spawning and rearing habitat. These effects are likely to be immeasurable compared to the background level of erosion and other contributors to embeddedness throughout the larger South Fork of Deep Creek and Mill Creek watersheds. Interior redband trout are present in the South Fork of Deep Creek. Alternatives 2 and 3 should have no

RMO or indicator	Effects	Cumulative Effects (the South Fork of Deep Creek and Mill Creek)
	This would have a beneficial effect on westslope cutthroat trout and their habitat (depending on how they compete with eastern brook trout for available habitat). Cattle grazing is not currently impairing the redband trout in the Rogers, Strauss, Meadow Creek, South Fork of Deep Creek, and North fork of Mill Creek; therefore, this alternative would have no impact to redband trout and their habitat.	cumulative effects on the population in the analysis area. Alternatives 2 and 3 are expected to have a beneficial effect to westslope cutthroat trout and salmonid habitat throughout the larger South Fork of Deep Creek watershed.

Effects of Alternative 1 (No change)

Table 3-4 lists environmental and cumulative effects of Alternative 1 (no change). For more detailed information, see the fisheries specialist report in the project analysis file.

Table 3-4. Effects of Alternative 1 (No change) on Fisheries

RMO or indicator	Effects	Cumulative Effects (the South Fork of Deep Creek and Mill Creek)
Water temperature	Water temperature regimes are not expected to change. South Fork of Deep Creek outside of the Forest boundary will stay on the 303D list for temperature. Current level of soil movement from stream bank erosion and other sources into the stream systems within the allotments is expected to continue. Existing stream and riparian habitat conditions are expected to remain stable. The seven-day averages of maximum daily temperatures for Meadow Creek, Rogers Creek, and Clinton Creeks do not exceed state standards and are adequate to support trout populations.	Alternative 1 is expected to prevent or retard movement toward achievement of this RMO on Smackout and Byers Creeks because of localized over-use of riparian vegetation and stream-bank vegetation. Alternative 1 (No change) is not anticipated to contribute to raising water temperatures of the South Fork of Deep Creek during the summer months. High summer water temperatures in certain segments of subwatersheds, such as upper Smackout Creek, are tempered by the effects of overhead shading and dilution. Increased stream temperature, if any, is likely to be immeasurable when compared to the other contributing tributaries and the solar heating of South Fork of Deep Creek and Mill Creek.
Pool frequency	Present numbers of pools in most surveyed stream reaches within the allotments do not meet the INFISH frequency expected for their specific widths. Existing levels of soil movement into the streams from riparian livestock-grazed areas and other sources are expected to continue. The lack of in-stream wood, particularly along a segment of Smackout Creek, will continue to limit the number of pools in that reach. Pool frequency will not change under the present grazing systems. The fishery will continue to be	Alternative 1 is anticipated to negatively affect the quantity and quality of pool habitat of the South Fork of Deep Creek and Mill Creek. The contribution of sediment-laden waters from subwatersheds will fill pools and reduce pool quality. The effect of the contribution, however, is likely to be immeasurable compared to the background level of erosion and other contributors, particularly roads, throughout the larger South Deep Creek and Mill Creek watersheds.

RMO or indicator	Effects	Cumulative Effects (the South Fork of Deep Creek and Mill Creek)
	negatively affected by the lack of quality pool habitat in localized areas. Alternative 1 is expected to continue to prevent or retard movement toward achievement of this RMO.	
Large woody debris	Large woody debris numbers would remain stable under Alternative 1 (No change). Current levels of in-stream wood in a majority of surveyed streams would continue to meet the INFISH RMOs, except for the reach of Smackout Creek in the fenced pasture system and the reach of Byers Creek in a former clearcut. Low numbers of woody vegetation would continue to be maintained in riparian areas where heavy livestock grazing has kept them to a minimum and decreased contribution to the stream system. Alternative 1 (No change) is expected to continue to prevent or retard the achievement of this RMO within these reaches.	The effect on the amount of large in-stream wood on the South Fork of Deep Creek and Mill Creek is expected to be negligible, because most large wood within the streams located within the allotments does not reach this creek..
Bankfull width/depth	The existing bankfull width/depth ratios on a majority of surveyed streams within the allotments meet the INFISH RMOs, except for the reach of Smackout Creek within the fenced pasture system. Bank sloughing and sediment accumulation in heavily-grazed riparian areas has widened the stream channels. Alternative 1 (No change) is expected to continue to prevent or retard the achievement of this RMO.	One factor that affects bankfull/width/ratio is the amount of sediment transported from the tributaries of the South Fork of Deep Creek that is deposited in its channel. The contribution of sediment, however, is likely to be immeasurable compared to the background level of erosion and other contributors, particularly roads throughout the larger South Fork of Deep Creek and Mill Creek watersheds.
Embeddedness	Embeddedness levels of the streambed substrate would remain stable under Alternative 1 (No change). There are high embeddedness levels in a majority of the reaches surveyed. Current level of soil movement from riparian areas from livestock over-use is not expected to significantly improve. Existing stream	Alternative 1 (No change) is anticipated to continue to contribute to the level of embeddedness of the South Fork of Deep Creek. The effect, however, is likely to be immeasurable compared to the background level of erosion and other contributors throughout the larger South Fork of Deep Creek and Mill Creek

RMO or indicator	Effects	Cumulative Effects (the South Fork of Deep Creek and Mill Creek)
	and riparian habitat conditions are expected to remain significantly unchanged. High embeddedness affects spawning habitat quality. Increased sediments levels can reduce quality or eliminate habitat. Alternative 1 is expected to allow the existing stream bank conditions, where over-use of the riparian vegetation occurs, to continue to have a detrimental effect on aquatic habitat in certain stream segments within the allotments.	watersheds.
Riparian vegetation	The present function of the riparian areas would remain stable. A majority of surveyed streams meet the INFISH RMOs for pools, in-stream wood width/depth ratio indicating that the riparian vegetation is fully functional, except for the segment of Smackout Creek within the fenced pasture system. Woody vegetation would continue to be poorly represented in heavily-grazed riparian areas. Alternative 1 (No change) is expected to maintain the present condition of the riparian vegetation.	Alternative 1 (No change) is not anticipated to have an effect on the riparian vegetation of the South Fork of Deep Creek and Mill Creek. Effects to riparian vegetation are direct effects that would involve direct grazing on the vegetation. Because the South Fork of Deep Creek and Mill Creek are outside the allotment areas, no grazing would occur on the vegetation from this action.
Fish populations	Existing stream and riparian habitat conditions are expected to remain consistent under Alternative 1 (No change). Woody vegetation would continue to be poorly represented in heavily-grazed riparian areas in parts of Smackout and Byers Creeks. Eastern brook trout would continue to tolerate degraded in-stream conditions (low frequency of pools, minor amount of in-stream woody debris, high embeddedness level) in segments of Smackout and Byers Creeks. Both streams have small, poorly distributed westslope cutthroat populations. High levels of sediment that increase the embeddedness of the streambed substrate, with high summer water	Alternative 1 (No change) is expected to continue to affect the fish population of the South Fork of Deep Creek and Mill Creek by contributing sediment-laden waters from subwatersheds. The redband trout population in the South Fork of Deep Creek will continue to be affected. The effect of the contribution, however, is likely to be immeasurable compared to the background level of erosion and other contributors to embeddedness throughout the larger South Fork of Deep Creek and Mill Creek watersheds.

RMO or indicator	Effects	Cumulative Effects (the South Fork of Deep Creek and Mill Creek)
	temperatures, continue to negatively affect the westslope cutthroat trout populations and their habitat in Byers and Smackout Creeks. No long-term expansion of these subpopulations is expected under existing habitat conditions. Fish populations elsewhere on the allotments are expected to remain stable.	

Potential Cumulative Effects Associated with Foreseeable Future Projects

The proposed South Deep Timber Sale project described in the introduction to this chapter is a foreseeable activity which could have a cumulative fisheries effect. If an action alternative for South Deep TS is selected there would likely be some level of construction of permanent and temporary roads. Erosion and sedimentation could occur where these roads cross intermittent and perennial streams. The additional sediment could have an adverse impact on fish and their habitat. The effects would be short-term as these sites revegetate. Depending on the location of crossings in relation to livestock travel and use areas the crossings could be adversely impacted by livestock accessing water.

Existing policy and regulations limits or excludes timber harvest activities adjacent to streams and in riparian areas. Some minor riparian harvesting could occur in South Deep as part of a scientific research project. If roads are constructed to access stream buffers and riparian areas livestock could graze the transitory range created and access the stream adjacent to the unit.

Monitoring activities following the South Deep TS would identify impact areas. Adaptive management treatments such as fencing could be used to mitigate the impact until a permanent solution is developed and analyzed

3.3.3. Works Cited

U.S. Department of Agriculture, Forest Service. 1991-2001. Stream surveys: Region 6 Hankin and Reeves Surveys. Unpublished stream surveys. On file with Colville National Forest, 765 South Main Street, Colville, WA. 99114.

U.S. Department of the Interior, Bureau of Land Management. **1993**. TR # 1737-9. Riparian area management: Process for assessing proper functioning condition. Denver, CO.

3.4. Forest Trees

Descriptions in this section rely on local information derived from aerial photographs, field reconnaissance, Colville District harvest activity database (D1-iadb). Forest Service Geographic Information System (GIS) was used to map allotment boundaries, plan management areas, harvest activities and other resource information. Information was also obtained from meetings with agency specialists and related project and resource specialist reports.

3.4.1. Affected Environment

The Aladdin, Meadow Creek, and Smackout allotments can be characterized as forested rangeland or transitory range[27] which provides food, water, and cover for domestic livestock. Stands of forest trees on these allotments are various mixtures of conifer species (western larch, Douglas-fir, lodgepole pine, ponderosa pine, western white pine, western red cedar, hemlock, grand fir, and Engelmann spruce) and hardwood trees (cottonwood, aspen, and birch). Several small meadows in riparian areas and adjacent wet lowlands were cleared for homes, farming and livestock grazing in the 1930s and introduced non-native grasses and forbs. Some of these created meadows have persisted into the present and are the major source of livestock forage in the allotment complex.

Hardwood Trees

Cottonwood, aspen, and birch trees throughout the Aladdin Complex provide forage for livestock. The condition of hardwood trees within the Aladdin Grazing Complex has been characterized as declining. Although browsing of aspen sprouts and other hardwoods occurs in the allotments, it was identified as a limiting factor only along Smackout Creek between pastures 1 and 4.

Transitory Range

Timber harvest creates transitory range within the openings of the forest and provides additional forage for livestock. It is transitory in that the openings are reforested over time and will not be openings for much more than 15 to 18 years (which is the amount of time that most stands in this area grow from seedlings to an average height of 4.5 feet). Transitory range can reduce grazing pressure on primary and secondary range. Approximately 25 percent (9,494 acres) of National Forest lands within the Aladdin Allotment Complex were harvested since 1965. Since 1965, regeneration harvests (clearcutting, final shelterwood cutting, seed tree removal) made up roughly 50 percent of the Aladdin and Smackout Allotments and 70 percent of the Meadow Creek Allotment harvest type. While current regeneration harvest levels are lower (26 percent of Aladdin, 38 percent of Meadow Creek, and 46 percent of Smackout) than they were before 1990, the regeneration plantations harvested since 1990 are still serving as transitory range.

Past Management Activities

Information about past timber harvest activities on National Forest lands, from approximately 1965 to present, is in the specialist report in the project analysis file. Tree regeneration problems

[27]Transitory range is land which produces suitable levels and composition of livestock forage or can temporarily provide such forage as a result of a disturbance event such as fire, or harvest activities (FSH 2202.21 and FSM 2200).

from past harvest include brush competition, mortality caused by insects and diseases (white pine blister rust, root pathogens, bark beetles), and damage from foraging by wildlife.

3.4.2. Potential Effects: Forest Trees

Cattle grazing can produce both negative and positive effects for silvicultural projects. Protection from direct damage to both planted and natural regeneration is the primary concern when cattle graze plantations. The first years of establishment of a plantation are the most critical and important. Any damage to seedlings will impact them throughout their life.

Potential Negative Effects

Possible direct effects of grazing include damage to tree seedlings from trampling, root damage, or browsing. Trampling can also cause detrimental effects to seedling establishment by compacting and disturbing the soil. Once established, seedlings may be uprooted, and mechanically injured by trampling. Retarded growth and even death from disease may result. Rubbing, horning, and similar activities result in broken branches or injury to the bark through which disease may enter.

Improper distribution of cattle is the usual cause of excessive trampling damage. More cattle in an area increase the probability that seedlings will be trampled. Also, the longer cattle are allowed to remain in an area the greater the chance that a seedling would be stepped on (Newman and Powell, 1997).

Browsing by cattle is unlikely to kill young trees unless it is both severe and repeated several times, but it can cause deformities. Removing the top bud of conifer trees, or of over half of the currant year's foliage, however, will reduce tree growth and vigor that year (Sharrow, 1997).

Indirect damage to tree seedlings includes soil compaction and soil erosion, which interrupts tree development. Cattle can also damage larger trees through soil compaction, leading to root damage or scarring of the stem. This damage may make trees more susceptible to insect and/or disease problems by creating a weakened point of entry.

Demchik states that cattle will rub trees mercilessly, especially during fly season, and continual rubbing will damage trees. If only patches of trees are left, cattle will stay in the trees for shelter when it is hot or cold and compact the soil. Trees are damaged by continual rubbing of bark, soil compaction and bark and bud browsing (Demchik, 2001).

Conflicts sometimes develop between managing areas for cattle use and silvicultural treatment of forested stands. Timber harvest may construct roads through, or remove trees from stands that had formed a barrier to cattle movement. These "natural" barriers may have prevented cattle from entering sensitive riparian areas or from crossing between pastures or allotment boundaries. Logging or thinning slash may inhibit cattle movement along established routes. Cattle may also be attracted to some harvest units and damage seedlings through trampling or incidental grazing. Silvicultural treatments can also be used to create desirable barriers to cattle movement where none existed before. In some cases timber harvesting has necessitated the construction and maintenance of additional fences and cattleguards by breaking existing barriers to cattle movement.

Potential Positive Effects
Cattle grazing may benefit silviculture treatments by reducing the amount of vegetation competing with small trees for water, nutrients, or light. It may also be a factor in creating seedbeds for natural regeneration. Increased growth of young trees attributable to grazing has been reported for ponderosa pine, Douglas-fir, western white pine, western larch, and white spruce. However, reports of silvicultural grazing being ineffective in substantially increasing conifer growth are also common (Sharrow, 1996).

Grazing animals can dramatically influence which plant species gain a competitive advantage and dominance through giving an advantage to non-palatable species and those that respond rapidly to grazing and browsing impacts.

Site Specific Effects of Livestock Grazing on Forest Trees
Based on review of reforestation stocking surveys, field review of plantations, recommending and certifying restocking of forested lands on harvested units, no effects from cattle grazing were observed that would result in a failure to meet regeneration objectives in the Aladdin Allotment Complex. No known problems with plantation failures could be attributed directly to cattle grazing. The condition of hardwood trees within the Aladdin Grazing Complex has been characterized as declining. Although browsing of aspen sprouts and other hardwoods occurs in the allotments, it was only identified as a limiting factor along Smackout Creek between pastures 1 and 4. Beneficial effects from cattle grazing, such as reducing losses due to fire, are very difficult to ascertain. Timber harvesting in the allotment complex has created transitory range and, thereby, improved the overall forage condition. Transitory range in the allotment complex has reduced grazing pressure on primary forage. This is most notable in the Smackout allotment where cattle graze forested land the majority of the season. In some cases timber harvesting has necessitated the construction and maintenance of additional fences and cattleguards by breaking existing barriers to cattle movement.

Alternative 1 (No change)

Alternative 1 continues current management. At the current use, there are no known problems with plantation failures attributed directly to cattle grazing. Damage to seedlings has been minor and limited in extent. Most of the forage for cattle grazing is available as transitory range. The quantity and quality of forage available over the next ten years is expected to continue to decline as a result of smaller unit sizes and fewer acres of regeneration harvest. Browsing and trampling of hardwood sprouts by cattle along the stream banks of a quarter mile section of Smackout Creek (between pastures 1 and 4) was identified as an undesirable effect to the re-establishment of hardwoods to restrict cattle movement in the riparian area and improve water quality by reducing fecal coliform levels.

Seedlings and Regeneration of Forest Trees
Based on review of reforestation stocking surveys, field review of plantations, recommending and certifying restocking of forested lands on harvested units, no effects from cattle grazing were observed that would result in a failure to meet regeneration objectives. No known problems with plantation failures could be attributed directly to cattle grazing. No changes to current stocking levels of forest trees are anticipated as a result of this alternative.

Livestock Water sources
The arrangement of water sources for cattle appears to be adequate and helps keep the distribution of livestock from becoming a problem to tree survival and growth. Notable damage to trees from this type of situation was not observed in the areas examined.

Conifer Re-Establishment in Meadows
In the absence of a fire disturbance or treatment, conifer trees will encroach and become re-established on the man-made meadows. Over time, this successional process will reduce the size of the meadows.

Hardwood Re-Establishment in Meadows and Along Stream Channels within Meadows
From a silviculture aspect, the compatibility of livestock grazing with intensive forest management of *conifer* regeneration is the major concern. Hardwood trees are not a commercial species and therefore, not included in calculating re-socking levels. Browsing and trampling of hardwood sprouts by cattle along the stream banks of a quarter mile section of Smackout Creek (between pastures 1 and 4) was identified as an undesirable effect to providing a vegetation barrier, protecting stream bancks, and improving water quality (reducing fecal coliform levels. The effects are described in detail in other specialist's reports.

There are no known irreversible or irretrievable effects to forest trees resulting from this alternative.

Alternative 2 (No grazing)

Under this alternative, the three allotments in the Aladdin Complex would be put in vacant status. Existing range improvements would not be maintained and no new improvements would be constructed.

As stated in Alternative 1, no known problems with plantation failures could be attributed directly to cattle grazing. For this reason, forest trees would not be affected by the no-grazing alternative. The effects are the same as stated in Alternative 1 except for the effects to the homestead meadows: the re-establishment of conifer trees in meadows would be increased by a few years. The homestead meadows could then be managed for timber production or other uses.

This alternative may also eliminate some of the positive impacts that cattle grazing may have on silvicultural practices. Removal of grazing could increase grass competition on seedlings and thereby reduce seedling survival. Increases in height and percent cover of grass could also increase the frequency and/or intensity of fire. The impacts of increased fires could be either detrimental or beneficial to tree growth, depending on the circumstances and resource objectives.

There are no known irreversible or irretrievable effects to forest trees resulting from this alternative.

Alternative 3 (Continued grazing with modifications)

This alternative differs from Alternative 1 by adding mitigation measures to protect resources. Overall, the effects to the vegetation resource of Alternative 3 are the same as Alternative 1.

As stated in Alternative 1, the arrangement of water sources for cattle appears to be adequate and helps to keep the distribution of livestock from becoming a problem to conifer tree survival and growth.

There are no known irreversible or irretrievable effects to forest trees resulting from this alternative.

Summary of Effects

None of the alternatives are clearly preferred. In general, the transitory range available in the Aladdin Allotment Complex appears to be underused by cattle.

Based on a review of reforestation stocking surveys, field review of plantations, recommending and certifying restocking of forested lands on harvested units, no effects from cattle grazing were observed that would result in a failure to meet regeneration objectives. There are no known problems with plantation failures that could be attributed directly to cattle grazing. Likewise, no positive impacts influenced the regeneration of conifer trees from cattle grazing.

In relation to restocking of forested lands, the differences among the different alternatives are indiscernible.

No extraordinary circumstances relative to forested vegetation or timber resources were identified for this project.

Potential Cumulative Effects

There are no known cumulative effects from grazing at the proposed grazing levels on forest trees within the allotments or the no grazing alternative as indicated by the minimal problems with plantation failures that could be attributed to grazing.

Management direction on projects planned since 1993 has de-emphasized regeneration treatments due to the Regional Foresters Amendments #1 and #2 to the Forest Plan (Eastside Screens). Given a continuation of a decline in regeneration harvest, and lack of fire or other disturbance event, forage will likely continue to decline over the next 10 years or until changes to the successional process are reset to earlier stages or precommercial thinning of plantations. This decline in transitory range should not have an effect upon the allotment carrying capacity.

The Aladdin Allotment Complex is within the proposed South Deep management Project planning area. If an action alternative is selected timber would be harvested from these areas likely requiring new road construction and reconstruction of some existing roads. After harvest treatment, activities would include use of prescribed fire to reduce fuels, grapple piling, artificial planting and natural regeneration of harvested units.

Commercial timber harvest and non-commercial thinning outside of harvested units have been identified in the South Deep TS action alternatives. The seed tree harvest units have the potential to create additional transitory range, which may shift grazing use in portions (Meadow and Rogers Creeks) of these allotments. Management activities associated with the South Deep timber sale would reduce stand densities and may increase cattle access and use, and could damage tree regeneration although this has not been a problem in harvest units associated with

past timber sales.. Pre-commercial thinning or harvest activities may leave large amounts of slash on the ground; this may impede cattle movement. Management activities could remove some natural barriers, which may increase the need for additional fencing. These potential cumulative effects will be addressed in detail in the South Deep analysis.

3.4.3. Works Cited

Demchik, M. **2001**. Cattle, trees and silvopasturing. Forest Tree Notes. 2: 1, May 2001.Minneapolis, MN: University of Minnesota Extension Service, University of Minnesota. Pp. 4-6.

Newman, R.; Powel, G. **1997**. Forest grazing: Effects of cattle trampling and browsing on lodgepole pine plantations. Extension Note, August 1997. Kamloops, British Columbia, Canada: Research Branch, B.C. Ministry of Forests. 4 pages.

Sharrow, S.H. **1996**. Agroforestry in interior northwest forests. The Grazier, 28 October 1996. Corvallis, OR: Oregon State University Extension Service, Oregon State University. Pp. 5-8.

Sharrow, S.H. **1997**. The biology of silvopastoralism. Agroforestry Notes – 9. November 1997. Denver, CO: National Agroforestry Center, U.S. Department of Agriculture, Forest Service; Lincoln, NE: U.S.D.A. Natural Resources Conservation Service, University of Nebraska at Lincoln. 4 pages.

3.5. Noxious Weeds

Descriptions in this section rely on local information derived from field observations surveys done in the planning area during 1994-2004. Information was also obtained from meetings with Pend Oreille County and Stevens County Weeds boards, agency specialists, and related resource specialist reports. For more information, see the specialist's report in the project analysis file.

3.5.1. Affected Environment

Noxious weeds in the Aladdin Allotment Complex include:

- Diffuse knapweed
- Spotted knapweed
- Orange hawkweed
- Yellow hawkweed
- Sulfur cinquefoil
- Plumeless thistle
- St. John's wort
- Canada thistle

Others are present, but are designated C Class weeds and are not of concern (examples include mullein and bull thistle).

Plumeless thistle, diffuse knapweed, spotted knapweed, and yellow knapweed have had the greatest impacts (for example, they replace desirable species with non-palatable species) on this area. Since the early 1990s, they have been the primary target of all methods of weed control. Because they are so aggressive, they will likely remain a concern for years to come and will continue to be the target of control efforts. Since 1992, the Colville National Forest has an aggressive noxious weed prevention and treatment program. Integrated weed management takes place within and adjacent to the Aladdin Allotments on federal, state, county, and private lands. Prevention activities have included reducing the amount of disturbance for forest activities, immediately reseeding disturbed ground, and cleaning equipment. Treatment efforts have included biological methods. Pesticide application has been necessary because biological control methods are not available for hawkweeds and are not effective on plumeless thistle. The permittee actively surveys for weeds, carries out preventive measures, and under Forest Service supervision treats small infested sites.

Hounds tongue is known primarily in only one area in the three allotment areas. Hounds tongue is the only weed present that spreads by attaching itself to animals. The other weed species are positively influenced by soil disturbance and quickly take advantage of unoccupied seed beds. For these reasons, the alternatives will have direct effects.

3.5.2. Potential Effects

Noxious weeds will be present with or without grazing. The differences among the alternatives would not be notable. Weed populations can be controlled only through an on-going weed maintenance program. Among the alternatives, only Alternative 2 (No grazing) differs from the others in terms of the amount of disturbance caused.

Common to All Alternatives

Integrated weed management is occurring within and adjacent to these allotments on federal, state, county, and private lands. Noxious weed control will continue in these areas. Other activities, such as timber harvest, prescribed fire, and recreation, also occur within and adjacent to this area. Integrated weed management methods are included in many of these activities as part of control and prevention of noxious weeds.

Alternative 2 (No grazing)

Under Alternative 2, hawkweeds, the knapweeds, plumeless thistle, and sulfur cinquefoil, are expected to move in and dominate the meadows and roadsides in all three allotments. These areas have been kept fairly weed-free by ongoing integrated weed management activities within and adjacent to the allotments on federal, state, county, and private lands. Noxious weed control will continue in these areas but to a lesser degree. This alternative could have some beneficial effect (by reducing the vectors of spreading) on weed control efforts especially where hounds tongue is present. Without active grazing, the permittees would no longer be available to help control the weeds. If grazing is ended, the Forest Service would lose a small portion of Forest Service funding that allows for weed treatment.

Effects Common to the Action Alternatives (1 and 3)

Alternative 1 (No change) and Alternative 3 (Continued grazing with modifications) both include grazing and both have improvements. The amount of disturbance caused by the improvement construction proposed in Alternative 3 (a new water trough, armored water crossing, new fence) are indiscernible in relation to the entire grazing allotments. Cattle-caused disturbance is not notable in relation to the size of the allotments. Weed infestation would not change notably. The Colville National Forest Weed Prevention Plan would be followed to reduce infestation and spread of noxious weeds (USDA FS 1998).

Cumulative Effects

None of the alternatives would pose notable cumulative effects in the three allotments.

Timber sales-related soil disturbance over the past twenty years increased forest openings, which encouraged the spread of noxious weeds, especially by creating seed beds. Future timber sales such as South Deep could potentially have similar results, however, the current weed prevention mitigation activities are much more stringent.. These treatments may include cleaning off-road equipment, minimizing disturbance through different yarding systems and prompt reestablishing vegetation, post-project monitoring and weed treatments..

3.5.3. Works Cited

U.S. Department of Agriculture. **1998**. Colville National Forest weed prevention guide. Unpublished document. Colville, WA.. On file with Colville National Forest, 755 South Main Street, Colville, WA. 99114.

U.S. Department of Agriculture. **1998**. Colville National Forest integrated noxious weed treatment environmental assessment. Colville, WA: Colville National Forest.

3.6. Range and Grazing

Descriptions in this section rely on local information derived from field visits and observations by Forest Service employees in the planning area. Information was also obtained from meetings with other Forest Service resource specialists and with the permittees.

3.6.1. Affected Environment

Range readiness criteria were established in 1977 and have been used since. Proper forage use in key areas was also established in 1977. The proper use rates have changed over the years with use on bluebunch wheatgrass raising to 50 percent on satisfactory condition range and lowering to 10 to 25 percent on unsatisfactory condition range. Kentucky bluegrass use rose to 55 percent - 60 percent. In 1988, with the current Forest Plan, proper use rates were adjusted and those from the Forest Plan were included in the annual operating plan for riparian areas. Monitoring in 1997 indicated the Smackout Allotment post-season use was in satisfactory condition.

Current emphasis is to monitor cattle use by the protocol issued in the Biological Opinion (US F&WS 1998) and incorporated in the Grazing Implementation Monitoring Module (USDA FS 1999). Monitoring is done, measuring stubble height, on the green line along the riparian zone. This was a 5 percent random sample of the allotment pastures. Smackout pastures were sampled in 2001 and were in satisfactory condition; in 2002 they were resampled and were unsatisfactory. The main problem was gates being left open; as a result, the area was unable to recover from the excess grazing. This pasture was sampled in 2003 and the results were satisfactory.

Transitory range is the area produced by openings created by timber harvest activities. Timber harvest activities have had a positive effect on grazing on these allotments. Transitory range, when it is available, reduces grazing pressure on primary and secondary range. Current harvest levels are lower than the levels ten years ago; also, the change from even age timber management to uneven age management has reduced the number of openings in the forest and the resulting available forage.

Long-term traditional use of quality Forest and rangelands is being adversely impacted by the encroachment of plants species that are unpalatable to cattle and aggressively competitive plant species. Plant diversity may be compromised over the long term. This is primarily because noxious weeds compete very effectively for nutrients, space, and water. The introduction and spread of noxious weeds occurs by motorized and non-motorized vehicles and equipment, forest users (including recreation, hunter, and firewood cutters), and animals such as wildlife and livestock. Noxious weeds in the Aladdin Allotment Complex allotments have been found primarily around soil disturbance sites, travel corridors, and the homestead meadows. For more information, see the specialist's report on noxious weeds, in the project analysis file.

3.6.2. Potential Effects: Range and Grazing

For the potential environmental effects on water quality, soils, riparian habitat, and other resources, see the specialist's reports in the project analysis file or sections of this EA.

Alternative 2 (No grazing)

The existing range improvements, including a fence, corral, and other developments, would not be maintained. They would quickly fall into disrepair and have to be removed at the expense of the Forest Service. Because of the length of fence (19.2 miles) and the size and construction of the corral this could cost thousands of dollars.

The existing meadows would continue to be invaded, to some degree, with trees, which would reduce the size of the meadows.

Cumulative Effects of Alternative 2

Under Alternative 2 (No grazing), the Dawson Ranch would lose the summer pasture provided in the allotments, and so would cease to exist. Stevens County would lose the approximately $250,000 of annual gross revenue produced by the Dawson Ranch.

Alternative 1 (No change)

Existing range improvements would continue to be used and maintained by the permittees. The improvements would continue to function as a control measure of livestock use. Recovery of riparian condition along Smackout Creek in pastures 1 and 4 will remain slow because cattle would still have access to the creek and would eat willow and alder sprouts that are important to riparian habitat. Woody vegetation is important to stream function because it reduces stream temperatures through shading and adds to bank stability.

Grazing in the meadows helps maintain a more vigorous and productive plant community. Some sod-forming grass plant communities would become less productive and regress to an earlier successional stage. Forage production would increase what it would be if these grasses were not grazed.

The Dawson Family Ranch would continue to operate, producing an income for two families, thus adding to the economic stability of the local economy.

Alternative 3 (Continued grazing with modifications)

The existing range improvements would continue to be maintained by the permittee. The construction of proposed improvements would take approximately five years to complete. Constructing and maintaining these improvements would create more work for the permittee. Implementing Alternative 3 would involve placing and maintaining about one-quarter of a mile of temporary electric fence. The initial cost of the fence would not be prohibitive, but the fence would require frequent checking and maintenance.

The amount of available forage for grazing would not change over that of Alternative 1.

Under Alternative 3, the Dawson Family Ranch would be able to continue to operate, adding to the economic stability of the local community.

Cumulative Effects of Alternatives 1 and 3

The area with in the Aladdin Complex has had permitted grazing for 60 years and was grazed for several decades before permitting. Future timber sales such as South Deep would produce more transitory range, which reduces grazing pressure on primary and secondary range. The quantity

of transitory range has been reduced over the past twenty years because current harvest levels are much lower than past harvest levels. Also, the change from even-age timber management to uneven-age management has reduced the number of openings in the forest and the quantity of resulting available forage while it has increased pressure on primary range. Timber sale projects also have the potential to breach natural barriers which make control of cattle distribution more difficult and require more fencing. Since the South Deep TS project is in the development stage and no decisions have been made the locations where these impacts may occur and their extent are unknown. This will be addressed in the South Deep Timber Sale analysis as appropriate.

3.6.3. Works Cited

U.S. Department of Agriculture, Forest Service. **1999**. Grazing implementation monitoring module developed by the monitoring task team as recommended by the Interagency Implementation Team and approved by the USFS Regional Foresters, Regions 1, 4, and 6, and the Bureau of Land Management State Directors, Idaho, Oregon/Washington, and Montana. 31 pages. On file with Colville National Forest, 755 South Main Street, Colville, WA, 99114.

U.S. Department of the Interior, Fish and Wildlife Service. **1998**. Biological opinion for the continued implementation of land and resource management plans and resource management plans as amended by the interim strategy for managing fish-producing watersheds in Eastern Oregon and Washington, Idaho, Western Montana, and portions of Nevada (INFISH) and the interim strategy for managing anadromous fish-producing watersheds in Eastern Oregon and Washington, Idaho and portions of California (PACFISH). Portland, OR: U.S. Fish and Wildlife Service.

3.7. Sensitive Plant Species

The following sources provided the basis for the pre-field review:

- Sensitive Species Plant List, Region 6, U.S.D.A. Forest Service (USDA 1999)
- Federally listed species (US FWS 1999 and 2001)
- Washington Natural Heritage sightings database (WNHP 1997 and 2005)
- Colville National Forest sensitive plant sightings database (USDA 2005)
- Aerial photos

During the pre-field review, species that typically occur below the elevation range of the planning area, or species whose typical habitat is not within the planning area, were omitted from the analysis. Field surveys were conducted from 1998-2001. Surveys were limited to areas in, adjacent to, or near the project area, where ground-disturbance may affect sensitive plant species.

3.7.1. Affected Environment

The area of potential habitat for sensitive plants within the Aladdin Complex project area includes: steams, woods, wetlands, hardwood stands, meadows, rocky outcroppings.

No federally-listed threatened or endangered plants, or plants proposed for listing, are known to occur in the project area (USDA FS 1999 and 2001). Forty-five plant species listed on the Regional Forester's Sensitive Species list are documented or suspected for the Colville National Forest. Six of these, in 17 populations, are known from the project area: *Botrychium crenulatum, B. paradoxum, B. pedunculosum, Carex flava, Cicuta bulbifera* and *Geum rivale*. Potential habitat exists in the analysis area for another 26 suspected sensitive plant species.

Surveys of the project area resulted in the documentation of six additional sensitive plant species in 12 populations*:* *Botrychium hesperium, Carex saxatilis var. major, Dryopteris cristata, Ophioglossum pusillum, Sisyrinchium septentrionale* and *Viola renifolia.* In addition, 11 new populations of known sensitive species (*Botrychium crenulatum, B. pedunculosum, Carex flava,* and *Geum rivale*) were also found. A total of 12 sensitive plant species in 40 populations are known from the Aladdin Allotment Complex project area.

Table 3-5. Sensitive Plant Species, with Populations, in the Aladdin Planning Area

Allotment	Species	# of Populations	Habitat
Aladdin	*Botrychium crenulatum*	3	Forest
	Botrychium hesperium	2	Moist meadow
	Botrychium pedunculosum	1	Moist meadow
	Carex flava	2	Wetland
	Carex saxatilis var. major	2	Wetland
	Cicuta bulbifera	1	Wetland
	Dryopteris cristata	1	Wetland
	Geum rivale	2	Wetland
	Ophioglossum pusillum	1	Moist meadow
	Sisyrinchium septentrionale	2	Moist meadow
Meadow Creek	*Botrychium crenulatum*	4	Forest

Allotment	Species	# of Populations	Habitat
	Botrychium hesperium	2	Moist meadow
	Botrychium paradoxum	1	Moist meadow
	Botrychium pedunculosum	1	Moist meadow
	Carex flava	3	Wetland
	Cicuta bulbifera	1	Wetland
	Geum rivale	2	Wetland
Smackout	*Botrychium crenulatum*	3	Moist meadow
	Botrychium hesperium	1	Moist meadow
	Botrychium paradoxum	1	Moist meadow
	Botrychium pedunculosum	1	Moist meadow
	Carex flava	1	Wetland
	Geum rivale	1	Wetland
	Viola reniflora	1	Forest

At many riparian sites where sensitive plants exist, there is little to no evidence of livestock use, and the habitat appears to be relatively unchanged or not significantly altered by cattle grazing. In other riparian areas, especially where past logging activities opened access and provided additional pathways used by cattle, the impacts of livestock grazing on sensitive plants and their habitat is easy to see.

3.7.2. Potential Effects

For all alternatives involving livestock, the numbers of cattle and the extent of the season of use is the same. The potential effects from each of the alternatives are described below. There are no irreversible or irretrievable effects associated with any of the action alternatives.

Alternative 2 (No grazing)

Under Alternative 2 grazing would be discontinued in the analysis area with no direct impact on sensitive plants. Noxious weeds would continue to spread. Existing range improvements would not be maintained.

The Likelihood of Adverse Effects is considered to be "Moderate" (5). The Consequence of Adverse Effects is rated as "Moderate" (5), because of possible effects to habitat from the spread of weeds. The resulting Risk Assessment value is 25-- modify the project if feasible to reduce risk.

Alternative 1 (No change)

Under Alternative 1 the current grazing system would continue under management guided by the existing AMPs. This would add to the spread of noxious weeds that displace native vegetation and encroached on sensitive plant populations. Trampling of individual plants would occur. Some plants that tolerate or even require disturbance may benefit from grazing, if the disturbance is minimal and we require cattle movement throughout the allotments. Although cattle may spread noxious species, they also remove competing vegetation for sensitive plants, such as *Botrychiums*.

For Alternative 1, with implementation of the mitigation measures and monitoring of sensitive plant populations, the Likelihood of Adverse Effects is considered to be "Moderate" (5). The

Consequence of Adverse Effects is rated as “Moderate” (5), because of possible effects to habitat from the spread of weeds and degradation of the riparian areas. The resulting Risk Assessment value is 25-- modify the project, if feasible, to reduce risk.

Alternative 3 (Continued grazing with modifications)

Activities proposed under Alternative 3 intend to restore riparian areas. These would also have positive effects on sensitive plant habitat.

The range improvements and activities in Alternative 3, intended to restore riparian areas, and for the control of noxious weeds, would benefit sensitive plant habitat. Maintenance, monitoring and actively moving cattle throughout the allotment can further reduce the potential impacts to sensitive plants caused by continued grazing.

Alternative 3 includes some risk to sensitive plant populations. The presence of livestock has the potential to add to the spread of noxious weeds. Noxious weeds displace native vegetation, including sensitive plant populations and habitat. Alternative 3 provides for the control of noxious weeds, which would benefit sensitive plant habitat. Trampling and destruction of individual sensitive plants by cattle may occur. Maintenance, monitoring, and actively moving cattle throughout the allotment can reduce potential impacts to sensitive plants caused by continued grazing.

For Alternative 3, if the mitigation measures and monitoring of sensitive plant populations are implemented, the Likelihood of Adverse Effects is considered to be "Moderate" (5). The Consequence of Adverse Effects is rated as "Moderate" (5), because of trampling. The resulting Risk Assessment value is 25-- modify the project if feasible to reduce risk.

For All Alternatives

Monitoring selected sensitive plant populations found in the analysis area is recommended. By implementing the mitigations measures, the sensitive plant populations located within the Aladdin Allotment Complex are anticipated to maintain at least present population levels and viability. Monitoring sample populations in the project area is needed to assess the cumulative effects of livestock grazing. By implementing the mitigation measures listed below, the Likelihood of Adverse Effects for Alternative 3 is decreased to "Low" (1). The Consequence of Adverse Effects is "Moderate" (5), because of possible effects to plants or habitat. The resulting Risk Assessment value of 5 means that the project may proceed as planned for Alternative 3.

To ensure that sensitive plants are not present in any range improvement or project areas, sensitive plant surveys should be conducted for any structure improvements or changes in the AMPs or APIs. In the event that sensitive plant species are found, modifications to the project will be made to prevent adverse habitat changes to the population.

Management standards direct the Forest to maintain viable populations of all sensitive plant species known from the Forest. Populations of sensitive plants are not to decline by more than 15%. If the 15% threshold is not sufficient to maintain viability, this threshold will be adjusted. Monitor selected populations of sensitive plants in the analysis area to determine their population trends.

Potential Cumulative Effects

The cumulative effects of grazing on sensitive plants are difficult to quantify. In addition to grazing on these allotments that dates to at least the 1940s, portions of the analysis area were logged, mined, and also burned in fires in the 1920s and 1930s. Exotic grasses and noxious weeds have been introduced and continue to spread. The cumulative effects of all of these activities have altered site conditions in some areas. Cumulative effects from the South Deep Timber Sale will be analyzed in the South Deep EIS.

At many riparian sites where sensitive plants exist, there is little to no evidence of livestock use, and the habitat appears to be relatively unchanged or not significantly altered due to cattle grazing. In other riparian areas, especially where past logging activities opened access and provided additional pathways used by cattle, the impacts of livestock grazing on sensitive plants and their habitat is easier to see.

Risk assessment, effects, and findings described above assume that the mitigation measures specified in this environmental assessment are fully implemented. All alternatives may have an impact on individuals, but are not likely to cause a trend to federal listing or loss of viability, if the mitigation measures are implemented.

3.7.3. Works Cited

U.S. Department of Agriculture, Forest Service. **1999**. Sensitive species list, Region 6, Portland, OR: Pacific Northwest Regional Office.

U.S. Department of Agriculture, Forest Service. **2005**. Sensitive plant species sighting forms for the Colville National Forest. Unpublished Report. Colville, WA. On file with Colville National Forest, 755 South Main Street, Colville, WA. 99114.

U.S. Department of the Interior, Fish and Wildlife Service. **1999**. Endangered, threatened, proposed, and candidate species, species of concern, and critical habitat in eastern Washington state, as listed by the U.S. Fish and Wildlife Service. Memo dated April 2, 1999. 8 pages.

U.S. Department of the Interior, Fish and Wildlife Service. **2001**. Federal Register. Vol. 66, No. 210, Tuesday, October 30, 2001. Endangered and threatened wildlife and plants; review of plant and animal species that are candidates or proposed for listing as endangered or threatened, annual notice of findings on recycled petitions, and annual description of progress on listing actions; proposed rule. Pages 54808-54822, 54830.

Washington Natural Heritage Program. **1997**. Endangered, threatened, and sensitive vascular plants of Washington – with working lists of rare non-vascular species. Olympia, WA: Department of Natural Resources.

Washington Natural Heritage Program. **2005**. Endangered, threatened, and sensitive plant database. Olympia, WA: Department of Natural Resources.

3.8. Soils and Water

The following sections describe the pertinent affected environment and the environmental effects to the resources of soils and water. For more specific information, see the specialist reports in the project analysis file.

3.8.1. Soils

Descriptions in this section rely on information from the Soil Survey of Stevens County, Washington (USDA FS 1982), the South Deep Creek watershed analysis (USDA FS 1999), aerial photographs, field observations, sampling, and surveys done in the project planning area. Information was also obtained from meetings with agency specialists, and related project and resource specialist reports.

Affected Environment

The Aladdin Complex allotments, which lie within the Selkirk Mountain range, are located between the Columbia and Pend Oreille rivers, and contain landforms representative of the Northern Glaciated Mountains. Most of the project area watersheds are typified by heavily forested mountainous terrain of modest elevation. Most of the higher elevations and steeper terrain are part of the Colville National Forest. The valley bottom along the South Fork of Deep Creek is owned by rural residents and used primarily for farming and livestock grazing (USDA FS 1999).

Soil types in the allotment watersheds are somewhat variable. Valley soil types are generally made up of coarse to medium textures and are usually very rocky. These soils make up two general valley landforms: terraces and bottomlands. Soils on terraces are warm, moist, deep to very deep, productive loams to silt loams that are rich in organic matter and moderately well drained to poorly drained. Bottomlands include floodplains, alluvial fans, and depressional areas (USDA FS 1999; USDA FS 1982).

Two primary inherent erosion processes transport sediment through the planning area watersheds: fluvial erosion and hillslope erosion (USDA FS 1999). The inherent sediment regime in the watershed has been somewhat altered by land use practices (such as roads, logging, cattle grazing, mining, and the development of private residences). Surface erosion is now much more prevalent across the watershed (USDA FS 1999). Soil creep is widespread and perceived to be the dominant inherent hillslope process in the planning area.

3.8.2. Water

Descriptions in this section rely on local information derived from the South Deep Creek watershed analysis (USDA FS 1999), aerial photographs, field observations, sampling done in 1997-2000, and surveys done in the planning area.

Affected Environment

The hydrology of the Northern Glaciated Mountains ecological reporting unit (ERU), in which these allotments are located, is best characterized as snow-pack dominated. More than half the annual runoff is estimated to be snowmelt influenced, about 30 percent by rain, and about 10 percent by groundwater. Peak discharge generally occurs from May through June. Periodic rain-on-snow events can cause elevated streamflow during winter months. Generally, base flow in the summer is maintained by groundwater and is relatively unaffected by precipitation. Mid-winter rain-on-snow events are rare, but they can cause runoff damage from peak flows. Late spring, rain-on-snow events, and/or Chinook wind events are more common, but they are usually confined to the higher elevations and resulting peak flows are localized and usually not excessive (USDA FS 1999). Basic drainage patterns in these watersheds are dendritic to parallel. Flood or peak discharge events are presumed to be the dominant natural channel-shaping processes (USDA FS 1999).

Water Quality

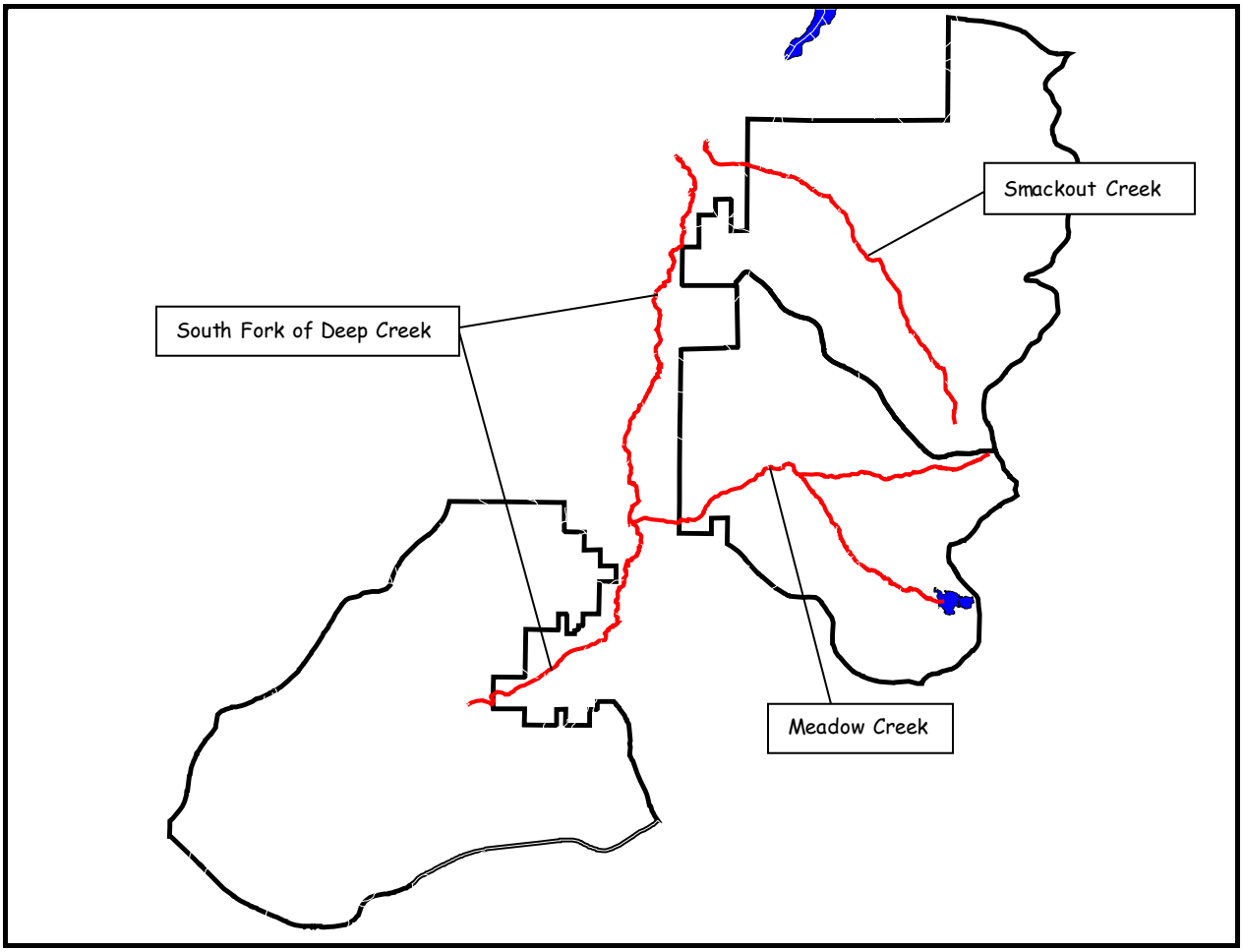
Three streams in the Aladdin Allotment Complex are on the 1998 Washington State 303(d) List of threatened and impaired water bodies (see Figure 3-1).

1. Meadow Creek was listed for fecal coliform in 1998. It is being proposed for removal from the 2002/2004 303(d) list because recent water quality sampling indicates that it is currently meeting state standards (it does not currently appear on the most recent draft 2002-2204 303(d) list).
2. Smackout Creek is currently listed for pH and fecal coliform. Recent sampling (2004) on Smackout Creek indicates that this stream is still exceeding state water quality criteria and will remain on the state list of impaired waters for fecal coliform bacteria and pH. Even though pH is a concern to water quality, it does not appear to be related to grazing practices.
3. South Fork of Deep Creek main stem is currently listed for temperature.

Fecal coliform sampling done on Meadow Creek in 2003 and 2004 indicates that this stream is now meeting state water quality criteria; therefore, it will probably be removed from the next 303(d) list. Recent sampling on Smackout Creek indicates that this stream has some elevated bacterial levels and will probably remain on the next 303(d) list.

Cattle and wildlife may affect fecal coliform levels in streams. Wildlife data is very limited and applies to large areas, such as Northeast Washington. Moose abundance is increasing and their range is expected to at least remain at the current level. Waterfowl populations are expected to remain constant. No information is available about beaver populations and trends. Beaver inhabit Big Meadow Lake and, periodically, the smaller streams. The overall population totals for deer are uncertain, but are probably remaining fairly constant (Zender et al. 2001).

Figure 3-1. 303(d) Listed Streams within the Aladdin Allotment Complex



The status of the temperature listing on the South Fork of Deep Creek is unknown (sampling locations are outside the Colville National Forest administrative boundary and are outside the jurisdiction of this agency). For purposes of this analysis, it is assumed that the South Fork of Deep Creek will remain listed as a 303(d) stream for temperature.

Recreation can adversely affect water quality, primarily through the inadequate disposal of human wastes. Toilet facilities at the developed campground at Big Meadow Lake have been recently upgraded. Recreation use in the Aladdin Allotment Complex is expected to increase slowly over the next five to 10 years; most of the increase will likely occur in dispersed sites outside the developed campground at Big Meadow Lake. Increased recreational activity in and adjacent to riparian areas increases the risk of raising levels of fecal coliform bacteria.

Riparian Areas and Wetlands

Riparian areas are specialized habitats that often support unusual species of plants and animals. Because they are wet, riparian soils are sensitive to soil displacement, rutting, and changes in the groundwater regime. These areas are a critical component of a watershed's hydrologic budget.

Their sponge effect helps regulate both high and low flows. They may also exert a strong control on surface water quality.

A variety of wetlands is found within the Aladdin Allotment Complex, as classified by the National Wetlands Inventory. Except for Big Meadow Lake, wetlands in the planning area include non-tidal wetlands dominated by trees, shrubs, persistent emergents, and emergent mosses and lichens; wetlands dominated by emergent species; and others dominated by scrub-shrub species. A few wetlands exhibit open water characteristics, and are associated with active or inactive beaver ponds.

The Big Meadow Lake campground and the riparian area below the dam were originally fenced to exclude cattle, but because of reduced Forest Service recreation budgets maintenance of the fence ended in 2000. A fence constructed in 2004 excludes cattle from the campground but allows access to the wetlands below the dam.

The largest wetlands in the planning area are located in the Smackout Allotment, primarily in Smackout Meadow. Sedges dominate much of the vegetation in this area. High water tables prevent trees and shrubs from becoming established on these sites. Narrow riparian corridors are also found along perennial and intermittent streams within the planning area.

During mid-June 2001, 102 road and stream crossings and wetland sites on the three allotments were examined for evidence of both current and past cattle impacts. Sites that showed no or very little evidence of cattle use were classified as light, sites showing < 100 ft^2 of disturbance at the site were classified as moderate, and sites where > 100 ft^2 of area were trampled, eroding, and/or displayed increased width/depth stream ratios were classified as heavy.

The Smackout Allotment contains nine heavily impacted sites; the Aladdin Allotment contains two; the Meadow Creek Allotment has five.

Of the 102 sites surveyed:

- 16 percent had heavy impacts
- 34 percent were classified as having moderate impacts
- 50 percent were classified as having light impacts.

Only heavily impacted sites may have substantial, long-term effects to streams and water quality.

3.8.3. Potential Effects: Soils and Water

This section describes the environmental effects of the three alternatives in relation to soils, water quality, riparian condition, wetlands and floodplains.

Common to All Alternatives.(1, 2, 3)

Cumulative Effects on Soils

Timber sales activities associated with the South Deep EIS have the potential to cumulatively affect soil compaction, when added to the effects that already exist within the planning area (previous timber harvest, homesteading, recreation, cattle, etc.). The amount of soil disturbance (compaction, erosion, etc.) attributed to cattle is small (1-2 percent). This level is not anticipated

to increase appreciably in the foreseeable future because numbers and season of use will remain the same. Cattle are creatures of habit, and tend to re-use areas every year that have already been affected (existing roads, skid trails, cattle trails), rather than disturb new areas each grazing season. If timber harvest occurs in the South Deep project, cattle access to streams and riparian areas would be expected to increase; however, effects will be slight because some of the proposed riparian harvest units are located in Rocky Creek, a vacant allotment. Other riparian harvest units are located on the east side of Rogers Mountain, where thick vegetation and light grazing pressure currently limit cattle effects to soils. The cumulative soil effects that are specific to the South Deep proposal will be analyzed in the South Deep EIS.

Alternative 2 (No grazing)

Direct and Indirect Effects on Soils. Under Alternative 2, the direct effects to soils from cattle (compaction, displacement, and erosion) will end. Removing cattle from the allotments will generally result in a slight decrease in detrimental conditions and an improvement in soil productivity. Surface runoff, erosion, and infiltration rates due to cattle will begin to recover. The effects of compaction will take the longest time to recover—perhaps a hundred years or more. The effects of soil displacement and erosion from cattle will recover faster than compaction as native and exotic plant species reestablish themselves on disturbed sites. On a watershed scale, effects to sediment levels and soil productivity are minor.

Direct and Indirect Effects on Water Quality, Flow Regimes, Channel Morphology. The most immediate change would be a net decrease in fecal coliform levels in the Smackout Allotment. State water quality standards for fecals would likely be met on all planning area streams in the near future.

Stream channel and riparian conditions will continue to improve as vegetation becomes reestablished and as any overgrazed areas recover. The total amount of sediment introduced into the stream systems would decrease slightly. Riparian vegetation is expected to regain vigor and stabilize the streambanks. The trend for streambank stability would be expected to increase slightly.

Cumulative Effects on Water Quality, Flow Regimes. Wetlands, Floodplains. Eliminating cattle grazing on these three allotments would reduce the amount of fecal coliform bacteria moving downstream into the lower reaches of the planning area. These changes downstream on the mainstem of Deep Creek are expected to be negligible.

The downstream cumulative impacts of Alternative 2 (No grazing) are probably small and not detectable. Without controlled grazing on federal lands, more pressure may be put on the riparian areas of lands outside the Forest boundary, especially at lower elevations. If this happens, the effects may include elevated fecal coliform levels, bank trampling, cropped vegetation, and sedimentation. No changes to current groundwater quality or quantity are anticipated.

Wetland and floodplain conditions and functions will not change appreciably; wetlands and floodplains are already functioning normally in most parts of the planning area. Removing cattle from the allotments will create a slow recovery on limited areas (such as Smackout Creek in the meadows and at road crossings).

Effects Common to Action Alternatives (1 and 3)

Direct and Indirect Effects on Soils. Lack of maintenance to the old fence will increase cattle in the wetland and increase the possibility of fecal coliform. The increased bank trampling, compaction, erosion, and sedimentation that have begun at this site would be expected to increase for the next two to three years.

Direct and Indirect Effects on Water Quality, Flow Regimes, Wetlands, Floodplains. Cattle access in the wetlands below Big Meadow Lake, increased by the non-maintenance of a fence, will increase the possibility of fecal coliform delivery to the stream system below the dam. This could result in Meadow Creek being placed back on the 303(d) list. The risk is small because this is a much smaller area than Smackout Meadow, where cattle have greater access to the stream.

Because pH is indirectly affected and not very sensitive to grazing practices it is not likely to change over existing levels (MacDonald 1991). Based on lack of vegetative changes, water temperatures are expected to remain unchanged and will continue to meet state standards under these alternatives.

Sedimentation changes due to improved riparian conditions in Smackout Creek under Alternative 3 would be small (on a watershed scale) and undetectable using current monitoring techniques. Flow regimes are not expected to change over existing levels in either Alternative 1 or Alternative 3.

Wetland and floodplain conditions and functions are already functioning normally in most parts of the planning area, and are not expected to change appreciably under the two action alternatives. Cattle will continue to impact soils, streambanks, and riparian vegetation in limited areas along streams and around the perimeter of wetlands. On a watershed scale, these changes are localized and will be undetectable.

Cumulative Effects on Soils and Water Quality, Flow Regimes, Wetlands, Floodplains. The off-site movement of disturbed soils from private ownership is expected to remain at existing levels over the next 5-10 years. These areas will continue to deliver sediment to area streams, mainly along the mainstem of the South Fork of Deep Creek and Mill Creek. These mainstem areas have been impacted by past activities (cattle grazing, farming, residential home construction, powerline rights-of-way, road construction and maintenance, natural events). Results have been elevated levels of bank instability, scouring, and deposition (bar-building) along many of the low elevation stream reaches outside the Forest boundary.

Increased recreation effects are anticipated to be small but cumulative for compaction when added to existing levels currently caused by cattle, roads, logging, wildlife, and recreation. Activities will cause soil compaction, displacement, and erosion. These cumulative on-site increases will occur, but are anticipated to be small and are not projected to exceed Forest Plan standards in the near future (5-10 years). Most of these recreation impacts will occur adjacent to streams, wetlands, and openings and will likely be on the same areas already affected by cattle.

Activities associated with the action alternatives for the proposed South Deep timber sale may affect vegetation in riparian zones and increase the accessibility of cattle to streams and

wetlands. This will occur where new road construction or harvest units are located within or adjacent to streams and wetland riparian areas. This has the potential to affect stream temperatures, sedimentation, and fecal coliform levels. If timber harvest occurs in the South Deep project, cattle access to streams and riparian areas would be expected to increase; however, effects will be slight because some of the proposed riparian harvest units are located in Rocky Creek, a vacant allotment. Other riparian harvest units are located on the east side of Rogers Mountain, where thick vegetation and light grazing pressure currently limit cattle effects. Site-specific effects will be analyzed in the South Deep EIS. Implementation of sire-specific BMPs will effectively mitigate many of these effects.

Effects Unique to Each Alternative

Alternative 1 (Continued grazing—no change)

Direct and Indirect Effects: Soils. The grazing effects to soils under Alternative 1 are expected to remain at existing levels within the three allotments; cattle-caused compaction and displacement would be noticeable at various locations. Streams and riparian areas would continue to be affected at road crossings and around the perimeter of wetlands; these effects are concentrated in areas that cattle use for food, water, and shade. Detrimental effects to soils appear to be within the standards specified in the Forest Plan.

Based on informal site surveys, only riparian area soils adjacent to Smackout Creek between Pastures #1 and #4 are probably exceeding Forest Plan standards for livestock-related bare mineral soil disturbance. Under Alternative 1 (No change), this condition is likely to continue for at least the next 5-10 years and probably longer. Surface erosion and offsite movement of soil particles will continue at existing levels. The indirect effects on these three allotments (increased embeddedness of gravels, bar development, pool filling, etc.) are expected to be very small and undetectable. On a watershed scale, these changes are localized and would be undetectable.

Direct and Indirect Effects: Water Quality, Channel Morphology. Smackout Creek may meet state water quality standards for fecal coliform in the future, if vegetation in the riparian zone continues on its current slow upward trend; however, this is not expected to occur for many years. Smackout Creek is proposed for listing as a Category 5 stream on the Washington State 303(d) list for 2002/2004. Streams listed as Category 5 waters would require the preparation of water cleanup plans, known as Total Maximum Daily Loads (TMDLs) in accordance with the Clean Water Act and Colville-specific TMDLs.

Stream channels would continue to exhibit higher than normal width-depth ratios, bank trampling, and reduced levels of riparian vegetation in areas affected by cattle. This will be most noticeable in the stream segments along Smackout Meadows where cattle are crossing and congregating in the riparian area. This condition is expected to continue in this area for at least the next 10 years and probably much longer.

Cumulative Effects: Soils. No measurable off-site cumulative effects to soils are anticipated to occur under Alternative 1. Maintaining current animal numbers and season of use would help ensure that on-site compaction remain within Forest Plan standards. Detrimental soil effects due to recreation, roads, timber harvest, and cattle are expected to remain below the 20 percent threshold identified within Regional and Forest guidelines. Cumulative soil effects from cattle

and other management-related activities are expected to continue to meet regional soil standards over the next 5-10 years at the watershed scale. Soils in some localized areas such as Smackout Meadow will continue to exceed Forest Service standards when effects from current uses (cattle grazing) are cumulatively added to past management practices (such as homesteading).

Cumulative Effects: Water Quality, Channel Morphology. The cumulative effect of fecals contributed by cattle from Forest Service grazing allotments is not expected to change under Alternative 1 (No change) because there is no change in season of use or numbers of allotted cattle.

Based on the limited size and extent of direct and indirect channel morphology changes, no measurable downstream cumulative effects are anticipated under this alternative.

Alternative 3 (Grazing with Modifications)

Direct and Indirect Effects: Soils. Under Alternative 3 detrimental soil effects (compaction, displacement, and erosion) from grazing may decrease slightly over existing levels; these changes would be so small that they would be undetectable on a watershed scale. Soil compaction and displacement would decrease (over existing conditions) at various locations throughout the allotment. Most of these improvements would be along streams and wetlands where new water developments, fences, and armored sites begin to offset the current effects from cattle (mostly in the Smackout Allotment). The recovery of these areas would take years, decades, and even centuries (for compaction). Streams and riparian areas would continue experiencing effects of cattle-caused sediment erosion, primarily at road crossings. The effects of sedimentation would be diluted as the distance from the point of origin increases. These effects would be concentrated in areas that cattle use for food, shade, and water.

New watering sites would help lure cattle away from sensitive riparian areas, but may also result in a transfer of soil impacts from the riparian areas along Smackout Creek to the new watering sites.

Relocating the ford between Pasture #1 and #4 in Smackout Meadow would improve soil compaction and displacement in Pasture #1. Affected soils at this site would never completely recover because cattle would continue to affect soils in this pasture.

The proposed temporary fence between pastures #1 and #4 along Smackout Creek would exclude cattle from the stream until riparian vegetation can recover. The exclusion of cattle and reestablishment of vegetation over the next 10-15 years (estimated) would limit future cattle access and eventually result in less compaction, displacement, and erosion along the stream.

Armoring stream cattle crossings in the Aladdin Allotment would have a small, positive effect on erosion and sedimentation.

Surface erosion and offsite movement of soil particles would continue at existing or slightly improved levels. The indirect effects from Forest Service cattle allotments (increased embeddedness of gravels, bar development, pool filling, etc.) are expected to be very small and undetectable using current measurement techniques and sampling levels.

Direct and Indirect Effects: Water Quality, Channel Morphology.
Smackout Creek--Sedimentation in Smackout Creek would be reduced slightly by relocating the cattle crossing between pastures #1 and #4 to a drier, upland site. However, these effects would be small because the crossing is used only once or twice a year. Constructing the temporary fence between Pasture #4 and Pasture #1 would help protect streambanks during the early season (when soil moistures are highest and banks are most susceptible to trampling damage). Stream sedimentation would increase slightly while the new ford is being constructed and the previous ford is being rehabilitated. These increases would last only hours or a couple of days and are expected to be contained within the mixing zone as specified in state water quality standards.

Smackout Creek fecal levels are expected to improve from an additional one-quarter of a mile of temporary fence that would exclude cattle from the creek. Fecal levels would probably increase slightly after the fence is removed, but are expected to continue to meet state standards (reestablished riparian vegetation would continue to limit cattle access over current levels). Alternative 3 offers the greatest potential for reducing fecal levels over the shortest period of time. If water quality monitoring for fecals on Smackout Creek shows consistent compliance with state water quality standards as a result of these changes, the Forest will petition DOE to have the stream removed from the 303(d) list.

Off-site watering would compensate for the restricted cattle access caused by fencing, and would help to draw and keep cattle in the drier, upland areas of these pastures. This should relieve some of the current grazing pressure on riparian areas by encouraging a more uniform distribution of cattle across the allotment pastures. These sites should also experience a slight reduction in fecal coliform delivery to Smackout Creek.

Armored cattle crossings in the Aladdin Allotment would reduce erosion and have a small, positive effect on the sediment being introduced to into these streams by cattle.

Width/depth ratios and streambank stability on Smackout Creek are expected to improve because of additional fencing, armored crossings, water developments, and the reestablishment of riparian vegetation. On a watershed scale these changes will be small and undetectable.

Smackout Creek in the meadows already appears to be on a very slow upward trend toward recovery. This alternative would speed up the channel recovery processes and stabilize banks sooner than under Alternative 1.

Allotment Streams Other Than Smackout Creek--Water quality is expected to remain at existing levels on other streams within these allotments. No changes to the state 303(d) list are anticipated for these streams.

Cumulative Effects: Soils. Cattle would continue to trail throughout the allotments. Detrimental soil impacts from recreation, roads, timber harvest, and cattle appear to be below the 20 percent threshold identified in Regional and Forest guidelines. Based on current conditions and monitoring surveys, cumulative soil effects from cattle and other management-related activities are expected to meet Regional soil standards in the foreseeable future (5-10 years). This alternative may result in a slight net improvement to detrimental soil conditions from cattle

impacts, but these gains may be offset in the future if dispersed recreation activities increase as predicted.

Cumulative Effects: Water Quality, Channel Morphology. The cumulative effects for all allotment streams and channel morphology are anticipated to be the same as those under Alternative 1.

3.8.4. Works Cited

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3.9. Visuals and Recreation

A field trip for specialists was held July 18, 2000 on the Meadow Creek Allotment to discuss issues in the field, particularly Big Meadow Lake Campground. A major topic of discussion was cattle in the campground and fencing responsibilities.

3.9.1. Affected Environment

The Aladdin Allotment Complex includes several Management Areas, described in the Colville National Forest Land and Resource Management Plan (see Table 1-2 in Chapter 1).

Visuals

The visual condition of this area is naturally-appearing. Rolling hill landforms are prevalent; tree cover varies from continuous canopy to some small scattered trees among rock outcrops. Timber harvest is evident in the foreground and middle ground. From the Aladdin Highway, farming is evident (including pastures and haying); timber harvest (on private property) is evident in the foreground and background. Fall foliage of western larch and birch colors the landscape. Along most roads, several homestead meadows are evident, especially in the Smackout Creek drainage. Fences in Smackout Meadow are visible. A Bonneville Power Administration (BPA) power line goes through the portions of Smackout and Meadow Creek Allotments.

Cattle are visible as part of the environment. From roads and trails, cattle can be seen in meadows, tree plantations, timber stand openings, in roads and riparian areas. Cattle access to watering and riparian areas is noticeable, as is evidence of cattle-presence (cow droppings, muddied water, well-used trails). Grazing modifies the natural appearances of grass and shrubs species. Some vegetation shows evidence of browsing and trampling.

Recreation

Current recreation uses in the Aladdin Complex include berry picking, firewood gathering, camping, hunting, and off-road vehicle use. The project area is heavily used during big game hunting season. Winter sports include snowmobiling, cross-country skiing, and snowshoeing. Dispersed camping occurs throughout the three allotments, especially near creeks and in meadows.

The Meadow Creek Allotment contains MA 3A (recreation) areas. The fence that is in place eliminates potential conflicts between recreationists and grazing. In this allotment are Big Meadow Lake, a trail system (a 1.5 mile lakeshore trail), and campground. The Big Meadow Lake area is a National Wildlife Viewing area. At the lake are 16 rustic campsites (free of charge), a boat ramp, barrier-free fishing dock, and restrooms. Dispersed camping occurs on the east side of the lake.

The Aladdin Allotment includes the Roger Mountain and Mount Roger trail system are in the high elevation area. There are trailheads and a horse camp on the east side of the trail system and a trailhead on Gillette Mountain on the west.

3.9.2. Potential Effects: Visuals and Recreation

This section describes the potential effects of the three alternatives on the resources of visual appearance and recreation. For more information, see the specialist's report in the project analysis file.

Alternative 2 (No grazing)

Visuals

The area would continue to be natural-appearing. Cattle and evidence of their presence (such as disturbances near watering areas) would gradually diminish or be integrated. Without grazing, vegetation growth may restrict some viewing areas. Fences would deteriorate, possibly becoming unattractive to some people. Deteriorating fences may also present safety problems.

The Big Meadow Lake campground, including trails, would be free of cattle and evidence of their presence.

Recreation

Cattle and the evidence of cattle presence would no longer be a part of the environment. Livestock obstructing roadways, odor, noise, and cattle droppings would not occur. Recreation experiences can be positive or negative, depending on visitors' subjective interpretations.

Alternative 1 (No change)

Visuals

Cattle and evidence of their presence would continue to be seen. No notable effects would occur under this objective

Recreation

Effects to recreation could include livestock obstructing roadways, odor, noise, and cattle droppings. Recreation experiences can be positive or negative, depending on visitors' subjective interpretations. There would be no notable effects under this alternative.

Alternative 3 (Continued grazing with modifications)

Visuals

Cattle and evidence of the presence of cattle would continue to be seen as part of the environment. In the three allotments, placing water troughs away from creeks would reduce cattle use in the creeks. In Aladdin and Smackout Allotments, armoring crossings with gravel will reduce muddied water at crossings.

Recreation

Effects to recreation could include livestock obstructing roadways, odor, noise, and cattle droppings. Recreation experiences can be positive or negative, depending on visitors' subjective interpretations. Public access to Smackout Creek will be restricted by the temporary electric fence for several weeks during the grazing season. There would be no notable effects under this alternative.

Potential Cumulative Effects

None of the alternatives would have notable cumulative effects on the visuals or recreation resources.

If an action alternative is selected for the South Deep TS project thee will likely be road construction and reconstruction. Livestock will likely utilize some of these roads for travel routes to grazing sites. These roads could also be potentially used recreationists depending on the travel management decisions. There is a potential for conflicts between recreationists and livestock utilizing the same road. This potential for conflict is anticipated to be very minor.

3.10. Wildlife, Management Indicator Species, and Neotropical Migratory Birds

3.10.1. Threatened, Endangered, and Sensitive Species

The Endangered Species Act (ESA) requires that the Forest Service address the potential effects of proposed management activities on threatened and endangered species. Each Region of the Forest Service also maintains a list of sensitive species: those whose population viability is of concern because of either notable current or predicted downward trends in population numbers or density, or because of notable current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

The Regional Forester identifies the species listed below as sensitive for the Colville National Forest; however, they are not expected to occur within the project area because: a) suitable habitat is not present in the Aladdin Allotment Complex, or b) the allotment lies outside the known range of these species (except as possible migrants passing through the area). None of the alternatives will impact these species. There will be no direct, indirect, or cumulative effects associated with any of the alternatives.

- Northern leopard frog
- Clark's grebe
- Eared grebe
- Ferruginous hawk
- Sharp-tailed grouse
- Yellow-billed cuckoo
- Ash-throated flycatcher
- Green-tailed towhee
- Western gray squirrel
- American white pelican
- Greater sandhill crane

Table 3-6 summarizes effects on federally and regionally listed species. For more detailed information, see the Biological Evaluation in the project analysis file.

Table 3-6. Threatened, Endangered, and Sensitive Species

Name & Status	Existing Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects	Risk Assessment
Bald eagle (*Haliaeetus leucocephalus*) Threatened	• No nests in planning area. • No winter roost sites because of distance to winter food sources.	• No effect to species or habitat in any alternative.	• No cumulative effects to species or its habitat associated with past, other present or foreseeable future projects..	• No effect for all alternatives.
Bull trout (*Salvelinus confluentus*) Threatened	See section 3.3 in Chapter 3 and also the fisheries specialist's report in the project analysis file.			
Gray wolf (*Canis lupus*) Threatened	• Wild ungulate prey base: -Livestock AUM use exceeds needs of projected wildlife populations so sufficient forage exists to support current levels of big game. -Cattle are not present so do not compete with big game during critical early spring period. -Except for hotspots in meadows, livestock grazing does not negatively affect summer range. • Contact with livestock: -Cattle currently graze allotment with no known attacks by wolves. Sheep, to which wolves seem most attracted, do not graze allotment. • Suitable denning and	• All alternatives comply with the Forest Plan; none will negatively affect winter range, especially the quantity of early spring forage. • No alternative would result in a decrease of big game over that identified in the Forest Plan. A-2, because it eliminates cattle grazing, would result in more forage for big game. • A-2 would eliminate the risk of cattle being attacked by wolves. • No alternative dramatically improves or worsens the condition of big game habitat. A-2 would remove any potential indirect competition	• This project does not notably contribute to positive or negative effects to gray wolves. • This project will not increase the number of livestock on the allotments. • This project will not reduce denning or rendezvous sites, nor will it affect the amount of seclusion habitat. • Non-grazing projects proposed or implemented in the recent past either have had little effect to prey habitat or have improved habitat conditions for prey. • The proposed South Deep project contains harvest units	• May affect, but not likely to adversely affect, for all alternatives. • A-2 results in slightly better habitat conditions than A-1 and A-3.

Name & Status	Existing Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects	Risk Assessment
	rendezvous sites are not an issue per discussion with USFWS wolf recovery coordinator. • Sufficient space with minimal exposure to humans is not an issue per discussion with USFWS wolf recovery coordinator.	for forage.	in summer range but not winter range that cattle will access. The cumulative effects would be minor, but A-2 would result in slightly better habitat conditions than A-1 and A-3.	
Grizzly bear (*Ursus arctos*) Threatened	• Project area is in Management Situation 5, not managed as grizzly bear habitat. • Travel corridors, hiding cover and forage (big game) are present. • Core areas and seclusion habitat exist in small amounts. Managing livestock requires human presence. Current level of disturbance has not prevented at least 2 grizzly bears from using the area in past decade.	• Travel corridors, hiding cover, core areas will not be affected by any alternative. • Effects to forage are the same as for gray wolf. • Effects to seclusion habitat will not change in A-1 and A-3 or will be eliminated in A-2: current human use does not seem to affect use of area by grizzly bears.	• Cumulative effects to forage are the same as for gray wolf. • The proposed actions for remaining allotments east of the Pend Oreille Crest and west of the Columbia River do change the number of cattle or the amount of human activity. • Grizzly bears in the area have used areas occupied by cattle, so the cumulative effects of this and other projects will not preclude grizzly bears from using the area, though disturbance in localized areas could create conditions that bears would avoid.	• May affect, not likely to adversely affect, for all alternatives. A-2 will provide slightly better habitat conditions than A-1 or A-3.
Canada lynx (*Lynx canadensis*) Threatened	• Most of project area lies at elevations lower than lynx generally occupy and does not provide lynx habitat; higher elevations fall within lynx analysis	• A-1 and A-3 might have localized, minor negative effects on regenerating lodgepole pine or other timber or aspen. A-2 will not affect	Within lynx habitat, cumulative effects of proposed projects within allotments would be managed to according to LCAS and would prevent negative effects to:	• May affect, not likely to adversely affect for all alternatives.

Name & Status	Existing Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects	Risk Assessment
	units and do provide habitat. • Lynx have been recorded from the area, though not in past 2 decades. • Outside LAU, grazing can affect development and maintenance of cover that links LAUs. Except for heavily grazed meadows, this has not occurred. • Based on the Lynx Conservation Assessment and Strategy, grazing can negatively affect lynx habitat by: -Inhibiting regeneration of lodgepole pine or other timber or aspen. Grazing has had little or no effect on lodgepole pine or other timber. Grazing has affected regeneration of aspen and other riparian vegetation, but these areas are not within lynx habitat. -Reducing winter browse for snowshoe hare. Both big game and cattle browse woody vegetation used by snowshoe hare. No areas in lynx habitat have been severely affected by browsing by cattle. -Reducing understory vegetation between habitat patches. The current level of grazing within the LAU has not reduced vegetation to where openings	regeneration. • A-1 and A-3 would have minor negative effects to winter browse of snowshoe hare and A-2 would have no negative effects and perhaps a slightly positive effect. • None of the alternatives would result in conditions that reduced vegetation to where lynx or snowshoe hare would be inhibited from moving among habitat patches. • Riparian areas, aspen and willow in lynx habitat are not currently significantly, negatively affected, so A-1 and A-3 will not negatively affect this habitat. A-2 might have a slight positive effect.	• Regenerating lodgepole pine or other timber or aspen; • Winter browse for snowshoe hare; • Understory vegetation between habitat patches; • The composition of plant communities, especially riparian areas, aspen and willow.	

Name & Status	Existing Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects	Risk Assessment
	would restrict use by snowshoe hare or lynx. -Changing the composition of plant communities, especially riparian areas, aspen and willow. The area does not contain high-elevation willow communities, though willow is a component of most open stands. Riparian areas at high elevations are not significantly, negatively affected by cattle grazing as are the meadow complexes at lower elevations outside lynx habitat.			
Woodland caribou (*Rangifer tarandus*) Endangered	• Project not near recovery zone: -Woodland caribou are separated from the planning area by a mountain range and the Pend Oreille River. • No caribou exist in project area.	• No effect to species or habitat in any alternative.	• No cumulative effects to species or its habitat associated with past, other present or foreseeable future projects.. .	• No effect.
California wolverine (*Gulo gulo luteus*) Region 6 Sensitive	• Habitat exists; wolverine have been documented on the Colville National Forest. • Habitat elements are related to the effects of grazing on wolverine prey availability, thus are the same as for grizzly bear and gray wolf.	• All alternatives comply with the Forest Plan and none will negatively affect winter range, especially the quantity of early spring forage. • No alternative would result in a decrease of big game over that identified in the Forest Plan. A-2, because it eliminates cattle grazing, would result in more forage for big game.	• This project does not notably contribute to positive or negative effects to wolverine. • This project will not increase the number of livestock on the allotments. • Non-grazing projects implemented in the recent past have had little effect to prey habitat. The proposed South	• All alternatives "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." A-2 will provide slightly better habitat conditions than A-1 or A-3.

Name & Status	Existing Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects	Risk Assessment
			Deep project would slightly improve habitat conditions for prey. This project will not notably contribute either positively or negatively to prey habitat conditions.	
Common loon *(Gavia immer)* Region 6 Sensitive	• Big Meadow Lake is on the area and loons use the lake during spring and early summer. No loons have nested on the lake. Cattle grazing does not affect loon habitat.	• No alternative will affect this species.	• No alternative will cumulatively affect this species nor will there be effects associated with past, other present or foreseeable future projects...	• All alternatives will have no impact to these species.
Fisher *(Martes pennanti)* Region 6 Sensitive	• Sightings have not been recorded in Steven's County and fisher are nearly absent from Washington State. • Elements of fisher habitat are canopy cover, snags and down wood debris, and riparian conditions; only riparian conditions are affected by cattle grazing. Some lower-elevation riparian meadows are extensively negatively impacted by cattle grazing and historic land use, though the habitat is on a slow, improving trend. This amount of habitat is nonsubstantial when compared to the total amount of potential habitat in the planning area.	• A-2 will slightly improve the lower-elevation meadows. A-1 does not actively improve those areas, though the habitat is on a slow, improving trend. A-3 proposes to seasonally fence portions of the riparian area and will have an effect slightly better than A-1. • No alternative will have a notable positive or negative effect to fisher habitat because the scale of improvement (the riparian meadow areas) is very small.	• None of the alternatives would contribute to cumulate positive or negative effects to fisher nor will there be effects associated with past, other present or foreseeable future projects...	• All alternatives will have no impact to these species.

Name & Status	Existing Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects	Risk Assessment
Great gray owl (*Strix nebulosa*) Region 6 Sensitive	• Great gray owls probably occupy the area. • Prey availability affected in low-elevation, heavily-grazed meadow areas. • Nest site availability is not affected by cattle grazing.	• A-2 would improve conditions in the low-elevation riparian meadows, though the impact to great gray owl populations would not be notable. • A-1 and A-3 would maintain current conditions but would not negatively affect higher elevation open habitats.	This project will not contribute to notable positive or negative cumulative effects to this species or its habitat nor will there be effects associated with past, other present or foreseeable future projects....	• A-1 & A-3: May impact individuals or their habitat but are not expected to lead to a trend toward federal listing. • A-2: Will have no impact to individuals or their habitat.
Pacific western big-eared bat *(Corynorhinus townsendii)* Region 6 Sensitive	• Caves, old mines, and/or old buildings provide roost and hibernation sites, which are not negatively or positively affected by grazing. • Vegetation in feeding areas has not been appreciably altered by grazing except for low-elevation meadows.	• No alternative will notably alter vegetation, thus will not alter feeding patterns.	• The proposed project does not add to cumulative effects for this species nor will there be effects associated with past, other present or foreseeable future projects...	• All alternatives will have no impact to these species.
Redband trout (*Oncorhynchus mykiss)* & cutthroat trout *(Oncorhynchus clarki lewisi)* Region 6 Sensitive	See the Fisheries section in Chapter 3 and also the fisheries specialist's report in the project analysis file.			

3.10.2. Management Indicator Species (MIS)

Management Indicator Species (MIS) are chosen to represent habitat needs of all vertebrate species, to monitor selected habitats that could become limiting to some species through forest management activities, and to provide sufficient populations of selected species to meet demands for wildlife-related recreation.

Of the 14 MIS listed in the Colville Forest Plan, 13 might be found within the Aladdin Allotment planning area. The project area contains potential grizzly bear habitat, and effects of proposed activities on this habitat are detailed in the Biological Assessment, found in the project analysis file. The planning area is about 20 miles from the woodland caribou recovery area and caribou are not expected to inhabit the planning area.

Table 3-7 lists management indicator species (MIS) and summarizes habitat requirements for that species, the potential effects and cumulative effects of the project alternatives on each species. For more detailed information, see the biologist's report in the project analysis file.

Table 3-7. Aladdin Project Environmental and Cumulative Effects on MIS

Name & Status	Current Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects
Deer and elk *(Odocoileus virginianus and Cervus elaphus)*	• Overstory cover is not affected by grazing. • Summer range forage is not limiting because other than some identified "hotspots" in the meadows and some riparian areas in the valley bottoms, most of the area receives light foraging. pressure by cattle during summer. • No direct competition for forage in winter because cattle not present. • Cattle AUM use allows for big game use that exceeds the levels in the Forest Plan, so	• All alternatives comply with the Forest Plan and none will negatively affect winter range, especially the quantity of early spring forage. • No alternative would result in a decrease of big game over that identified in the Forest Plan. • A-2, because it eliminates cattle grazing, would result in more forage for big game, though the amount would not notably affect big game populations.	• Other projects have affected winter range by decreasing cover and increasing forage, but other than fire in the early 1900s, none have dramatically affected winter range areas. • The proposed South Deep project contains harvest units in summer range but not winter range; units are designed to improve habitat conditions. • None of the alternatives would contribute to cumulative effects caused by other projects, including South Deep.

Name & Status	Current Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects
	there are few of no indirect effects from existing use. • Cattle not present during critical spring period. • Rate of spread of noxious weeds most affected by vehicles, not cattle or big game.		
Barred owl *(Strix varia)*	• Low elevation large trees or old growth habitat not currently affected • MA-1 areas not currently affected.	No alternatives will affect this species' habitat.	None of the alternatives would contribute to cumulative effects caused by other past, other present or foreseeable future projects.
Beaver *(Castor canadensis)*	• Inactive beaver dams occur in all low-gradient major streams in planning area. • Lack of woody vegetation in heavily grazed meadows was caused by homestead activity and is maintained by heavy grazing.	• A-1: Fails to meet Forest Plan standard for maintaining beaver habitat because it allows cattle to suppress hardwoods in riparian meadows areas. • A-2: Slight improvement but riparian meadows still accessible to big game; meets Forest Plan standard. • A-3: Slight improvement over A-2 by seasonally fencing riparian meadow areas; meets Forest Plan standard.	• A-2 and A-3 would improve cumulative habitat conditions by allowing woody vegetation to re-establish itself, adding to the positive effects from the proposed South Deep project. • A-1 will continue to suppress beaver habitat by preventing re-establishment of woody vegetation.
Blue grouse *(Dendragapus obscurus)*	• Cattle grazing does not affect large, limby Douglas-fir or subalpine fir in ridgetop habitats. • None of the small ponds on NFS land lack cover. Riparian areas in the heavily grazed	• A-1: Continued slow improvement of riparian areas of meadows. • A-2 and A-3: Faster improvement of meadows than A-1 because cattle are removed or area is fenced. • No improvements will dramatically increase habitat quality because the	• The heavily grazed open meadows constitute a very small portion of blue grouse habitat. • Proposed projects will improve habitat by creating openings, which will also attract cattle. The positive effects of distributing cattle use are very small, but

Name & Status	Current Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects
	valley meadows, particularly Smackout meadow, do not support adequate riparian vegetation to provide cover. Quality of riparian vegetation shows a slight improving trend.	heavily grazed meadows comprise a small amount of blue grouse habitat.	will be greater when the proposed South Deep project opens more habitat to access by livestock. • None of the proposed alternatives would notably contribute to cumulative effects that would negatively affect the blue grouse population.
Franklin's grouse *(Falcipennis canadensis)*	• Large stands of young lodgepole pine do not exist in project area, and cattle do not notably affect regeneration of lodgepole pine.	• No proposed alternatives would affect this species' habitat.	• None of the alternatives would contribute to cumulative effects caused by other past, present or foreseeable future projects...
Large raptors (*Accipiter* species) and great blue heron *(Ardea herodias)*	• Nest trees present and used. Cattle to not affect nest trees.	• None of the alternatives would notably affect these species' habitat: cattle do not notably affect coniferous trees; raptors & great blue herons are flexible in tree species choice.	• None of the alternatives would contribute to cumulative effects caused by other past, present or foreseeable future projects.
Northern bog lemming *(Synaptomis borealis)*	• Wet areas in good subalpine habitats not notably affected by current cattle grazing. • Current cattle grazing reduces habitat quality in marginal, low-elevation habitat in riparian meadows by removing vegetation.	• None of the alternatives would have a notable positive or negative effect on this species' habitat. Typically, bog lemmings occupy higher elevations than the grazed valley bottom meadows.	• None of the alternatives would contribute to cumulative effects caused by other past or foreseeable future projects.
Northern three-toed *(Picoides tridactylus)* and pileated	• Dead trees not affected by grazing. • Establishment and growth of conifers little affected by	• A-1: Minor, localized, negative effect; cattle and big game continue to suppress cottonwood and aspen. • A-2: Slight, localized, positive effect;	• No alternatives will have notable positive or negative cumulative effects on these species' habitat and would not contribute to effects from the proposed

Name & Status	Current Conditions and Habitat Elements	Effects of Alternatives	Cumulative Effects
woodpeckers *(Dryocopus pileatus)*; other primary cavity nesters	grazing. • Growth of established hardwood trees little affected by current grazing except for open riparian meadows.	positive effect to aspen & cottonwood by removing cattle but not big game. • A-3: Slightly greater, localized, positive effect than A-2; excludes cattle & dissuades big game from using the riparian meadow area.	South Deep project. • Lack of disturbance has greater effect on establishing aspen than current browsing by cattle, except for heavily grazed riparian meadows. • Browsing of aspen occurs mainly by big game in winter.
Pine marten *(Martes americana)*	• Canopy cover and down wood not affected by cattle grazing.	• No alternatives will have a notable affect on this species' habitat.	• None of the alternatives would contribute to cumulative effects caused by other past, present or foreseeable future projects.
Trout	See the Fisheries section of this EA and the Fisheries biologist's report in the project analysis file.		
Waterfowl	• Waterfowl nest in upland areas or in trees with cavities. • Waterfowl use shoreline vegetation for hiding.	• A-2 would be incrementally better than A-1 or A-3 because it removes any effect of cattle, though the difference is minor. • Vegetation is currently sufficient in Big Meadow Lake and other ponds.	• None of the alternatives would contribute to cumulative effects caused by other past, present or foreseeable future projects.

3.10.3. Neotropical Migratory Birds

In North America, populations of several neotropical migratory bird species have declined. Though these declines are most apparent for some grassland and eastern forest-dwelling species, the Landbird Strategic Plan includes direction to assess and disclose the effects of management action on landbirds in NEPA documents. A 2001 executive order outlines responsibilities of Federal agencies to protect migratory birds. Provisions include supporting conservation intent of migratory bird conventions by integrating conservation measures into project planning to avoid or minimize impacts on migratory bird resources and evaluating the effects of actions on migratory birds. A 2001 Memorandum of Understanding between the Forest Service and USDI Fish and Wildlife Service directs that the Forest Service shall incorporate habitat and population management objectives into agency planning and strive to protect, restore, enhance and manage habitats of migratory birds on NFS lands.

- Habitat loss and fragmentation on wintering and breeding grounds
- Predation
- Cowbird parasitism
- Pesticide use

Of concern in this projects are the effects of cattle grazing on breeding grounds. Predation and pesticide use are not associated with the proposed project. A study conducted within 20 miles of the area which had livestock densities similar to those in the project area, concluded that though cowbirds parasitized nests, the level did not reduce the densities of any species (Beutler 2000). The area does not serve as wintering habitat for neotropical migratory birds.

Potential direct and indirect effects applicable to neotropical birds are listed below and will be used to analyze effects.

Element 1. Reduced or altered vegetation structure, cover or composition (for nesting, foraging)
Element 2. Trampling of ground-nesting birds and young; disturbances that may lead to nest abandonment or destroy nests or young.
Element 3. Loss of vegetation that supports insect prey
Element 4. Loss of vegetation structure

Affected Environment and Existing Condition

The three Aladdin allotments provide habitat for many species of migratory birds. In these allotments, because cattle occupy mainly open grass, shrub and tree habitats, populations of migratory birds that use more closed-canopy stands are not negatively affected by grazing.

Element 1: Cattle use by nature reduces or alters vegetation. Humans removed most of the large deciduous trees along the riparian areas in the lower-elevation open meadows. Cattle grazing continues to suppress woody vegetation and remove herbaceous vegetation, which suppresses local populations of migratory birds that use these habitat types. Outside of these areas, vegetation structure, cover and composition are not greatly affected by the current level of cattle grazing.

Element 2: Cattle are released onto the allotment near the end of the brooding period for most ground-nesting birds, but in the beginning of rearing. The ground-nesting species that might be affected are common in the project area.

Element 3: Only the open meadows and associated riparian habitats receive sufficiently intense grazing pressure to reduce insect populations. These areas also create warm habitats conducive to certain insect species and the open riparian areas result in warmer water and greater insect production, which attracts species that depend on open conditions: swifts, swallows, and some of the flycatchers.

Element 4: Ecosystem processes in the allotment have not changed. The areas most heavily affected by humans and cattle, the open meadows and associated riparian areas, are considered to be functioning at risk, with a slow, upward trend.

Potential Cumulative Effects

For some species, the cumulative effects of annual grazing pressure, combined with other effects on non-Forest Service lands both here and in wintering habitats, may contribute to population declines. Either these species do not inhabit the Aladdin Allotment Complex or the negative effects are caused by factors off NFS lands.

If an action alternative is selected for South Deep TS the harvest activities would favor species that occupy habitats like those used by livestock on the Aladdin Allotment Complex. None of these species are listed as species of special management concern.

Alternative 1. Retaining cattle use in productive riparian areas without allowing the riparian vegetation that historically occurred there to reestablish itself would retain the localized reduction in populations of some species that require this habitat.

Alternative 2 and Alternative 3. Habitat for some species of concern would improve if the riparian areas are actively or passively managed to allow woody vegetation to re-establish itself. The increase in woody vegetation would also result in a decline in the use of these areas by other species, particularly swallows, but sufficient habitat remains to maintain healthy populations of swallows.

3.10.4. Works Cited

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3.11. Other Required Analysis

3.11.1. Air Quality and Clean Air Act

None of the alternatives would affect air quality. The three allotments do not contain any Class I air sheds. No burning, road construction, or earth disturbance are planned that might add dust or particulate matter into the environment. All alternatives comply with the Clean Air Act.

3.11.2. American Indian Rights

No effects on the American Indian Religious Freedom Act are expected from the three alternatives.

No effects are anticipated on American Indian social, economic, or subsistence rights from any of the alternatives. Under Alternative 2 (No grazing) some individuals in the local community who work in the agriculture sector could be affected, as discussed in the Economic and Social section.

3.11.3. Conflicts with Objectives of Other Land Management plans, Policies, and Controls

Alternative 2 (No grazing) complies with the Forest Plan.

Under Alternative 1 (No change), Smackout Creek would continue to not meet state water quality standards.

Alternative 3 (Continued grazing with modifications) complies with the Forest Plan and all applicable laws and regulations.

3.11.4. Consumers, Civil Rights, Minority Groups, and Women

Alternative 2 (No grazing) may affect consumers due to the potential decrease in buying power for grazing permitees and their extended families. If other decisions are made to reduce or eliminate grazing from private, state, and federal lands, there could be a cumulative effect on consumers whose income depends on the agriculture sector. This includes businesses and individuals that supply products, individuals who work in the agriculture sector, and companies or ranches that buy livestock.

Alternative 1 (No change) and Alternative 3 (Continued grazing with modifications) should not affect the current buying power of the permittees or their extended families.

Cumulatively, each alternative affects the stability of the consumers in northeast Washington who depend on the agriculture sector. If levels of grazing on private, state, and federal lands decrease, the continuation of grazing in the Aladdin Complex will provide a smaller measure of stability.

3.11.5. Cumulative Effects

National Forest lands. Past, present, and reasonably foreseeable future actions on National Forest System lands within the Aladdin Allotment Complex include

1. Range management activities (livestock grazing and range improvement construction)
2. Timber management activities (timber harvesting, precommercial thinning, planting)
3. Fire management activities (fuels reduction, prescribed fire, fire control)
4. Road management activities (use of roads, maintenance, reconstruction, construction)
5. Heritage site management (inventorying, protecting)
6. Mineral activities (mining exploration, mining, mineral material removal, stockpiling)
7. Noxious weed management (herbicide use, hand-pulling, bio-releases)
8. Recreation management (development, use, and maintenance of Big Meadow Lake Campground, dispersed camping, hunting, fishing, firewood gathering)
9. Wildlife, hydrology, and fisheries management (stream habitat improvement or protection projects, prescribed fire)
10. Permitted uses (such as the BPA power transmission line)

State lands. Past, present, and reasonably foreseeable future actions on the two sections of Washington state lands include timber harvest and road construction. No grazing is currently permitted and cattle have not been known to use these areas.

Private lands. Past, present, and reasonably foreseeable future actions on private lands include

1. Agriculture (livestock grazing, hay production, farming, winter confinement operations, irrigation)
2. Forestry (harvesting, thinning, burning, planting)
3. Power transmission line corridors
4. Public transportation corridors (state and county roads, including maintenance and reconstruction)
5. Residential use (year-round and summer homes, livestock such as pleasure horses)
6. Mining activities, small products removal (mostly firewood)
7. Dispersed recreation (such as hunting)

Cumulative effects of livestock grazing in conjunction with these activities are addressed in the Chapter IV of the Forest Plan FEIS (USDA FS 1988b), in Section 3.6 (Range and Grazing) of this EA, and in the specialists' reports in the project analysis file.

3.11.6. Economic and Social Effects

Affected Environment

Farming and ranching has been a major part of the counties in this area since the early 1900s. The existing Forest Service term grazing permit is a vital part of the Dawson Family Ranch. They rely on this summer pasture to augment the forage available on their base property. Most suitable grazing land on other private lands has been converted to farm land or subdivided into residential or other commercial uses. Leases with a preference for renewal on state and private timber lands are difficult to obtain. There are not additional available grazing lands for lease. Studies concerning grazing fees and grazing on Federal lands (Rimbley, 1989: Larson, 1990; Rostvold and Dudley, 1993) indicate that ranchers who rely on federal grazing land experience higher costs, smaller yields, greater risks, and lower returns on investments. Therefore, these

ranchers have economic and financial disadvantages compared to ranchers who do not rely on federal grazing.

Also, federal land grazing permittees face increasing management complexity. For example, they are faced with other users on the land (such as public recreation use around Big Meadow Lake), meeting water quality standards, and concerns about the quality of riparian habitat. These concerns often result in more fencing and water developments than would be required on other lands and they increase maintenance requirements for permittees. The costs of managing livestock and maintaining improvements on National Forest lands make it increasingly difficult for family ranchers to support themselves by raising cattle.

Present net value (PNV) is used to estimate the financial efficiency of the grazing on an allotment. PNV is the difference between the revenues generated and the costs incurred. Quantifiable revenues received by the Forest Service are from grazing fees. Quantifiable costs incurred by the Forest Service are from grazing permit administration, monitoring of the range resource, and construction and maintenance of range improvements. Revenues and costs that are difficult to quantify include benefits and impacts to other resources such as recreation, wildlife, and fisheries. Benefits of livestock grazing include vegetation control in dispersed campsites, brushing out of trails used by hunters and hikers, use of water developments by wildlife and recreational livestock. Costs of livestock grazing include conflicts with recreational users that object to seeing livestock (or signs of livestock use) in areas where they want to be. Other benefits and costs that are not quantifiable can be found throughout the various other resource reports.

Alternative 2 (No grazing)

The existing range improvements would not be maintained. They would quickly fall into disrepair and would have to be removed at the expense of the Forest Service. Because of the miles of fence involved and the size and construction of the corral in the Smackout Allotment, the cost is expected to be high.

The Dawson Ranch would cease to exist without this summer pasture. Without the Dawson Ranch, there would be a loss of about $250,000 of annual gross revenue from the Stevens County economy (Dawson 2001).

The three counties occupied by the Colville National Forest are among the poorest in Washington. Local communities benefit economically from the local livestock industry. The Dawson Family Farm contributes a gross annual business of roughly a quarter of a million dollars; the majority of that is spent in these counties. The cumulative effect of several losses, or the loss of public and land grazing entirely, could impact the community for the long term. These long-term losses may include loss of county tax revenue, loss of ability for ranchers' purchasing power in the community, a loss of jobs in the area (Geier and Holland, 1991).

The counties each receive 25 percent of the grazing fees collected from the grazing permittees within that county. The US Treasury receives 50 percent of the grazing fees collected and 25 percent returned to the Colville National Forest as Range Betterment funds that are used solely for on the ground improvements of the range resource. These funds would be lost if the grazing permit is not reissued.

Alternative 1 (No change)

The Dawson Family Ranch would continue to operate, producing an income for two families.

Alternative 3 (Continued grazing with modifications)

The Dawson Family Ranch will be able to continue to operate, maintaining its contribution to the economy of the area.

3.11.7. Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources is an action that disturbs a nonrenewable or renewable resource to the point that renewal can occur only over a long period of time or at great expense (USDA FS 1988b, pp. IV-142 – IV-144). The Forest Plan FEIS does not identify the use of range resources or any effects of grazing as an irreversible commitment of resources.

The irretrievable commitment of resources is the loss of the production of or use of renewable resources because of an allocation decision (USDA FS 1988b, pp. IV-142 – IV-144). Included in irretrievable resources are the use of the forage resource and the potential of livestock impacts on regeneration. Each of these effects is addressed in detail in the Range and Silviculture sections of Chapter 3.

The implementation of any of the alternatives would not cause any irreversible or irretrievable commitment of resources, beyond that already addressed in the Forest Plan.

3.11.8. Prime Farmlands, Rangelands, and Forestlands

Alternative 2 (No grazing) could increase grazing pressure on prime farmlands and rangelands on private or state lands, due to the loss of summer grazing on National Forest lands. Unless the loss of summer grazing is compensated through clearing prime forestlands to create pasture, it is unlikely that prime forestlands will be affected.

Alternative 1 (No change) and Alternative 3 (Continued grazing with modifications) will not affect prime farmlands, rangelands, or forestlands. No roads are proposed for construction.

Cumulatively, with other decisions to reduce or eliminate grazing on private, federal, or state lands, Alternative 2 (No grazing) could affect prime farmlands, rangelands and forestlands on private lands. These could be cumulatively affected as family operations are lost and subdivided in the local area. This follows the cumulative effects on consumers identified in Section 3.11.4 of this EA. The cumulative effect on prime forestlands on private lands could occur if these lands are cleared for summer pastures.

Alternative 1 (No change) and Alternative 3 (Continued grazing with modifications) will have no cumulative effects on prime farmlands or forestlands.

3.11.9. Short-Term Use and Long-Term Productivity

Short-term uses are typically uses that determine the present quality of life for the public. They might be activities such as livestock grazing, recreation, removal of timber, road construction, and mineral exploration.

Long-term productivity is the capability of the land to provide resources, such as forage, timber, and high quality water. Long-term productivity determines the quality of life for future generations. Maintaining soil productivity and water quality are assumed to assure maintenance of long-term productivity. The standards and guidelines in the Forest Plan, Chapter 4, were developed to protect the long-term productivity of the Colville National Forest. For information about short-term use and long-term productivity, see the Forest Plan FEIS (USDA FS 1998b, p. IV-145).

Alternative 2 (No grazing). Long-term productivity of forage may be reduced under Alternative 2 (No grazing) as shrubs and trees replace forage species through succession, particularly in created openings such as old homestead meadows. Soil and water quality would improve.

Alternatives 1 and 3. Alternative 1 (No change) is expected to maintain the short-term productivity of resources affected by grazing. Alternative 3 is expected to enhance it: grazing and forage enhancement activities may enhance the long-term productivity of forage or, at a minimum, delay the replacement of forage with shrubs and trees.

3.11.10. Unavoidable Effects

Alternative 2 (No grazing). The unavoidable effects identified in the Forest Plan FEIS would not occur (USDA FS 1998b, pp. IV-147 – IV-148).

Alternatives 1 (No Action) and 3 (Proposed Action). These alternatives may cause some unavoidable indirect and direct effects that are inherent in the type of activity to be implemented. The Forest Plan FEIS identifies indirect and unavoidable effects associated with livestock grazing in regard to soils, water quality, wildlife, and livestock forage (USDA FS 1998b, pp. IV-147 – IV-148). In general, the Forest Plan FEIS states that:

- Livestock grazing may cause soil compaction.
- Livestock may contaminate and increase sediment in streams where they access them.
- Fisheries habitat may be degraded by grazing; although proper mitigation and habitat improvements should maintain or enhance fisheries habitat.
- A certain amount of streamside trampling and damage to riparian vegetation may occur.

The Forest Plan standards and guidelines and the management area prescriptions in Chapter 4, Forest Plan, as amended, were developed to mitigate these unavoidable effects.

All of these unavoidable effects were further analyzed for the Aladdin Allotment Complex. Management standards, practices, BMPs, and mitigation measures designed specifically for the Aladdin Allotment Complex are also in Chapter 2 of this EA.

3.11.11. Unroaded and Roadless Areas

The Aladdin Allotment Complex contains a small portion of the Abercrombie-Hooknose Roadless Area (6011). Approximately 2,464 acres[28] of the southwest corner of Abercrombie-Hooknose overlap with the northeast corner of the Smackout Allotment. Impacts of grazing to Abercrombie-Hooknose are included in the Forest Plan FEIS, Appendix C, (USDA FS 1988a, pp. C-121 – C-130). No road construction or reconstruction is proposed in any of the

[28] Generated from GIS overlays on August 20, 2002.

alternatives. All alternatives comply with the Roadless Area Conservation Rule.

3.11.12. Wetlands and Floodplains

For effects on wetlands and floodplains, see the Soils and Water and the Fisheries sections of Chapter 3.

3.11.13. Wilderness, Wild and Scenic Rivers, and Research Natural Areas

The Aladdin Allotment Complex does not contain any designated wilderness, wild and scenic rivers, or research natural areas.

3.11.14. Works Cited

Dawson, John. **2001**. Range permit operator. Personal conversation, Colville, WA.

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CHAPTER 4

4.1. Agencies and Persons Involved

Listed below are the members of the interdisciplinary team and other individuals and agencies that participated in the development of this EA. Specialists' reports are available from the project analysis file.

4.1.1. Interdisciplinary Team Members

Resource Specialty	Name
Fire and Fuels	Leon Mitchell, Mike Almas
Fisheries	Tom Shuhda, Karen Honeycutt
Heritage	Louanne Atherley, Steve Kramer
Hydrology	Albertus Wasson
Hydrology and Soils	Joe Coates
Interdisciplinary team leader	Ellen Picard, Tom Pawley, John Ridlington
NEPA coordinator	Dennis Gordon
NEPA reviewer	Jim Parker
Range	Ellen Picard, John Ridlington
Noxious Weeds	John Ridlington
Sensitive and Threatened Plants	Kathy Ahlenslager
Silviculture	Tom DeSpain, Michelle Satterfield
Visuals and Recreation	Jan Bodie, Diane Bestrom
Wildlife	Sandy Mosconi, James McGowan, Chris Loggers
Writer-editor	Elaine Leyda

4.1.2. Agencies and Persons Consulted

The U.S. Fish and Wildlife Service was consulted during the development of the Aladdin Allotment Complex EA and concurred with the proposed action.

4.1.3. Members of the Public

The following contributed comments or suggestions during the development of this EA.

Name	Association
Jeff Dawson	Aladdin Allotments Permittee
John Dawson	Aladdin Allotments Permittee
Melva Dawson	Aladdin Allotments Permittee
Leisa Hill	Resident
David Heflick	Kettle Range Conservation Group
Lee McNinch	Local rancher
Sharon Shumate	Ferry County Natural Resource Board

APPENDIX A

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APPENDIX B

Best Management Practices

Introduction

After evaluating the alternatives for the Aladdin Allotment Complex project the interdisciplinary team selected and designed best management practices (BMPs). These BMPs will protect fisheries and water quality values while meeting other resource needs.

Best management practices are defined as ". . . methods, measures, or practices selected by an agency to meet its nonpoint source control needs. BMPs include, but are not limited to, structural and nonstructural controls, operations and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters" (40 CFR 130.2, EPA Water Quality Standards Regulation).

BMPs are usually applied as a system of practices rather than as a single practice. They are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility. BMPs are basically a preventative rather than an enforcement system. BMPs are a whole management and planning system in relation to sound water quality goals, including both broad policy and site-specific prescriptions.

Individual, general BMPs are described in the 1988 "General Water Quality Best Management Practices" from the Pacific Northwest Regional Forest Service office (USDA FS 1988b). This provides guidance but is not a direction document. Not all of the general BMPs listed in the document will typically apply to a given project, and there may be specific BMPs which are not represented by one of the general BMPs in the document. The general BMPs from the above reference are rewritten by each interdisciplinary team to be site-specific for each project area.

The selection and redesign of BMPs are an integral part of the Colville National Forest's Land and Resource Management Plan Standard and Guidelines for Soil, Water, and Air (USDA FS 1988a, pages 4-50 to 4-54). In cooperation with the state of Washington, the Forest will use the following process:

a. Select and redesign BMPs based on specific site conditions, technical, economic and institutional feasibility, and the water quality standards for those waters potentially impacted.
b. Implement and enforce BMPs.
c. Monitor to ensure that practices are correctly applied as designed.
d. Monitor to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards.
e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected.

f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate the appropriateness of water quality criteria for reasonable assuring protection of beneficial uses.

To control or prevent nonpoint sources of pollution from resource management activities, the Forest Service will implement the State Water Quality Management Plan on lands administered by the Forest Service. The process used to implement this plan is described in the Memorandum of Understanding (MOU) between the Washington Department of Ecology and the USDA Forest Service (7/79), and "Attachment A" referred to in the MOU (Implementation Plan for Water Quality Planning on National Forest Lands in the Pacific Northwest 12/78).

The selected BMPs, an estimate of their effectiveness, and a plan for monitoring them is included in the project analysis file. Evaluations of the ability to implement and estimated effectiveness are made at the project level. Selected BMPs are included as mitigation measures and some are incorporated as standard practice in project implementation. BMP selection and design are dictated by water quality objectives, soils, topography, geology, vegetation, climate, economics, institutional constraints, etc. Environmental effects and water quality protection options are evaluated and a range of practices are considered. A final set of practices are selected that not only protect beneficial uses, but meet other resource needs. These final selected practices are the BMPs.

For a more complete explanation of the above, see Appendix G (Best Management Practices) in the FEIS Land and Resource Management Plan for the Colville National Forest.

Each BMP includes the Title, Objective, Explanation, Implementation and Responsibility, Ability to Implement, Effectiveness, and Monitoring. An explanation of the Ability to Implement and Effectiveness sections are described below.

Ability to Implement: Provides a qualitative estimate of the ability of the Forest Service to implement the BMP. Evaluations of ability to implement are made at the project level. The following criteria are used to rate the ability to implement as either High, Moderate or Low:

High: Almost certain the BMP can be implemented as planned. These BMPs are usually implemented or enforced using mechanisms such as the Planning Process, Timber Sale Contract Provisions and road construction specifications, Forest Service Manual direction, environmental documents, and Forest Plan Standards and Guidelines.

Moderate: Greater than 75% certainty the BMP can be implemented as planned. Implementation of the BMP may be dependent on factors such as funding, or unidentified physical constraints, such as soil or topographic conditions or extreme weather events such as a 50 or 100 year flood event occurring in the project area.

Low: Less than 75% certainty the BMP can be implemented as planned. An example of a low ability to implement might be conflicting regulatory requirements, excessive project restrictions, or lack of funding.

Effectiveness: The effectiveness section provides a qualitative assessment of the expected effectiveness that the applied measure will have on preventing or reducing impacts on water quality and beneficial uses. Each BMP will include monitoring and evaluation duties, in order to measure its level of effectiveness. Future BMP implementation will be based on the monitored level of effectiveness.

The effectiveness of each BMP will be evaluated with an index that rates the effectiveness of each BMP as either High, Moderate, or Low. The index is:

High: Practice is highly effective (> 90%) and one or more of the following types of evaluations are available:

a. Literature/Research - must be applicable to the area.
b. Administrative studies - local or within similar situations.
c. Experience - judgement of an expert by education and/or experience.
d. During the BMP selection and design process, all BMPs will be reviewed by qualified personnel such as the Interdisciplinary Team, Monitoring Team, Sale Administrators, etc.
e. Fact - obvious by reasoned (logical) response.

Moderate: Documentation shows that the practice is effective less than 90% of the time but at least 75% of the time.
Logic indicates that this practice is highly effective but there is little or no documentation to back it up.
Implementation and effectiveness of this practice will be monitored and the practice will be modified if necessary to achieve the objective of the BMP.

Low: Effectiveness unknown or unverified, and there is little or no documentation. Applied logic is uncertain in this case, or the practice is estimated to be less than 75% effective. This practice is speculative and needs both effectiveness and validation monitoring. Specific tools to measure the effects do not exist.

Implementation and effectiveness of this practice will be monitored and the practice will be modified if necessary to achieve the objective of the BMP.

The following BMPs have been selected and redesigned to meet water quality standards and will be included by reference in the Environmental Assessment. In the BMPs, the acronym RHCA is an abbreviation for riparian habitat conservation areas, a term further defined in the Inland Native Fish Strategy Environmental Assessment (INFISH).

Best Management Practices for the Aladdin Allotment Complex

The following BMPs have been tailored for the Aladdin Allotment Complex and are included in the proposed action Alternative 3 (Continued grazing with modifications).

PRM-2 Controlling Livestock Numbers and Season of Use

Objective: Promote improving trends or maintain desired riparian conditions through management of livestock numbers and season of use. Ensure that riparian utilization and impact standards adequately provide for maintenance of desired riparian conditions or recovery to desired conditions.

Explanation: In addition to proper stocking rate and season of use specified in the grazing permit, adequate field checks will be made to identify needed adjustments in season and livestock numbers. Checks include:

a) Range readiness evaluations to assure that the soil is not too wet and that sufficient forage growth has occurred.
b) Stock counts to assure that only permitted livestock enter the allotment
c) Forage utilization measurements to provide data for improved livestock distribution and stocking.
d) Periodic range assessments will be conducted to verify soil and vegetative condition and trend. See PRM-3 where specific standards for allowable utilization have been established. Livestock numbers and season of use are adjusted based on these field checks.

All critical areas (accessible, palatable, and sensitive) will be monitored at three-year intervals to evaluate their status and the trend in riparian condition. Monitoring will include, but not be limited to, a riparian functional rating per report TR 1737-9 (USDI 1993).

Based on this monitoring, sites will be designated as within or below properly functioning condition (PFC), and on an upward or downward trend. If the canopy cover of key indicator species is less than 50% of the average cover described for a reach's riparian association by Kovalchik (1993), riparian condition will be considered below desired for that area. A functional rating below PFC will also result in a determination that a reach is below condition. Changes in channel inventory parameters over time, in addition to changes in vegetation and functional rating, will be used to determine the direction of trend, if any.

Random spot checks will be made to verify that new conditions are not creating access problems in reaches not already designated as below desired condition. If livestock are found to be causing impacts above allowed levels during these spot checks, if riparian vegetation is below desired condition, or if the functional rating is not at PFC, the reach will be designated as below desired condition and allotment management plans will be reevaluated and modified.

Implementation and Responsibility: An interdisciplinary team will locate and mark monitoring locations within the first year of the decision. They will conduct the first set

of vegetation and channel measurements at that time, and will train District resource staff in measurement techniques. This trend monitoring will be conducted by resource staff members, who may request assistance from the rangeland management specialist. These monitoring observations will be documented in a periodic allotment monitoring report. The report will describe any changes in reach designation and recommendations for adjusting the grazing permit accordingly.

Ability to Implement: Because monitoring for range allotments is not well funded, this monitoring effort may not be done in a timely fashion. It is likely that monitoring will occur, but timeliness will probably be moderate or poor.

Effectiveness: Moderate: management would be responsive to results of this monitoring, but changes may not occur as rapidly as needed for high effectiveness.

Monitoring: A copy of the allotment monitoring report, including the field data sheets and photos will be submitted to the Forest rangeland management specialist, and it will be filed in the permanent allotment files.

PRM-3 Controlling Livestock Distribution within Allotments

Objective: Limit the intensity and duration of stock use in areas sensitive to concentrated use and preclude prolonged use of any area that would result in unacceptable impacts to vegetative cover and soils. Limit livestock impacts in riparian areas to levels that will permit recovery toward or maintenance of desired riparian conditions.

Explanation: The following management actions will be taken to minimize soil and water damage due to livestock.

1) Construction of pasture fences will be completed and on-going maintenance will occur as needed.
2) Herding will be required to maximize allowable utilization of all forage while meeting riparian guidelines. The frequency of herding will vary depending on riparian and upland soil and forage conditions throughout the season of use. To ensure that riparian standards are not exceeded, herding will probably be needed more often in wet or hot, dry conditions than in moderate conditions.
3) Wherever possible, salt and supplements will be placed at least 1/2 mile from riparian areas below PFC. They will be placed no closer than 1/4 mile from riparian areas at PFC, including intermittent drainages. Salt and supplements will not be placed to attract cows into ephemeral draws.
4) Livestock will be moved when any one of the following riparian standards is about to be reached in a critical area:
    a) An average 4" stubble height of herbaceous vegetation must remain in riparian areas. Riparian shrub utilization is expected to remain within acceptable limits where this stubble height is maintained. The underlying objective is to permit no more than 30% woody plant utilization, but it has been shown that shrub utilization cannot be consistently measured with accuracy (Hall, personal communication to John Ridlington 1995).

b) Percent total bank length with livestock-related bank disturbance will not exceed 10% in riparian areas at least 500' long. Bank disturbance includes bank caving, sloughing, and compaction directly related to ungulate hoof action. Chronic intense (>10%) bank disturbance by stock over lengths shorter than 500' will be discouraged by placement of barriers, by herding, or by other means.

c) Areas where bare soil is exposed due to cattle grazing or trampling will not exceed 5% of critical riparian areas. (USDA FS 1988, p. 4-53) This variable will usually be evaluated on the floodplain and low terrace surfaces immediately adjacent to streams although, where wetlands are extensive; the entire area may be assessed.

Critical monitoring areas have been identified as streams and wetlands that have palatable forage and provide open access for cattle. For routine pasture management, these areas will be monitored to determine when a standard is being exceeded or is imminent. When a standard is exceeded on any 500' stream reach, the permittee(s) will be notified to move stock. If standards are exceeded a second time, the pasture will be closed. Full use of pasture forage will depend on the consistency of the permittee in moving the cattle out of riparian areas and avoiding exceeding this standard. Table B-1 lists the critical monitoring areas.

Table B-1. Critical Monitoring Areas and Legal Locations

Monitoring Area	Legal Location
Smackout Creek in Smackout Meadows	S 11, 12, 13, T38N, R41E
Byers Creek	NE1/4, S 35, T38N, R41E
Wetlands NE of Smackout Meadows	SW¼, S18, T38N, R42E
Riparian area below Big Meadow Lake Dam*	SE1/4, S 1, T37N, R41E
Meadow Creek Wetland	SE/NE1/4, S2, T37N, R41E SW/NW1/4, S1, T37N, R41E
Rabbit Creek Wetland	NW1/4, S19, T387N, R41E NE1/4, S24, T37N, R41E
Aladdin Mountain Wetland	NW1.4, S12, T37N, R41E

*The riparian area below BML may drop off this list of critical areas if a decision is made to maintain the exclusion fence around the perimeter of the riparian area.

(See Figures 2-1 and 2-2 in Chapter 2 of this EA.) Critical areas may be added or dropped depending on monitoring results (PRM-2) and listed in the AOP.

5) When cattle are moved to a new pasture, the permittee will make every effort to ensure that all animals enter the new pasture within five days of the moving date. Until all stock are moved, the permittee will be required to conduct frequent checks of the unit's riparian areas. Riparian damage can result from a few stragglers.

6) Develop water sources in areas that currently receive little use and close off water developments when prescribed utilization levels have been achieved. Permanent water access points will be located where floodplains cannot be detrimentally affected by loss of defined stream banks; that is, they will usually be located where the stream channel is at least moderately confined. If livestock damage occurs on both banks, both should be hardened or otherwise protected (for example, by fencing). Surface hardening may be accomplished by placement and periodic replacement of crushed or pit run rock. Geotextiles may also be used. Work will be done during summer low flows and equipment will not enter surface waters. District range managers will periodically verify that hardened access points are in good condition and functioning effectively.

Implementation and Responsibility: All requirements mentioned above will be included in the grazing permit and will be fulfilled by the permittee. District range conservationist is responsible for tracking riparian condition and verifying that standards are not exceeded. Frequency of critical area field checks required to track riparian condition will vary throughout the season depending on the relative attractiveness of riparian areas to stock, and on how closely a standard is being approached at any time. Inspections will be frequent enough to avoid exceeding these standards. Riparian condition checks will be documented in the allotment inspection diary by the range management specialist.

Ability to Implement: High for 1 through 3 above. Moderate at first for 4 since this would be a new management requirement. Moderate for 5 and 6 since cows may be difficult to locate and funding is variable.

Effectiveness: Moderate--management will be responsive to results of this monitoring, but changes may not occur as rapidly as needed for high effectiveness. These practices are recommended in numerous publications on management of grazing in riparian areas. They address the stock management problems that can degrade channel conditions and affect riparian area quality. References supporting these practices include:

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- Clary, W.P.; Webster, B.F. 1989. Managing grazing of riparian areas in the Intermountain Region. (USDA FS GTR INT-263)
- Hall, F.C.; Bryant, L. 1995. Herbaceous stubble height as a warning of impending cattle grazing damage to riparian areas. (USDA FS PNW-GTR-362.)

Monitoring: Allotment inspection diaries will serve to document the implementation of this BMP. Effectiveness of this BMP, as well as other BMPs, will be monitored as described in PRM-2.

PRM-4. Title: Rangeland Improvements

Objective: Safeguard water quality under sustained forage production and manage forage harvest by livestock and wildlife.

Explanation: Rangeland improvements are intended to restore or improve forage quality, quantity, and/or availability. They may provide rest through rotation grazing, or fencing,

or lighter grazing use by changing the grazing season, kind, class, or permitted number of livestock. Other measures may include stream channel stabilization efforts such as riprapping, gully plugging, and planting. Reseeding and/or fertilization may be done alone or in conjunction with any of these measures. Water developments are often included in rangeland improvement projects. Improvement efforts are directed at increasing the ability of the range to produce at or as near its potential as possible; to make the forage available to livestock and wildlife; to foster decreased livestock use of streamside riparian areas as watering areas by providing alternate water sources located away from streams; and to provide protection to the other resources. Practices used for improvement of watershed conditions, which include the exclusion of livestock, are described in Watershed BMPs: W-1. Watershed Restoration and W-8. Management by Closure to Use.

Implementation and Responsibility: The permittee is a cooperator in rangeland improvements and may actually complete the work under Forest Service direction. Implementation may also be done by Forest Service crews or contractors. Range improvement needs are usually recognized in the range allotment planning process and are scheduled for implementation in the allotment plan. Watershed condition assessments developed by an interdisciplinary team should be used in development of range improvement treatments and programs.

Ability to implement: Moderate

Effectiveness: High

Monitoring: Implementation of this BMP will be monitored by the District range conservationist and documented in the allotment inspection diary.

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U.S. Environmental Protection Agency. **1987**. Nonpoint source controls and water quality standards. Water quality standards handbook. Page 2-25.

APPENDIX C

The following standards are referred to in the description of Alternative 3 found in Chapter 2. They are taken from the INFISH document (USDA FS 1995).

GM-1.Modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of RMOs or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusting practices is not effective in meeting RMOs and avoiding adverse effects on listed anadromous fish/inland native fish.

GM-2.Locate new livestock handling and/or management facilities outside of RHCA. For existing livestock handling facilities inside the RHCA, assure that facilities do not prevent attainment of RMOs or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be met.

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

U.S. Department of Agriculture, Forest Service. **1995**. [INFISH] Decision notice and finding of no significant impact for the inland native fish strategy environmental assessment. Missoula, MT; Ogden, UT; Portland, OR.

APPENDIX D

Acronyms Used in the Aladdin Complex EA

Acronym	Meaning	Term First Appears in
AMP	allotment management plan	Chapter 1
AOI	annual operating instructions	Chapter 1
AUM	animal unit month	Chapter 3
BMPs	best management practices	Chapter 1 and 2
BPA	Bonneville Power Administration	Chapter 3
CWA	Clean Water Act	Chapter 1
DOE	Department of Ecology	Chapter 1
EA	environmental assessment	Chapter 1
EPA	Environmental Protection Agency	Chapter 1
ESA	Endangered Species Act	Chapter 3
GIS	geographical information system	Chapter 3
INFISH	Inland Native Fish Strategy, 1995	Chapter 1
LAU	lynx analysis unit	Chapter 3
MA	management area	Chapter 1
MIS	management indicator species	Chapter 3
NEPA	National Environmental Policy Act	Chapter 1
NFS	National Forest System	Chapter 1
PFC	proper functioning condition	Chapter 3
PNV	present net value	Chapter 3
PRM	project range management	Chapter 2, 3, Appendix A
RHCA	riparian habitat conservation area	Chapter 1
RMO	riparian management objective	Chapter 1
ROD	Record of Decision	Chapter 1
SOPA	schedule of proposed actions	Chapter 1
TES	threatened, endangered, sensitive	Chapter 1 and 3
TMDL	total maximum daily load	Chapter 1 and 2
USDI	U.S. Department of the Interior	Chapter 2
WUI	wildland-urban interface	Chapter 3