United States
Department Of Agriculture

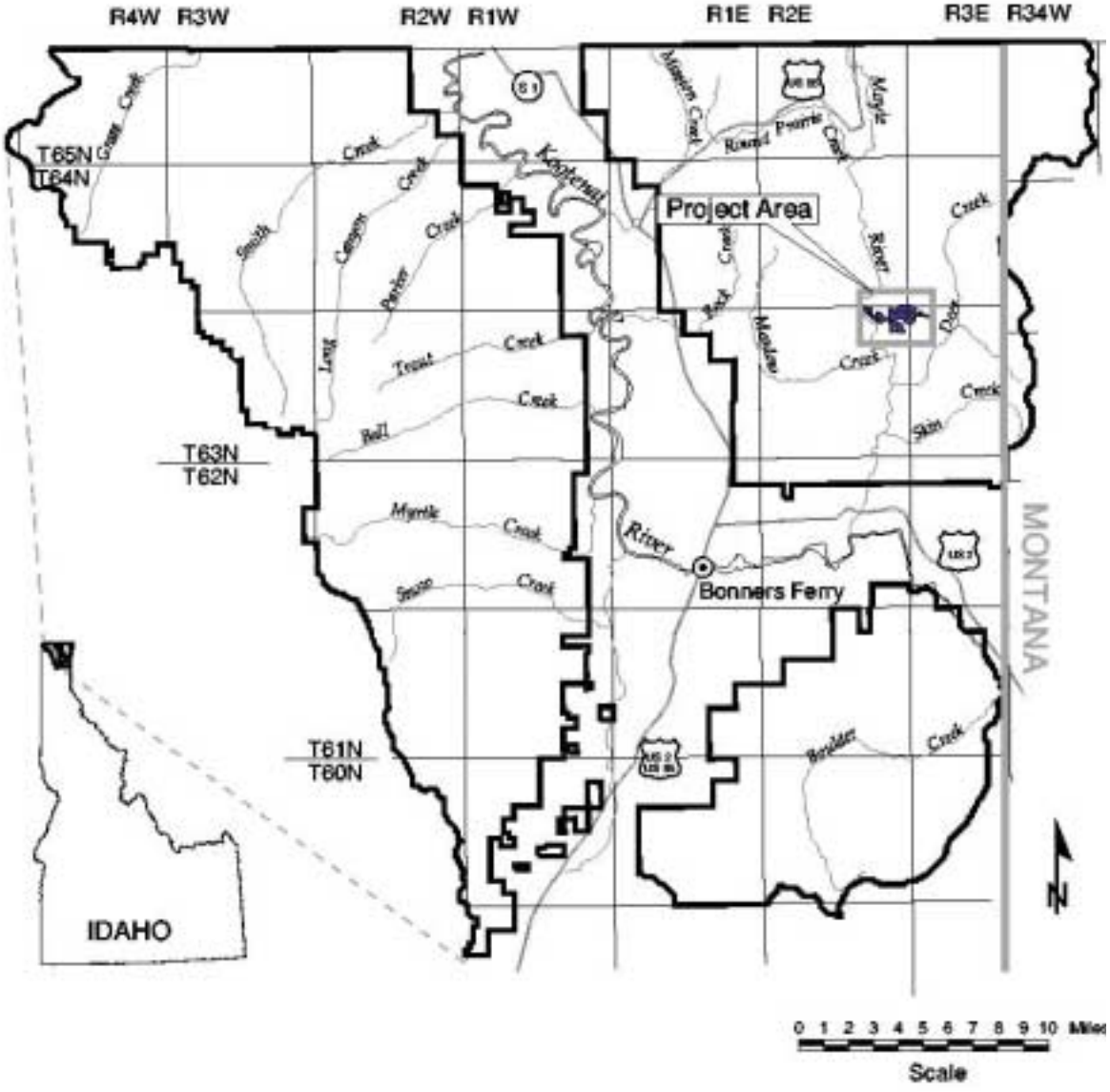
Forest Service
Northern Region
Idaho Panhandle National Forests

Bonners Ferry Ranger District

Pipeline Environmental Assessment

Figure 1-1

Pipeline EA Vicinity Map



Pipeline Environmental Analysis Highlights

- Scoping for the Pipeline EA began in July 1998.

- The District Ranger, Project Forester and local landowners visited the Pipeline EA project area during two separate field trips. Topics covered included forest health, urban interface fire danger, wildlife habitat, prescribed fire, logging truck haul routes and dust abatement.

- There are no Threatened or Endangered Species (Flora or Fauna), their habitat, or their Recovery Zones in the project area.

- No archeological sites exist in the project area.

- No old growth exists in the project area.

- There are no roadless, or proposed roadless areas located within the project boundaries.

- No new roads will be constructed.

- The Pipeline project area encompasses a Disabled Hunter Access Area that is open during deer /elk rifle and archery season.

- Issues and alternatives for the EA were developed using discussions from interested agencies, public comments and direction from the following documents:
  - Forest Plan
  - Inland Native Fish Strategy (INFS)
  - State of Idaho Best Management Practices (BMP)
  - Scientific Analysis from the Upper Columbia River Basin EIS
  - Ecosystem Management documents.

- Two issues were used to develop alternatives, Forest Health trends and Big Game Winter Range.

- If any action alternative is implemented, a timber sale road package will replace old culverts, upgrade retaining walls, and install more cross drains on the Deer Ridge Road (Road number 2540), resulting in a reduction of sediment delivery to Placer Creek and a net benefit to the watershed. See the watershed report in Appendix B for more information.

- The culvert on the Placer Creek Connection / Deer Ridge Road junction (Road number 2540 with 2541) would be upgraded to a fish passable crossing. See Road and Stream crossing map – crossing #11 in Appendix B, page B-65.

RESOURCE	**ALT 1** No Action	**ALT 2** Proposed Action	**ALT** 3 Modified Proposed Action
Forest Health Trend			
• Trend in stand conditions with respect to the Historical Range of Variability (HRV).	Trend *away* from HRV.	Trend toward HRV.	Trend toward HRV.
• Forest ecosystem's resilience to disturbances such as insects, disease, and fire.	Decrease in resilience.	Increase in resilience.	Increase in resilience.
Big Game Winter Range Trends			
• Quality and quantity of forage for winter browse.	Declining conditions.	Increase	Increase
• Number of animals surviving the winter.	Fewer	Increase	Increase
• Social demand for viewing / hunting wildlife	Declining viewing conditions.	Improved viewing conditions.	Improved viewing conditions.
Fire Trends			
• Risk of urban interface wildfire.	Increasing	Reduced	Reduced
• Risk of stand replacement fire with associated damages to soils, vegetation, wildlife and fish habitat.	Increasing	Reduced	Reduced
• Trend in fire intervals (using prescribed fire) with respect to HRV.	Trend *away* from HRV.	Trend toward HRV.	Trend toward HRV.
Aquatic Habitat Conditions and Trends			
• If any action alternative is implemented, a timber sale road package will replace old culverts, upgrade retaining walls, and install more cross drains on the Deer Ridge Road (Road number 2540), resulting in a reduction of sediment delivery to Placer Creek and a net benefit to the watershed. See the watershed report in Appendix B for more information.	No	Yes	Yes
• The culvert on the Placer Creek Connection / Deer Ridge Road junction (Road number 2540 with 2541) would be upgraded to a fish passable crossing. See Road and Stream crossing map – crossing #11 in Appendix B, page B-65.	No	Yes	Yes

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Chapter 1 - PURPOSE AND NEED FOR ACTION

This chapter contains the following sub headings:

- Introduction
- Project background
- Desired Future Conditions (Goals)
- Purpose and Need Statements (Objectives)
- Proposed Action
- Scope of Proposed Action
- Geographical Scope of Project Area Analysis
- Vicinity Map
- Tiering to the Forest Plan
- Management Area Objectives
- Historical Range of Variability
- Decision to be made
- Organization of this Document

INTRODUCTION

The Bonners Ferry Ranger District, Idaho Panhandle National Forests (IPNF) proposes resource management activities in the Placer Creek area. The project area includes public lands administered by the Bonners Ferry Ranger District within parts of sections 1, 2 in T63N, R2E; part of section 6 in T63N, R3E; and, part of section 35 in T64N, R2E, Boise Meridian, Boundary County, Idaho. The project scoping notice identifies the analysis area as the Pipeline Salvage Environmental Assessment (EA).

The Idaho Panhandle National Forests began implementation of its Land and Resource Management Plan (Forest Plan) in September 1987. The Forest Plan and accompanying Final Environmental Impact Statement (FEIS) specify the overall management direction for National Forest lands. Specific direction and decisions for individual projects, such as those proposed under the Pipeline Environmental Assessment (EA) are determined following a site-specific analysis. This EA documents the site-specific analysis necessary for the deciding official to make a reasoned choice for reaching desired objectives within the project area.

Development of this EA follows implementing regulations of the National Forest Management Act (NFMA); Title 36, Code of Federal Regulations, Part 219 (36 CFR 219); Council on Environmental Quality, Title 40; Code of Federal Regulations, Parts 1500-1508 (40 CFR 1500-1508); National Environmental Policy Act (NEPA); and is tiered to the Forest Plan Final Environmental Impact Statement (1987). This analysis incorporates direction and guidance provided in the Idaho Panhandle National Forests Plan EIS, Record of Decision, and Forest Plan (1987), and as amended by the Inland Native Fish Strategy EA and Decision Notice (1995) (INFS).

PROJECT BACKGROUND

The Pipeline project is located on a low elevation bench on the east side of the Moyie River, an area that has historically supported both dry and moist forest type ecosystems. The timbered stands in the assessment area have undergone changes since the turn of the century. One result has been a major increase in the stocking levels and change in the species composition of trees in the timbered stands. Douglas-fir, Grand fir and Lodgepole Pine now dominate the stands that well spaced, larger-diameter Ponderosa pine, Larch, and White pine once occupied.

Prior to the turn of the century, low intensity forest fires would burn through the project area on a frequent basis, naturally thinning the forest. The older thick-barked trees tended to survive the fires, creating an open grown forest of ponderosa pine, Larch, and Douglas-fir. Fire suppression policy over time has interrupted this natural thinning process, leading to the densely stocked stands we see today. These timbered stands are now experiencing mortality from numerous insects and diseases as well as decreased vigor due to overcrowding. Thinning or regenerating these stands would reduce the number of trees, creating conditions that are similar to what historically occurred in the forest ecosystem.

White pine used to be a major component in moist forest ecosystems until a non-native fungus known as "White Pine Blister Rust" decimated the Eastern and White pine population. White pine blister rust has been damaging and killing white pines since the turn of the century. Some blister rust-free White pines exist in the project area; however, most of them are showing symptoms of blister rust.

The project area also includes several existing harvest units from past timber sales:

- ComPlacerC Thin Timber Sale (1992)
- Orser Creek Timber Sale (1990)
- Pipeline Timber Sale (1983)

DESIRED FUTURE CONDITION (GOALS)

Based on observations made in the field by forest entomologists, concerned public citizens and responses from the Pipeline scoping letter, the following goals for the EA have been developed. The Desired Future Condition (DFC) or Goals for Pipeline EA are designed to address forest health concerns, big game winter range, and the threat of wildfire(s) in an urban interface setting. Supporting documents such as the Forest Plan are listed on page 1-9.

1) Trend timber stand characteristics toward levels within their Historical Range of Variability (HRV). The definition of HRV is on page 1-10.

2) Increase the quality and quantity of big game winter range.

3) Reduce the intensity of wildfires to National Forest and adjacent private lands.

PURPOSE AND NEED (OBJECTIVES)

Many ecological factors have combined to shape our forests as we see them today. Fire is the primary ecological factor that influences their development. It stands to reason that fire suppression by Federal and State agencies since the turn of the century has certainly changed the way these forests look and function today versus how they would have looked if humans had not been around to suppress fires.

In the last 100 years forests in the interior Columbia River basin have become more densely stocked and over time developed an increasing dominance of shade tolerant species (e.g., Douglas-fir, grand fir, subalpine fir) and become more susceptible to severe fire, insect, and disease disturbances (USDA-USDI 1996). Overcrowded forest conditions create more competition for water, nutrients, and stresses the trees. Ironically, our very actions to save these forests may be contributing to the decline in the health of these ecosystems that evolved over the time with fire. Consequently, this may limit the ability of these forests to provide the products, habitats, services, and recreation desired by society. In addition, forest composition and structures have become more homogeneous (USDA-USDI 1996). In other words, forest diversity has declined. The IPNF North Zone Geographic Assessment (Zack et al, 1998) determined that similar changes in the forested landscape have occurred over this same time frame in the Kootenai River sub-basin (i.e., the Bonners Ferry Ranger District). In the Pipeline EA project area white pine, larch, and ponderosa pine (seral species) are being replaced by Douglas-fir, grand fir, subalpine fir, hemlock, and cedar (shade tolerant species). Furthermore, over half of the landscape is composed mature and old growth forests, while forest openings and smaller tree size classes are near the lower end of their historical range.

To determine potential treatment opportunities, the existing condition of the forested vegetation in the project area will be compared to historic conditions. In the long-term, restoration of historic forest structures and composition will improve tree vigor, reduce vulnerability to insects, disease, severe fires, and provide wildlife habitat that more closely resembles historic conditions.

The purpose and need, or objectives, for entering the Pipeline EA project area is to improve forest composition, structure, and diversity of the landscape by providing for tree species and stocking levels similar to historic levels that better resist insects, diseases, wildfire, and that wildlife are adapted to. More specifically:

- Reduce the number of trees per acre, and favor the development of large diameter ponderosa pine and larch on dry forest types.

- Reestablish white pine as a significant component of its historic range.

- Reduce the overmature lodgepole pine component in stands where this species is currently susceptible to mountain pine beetle infestations.

- Improve the diversity of forest structures in the area, including larger patch sizes with less fragmentation. This will provide for wildlife, fish, and plant habitat diversity and security. The project area contains stands that are relatively similar in size and age, and therefore, not providing a wide range of wildlife habitats.

- Improve cover and forage conditions on big game winter range.

- Reduce the sediment risk associated with stream crossing failures.

- Reduce the production and delivery of sediment from road surfaces and ditches.

The 1897 Organic Act states, "No national forest shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of the citizens of the United States." Therefore, one of the objectives for entering the Pipeline EA assessment area will be to contribute to the short-term supply of timber to help meet the national demand for wood products and employment opportunities.

The forest ecosystem located within the Pipeline project area is not functioning as it did historically, and numerous components of the ecosystem are broken or missing altogether. Upon comparing the current forest ecosystem conditions to those in the Historical Range of Variation (HRV), numerous components i.e. fire are missing in today's forest ecosystem that need to be there if we truly desire sustainable healthy forests for future generations (Cooley, 1999).

The proposed activities are designed to improve forest health within the project area by maintaining a diverse, productive and sustainable forest. A sustainable healthy forest can be maintained by keeping natural processes intact and interacting in the same way the forest ecosystem evolved.

Overcrowded, unhealthy stand conditons, outside of the HRV, similar to those in the Pipeline EA project area.

Desired future stand conditions (within the HRV) for the overcrowded stands in the Pipeline EA project area.

PROPOSED ACTION

The proposed action would trend about 555 acres toward conditions within the HRV. Timber harvest, prescribed burning, mechanical treatments, and precommercial thinning would be used to meet the stated purpose and need (reduce the number of trees per acre in ponderosa pine forests, reestablish white pine, improve wildlife habitat, etc.). The focus of each timber sale unit would be based on the desired condition after management rather than the quantity of products removed from each unit. In fact, in some cases there would be no removal of forest products, such as in the ecosystem burn (see Chapter 2).

The proposed action is to:

1) Trend approximately 555 acres towards more open grown stands of larger diameter, fire resistant tree species such as Ponderosa pine and Larch. These activities would begin to establish the stand characteristics that fire would have naturally created on these sites.

2) Reestablish White pine as a major stand component by implementing silvicultural prescriptions such as: salvage, sanitation, commercial thinning, shelterwood, and seed tree harvesting.

3) Use prescribed fire and machine piling to reduce fuel loadings, prepare seedbeds, and encourage forage production for big game.

4) Use existing road system.

SCOPE OF PROPOSED ACTON

The Pipeline project analysis area covers approximately 1127 acres north and east of the Moyie River. A small portion of the project area drains into Placer Creek, while most of the area drains directly into the Moyie River. The project area includes public lands administered by the Bonners Ferry Ranger District within parts of sections 1, 2 in T63N, R2E; part of section 6 in T63N, R3E; and, part of section 35 in T64N, R2E, Boise Meridian, Boundary County, Idaho.

On the landscape level, the project area is within the Moyie River drainage. This drainage has its headwaters in Canada, and flows southerly into Idaho. The Moyie joins the Kootenai River at Moyie Springs, approximately 7 miles south of the project area. The headwaters of the Kootenai River are also in Canada, flowing southwesterly through northwest Montana and northern Idaho, before heading north back into Canada. The Kootenai River is major sub drainage of the Columbia River.

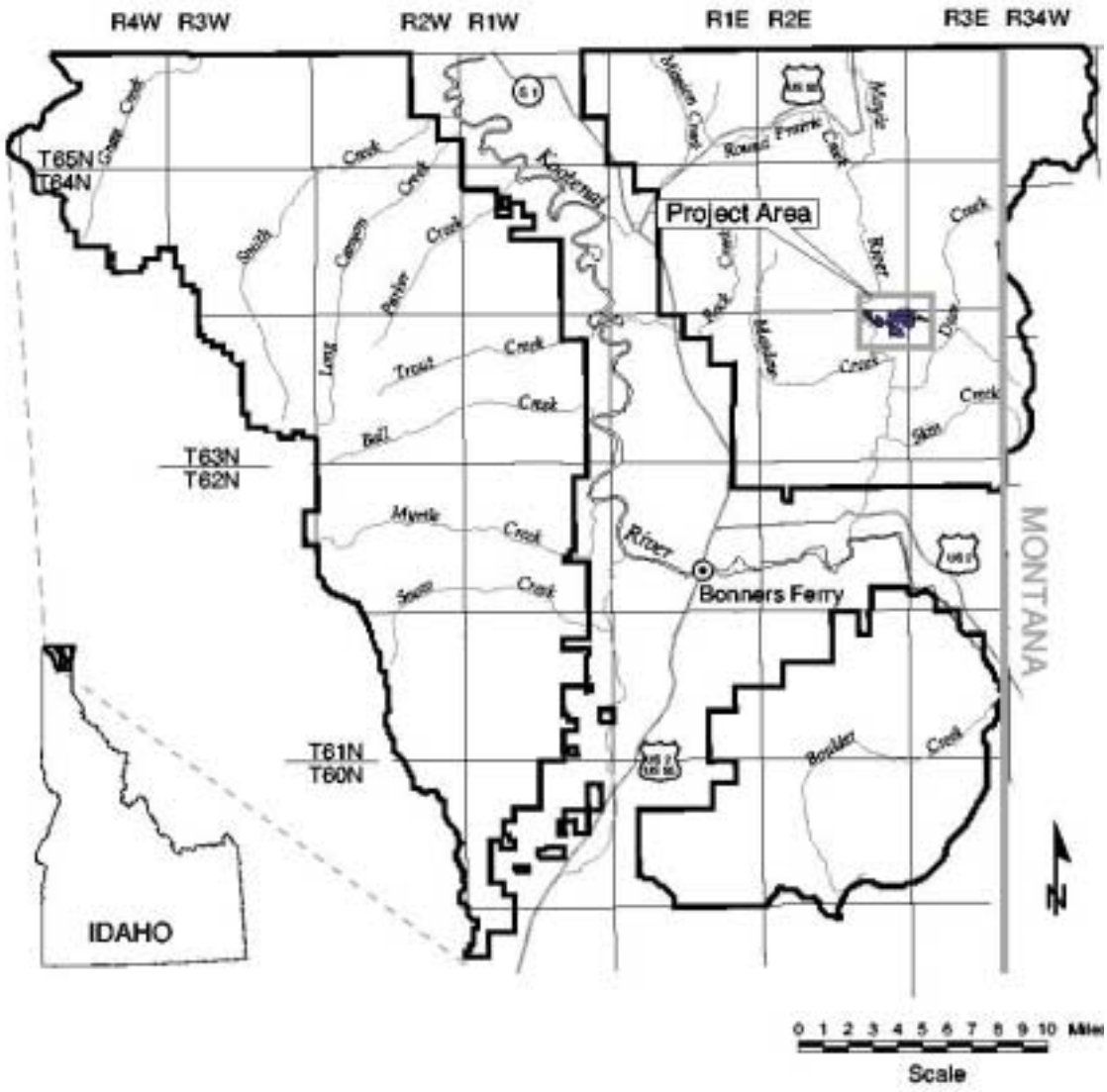
GEOGRAPHICAL SCOPE OF THE PROJECT AREA ANALYSIS

The Pipeline EA analyzes the environmental effects of the proposed action within the assessment area and includes the Placer Creek watershed. It is the site-specific documentation for Forest Plan implementation. The proposed action would provide the basis of a management strategy for the project area based upon the specific Forest-wide goals, objectives, and standards of the Forest Plan.

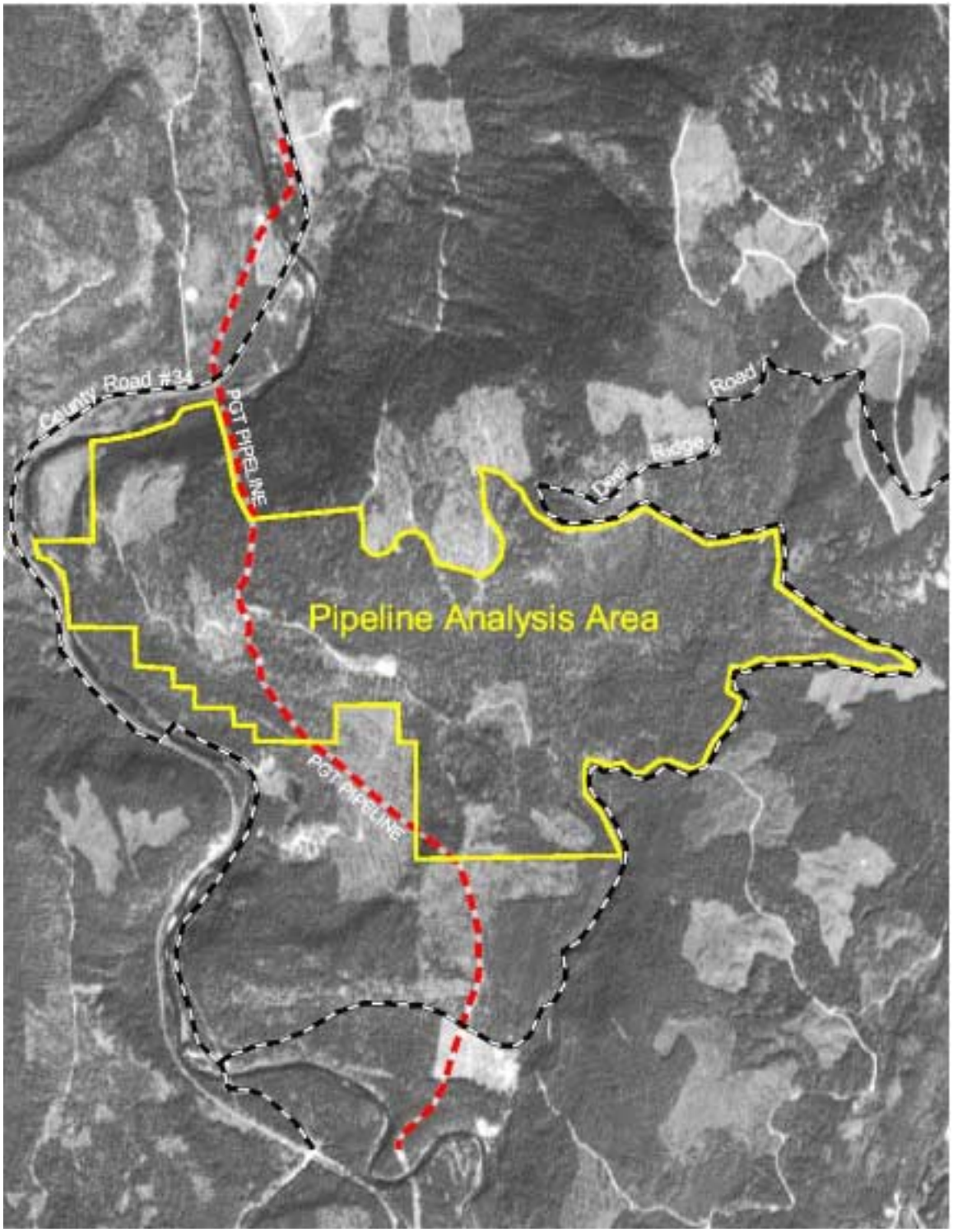
A vicinity map of the proposed project is provided in Figure 1-1.

Figure 1-1

Pipeline EA Vicinity Map



Satellite Image of the Pipeline Analysis Area.



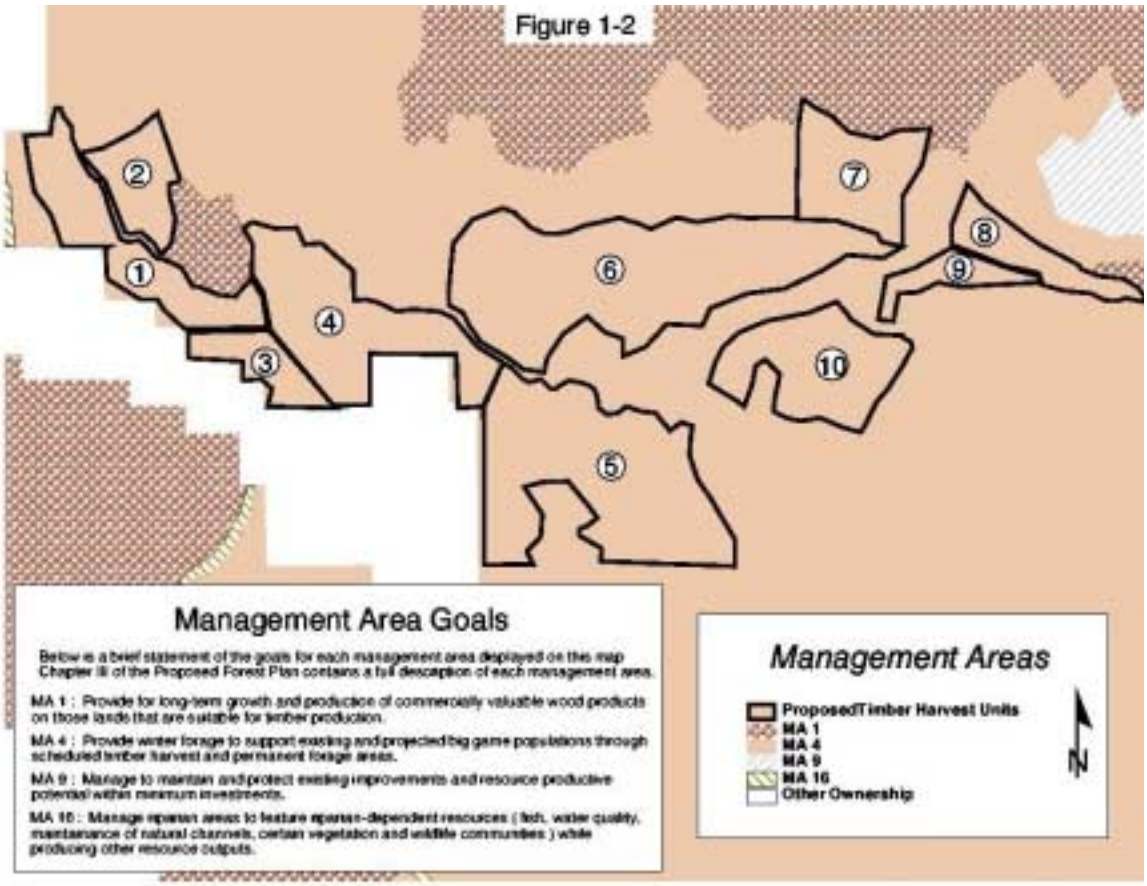
TIERING TO THE FOREST PLAN

The Pipeline EA tiers to the IPNF's Forest Plan, Final Environmental Impact Statement (FEIS), and Record of Decision (ROD), dated September 17, 1987. The Forest Plan guides all resource management activities and establishes management standards providing the overall direction for the Forest. Information in this environmental document tiers to the FEIS analysis, and standards and guidelines in the IPNF Forest Plan and as amended by Inland Native Fish Strategy (INFS). This analysis focuses on the effects of implementing the site-specific actions that are not discussed in the above documents.

Environmental analysis within the project area was last conducted under the East Moyie Environmental Assessment (February, 1992). Since that time, the Scientific Assessment, through the Interior Columbia Basin Ecosystem Management Project (ICBEMP September, 1996) has become available. The Pipeline project area is within the Upper Columbia River Basin assessment area.

MANAGEMENT AREA OBJECTIVES

The Forest Plan for the Idaho Panhandle National Forests has categorized all lands into management areas (MA's). Each MA has different management goals, resource potential, and limitations. "Except for Congressionally established or special administrative boundaries, the MA boundaries are not firm lines and do not always follow easily identified topographic features such as major ridges, rivers, streams, roads, etc. The boundaries represent a transition from one set of opportunities and limitations to another with direction established for each" (IPNF Volume 1, Chapter III).
The project area is located entirely within MA 4, Big Game Winter Range.



Guidelines for this MA are to manage big game winter range in order to provide sufficient forage for projected big game habitat needs. Scheduled timber harvesting should create more openings for forage to grow in and:

- Provide long-term growth and production of commercially valuable wood products.
- Provide cost effective timber production.
- Protect soil productivity.
- Meet or exceed state water quality standards.
- Provide for opportunities for dispersed recreation consistent with wildlife habitat needs.
- Meet visual quality objectives.

HISTORIC RANGE OF VARIABILITY

To accomplish an ecosystem management approach and determine potential activities in the Pipeline project area, this analysis examines the historic conditions of the area, which are compared to the existing conditions. From this comparison, a historic range of variability (HRV), or ecological trends that have occurred over time were determined, as well as the natural processes, such as the influence of fire, that maintained this range.

"HRV is not a goal, but a measure of ecosystem changes and trends" (Zack 1999).

"When ecosystems are outside the range, changes may occur dramatically and rapidly. Consequently, when ecosystems are outside their ranges this may limit their ability to provide the amenities and products desired by society. An investment of money, energy, or human effort may be required to counter processes that would change the desired state of the ecosystem" (Morgan et al. 1994).

The information on ecological trends is used to identify the desired condition for the project area. Simply put, this information tells us:

1) Where we have been.
2) Where we are now.
3) Where we want to go.

Through the process of comparing the HRV, current conditions, and Desired Future Condition (DFC), goals and objectives were formulated and used to develop the purpose and need, proposed action, and alternatives for the Pipeline EA.

Additional information regarding this analysis can be found in the Pipeline project file, located at the Bonners Ferry Ranger Station. The project file is a part of this environmental assessment.

DECISION TO BE MADE

This environmental assessment compares the effects of various resource management alternatives and displays their effects on resource values identified by the public and the Forest Service during the public involvement process. The analysis will form the basis for the District Ranger's choice on whether, how, when and at what level to treat the selected timber stands, and associated activities. The rationale for the decision will be documented in the Decision Notice (DN).

ORGANIZATION OF THE DOCUMENT

Chapter 1 describes the scope of the proposal, goals, objectives, and other information used to develop the project proposal.

Chapter 2 describes the issues identified through the scoping process (a NEPA term defining the range of actions, alternatives and impacts in an Environmental Assessment (EA) based on internal and public comments about a proposal) and the alternatives that address the issues. Detailed comparisons between alternatives are also made.

Chapter 3 describes the existing condition of various resources potentially affected by the proposed action. The components of the biological, physical, social, and economical resources are described, as well as a historical overview of the project area.

Chapter 4 describes the expected environmental effects on the specific resources listed in Chapter 3. Direct, indirect, and the cumulative effects of past, proposed, and foreseeable future actions are discussed.

Chapter 5 contains a listing of the Forest Service personnel involved in the Interdisciplinary Team (a panel of resource professionals, i.e. foresters, logging engineers, wildlife biologists, hydrologists) and other Forest Service personnel consulted during the course of this project.

Chapter 6 summarizes the public involvement process undertaken by the Forest Service for this project.

Chapter 7 is the bibliography of literature cited and references used in the development of this analysis and documentation.

The Appendices contain analytical reports and summaries or supplemental information that clarify or support the narrative within the EA.

Other analysis documents, reports, internal memos, and maps have been referenced or developed during the course of this project. Items not included in this document because of their technical nature or excessive length, are included in the Pipeline Environmental Assessment project file, located at the Bonners Ferry Ranger Station.

Chapter 2 -ISSUES AND ALTERNATIVES

Chapter 2 discusses the following:

- Introduction
- Alternative driving issues
- Other Resource concerns
- Alternatives considered in detail
- Alternative summary
- Alternative comparison
- Alternatives considered but eliminated from further study
- Listing of Resource Issues
- Knudson-Vandenburg (KV) Projects

Introduction: This chapter describes the alternative driving issues, alternative development, and compares the differences in alternatives and their respective environmental impacts. The following terms are interchangeable in this document:
Alternative 1 = No Action.
Alternative 2 = Proposed Action.
Alternative 3 = Modified Proposed Action.

The issues and alternatives were developed in response to public comments, desired future conditions (Goals), purpose and need (Objectives), and MA 4 criteria, identified in Chapter 1. Resource issues that were not used in designing alternatives are listed in this chapter, but discussed in detail in Appendix A.

ALTERNATIVE DRIVING ISSUES

Issues stemming from the proposed action in Chapter 1 were identified early in the planning process, and were developed as guidelines to assure adequate consideration for all resources. This section describes the various issues that were identified through our internal and external scoping efforts. Public scoping was accomplished through notices in the local newspapers, publication in the IPNF's Quarterly Schedule of Proposed Actions, and through an informational letter sent to adjacent landowners, groups and individuals that have asked to be kept informed. Internal scoping involved reviewing the IPNF Forest Plan, past environmental documents covering this project area, and the public input received on these documents. More information on the scoping or public involvement process is contained in Chapter 6.

Based on input from the previously mentioned sources, the following alternative driving issues were identified:

Issue 1 - Forest Health
Issue 2 - Big Game Winter Range

ISSUE 1

Forest Health

Definition: Term used in this EA to rate the relative health of the forest, usually on a stand-by-stand basis. Forest health is directly affected by the following major factors:

- History of fire frequency and intensity.
- Density of trees per acre.
- Stand composition and structure by tree species.
- Canopy layers and canopy closure.
- Abundance of insect and disease symptoms.
- Predicted tree mortality levels.

Forest Health: Historically, timbered stands in the project area underburned periodically (5-20 years); reducing the number of tree saplings per acre, and created park-like stand structures. Because of the exclusion of the natural role of fire, the current forest ecosystem is growing more trees than it can support as a sustainable, healthy, functioning ecosystem (Zack, 1999). Consequently, these changes in stand composition, structure, and inter-tree competition for light, water and nutrients are causing stress, decreased vigor and mortality in many tree species. With entire stands of stressed trees (which are food sources for insect/diseases) across the landscape, insect and disease problems are widespread. Besides limiting timber production, the dead trees left by the insect and diseases often blowdown; creating fire hazards, reducing visual quality, and limit movement of big game.

Alternative 1 (No Action): Would not meet the project's purpose and need because forest insect/disease mortality in the project area would continue to increase. Shade tolerant tree species such as Grand Fir and Douglas-fir would regenerate amongst the blowdown, creating the type of fuelbed conducive to a stand replacement fire. If chosen, this alternative would keep forest health on a downward trend, away from the HRV.

Alternative 2 (Proposed Alternative): This alternative would meet the project's purpose and need by blending big game winter range ***cover/forage*** needs with silvicultural prescriptions designed to trend forest health attributes toward values in the HRV. Attributes such as overcrowding, species composition, insect/disease mortality and the associated risk of stand replacement fires would be addressed by timber harvesting in:

- Ten-timber sale Units spanning approximately 555 acres.
- Regeneration harvesting (seed tree or shelterwood cuts) would include about 320 acres.
- Intermediate harvesting (commercial thinning and sanitation/salvage cuts) would include about 235 acres.

Alternative 3 (Modified Proposed Action): This alternative would meet the project's purpose and need by blending big game winter range ***forage*** needs with silvicultural prescriptions designed to trend the forest health attributes toward values in the HRV.

Attributes such as overcrowding, species composition, insect/disease mortality and the associated risk of stand replacement fires would be addressed by timber harvesting in:

- Ten - timber sale units spanning approximately 555 acres.
- Regeneration harvesting (seed tree or shelterwood cuts) would include about 555 acres.

Indicator: Restoring forest health by manipulating the composition and structure of timbered stands in the assessment area would be measured in *acres* trended toward historic condition.

ISSUE 2

Big Game Winter Range

Definition: The Pipeline project area is located within an area designated by the Forest Plan as Management Area (MA) 4 (See Fig 1-2). Criteria from the Forest plan indicate that lands within MA 4 will:

- Provide for wildlife habitat diversity and security.
- Manage big game winter range in order to provide sufficient forage for projected big game habitat needs.
- Scheduled timber harvesting should create more openings for plants favored by big game to grow in.

Big Game Winter Range: All of the alternatives would affect the quantity and quality of forage and cover for white-tailed deer. The effects would be most important during the winter months, a critical period when deer need a mosaic of forage and cover in close proximity to each other.

Alternative 1 (No Action): This alternative would not meet most of the project's purpose and need because it only provides more ***cover*** for big game. It would not create the openings in the forest needed to regenerate or rejuvenate browse plants.

Alternative 2 (Proposed Action): This alternative would meet the project's purpose and need by treating the big game winter range in the project area with silvicultural prescriptions designed to address forest health issues and create a mosaic of ***forage*** and ***cover*** for big game during winter months. The silvicultural prescriptions are as follows:

- Ten - timber sale units spanning approximately 555 acres.
- Regeneration harvesting (seed tree or shelterwood cuts) would include about 320 acres.
- Intermediate harvesting (commercial thinning and sanitation/salvage cuts) would include about 235 acres.

Alternative 3 (Modified Proposed Action): This alternative would meet the project's purpose and need by blending big game winter range ***forage*** needs with silvicultural

prescriptions designed to trend the forest health attributes toward values in the HRV. Attributes such as overcrowding, species composition, insect/disease mortality and the associated risk of stand replacement fires would be addressed by timber harvesting in:

- Ten timber sale units spanning approximately 555 acres.
- Regeneration harvesting (seed tree or shelterwood cuts) would include about 555 acres.

Indicator: Meet Forest Plan criteria for MA 4. Maintain or improve cover and forage for big game winter range. Changes in the availability of forage and cover will be measured in acres.

Table 2-1
Comparison of Alternatives to Issues of Forest Health and Big Game Winter Range

	Alt 1	Alt 2	Alt 3
Acres left untreated (No Action)	555	0	0
Forest Health Issue			
Acres trended toward HRV - using *regeneration* * harvesting - with underburning	0	320	555
Forest Health Issue			
Acres trended toward HRV - using *intermediate** harvesting - no underburning	0	235	0

	Alt 1	Alt 2	Alt 3
Big Game Winter Range Issue			
Acres of *forage* created - using *regeneration* harvesting - with underburning	0	320	555
Big Game Winter Range Issue			
Acres of *cover* maintained - using *intermediate* harvesting - no underburning	0	235	0

* - Regeneration harvesting = seed and shelterwood cuts.
- Intermediate harvesting = commercial thinning and sanitation salvage cuts.

See Silvicultural definitions Appendix C.

OTHER RESOURCE CONCERNS

After reviewing input from public comments and internal scoping, the potential effects of the proposed action to other resource concerns were identified, analyzed, and evaluated by the Interdisciplinary Team (IDT). Collectively, the ID team and the District Ranger did not feel that any of these issues warranted a separate alternative. It has been determined that these issues can be designed into the project through site-specific implementation measures, silvicultural treatments, timing of the proposed action, and associated Knudsen-Vandenburg (KV) projects. None of the KV projects are required for project implementation, however, they would enhance the biodiversity in the project area.
Below is a list of resource issues; detailed discussions of each are located in *Appendix A.*

Biodiversity

A. Biological Factors

1. Noxious Weeds
2. Wildlife (Aquatic and Terrestrial)
    a) Threatened or Endangered Species
    b) Sensitive Species
    c) Management Indicator Species
    d) Snag Dependent Species
    e) Native Plant Species
    f) Neotropical Migrant Birds
    g) Old Growth
    h) Fragmentation
    i) Linkages
    j) Range

B. Social/Economic

a) Cultural Resources
b) Economics/Community Stability
c) Visual Resources
d) Recreation
e) Public Health and Safety
f) Access Management
g) Roadless Area
h) Minerals
i) Special Use Permits
j) Wood Substitute
k) Alternate Supply of Wood

ALTERNATIVES CONSIDERED IN DETAIL

Following is a listing of the features that are common to all of the "action" alternatives and a description of the "no action" alternative. These alternatives were developed to address the Forest Health and Big Game Winter Range Issues.

Features Common to All Action Alternatives

Silviculture

1) To maintain open Larch and Ponderosa pine forests containing larger trees that were historically associated with these sites. Longer rotation ages of 100-200 years will be used when even-aged harvest systems are applied. Rotation ages will be documented in the silvicultural prescriptions for each of the stands.

2) All standing non-merchantable dead trees will be retained (except those that are hazardous to logging operations) for snag dependent wildlife and large woody debris recruitment. A snag analysis for the Pipeline project area was conducted and, as a whole, the area exceeds standards in the *Regional Snag Management Protocol of January, 2000* for snags. The District will continue maintenance of these standards by leaving a range of 6 – 12 snags/replacement snags per acre (depending on habitat type) throughout areas proposed for timber harvest.

3) Weed and release treatments (KV) will be used to adjust tree species compositions in the existing regeneration units that were created in the 1980's. No cutting will be conducted within Riparian Habitat Conservation Areas (RHCAs). All slash will be removed from road ditch lines.

4) Another recommended, yet not required KV project involves the Aspen clumps in Unit 5. These Aspen clones would be slashed and burned to encourage more aspen reproduction and maintain the aspen component in the forest ecosystem. Rejuvenating aspen colonies also creates food for big game in the winter months.

Slash and Natural Fuels

1) A variety of slash disposal methods will be utilized: underburning, grapple piling, yarding tops, and lop/scatter. To provide for soil nutrients, enough slash will be left in various sizes, to meet coarse woody debris guidelines established by Graham et al (1994) for each given habitat type. Optimally, the slash (except for landing slash) will be allowed to cure for at least six months, prior to any mechanical disposal activities, to allow enough time for the bulk of nutrients to leach from the foliage into the soil (Bruna 1994). The decision to use a particular method will be based on individual stand objectives.

2) All landing slash and any scattered grapple piles will be burned after completion of all sale related activities to reduce the risk of accidental ignition during dry periods of the year. They will be burned in the late fall when the risk of escape into adjoining stands and damage to the residual timber is reduced.

3) The "Ecosystem burn" if funded, would be carried out in conjunction with site preparation underburns in adjacent harvest units.

Soils

1) Specifications found in the Region One Soil Quality Standards (revised Feb 7, 2000) would be followed.

2) The following practices are designed to minimize the detrimental soil impacts of soil compaction, displacement, severe burning, and nutrient / organic matter depletion on long-term soil productivity. The use of these practices will insure that the soil quality standards listed in the Forest Plan would be met.

- Use existing skid trails and landings where feasible.
- In units with 10% or less detrimentally disturbed soils, where terrain is conducive, space trails 100 feet or more apart, except where converging.
- In units with 10% to 15% detrimentally disturbed soils, where terrain is conducive, space trails 120 feet or more apart, except where converging.
- In units with more than 15% detrimentally disturbed soils, only existing skid trails will be used.
- When winter conditions on site consist of two or more feet of snow and/or frozen ground, skid trails may be as close as 100 feet apart.

3) A variety of ground based and cable yarding systems will be used. The system chosen will be based on factors including, but not limited to, resource protection, economics, and current and future access needs.

4) To reduce soil compaction and displacement and to protect residual crop trees, existing and/or designated skid trails will be required for all ground-based and cable yarding operations (Froehlich, Aulerich, and Curtis, 1981).

5) Unit design and location will facilitate logging with a minimum amount of excavated skid trails. Where excavated trails are constructed, they will be kept to a minimum and will be obliterated by the purchaser following completion of logging activities. Organic debris will be placed on top of the obliterated prism to facilitate revegetation.

6) Implement site-specific soil and water conservation Best Management Practices for units and roads to meet or surpass the level of Idaho State Best Management Practices for soil and watershed protection (all action alternatives). Site-specific practices that meet or exceed Clean Water Act standards will be incorporated into the timber sale contract.

Fisheries

1) Management measures in the Inland Native Fish Strategy (INFS) are applied to all proposed or new projects and activities. This strategy is intended to reduce the risk of population loss and potential negative impacts to aquatic habitat. INFS standards will be applied to all activities within the project area.

2) Any changing of hoses, parts, or refueling will be conducted at least 300 feet away from streams and tributaries. A pre-operational inspection will be conducted by the Forest Service sale administrator for signs of leakage on machines that will be used to reconstruct stream crossings or place in-stream wood structures. The operator will inspect hoses daily for signs of wear. In the event any leakage or spillage enters any stream or open water, the operator will immediately notify the Contracting Officer Representative (COR) who will be required to follow the actions to be taken in case of hazardous spill, as outlined in the Forest Hazardous Spill Contingency Plan. A possible effect will be the damage to water quality should a leak of petroleum products or hydraulic fluids occur. As long as the above BMP is followed, impacts to downstream water quality are not likely.

Sensitive Plants

1) Any sensitive plants identified during project implementation will be evaluated. Any occurrences deemed critical to population or species viability will be protected by project design. Any proposed future salvage will be evaluated for suitable sensitive plant habitat and surveyed as necessary. Again, any occurrences deemed critical to population or species viability will be protected by project design.

2) Suitable habitat for the proposed threatened species Spalding's catchfly (*Silene spaldingii*) would be surveyed prior to project implementation. If populations are identified in proposed harvest units, Timber Sale Contract provisions would be implemented as necessary to protect the populations and their habitat.

Roads

1) A road package will be included with this project for road improvement, reconstruction, and maintenance. The site-specific BMP criteria listed in the back of the Watershed report (Appendix B) must be applied during project implementation.

Noxious Weeds

1) Identified existing weed infestations within the project area would be treated according to guidelines established in the Bonners Ferry Weed Control Projects EIS and Record of Decision (ROD) (USDA 1995).

2) The contract clause for Noxious Weed Control would be used to require cleaning of all off-road equipment *before and after* working in the Sale Area.

3) Contract provisions would be used to treat haul routes and landings in the project area for noxious weeds.

4) All reconstructed roads, and other areas of ground disturbance such as landings and skid trails, would be seeded with a weed free native and desired non-native seed mix and fertilized as necessary as soon after site disturbance as is practical.

Wildlife

1) See timing restrictions (4/1 – 7/31) for the Northern Goshawk and Harlequin Duck for proposed Unit 1 in the wildlife report in Appendix B.

Other

1) Assure protection of any encountered cultural sites, survey monuments, landlines, and other improvements by buffering or appropriate clauses in the timber sale contract, or both.

2) Throughout the project area, small amounts of blowdown and pockets of insect and disease may occur outside of the harvest units. This timber would be removed as long as it could be taken from existing access, and the action is consistent with all the mitigation and environmental concerns outlined in this document.

3) Proposed regeneration Units 1, 4, and 6 are each larger than 40 acres. Using ecosystem management principles, treating entire stands, regardless of size, allows the forest manager to blend harvest units into ridgetops, roads, existing regeneration units, and riparian areas. When an entire slope can be logged and underburned, visual standards can be met and those stands at a high risk of burning can be dropped to very a low risk. Removing the majority of the understory trees and *leaving* the large diameter ponderosa pine, larch, and Douglas-fir in the regeneration units would reduce the stand replacement fire risk on the private land interface. Future fire intensities would be greatly reduced; confining fires to the litter layer and understory vegetation at ground level. Treating areas larger than 40 acres blocks would also create stands more in line with historic conditions regarding pulse disturbances, patch size, and shape considerations. All of the units are designed to fit the landscape with no new road building and meet the project objectives listed previously.

ALTERNATIVE SUMMARY

Alternative 1 - No Action

- As required by NEPA- this is a No Action "no change in current management" alternative.
- Implementation of this alternative would defer timber harvest activities, winter range habitat improvements, fuel reduction activities, and associated Knutsen-Vandenburg (KV) projects.
- Current management activities such as spraying weeds, handicapped hunter access, and KV projects associated with Complacer C timber sale of 1992 would continue.

Alternative 2 - Proposed Action

Designed using big game winter range and forest health issues.

These actions are in addition to "Features Common to All Action Alternatives" section.

- Implements timber harvesting in ten units, spanning about 555 acres.
- Silvicultural prescriptions include salvage, commercial thinning, shelterwood and seed tree cuts.
- Ground based equipment would primarily operate on *existing* skid trails/corridors and landing systems where feasible.
- No new roads would be constructed.

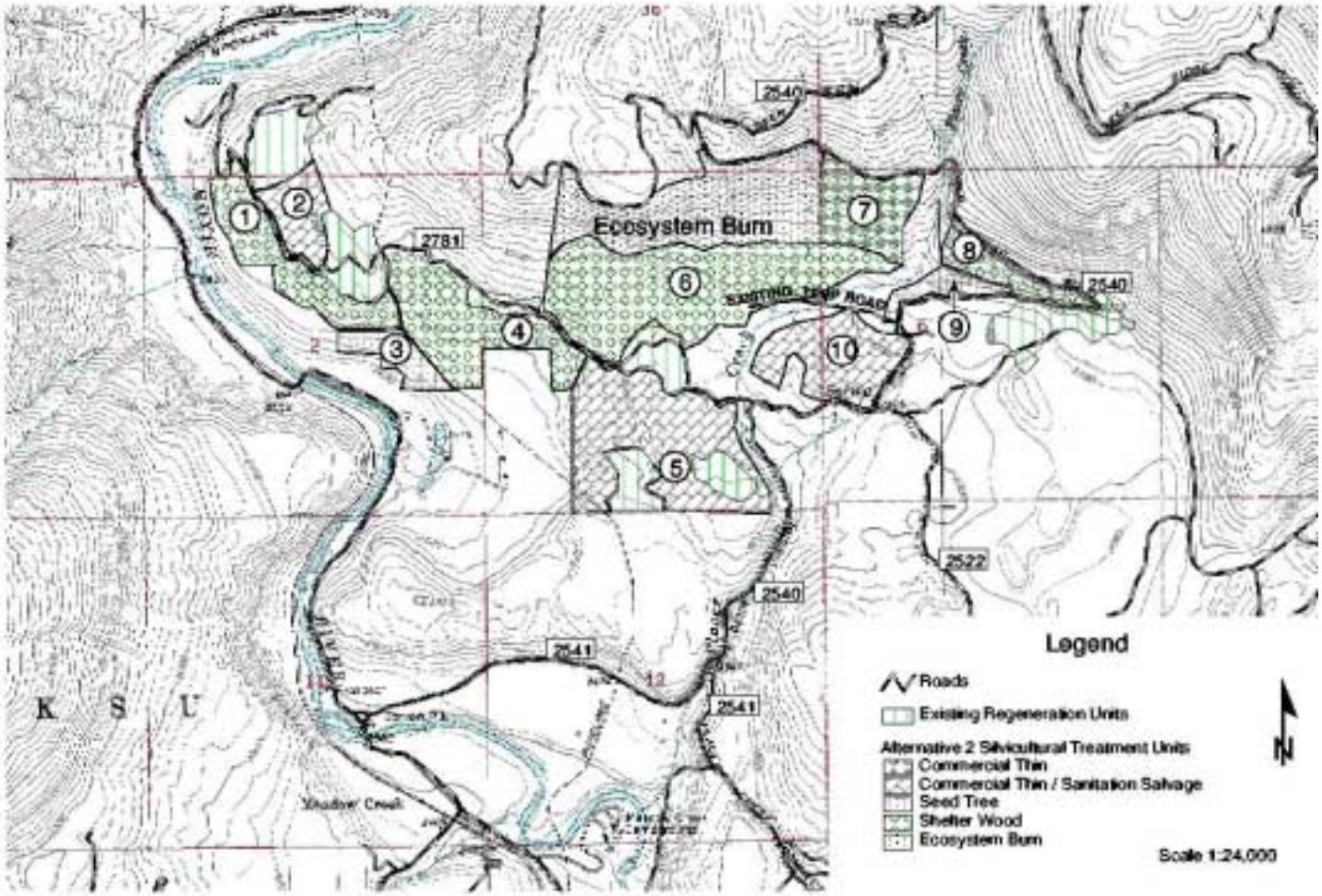
A map of this alternative is provided in Figure 2-1 and the treatments are outlined in Table 2-2.

Table 2-2. Alternative 2 Unit Treatments

Unit	Acres	Rx	PCC Before	PCC After	Logging System
1	49	SW	60-80	30-50	Cable
2	25	CT/SS	60-70	50-60	Ground
3	19	ST	50-60	10-20	Ground/Cable
4	72	SW	60-70	30-50	Ground/Cable
5	115	CT/SS	50-100	40-90	Ground/Cable
6	141	SW	50-60	30-50	Ground
7	42	CT	70-80	60-70	Cable
8	24	SW	70-80	30-50	Cable
9	14	ST	50-60	10-20	Ground
10	54	CT/SS	70-100	50-90	Ground
Total	***555***				
Ecosystem Burn	129	underburn	50-70	50-70	N/A

Rx = Silvicultural prescription **CT** = Commercial thin **PCC** = Percent canopy closure
CT/SS = Sanitation salvage **SW** = Irregular shelterwood **ST** = Seed tree
Ecosystem Burn = Prescribed burn (-recommended KV) for winter range improvement and fuels reduction.

Pipeline Project Area (Alternative 2)



Alternative 3

Designed using White pine restoration and forest health issues. Trends stand attributes towards values within their respective HRV.

These actions are in addition to "Features Common to All Action Alternatives" section.

- Implements silvicultural prescriptions such as seed tree and shelterwood harvest cutting to regenerate Ponderosa pine, White Pine and Larch.
- Unit shapes and sizes would be the same as Alt. 2, totalling approximately 555 acres.
- Units 2,5,7,10 would be **regenerated** with shelterwood or seed tree cuts instead of salvaging or thinning in these units.
- No new roads would be constructed

A map of this alternative is provided in Figure 2-3 and the treatments are outlined in Table 2-2.

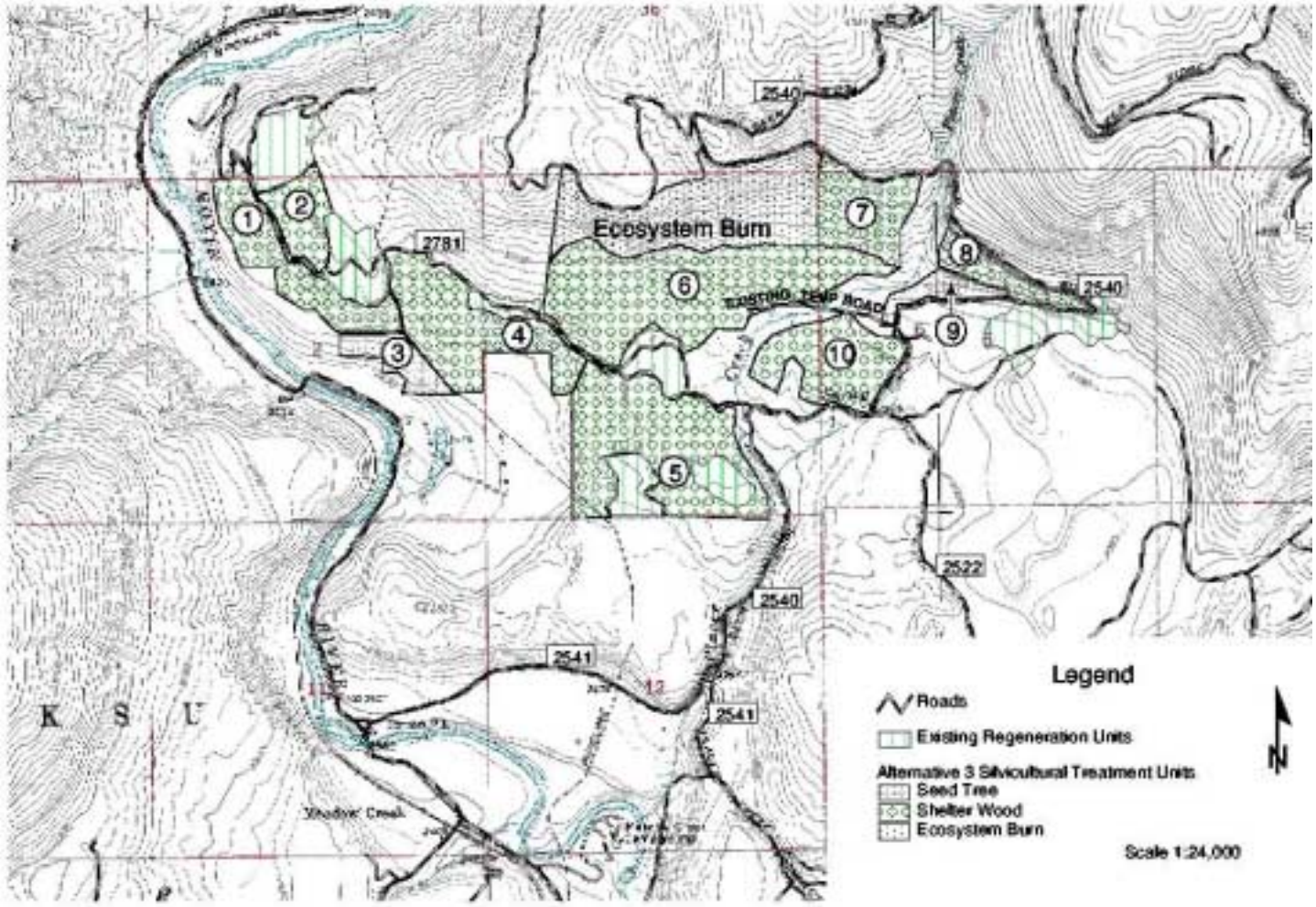
Table 2-3. Alternative 3 Unit Treatments

Unit	Acres	Rx	PCC Before	PCC After	Logging System
1	49	SW	60-80	30-50	Cable
2	25	* ***SW***	60-70	30-50	Ground
3	19	ST	50-60	10-20	Ground/Cable
4	72	SW	60-70	30-50	Ground/Cable
5	115	* ***SW***	50-100	30-50	Ground/Cable
6	141	SW	50-60	30-50	Ground
7	42	* ***SW***	70-80	30-50	Cable
8	24	SW	70-80	30-50	Cable
9	14	ST	50-60	10-20	Ground
10	54	* ***SW***	70-100	30-50	Ground
Total	**555**				
Eco. burn	129	underburn	50-70	50-70	N/A

* MODIFIED FROM Alt 2.

Rx = Silvicultural prescription
PCC = Percent canopy closure
SW = Irregular shelterwood
ST = Seed tree
Ecosystem Burn = Prescribed burn (-recommended KV) for winter range browse enhancemeent, fuels reduction.

Pipeline Project Area (Alternative 3)



ALTERNATIVE COMPARISONS

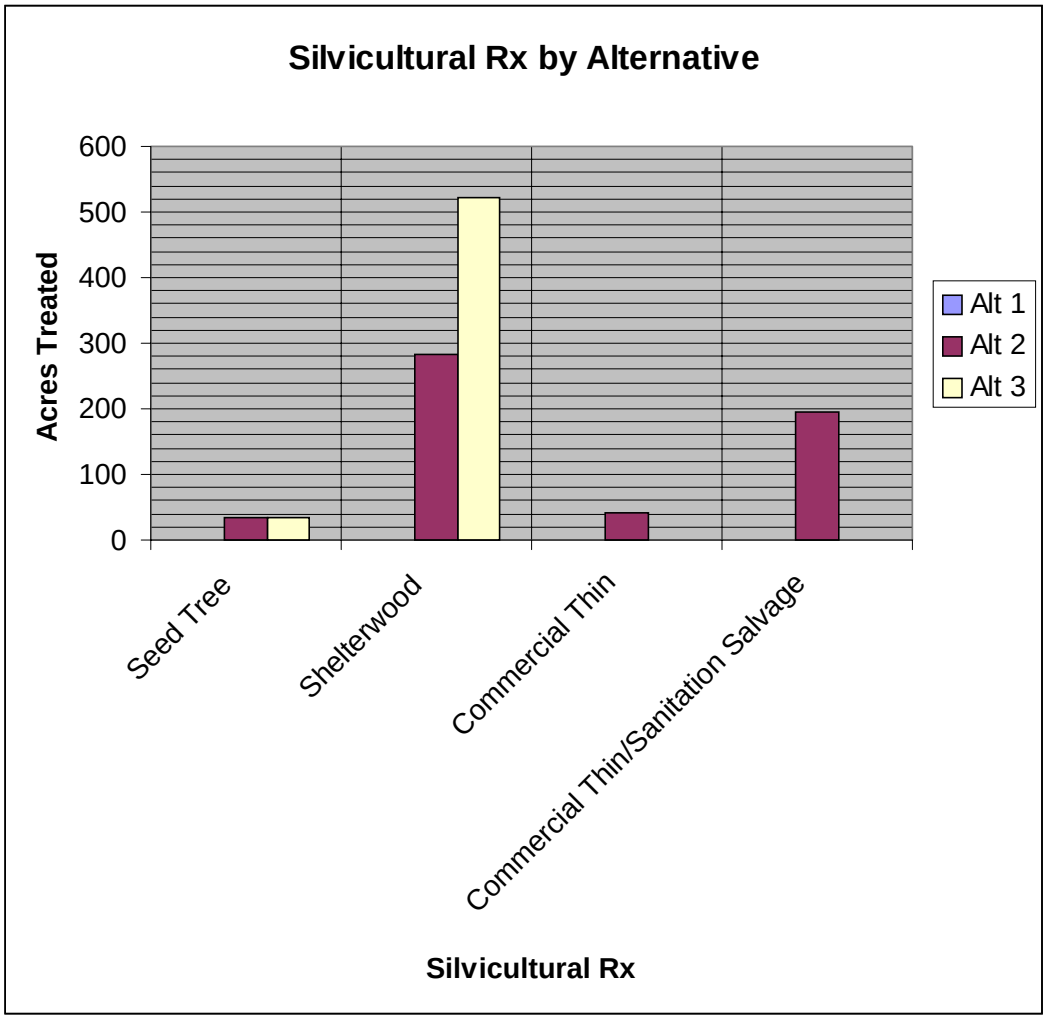
Tables 2-4. Alternative Comparison Charts

Comparison of Alternatives - Issues of Forest Health and Big Game Winter Range

Issue	Alt 1	Alt 2	Alt 3
Forest Health in relation to HRV.	Declining forest health, trending away from HRV.	Improved forest health, trending toward HRV. Mix of regeneration harvesting and thinning.	Much improved forest health, trending toward HRV. Exclusive use of regeneration harvesting
Big Game Winter Range (Percent of acres in project area)			
- Cover	90%	70%	56%
- Forage	10%	30%	34%

Tables 2-4. Alternative Comparison Charts (continued)

Silvicultural System	**Alt 1**	**Alt 2**	**Alt 3**
Seed Tree	0	33	33
Shelterwood	0	284	522
Commercial Thin	0	42	0
Commercial Thin/Sanitation Salvage	0	194	0
Totals			
Acres in Regeneration Harvest	0	319	555
Acres in Intermediate Harvest	0	236	0
Ecosystem Burning (- recommended KV project)	0	129	129
TOTAL ACRES TREATED	0	684	684



* A glossary of silvicultural prescriptions is contained in Appendix C.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

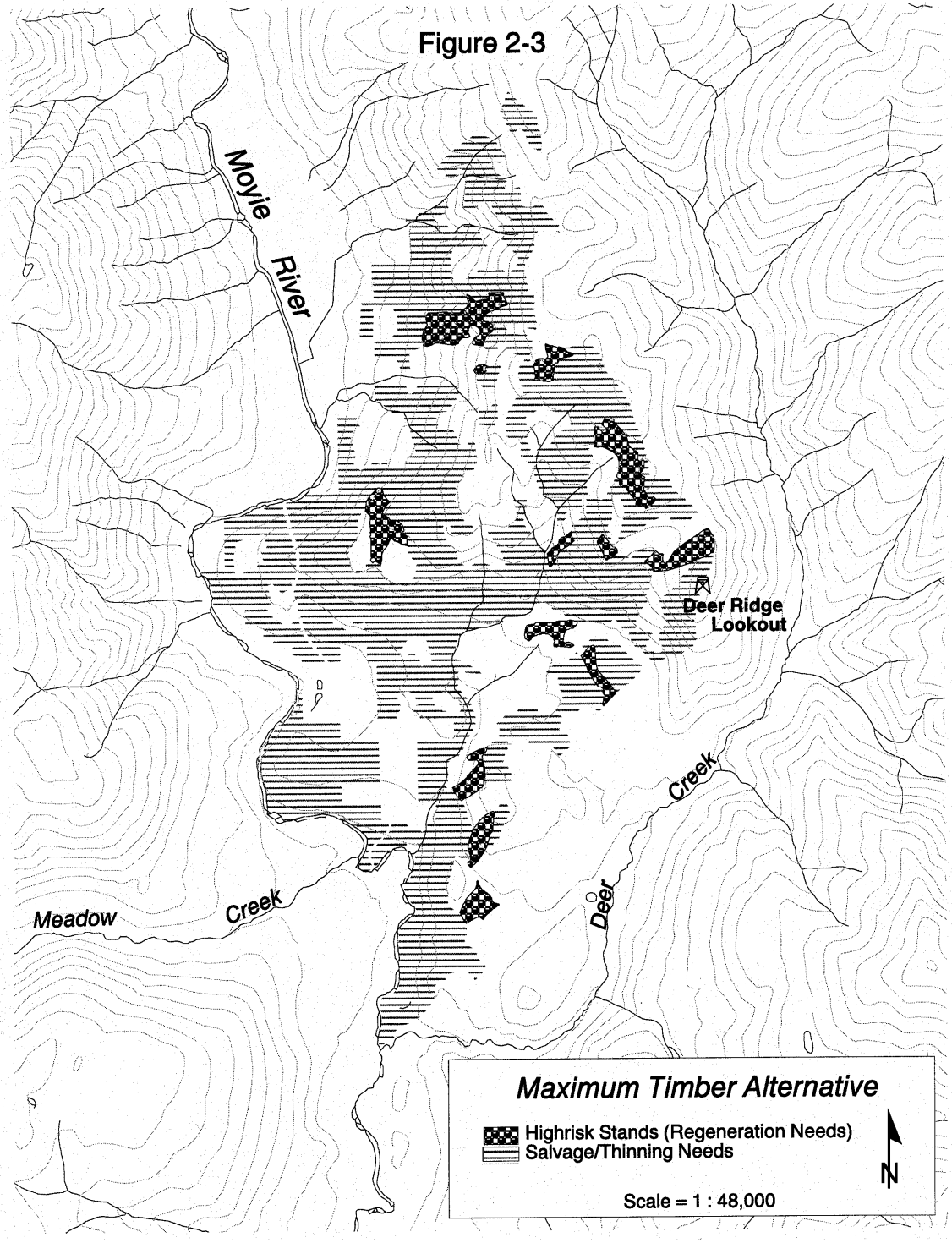
The other action alternatives considered in this assessment are the:

1) Maximum Timber alternative
2) Other Than Timber Harvest alternative

1) Maximum Timber: An alternative based on the IPNF's Forest Plan that emphasizes regeneration type harvesting. A silvicultural diagnosis was conducted for the entire Placer Creek watershed and nearly *4300 acres* were identified as needing some sort of treatment (see Figure 2-3). Under this alternative the treatments would be a combination of regeneration harvests (clearcut, seed tree and shelterwood), as well as thinning and salvage harvesting.

This alternative was dropped from further analysis because extensive road building would be required to access the high risk stands. From a multiple use stand point involving watershed constraints, Lynx Analysis Units, and the roadless issues, it did not appear to be a reasonable. Therefore it was eliminated from further study.

Figure 2-3. Maximum Timber Alternative



2) Other Than Timber Harvest

This alternative evaluates the potential treatments, other than timber harvest, that would meet the stated goals and objectives. Two methods were considered to accomplish this; both of which introduced fire back into these stands:

a) Prescribed burning without fuels treatment: This method would use prescribed fire to treat the stands without any site preparation work, at temperatures hot enough to kill the majority of the seedling and sapling sized trees and about a quarter of the pole and sawlog sized trees. For a burn like this to be effective the weather and fuel conditions would have to be very dry. It is obvious, when considering the amount of private land adjacent to these stands that would be much too risky with a very high potential for an escaped wildfire and disaster.

b) Prescribed burning with fuels treatment: This method includes some felling of the unwanted sapling trees to create a light continous fuelbed, followed up with prescribed burning. This could be done under moister conditions than the first method, however, with the acres involved and the proximity to private lands, this would still be very risky.

Both prescribed burning methods, regardless of success rates, would produce smoke well in excess of any of the timber harvest alternatives, risk losing the entire organic duff layer, (which is shallow) in these stands, and would waste wood fiber that could be utilized as products. Without a timber sale it is unlikely that we would receive funding for these activities based on budget projections. For these reasons the alternatives were eliminated from further study.

KNUTSON-VANDENBURG TREATMENTS

Following is a list of recommended KV projects. Implementation of these projects is dependent on the amount of revenue generated by the timber sale.
The following are enhancement projects and are *not* needed to mitigate the effects on the timber sale treatments. They are not required activities.

The projects are listed in order of highest to lowest priority. As other projects are identified within the sale area boundaries, a supplement to this EA will be prepared identifying specific projects.
See photo on the next page for locations of treatments.

An effects analysis of these projects has been incorporated in Chapter 4.

The following is a list of KV projects as prioritized by the interdisciplinary team:

1) The Ecosystem Burn is approximately 130 acres in size (see Fig. 2-1). Prescribed fire will be used to thin out understory seedling/sapling size trees, reduce ladder fuels, rejuvenate browse plants for wildlife and reduce dead fuel accumulations. The current overstory is a mix of Ponderosa pine and Douglas-fir with pockets of decadent brush species (i.e. Willow, Rocky Mountain Maple, Serviceberry, and *Ceanothus spp)*.

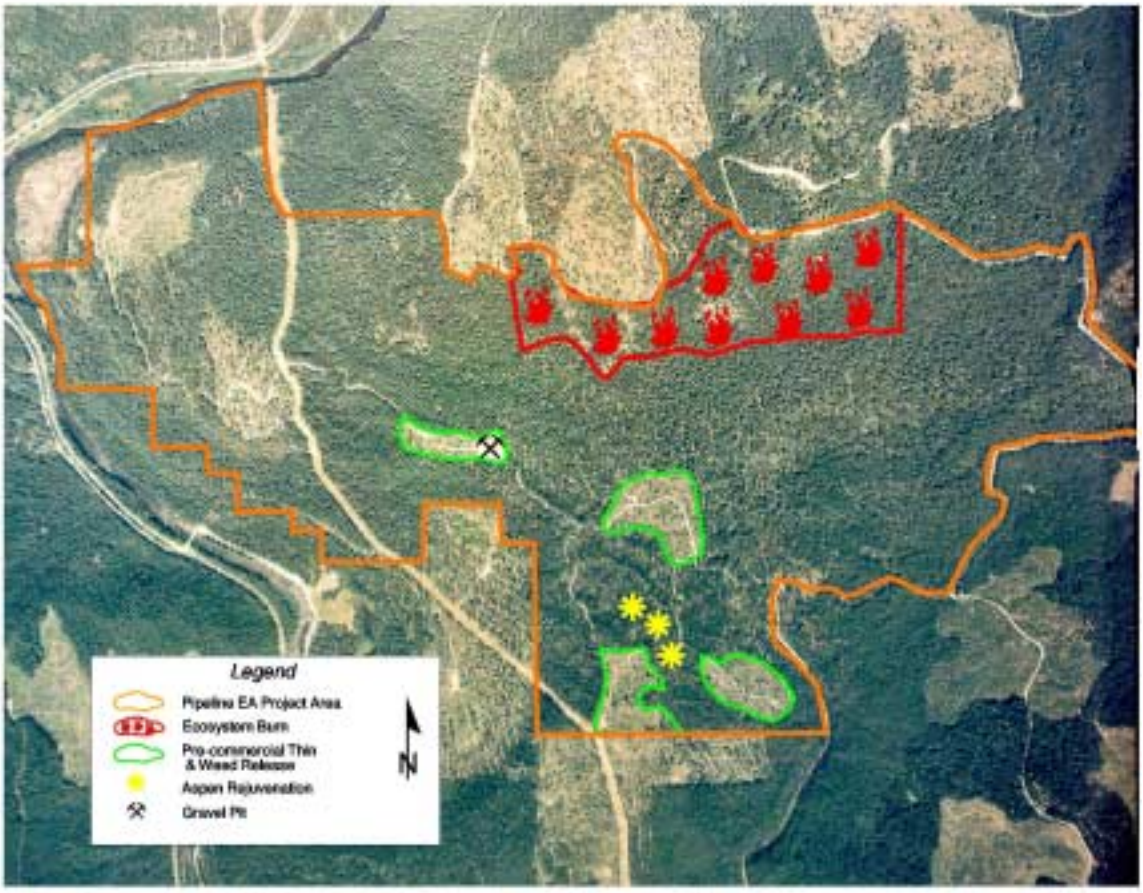
2) Pre-commercial thinning, weed and release, and cull tree removal within existing regeneration units. Stand numbers are listed below.

    - 739-01- (114, 054, 078)
    - 739-03-079

3) Aspen Regeneration:
   Aspen clones throughout the western U.S. are experiencing a major population decline associated with the exclusion of fire and competition from coniferous trees. In order to regenerate these aspen clones, the parent colony of aspen must be slashed along with adjoining conifers, allowing sunlight to reach the forest floor. After slashing and burning the aspen clones, the root system sends up aspen shoots or root suckers. About 30,000 – 60,000 shoots per acre can be expected to regenerate after treatment (Terrill).

   Three aspen clones (each 1-3 acres in size) in Unit 5 have been identified for regeneration treatment. All treatment areas are located on drier sites adjacent to existing skid tails, away from riparian areas. Slash produced in the treatment would be piled and burned.

Proposed KV Projects



Chapter 3 - AFFECTED ENVIRONMENT

INTRODUCTION

Chapter 3 describes the current condition, or baseline information of the resources that would be affected by the proposed action. Included are those resources related to the alternative driving issues and project objectives, previously discussed in Chapters 1 and 2. The following subjects are discussed in this chapter:

- Existing Condition
- Forest Health (Issue 1).
  - Role of Fires on the Landscape
  - Forest Types
  - Role of Humans on the Landscape
  - Health Report Card For Pipeline Project Area
  - Desired Condition
- Big Game Winter Range (Issue 2).
  - Winter Cover/Forage Requirements for White-tail Deer
  - Desired Condition

EXISTING CONDITION

The elevation of the project area ranges from 2400 feet to 3600 feet (above sea level). The topography is a series of terraces and small benches with a southwest aspect (See Chapter 2-12). The project analysis area encompasses roughly 1127 acres of National Forest lands. Road access is provided by Pipeline Road, FS No. 2781. This road is currently closed year-round, providing wildlife security for local populations of deer, elk, moose, and black bear. Administrative use is allowed by permit, year-round totaling 5-10 trips for spraying weeds and road clearing.

Since the early 1990's, the project area has been designated a "Disabled Hunter Access Area" which allows motorized access for hunters with disabilities. Private property on the west side of the Moyie River is accessed from the Pipeline Road. A Pacific Gas and Energy (PGE) Natural Gas Pipeline transects the project area and there are other special use permits located in the project area.

The landscape features a patchwork of openings created by ranching, home sites, and logging on public and private lands. As everywhere, the make-up of these stands has changed, and will continue to change through time. Various influences, both human-caused and natural have contributed to these changes.

The Moyie Valley below the project area is primarily private property with much activity. There are many new home sites, as well as ranches, concentrated in the valley. Boundary County Road No. 34, the Moyie River Road follows the Moyie River, and remains open year-round. The Union Pacific Railroad has a daily train schedule on tracks that parallel the road and river. The river itself is navigable; with both private and commercial float trips during the spring of every year.

FOREST HEALTH (ISSUE 1)

An analysis of the vegetation resource requires a look at the capabilities of the land within the vicinity of the project area. By comparing the historic vegetation patterns and disturbance processes with the existing vegetation patterns and disturbance processes, we can determine if the present vegetation is within the ecological/historical range of natural variability.

THE ROLE OF FIRE ON THE LANDSCAPE

Prior to European settlement, fire was the major disturbance factor that produced vegetation changes on the landscape. Fire has burned in every ecosystem and virtually every square meter of the coniferous forests and summer-dry mountainous forests of northern Idaho, western Montana, eastern Washington and adjacent portions of Canada. Fire was responsible for the widespread occurrence and even the existence of larch, Lodgepole, and White pine. Fire maintains ponderosa pine throughout its range at the lower elevations and kills ever-invading Douglas-fir and grand fir (Spurr and Barnes, 1980).

Many ecosystems are regularly recycled by fire; life for many forest species literally begins and ends with fire. Fires kill stands of timber, often in a mosaic pattern that creates habitats and niches for a variety of plants and animals. Fires reduce the amount of litter and prepare seedbeds for new forests. Fires eliminate tree, shrub and herbaceous competition and shading. In many cases, fires actually thin stands to allow faster growth of the surviving trees. Fires recycle nutrients contained in forest litter, woody debris and live vegetation. Nutrients that otherwise were unavailable become available.

Historically, recurrent low intensity fires regulated competition for limited site resources (e.g., water and nutrients) by reducing shrubs and thinning out the understory shade tolerant tree species, such as grand fir, cedar, hemlock and Douglas-fir. Because of an effective national “Smokey Bear” campaign and current fire policies, most fires are now extinguished. Because of fire suppression, forests have become overstocked with shade tolerant tree species. This condition has resulted in a general loss of vigor in all species, particularly the ponderosa pine and larch that require full sunlight to thrive.

This is an example of a managed ponderosa pine stand growing on a dry site. It has been thinned and underburned, - silvicultural practices that trend the stand attributes towards values within the stand's Historical Range of Variability (HRV).

This picture is typical of conditions in the Pipeline project area. Notice the effects of fire exclusion and the lack of forest management activities such as pre-commercial thinning. The severely overcrowded conditions are well outside values in the stand's (HRV). This overcrowding will lead to insect and disease outbreaks and create heavy fuel loadings conducive to a stand replacement fire.

In the absence of fire, insects and diseases regulate stand densities by attacking individuals and species. Formerly, frequent underburning fires prevented the excess accumulation of fuels. With exclusion of fire, organic residues have accumulated, as standing live and dead wood volumes (Harvey et al. 1994).

The current danger to these forests is not only stand replacing wildfire, but wildfire burning through fuel accumulations so high that resulting burns would be extremely hot, resulting in critical reductions of stored nutrients through volatilization, with accompanying losses to potential productivity and the threat adjacent private land, life and property. (Harvey et al. 1993).

These are typical conditions after a stand replacement fire. Notice that the entire organic layer or duff layer was vaporized by the heat. The exposed bare soil, ash and associated nutrients could potentially wash offsite and become sediment in a stream system.

In the discussion that follows, "severity" refers to the amount of impact a fire actually causes and "return interval" refers to how often a particular type of fire occurs. Here is a summary of the types of fires that occur in forested ecosystems:

Non-lethal fires: fires that kill 10% or less of the dominant tree canopy. A much larger percentage of small understory trees, shrubs and forbs may be burned back to the ground line. These are commonly low severity surface and understory fires, often (but not always) with short return intervals (few decades).

Mixed severity fires: fires that kill more than 10%, but less than 90% of the dominant tree canopy. These fires are commonly patchy, irregular burns, producing a mosaic of different burn severities. Return intervals on mixed severity fires may be quite variable.

Lethal Fires: fires that kill 90% or more of the dominant tree canopy. These are often called "stand-replacing" fires and they often burn with high severity. They are commonly (but not always) crown fires. In general (but not always), lethal fires have long return intervals (140-250+ years apart), but affect large areas when they do occur. Local examples of these types of fires would be the Sundance and Trapper Peak fires of 1967 that burned over 80,000 acres in a relatively short time period.

A stand replacement urban interface fire in the outskirts of Hamilton, Montana during August of 2000.

Ecosystems outside of their normal range may not be sustainable. Fire and humans are the two major influences that affect forest health...past, present, and future (Averill, 1994).

The Pipeline project area itself is an example of the role of fire and succession. Fire history studies and photo records have revealed that the project area burned numerous times with high intensity, lethal fires that consumed all trees, logs, snags, and duff down to bare soil. Only a few large old growth ponderosa pine survived the fires and lived to produce seed for the next generation. Given the extensive burned over areas, and limited seed sources, much of the regeneration was ponderosa pine on all forest habitat types.

Many of the ponderosa pine currently growing in the moist habitat types are showing signs of root disease and needle cast fungus (See field trip documentation notes later in the chapter). As proven with sample plots in the book "Forest Habitat Types of North Idaho", ponderosa pine is a relatively short-lived tree on moist habitat types.

The intensities and intervals of individual fires have and always will continue to vary, based on weather, stand conditions, fuels, aspect, forest types and other similar variables. To know exactly what the fire intervals have been in the project area for the past several hundred years is impossible. However, enough data has been accumulated from similar forest ecosystems to determine general fire intervals by forest types. Forest types are based on groupings of habitat types with similarities in natural disturbance regimes, successional patterns and structural characteristics of mature timber stands.

FOREST TYPES: There are two main forest types within the project area, the dry forest type and the moist forest type.

Dry Forest Types: These forest types consist primarily of Douglas-fir, ponderosa pine, and larch and represent approximately one third of the project area. Historically these sites maintained grassy and open park-like stands of large, old ponderosa pine and Douglas-fir with larch mixed in on the moister end of these sites. Prior to European settlement, light underburns occurred every 25 years on the average (O,Laughlin, et al 1993; Mutch, 1993) and maintained these open stand structures. Mixed severity fires and stand replacing fires were relatively infrequent in pre-settlement times in these dry forest types.

Under a natural disturbance regime, these are the only forest types where ponderosa pine will dominate tree canopies, and are commonly referred to as "ponderosa pine forests". A historic study of some of these types in western Montana illustrates some of the changes that have occurred in our dry forests. Before 1900, these sites may have supported an overstory of 27 trees per acres (TPA), with ponderosa pine and larch as the dominating species.

In the understory, the density of trees greater than three inches diameter at breast height (DBH) averaged 43 TPA. When compared to 1984, these sites supported 211 TPA (a five fold increase) greater than three inches DBH, with Douglas-fir dominating every size class except the largest overstory trees (Habeck, 1985). The second photo from the top on page 3-3 is an example of Douglas-fir overcrowding in the understory.

These conditions are much like those found on dry forest types in the project area where stocking levels of trees greater than three inch DBH equals 235 TPA in one stand proposed for treatment.

Ponderosa pines lose vigor in dense stands (USDA, 1990). Because of its intolerance of shade, ponderosa pine tends to grow best in even-aged stands. Larch is a species that grows fast and lives long, but requires lots of direct sunlight to establish itself. It is a desirable species because of its rapid height growth; relative resistance to insect and disease problems and fire (thanks to its thick bark), and it is also highly preferable to many wildlife species.

Moist Forest types: These forests are composed of a mixture of conifer species (cedar, hemlock, larch, Douglas-fir, grand fir, white pine, lodgepole, etc.) and account for approximately two thirds of the forest stands within the project area. Typically, a fire would underburn through the project area every 80 years or so; but about every 200 years, large lethal stand-replacing fires would become the dominant disturbance type. These fires were the result of heavy fuel accumulations (dead trees, limbs, cones, needles etc.) during routine moist seasons, followed by drought conditions that led to large, lethal, stand-replacing type wildfires (Zack, 1995).

White pine Forests: A Moist Forest Type.
Before the introduction of white pine Blister Rust, white pine was the dominant species; this was known as the "white pine type". Currently, there are no stands within the project area where white pine is the dominant overstory species. These stands are now dominated by Douglas-fir, lodgepole, grand fir, and larch in the overstory, with thick layers of Western Red cedar and hemlock in the understory.

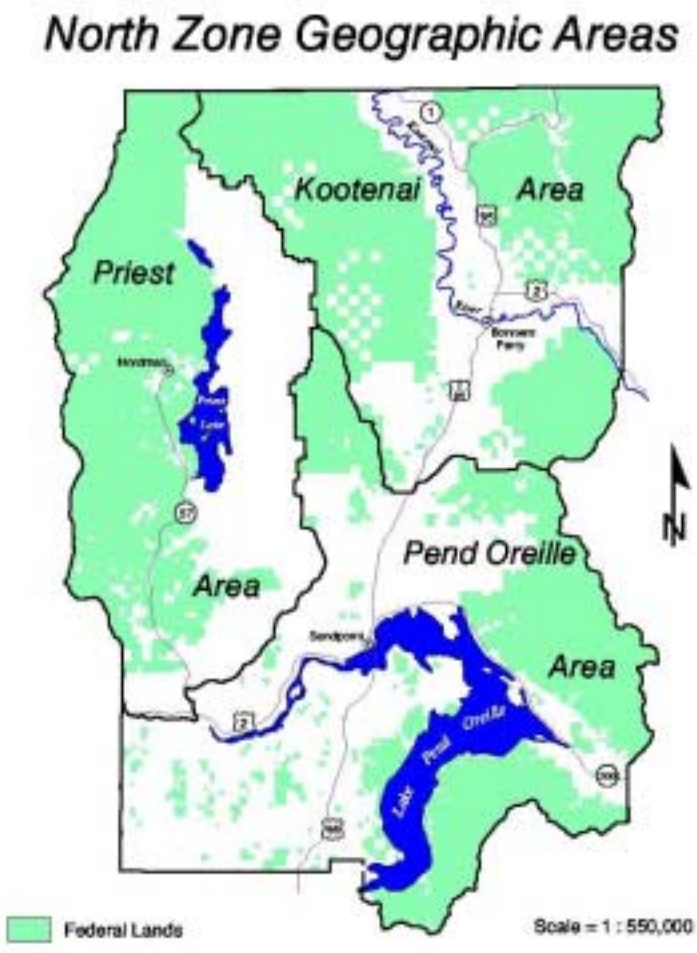
Because of its relative intolerance of shade, White pine attains a dominant position in the stand only following wildfires, even-aged silvicultural systems, or through cultural treatments (thinning) favoring the species (USDA, 1990).

Larch, a significant component of dry forest types, is also a significant component of these moist forests. Larch evolved with natural fire cycles. One can easily recognize burn patterns in the forest by looking for concentrations of larch. It depends on fire as an agent to expose mineral soil, reduce thick duff layers and create openings to germinate and grow in. Without fire or pre-commercial thinning, larch would drop out of most stands and not maintain the role it had prior to European settlement and fire suppression (Zack, 1995).

These forests are very productive and prior to European settlement tended to accumulate large amounts of biomass (the collection of all living plants in a forest) in the relatively long intervals (average 200+ years) between stand-replacing fires. They sometimes experienced a few non-lethal or mixed severity fires between stand-replacing fire events.

Within both forest types, fire would have favored ponderosa pine, larch, and white pine because those species regenerate well in full sunlight, have self- pruning lower branches and thick layers of bark to protect the tree from relatively frequent underburns and are long lived. The more shade tolerant (trees that can grow under shaded conditions), less fire resistant species such as subalpine fir and grand fir were thinned by root diseases, insects, and low intensity non-lethal fires. Large trees in patches would have dominated the landscape, with large patches of post-fire shrub/seedling/sapling stands (Zack, 1995).

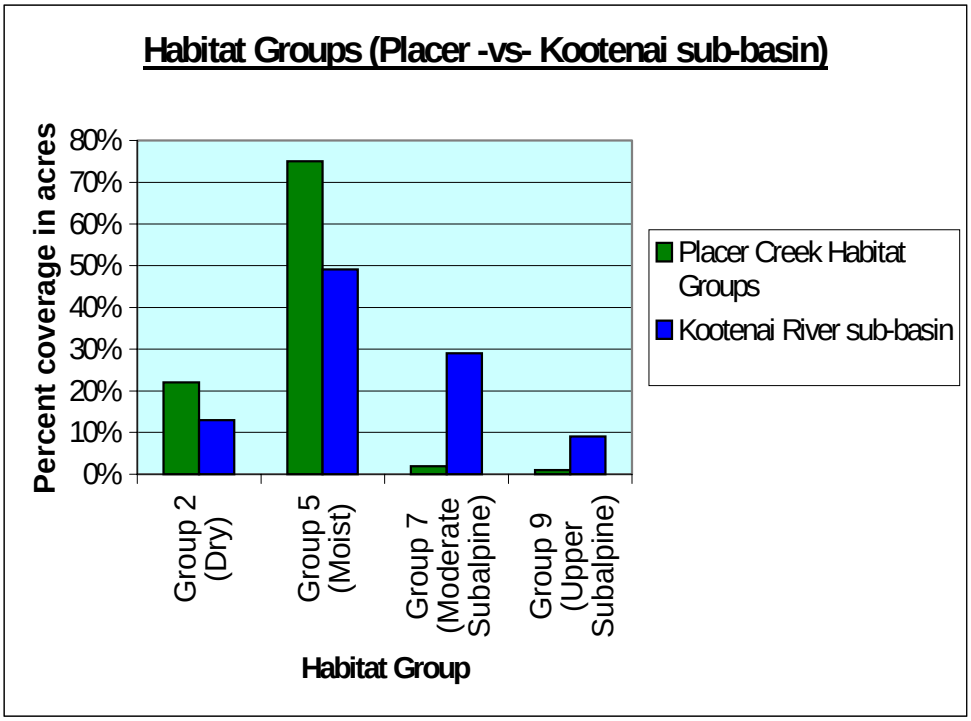
The following tables and bar charts are useful in broad scale planning when comparing habitat groups, tree species distributions, and the relative changes in the abundance of each tree species over time. Notice how the tree species composition in Placer Creek (part of the project area) relate to the larger Kootenai River sub-basin, the North Zone Geographic Area (see map below), and how they are all on the same trend when compared to historical conditions.



Existing Condition of Vegetation in the Placer Creek Watershed Compared to the Kootenai River sub-basin

PLACER CREEK WATERSHED
COMPARTMENT 739

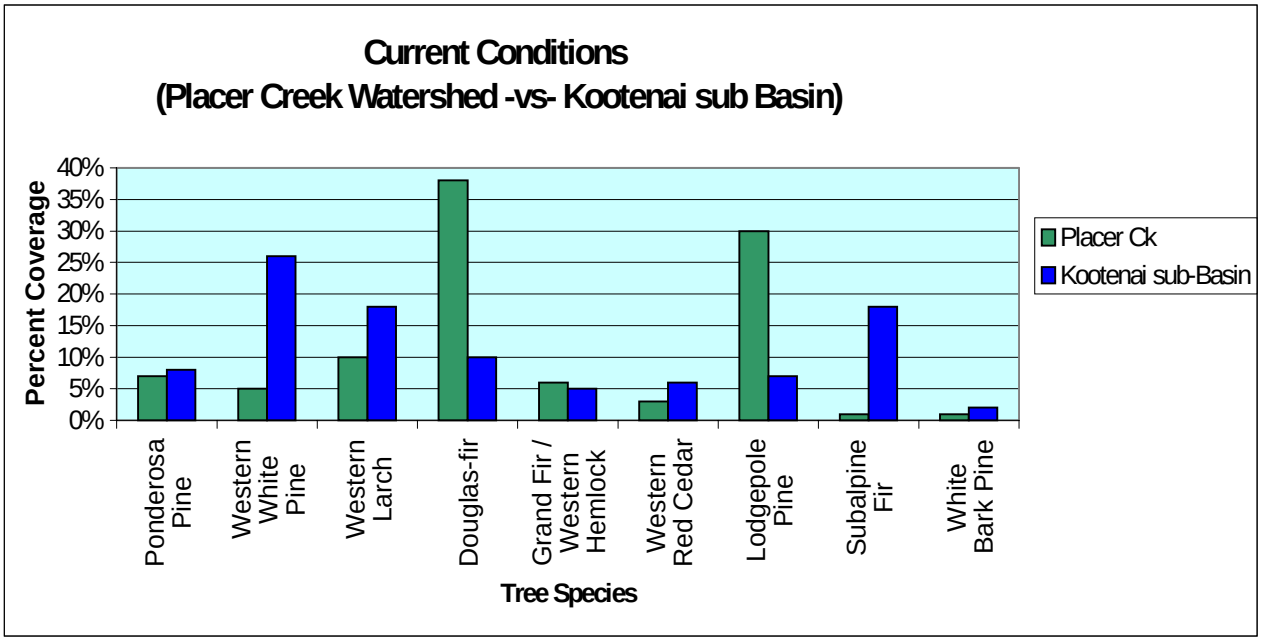
	Percent of Area (acres) Placer Creek Habitat Groups	Percent of Area (acres) Kootenai River sub-basin
Group 2 (Dry)	22%	13%
Group 5 (Moist)	75%	49%
Group 7 (Moderate Subalpine)	2%	29%
Group 9 (Upper Subalpine)	1%	9%



This chart illustrates the different kinds of habitat groups and compares their proportions in Placer Creek versus the Kootenai sub-basin.

Existing Condition of Vegetation in the Placer Creek Watershed Compared to the Kootenai River sub-basin

	CURRENT CONDITIONS Placer Creek Watershed	CURRENT CONDITIONS Kootenai River sub-Basin
Ponderosa Pine	7%	8%
Western White Pine	5%	26%
Western Larch	10%	18%
Douglas-fir	38%	10%
Grand Fir / Western Hemlock	6%	5%
Western Red Cedar	3%	6%
Lodgepole Pine	30%	7%
Subalpine Fir	1%	18%
White Bark Pine	1%	2%

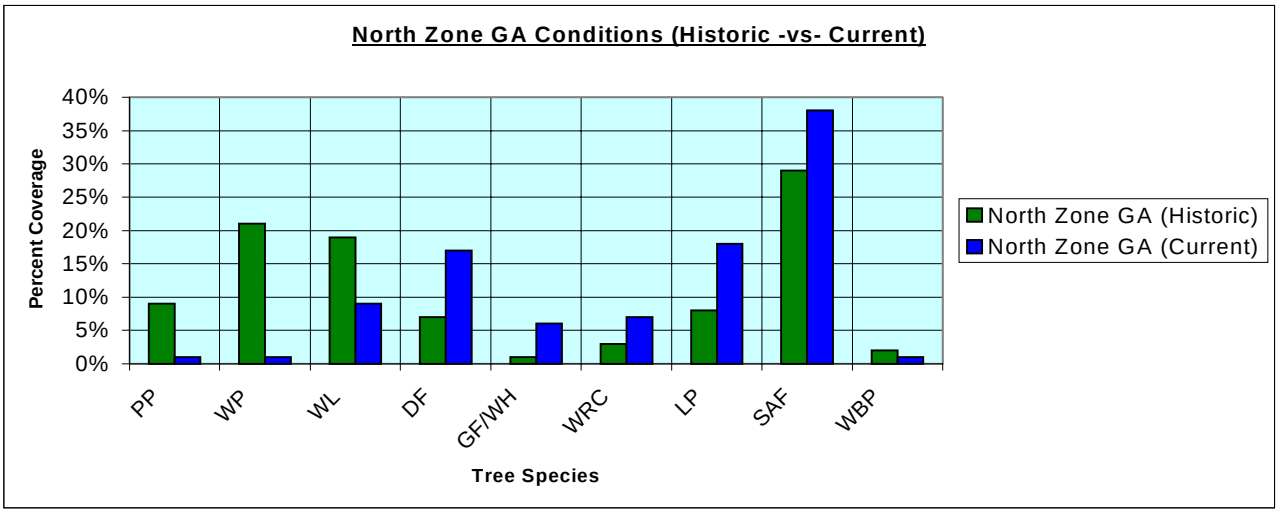


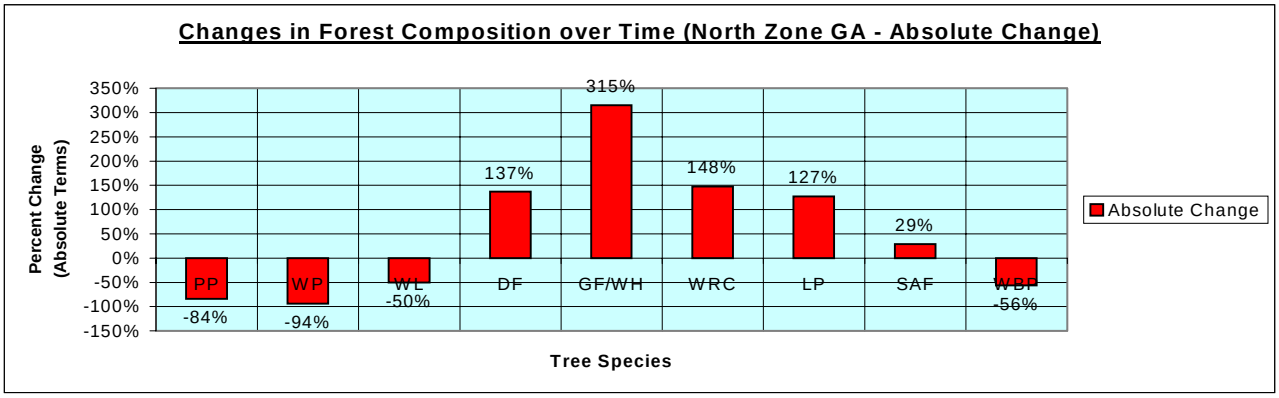
This chart illustrates the different tree species and their distribution in the Placer Creek and Kootenai sub Basin watersheds.

Forest Composition: Total North Zone Geographic Area (National Forest Lands)

Tree Species	PP	WP	WL	DF	GF/WH	WRC	LP	SAF	WBP
North Zone GA (Historic)	9%	21%	19%	7%	1%	3%	8%	29%	2%
North Zone GA (Current)	1%	1%	9%	17%	6%	7%	18%	38%	1%

Tree Species	PP	WP	WL	DF	GF/WH	WRC	LP	SAF	WBP
Absolute Change [(Current/Historic) - 1 = % Change]	-84%	-94%	-50%	137%	315%	148%	127%	29%	-56%





Abbreviations

Ponderosa Pine - (PP)	Western Hemlock - (WH)
Western White Pine - (WP)	Western Red Cedar - (WRC)
Western Larch - (WL)	Lodgepole Pine - (LP)
Douglas-fir - (DF)	Subalpine fir - (SAF)
Grand fir - (GF)	Whitebark Pine - (WBP)

Notice the current trend with the <u>decrease</u> in seral species (PP, WP, WL) and the <u>increase</u> in shade tolerant species (DF, GF, WH, WRC). All species are trending outside the Historical Range of Variability (HRV), away from the Desired Future Conditions (DFC) listed in Chapter 1.

THE ROLE OF HUMANS ON THE LANDSCAPE

Human influence has likely been present in the project area for centuries. Native Americans were known to burn parts of the ecosystem in which they lived to promote a diversity of habitats. They used fire to improve hunting through increased browse production, to encourage berry and medicinal plant production, to clear campsites, for agriculture, and to maintain their trail systems (Spur and Barnes, 1980). They tended to burn during different times of the year, sometimes in the early spring or summer, other times in the fall after the hunt and berry-picking season was over. Rarely did they purposefully burn during mid-summer when forests were most vulnerable to catastrophic wildfire. Often Native Americans burned selected areas yearly, or every other year, or as long as every five years.

Since European settlement in the area, the landscape has undergone substantial changes. Three main factors have contributed to these changes*:*

1) Fire suppression (aggressively putting all fires out)
2) Past logging practices
3) White pine blister rust fungus (Zack, 1995).

Fire suppression has had the largest effect since it has influenced many more acres than logging or White pine blister rust. Firefighting effectiveness increased in the 1940's and the 1950's with additional fire suppression dollars, which allowed for the increased use of trained firefighting crews, smokejumpers, airplanes, helicopters and bulldozers (Clark and Sampson, 1995).

Logging has had an influence on stand composition and structure of the timbered stands in the project area. There have been three timber sales in the project area during the past two decades:

- ComPlacerC Thin Timber Sale (1992) treated 142 acres in the project area with 91 acres of intermediate harvest and 51 acres of overstory removals.
- Orser Creek Timber Sale (1989) treated 47 acres in the project area (all regeneration harvest).
- Pipeline Timber Sale (1985) treated 60 acres in the project area (all regeneration harvest).

Scattered larch and ponderosa pine stumps are also present within portions of the project area indicating that there was some selective logging in the area in years past on the drier sites. In all, there has been some type of logging activity on approximately 50% of the project area within the past 60 or 70 years. The final factor is the White pine blister rust fungus. It was first detected in western North America, in 1921, in Vancouver, British Columbia (Boyce, 1961), and in northern Idaho in 1927, near Priest River (Forest Land Use Plan, 1975). This fungus has killed, and is still killing “five-needled” pine trees from seedlings to old growth veterans, not only in the project area, but also throughout North America. “Five- needled” pines are those species of pines with groups of five needles growing from their branches. Species in western North America include: Western White, Eastern White, Limber, Bristlecone, and Whitebark pines.

HEALTH REPORT CARD FOR THE PIPELINE PROJECT AREA

The landscape of the project area features a mosaic of small openings (11 to 24 acres), surrounded by timbered stands. Tree species represented are: Douglas-fir (DF), ponderosa pine (PP), larch (WL), and lodgepole (LPP) on the drier sites; and, in addition to the above species, White pine (WWP), cedar (WRC), grand fir (GF), and hemlock (WH) on the moist sites. Most of these stands are between 75 and 90 years old. Fire scars on scattered older trees indicate that a fire burned through the area around the turn of the century. A few PP and WL relics, remnants of the previous stands remain. Most of the health concerns with these timbered stands can be tied to the overstocked or crowded condition of the stands. The densely stocked stands we see today are causing a general health decline in all tree species. There is too much competition for moisture, sunlight, and nutrients.

The Forest Entomologist (insect) and the Pathologist (disease) from the Forest Service Coeur d' Alene field office made a field trip to the project area in July 1998, to investigate some forest health problems. This was their second trip to the area, the first being in July 1992. The field trip reports from both visits are included in this document as *Appendix E*. Field reviews have identified the following insect and disease problems in the project area, all related to the overstocked conditions in the forest.

Douglas-fir: Besides competing with PP and larch, the DF is dying from root rot and is now being attacked by Douglas-fir beetle.

Current forest health conditions in Northern Idaho, note the dead and dying Douglas-fir trees. The poor forest health conditions stem from overcrowded forests, which lead to nutrient cycle imbalances and thousands of stressed and weakened trees that are succumbing to root disease and Douglas-fir beetle attacks.

Ponderosa pine: Repeated bouts of needle cast (a needle fungus) have stressed the PP so that western bark beetles are attacking the species. Root rot has also been found in the PP.

Larch: Evidence of dwarf mistletoe in the dominant trees can damage WL regeneration. Stem rot is present in this species, but this is a plus for wildlife species such as cavity nesting birds.

Grand fir: Fir engraver, a beetle that attacks and girdles its host, is found in pockets where the GF species occurs.

Lodgepole: Mountain pine beetles are attacking and killing the mature LPP.

White pine: The blister rust fungus is present and individual members of the species show various stages of the rust affliction.

Cedar: Evidence of root rot was discovered in this species during the July 1998 field visit.

Aspen Colonies: Isolated colonies are scattered through the project area. All groves of aspen are showing the effects of being out competed by longer-lived shade tolerant conifers such as Douglas-fir and grand fir.

The forest entomologist (Kegley) has made some observations and recommendations to increase the health of the timbered stands. For the drier sites, "much of what we saw was an over-dense stand which was historically primarily widely spaced ponderosa pine, and is now being converted to a mixed stand of Douglas-fir and ponderosa pine, mostly due to the lack of fire. Improving the health of this stand can be done best by creating a stand of desirable species at stocking levels that will maintain vigorous growth. Fire (underburning) should be returned to this system if at all possible to clean up the fuels and the competing understory and to remove the Douglas-fir".

For the moist sites the entomologist said; "this area is over stocked and could benefit from some removals. This area can support a much broader variety of species than the drier sites; including larch and White pine. However, these species both need openings to regenerate successfully, and the current stand is converting to more shade-tolerant species" (Kegley, 1998).

Desired Conditions

The desire is to trend the area toward forest composition and structure levels that existed historically in the area. Specifically:

- Create stand conditions that favor development of seral tree species (larch, ponderosa pine and white pine) and reverse the trend toward dominance by mid and late successional species (Douglas-fir, grand fir, cedar, and hemlock). This can be done by creating forest openings that promote the establishment of these species, or by maintaining the dominance of these species where they are currently a significant component.

- Reduce the number of densely stocked closed canopy stands in the Pipeline project area. While these types of stands certainly existed historically, they now dominate the landscape to the point where open grown stands of ponderosa pine, larch, and white pine are virtually non-existent.

FSH 2409.17 Interim Directive No.1 states, "Harvest cutting is done to carry out the intent of the Forest Plan. The objective of harvest cutting is two fold:
1) Develop and maintain desired forest conditions over time and 2) utilize the timber resource. These objectives are not exclusive. Both must be considered when applying a harvest cutting method." Specific silvicultural operations can be used to create the desired stand structures and biomass accumulations within each stand. These operations include:

- Control of tree density and species composition;

- Salvage of dead and dying trees to reduce the amount of carbon on the site - and reduce the potential for unplanned fires and reburns;

- Site preparation to reduce undesired fuel, soil, or vegetation conditions; - competition control to encourage targeted species and avoid excesses or non-targeted species

- Productivity enhancement through fertilization, which may also increase tree resistance to insects and diseases;

- Gene management for trees, shrubs, and herbs to develop races which are resistant to introduced pests (Oliver et al. 1994).

BIG GAME WINTER RANGE (ISSUE 2) - EXISTING CONDITION

An important concept in the existing condition descriptions and analysis is the difference between capable habitat and suitable habitat. The following definitions are helpful in distinguishing between these two terms and the concepts they are based upon.

Capable habitat*:* Refers to the inherent potential of a site to produce essential habitat requirements of a species. The vegetation on the site may not be *currently* suitable for a given species because of variable stand attributes such as unsuitable seral stage, cover type or stand density, but it has the fixed attributes that would enable it to provide those variables under appropriate conditions. Some examples of fixed attributes are slope, aspect, soil or elevation.

Suitable Habitat*:* Wildlife habitat that currently has both the fixed and variable stand attributes for a given species' habitat requirements. Variable attributes change over time and may include seral stage, cover type, stand density, tree size, stand age, or stand condition.

See the Big Game Winter Range map on the next page illustrates the distribution of capable and critical deer habitat across the project area.

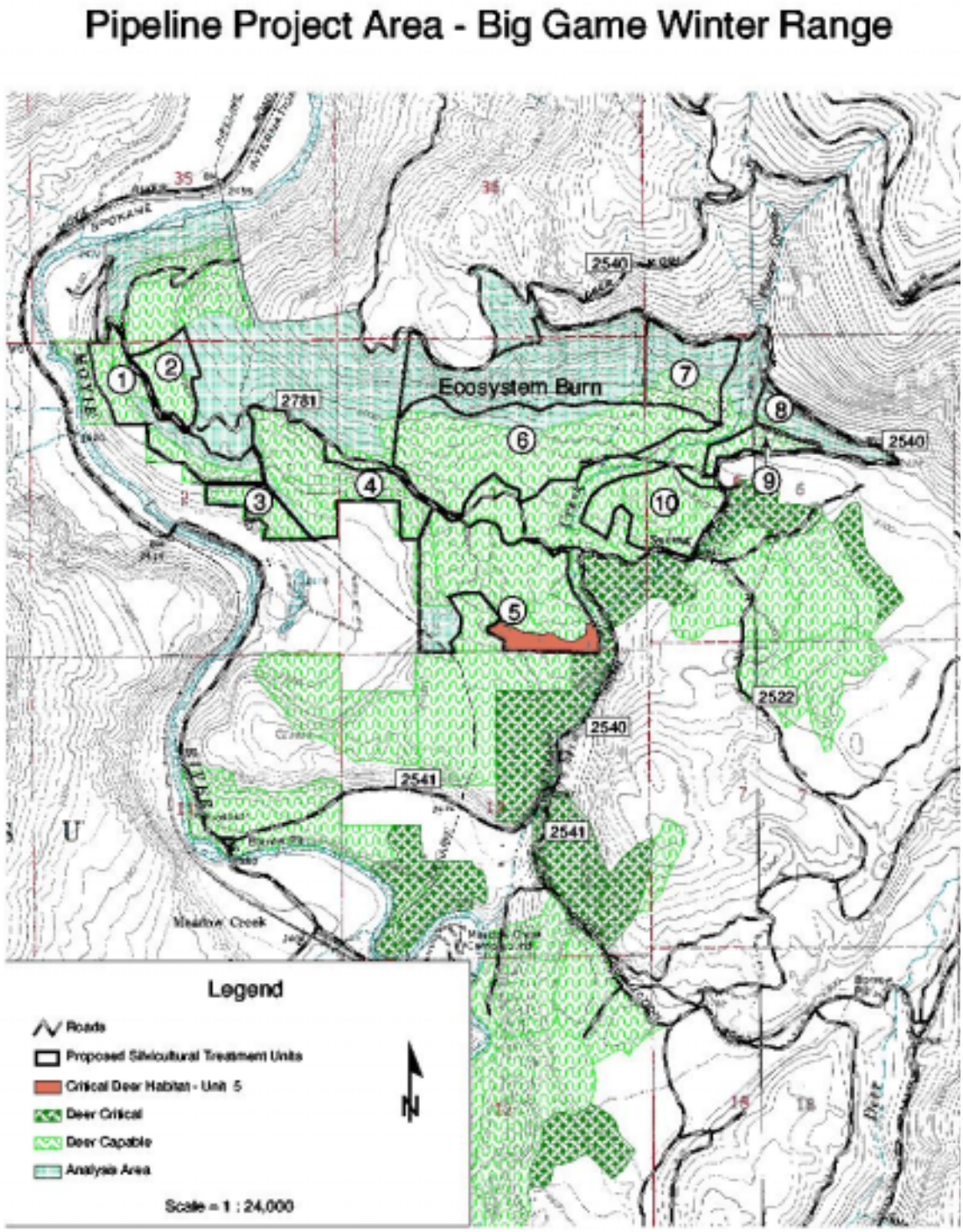
White-tailed Deer*:* White-tailed deer are abundant and important game animals on the Bonners Ferry Ranger District. They are very adaptable and prolific, and thrive in a variety of habitat and forest types. Climatic factors affect the seasonal variation of forage quality and quantity, accessibility to foraging areas, and the energetic and thermodynamic requirements to the animal (Pfingsten 1984). Winter is the most stressful period for big game.

Cover / Forage Ratios:
Based on research in the area of Priest Lake, Idaho, certain stands that are optimal for mid-winter cover / forage combination stands are those that meet the following criteria (Jageman H. 1984):

1) Contain 70% canopy cover.
2) Gentle topography.
3) Support forage in the understory.

Forage areas are places deer go to eat; and cover is where they go for shelter. The two species of understory utilized most in these kinds of stands are pachistima and cedar. White-tails use many other forage species but these species are most important for critical mid-winter snow conditions because of their occurrence under trees that intercept snow. The desired forage species are typically found on cedar and hemlock forest habitat types and the stands are normally greater than 35 years old before they attain a canopy cover of 70% or greater. Not all forested areas are capable of producing these habitat needs for white-tails.

The Big Game Winter Range Map illustrates the intersection of critical deer winter habitat with the proposed harvest units in the project area.



The brown shaded area is about 13 acres of critical deer habitat that overlaps with proposed Unit 5.

An analysis of critical mid-winter habitat in the Pipeline project area was conducted to determine how much of the area could potentially meet these requirements. It was determined that there are approximately 1859 acres of potential habitat (the green shaded areas of the Big Game Winter Range Map) are but only 331 acres would be considered *critical mid-winter range* at this time. The remaining stands are either too young, too sparse, or too dense.

The 331 acres of critical mid-winter range is an underestimate of the number of acres used in winter, but it represents the stands that during very harsh winters deer would retreat to and survive in.

Optimal mid-winter cover stands are necessary over time for deer to survive in, however, the optimal stand structure within these stands is only a temporary phase. Thus, the project area is limited on the number of acres that can be in "target" condition at any given time and the acres of those stands approaching target condition as others grow out of the target condition.

Distributions of Critical mid-Winter Range Habitat Proportions (Capable Habitat)

Condition	Stand age (< 15 Yrs). Foraging stage	Stand age (15-34 Yrs). Optimal stage	Stand age (35+ Yrs). Cover stage
Existing	2%	7%	90%
Desired	15%	20%	65%

This table shows the current difference between the existing and desired conditions within Critical mid-Winter Range. The project area has an abundance of cover with 90% in stands over 35 years old. Consequentially, the project area is lacking in younger, open stands that would be used as forage areas.

Another factor in the maintenance of these stands over time is that old growth-dependent species of plants and wildlife are frequently more rare and need as many stands as are currently available maintained as old growth. Fortunately, white-tailed deer and the other common ungulates are very adaptable and can tolerate many other conditions even if it is not optimal for maximizing their populations. Given that old growth dependent species are not as adaptable as white-tailed deer, we do not necessarily want to create deer habitat at the expense of old growth stands.

An analysis of the amount of non-critical winter range available in the project area was also conducted. This estimate does not distinguish between sites that are outside elevational bands for winter range, but it does estimate the total cover available for deer as well as other ungulates.

The following table depicts the current number of forested and non-forested acres in and around the project area. It also shows the current status of existing and the ideal (cover to forage) ratios for white-tail deer across the borders of the project area and including adjacent private land. An important consideration because private landowners are not mandated to manage for big game winter range and cover/forage ratios.

Ratios of Forested vs. Non-forested Acreage in Pipeline Analysis Area

Ownership	Total Acres	Forested	Non-Forested	Existing Ratio (%) Cover/forage	Ideal cover/forage range (%)
Adjacent Private Land	674	487	187	72/28	50 – 70% : 50 – 30%
Pipeline Project Area	1127	1111	116	90/10	50 – 70% : 50 – 30%
TOTALS	**1801**	**1564**	**237**	**87/13**	50 – 70% : 50 – 30%

1) Forested - All timbered lands where the average tree heights are 40 feet and greater.

2) Non-forested - This would include all "open" areas such as rock outcrops, fields, ponds, lakes, and regeneration harvests (clearcuts, seed tree cuts and shelterwoods) that contain trees that average less than 40 feet tall.

In general, those stands that are defined as forested would be considered as hiding, thermal or escape cover, and would include critical mid-winter cover which is a much more limited cover category. The non-forested areas would generally be considered foraging areas. Classically, big game habitat is considered ideal if the ratio of cover to forage is 50% -70% cover and 50 – 30% forage (Jageman, H. 1984), although this ratio varies depending on geographical area and ungulate species.

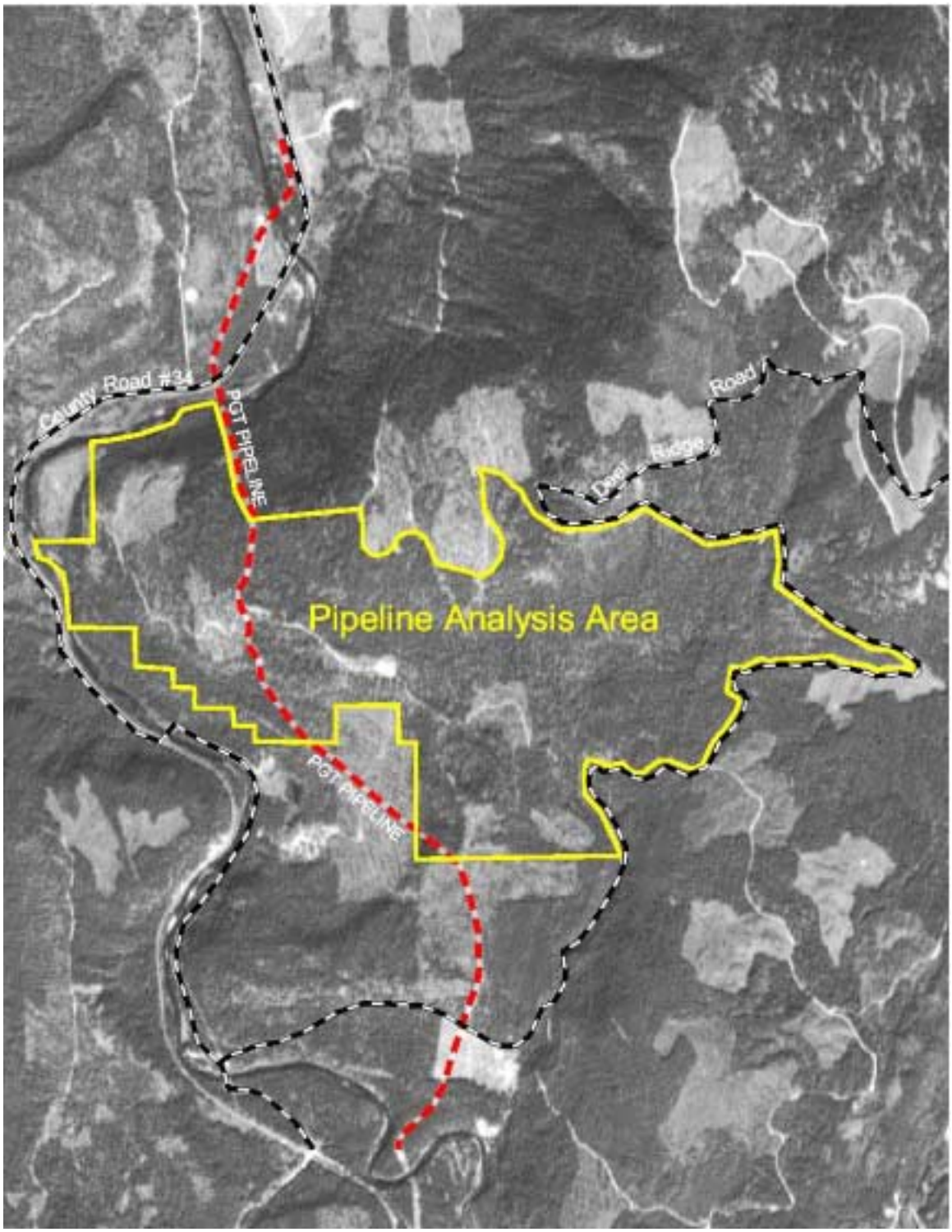
Desired Future Condition:

The Pipeline EA project area historically supported big game winter range because it historically underburned with non-lethal fires every 10-25 years, which maintained open park-like stands for browse species to grow. The land with in project area has the capacity to do so in the future provided:

- The existing food sources such as brush fields are rejuvenated periodically;
- Silvicultural prescriptions are used to create openings and adjust stand structures to sustain and/or create more critical mid-winter habitat.
- Planning and management monitor the condition of the winter range and track the stands as they grow into, and out of, critical mid-winter range status.
- Provide for MA-4 goals listed in Chapter 1 of this EA.

If left alone, the condition of big game winter range in the project area will gradually *decrease in quantity and quality* over time because trees will grow in any openings and in time, shade out (out-compete) any brush species on critical mid-winter range habitat.

Satellite Image of the Pipeline Analysis Area.



Chapter 4 - ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter describes the probable environmental consequences of implementing the alternatives that are described in Chapter 2. It forms the scientific and analytical basis for the comparison of alternatives. Effects or impacts (direct, indirect and cumulative) to the resources are directly linked to the alternative driving issues listed in Chapter 2. Environmental consequences that relate to issues in Appendix A are not discussed.

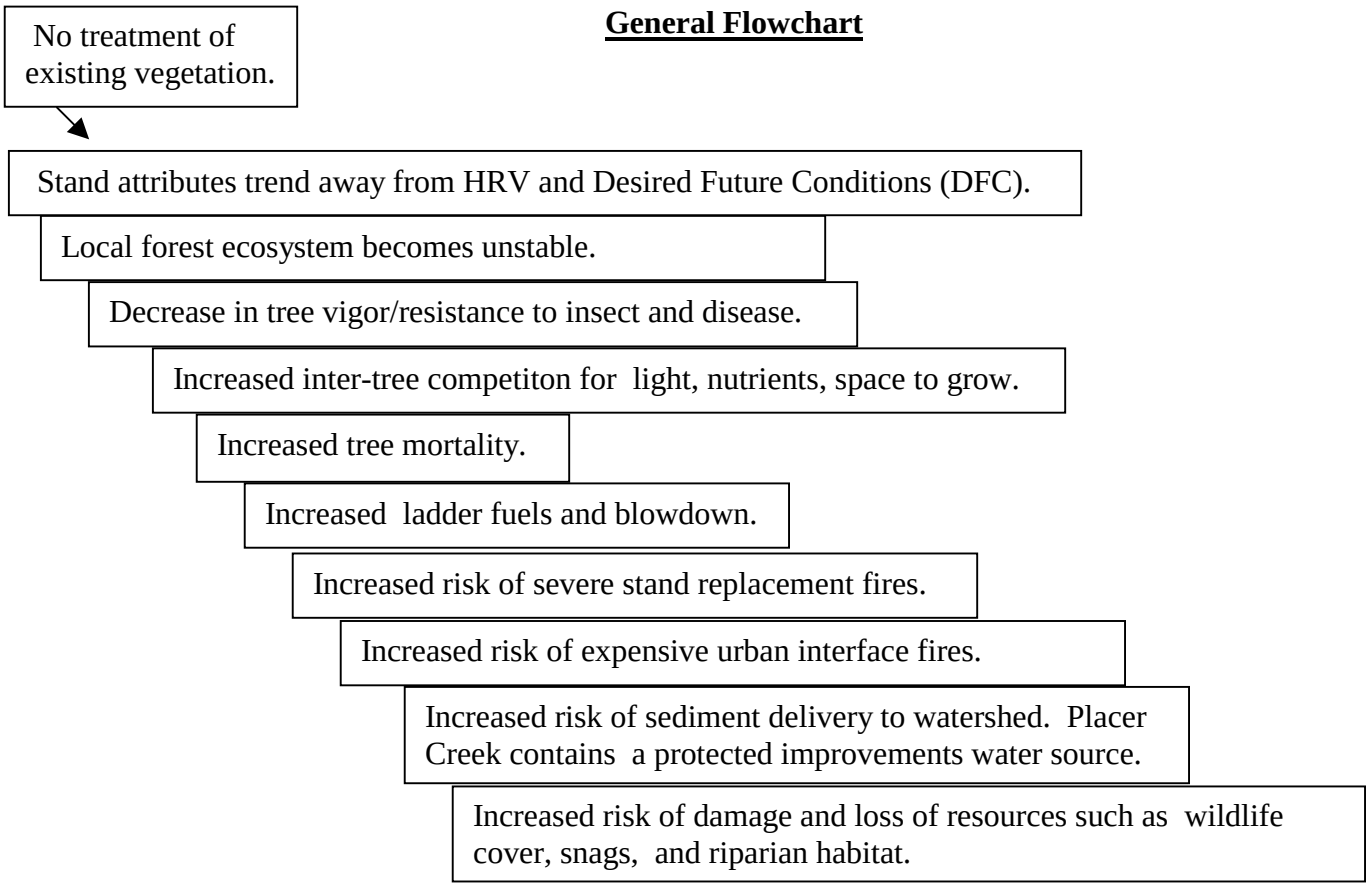
- Forest Health (Issue 1)
  - Alt 1
  - Alt 2 and 3
  - Effects of Proposed KV Projects
  - Reasonably Foreseeable Actions
  - Forest Plan Consistency

- Big Game Winter Range (Issue 2)
  - Alt 1
  - Alt 2 and 3
  - Effects of Proposed KV Projects
  - Reasonably Foreseeable Actions
  - Forest Plan Consistency

FOREST HEALTH

Alternative 1 - No Action

General Flowchart



The belief in a steady-state forest (one that doesn't change over time) has led scientists and others to assume that undisturbed forest structure or development pattern is natural and therefore conducive to sustaining biodiversity and sustainability. The steady-state model or paradigm of forest development has prevailed at different times in the thinking of foresters, conservationists, ecologists, and politicians for some parts of the past century.

The paradigm has led to the management policy of stopping all fires, to the ecological theories of disturbances destroying a steady-state ecosystem, to the policies of reducing clear cuts and trying to stop stream siltation events, and to the political assumption that stopping all human activities in the forests would mitigate loss of endangered species (Johnson et al, 1994). The steady-state paradigm for forest ecosystems has lost credit among plant ecologists (Oliver and Larson 1990, Picket and White 1985, Stevens 1990).

Under the No Action Alternative, it is assumed that fires would continue to occur within the project area. Furthermore, it is also assumed that these fires would continue to be actively suppressed. The State of Idaho Department of Lands has the fire suppression responsibilities for the project area, including these urban interface areas. Allowing wildfires to burn without taking suppression actions is not an acceptable option in areas of human development.

As stated in Chapter 3, the fire interval in the Pipeline project area has already been altered, with fires all but eliminated in the area since 1940. Since fire is the primary mechanism that controlled forest structure and composition, it safe to assume that these components of the ecosystem have likewise been altered.

Active fire suppression is an action that would continue disruption of the fire return interval. Without silvicultural treatments this disruption would further trend vegetation patterns away from historical conditions.

When ecosystems are outside the historical range of variability, changes may occur dramatically and rapidly. An investment of money, energy, or human effort may be required to counter processes that would change the desired state of the ecosystem (Morgan et al, 1994).

Ecosystems outside their historical range of variability are unstable and will trend away from the desired future conditions that are critical to a healthy sustainable forest. “When it comes to forest ecosystems, no action does not mean no change” (Wynsma, et al, 1999).

On drier sites, Douglas-fir and some grand fir would continue to dominate the understory layer, while larch and ponderosa pine would become displaced. Simply because Douglas-fir and grand fir are more successful at regeneration in the absence of canopy openings created by fire or timber harvest. Given that these dry sites already have a limited supply of moisture and nutrients, stocking excessive number of trees on them further limits their productivity. Without fire to control stocking levels, insects and disease would act as the agents of control when these stands do become overstocked and stressed. Furthermore, the lack of fire has allowed excessive fuels to build up. Consequently, fires would burn with much more intensity than they did historically on these drier sites with much different outcomes. Trees such as old "veteran" ponderosa pine that would have historically survived light intensity burns would likely be killed, and the risk of permanent site damage and alteration of species composition would increase.

Changes in Forest Composition with No Management or Underburning Over Time.

Ecosystem management is based on the understanding that forested ecosystems are constantly changing with or without human intervention (Zack 1996).

Changes in Species Composition and Forest Structure

Figure 2

1909 Photo
This serves as the baseline reference of forest stand conditions that evolved from regularly occurring, low-intensity surface burning. Analysis of living fire-scarred trees indicates that, on average, fire swept these forests at 5-15 year intervals. The fires were "hot" enough to restrict most encroaching vegetation, but "cool" enough to avoid killing most of the older-age trees. The forest was open and dominated by the larger fire-tolerant, fire-adapted ponderosa pine.

Figure 3

1948 Photo
By 1948, the forest is beginning to reveal changes in species composition and structure as fire has been excluded for several years. The fire-intolerant, late-successional species, including Douglas fir and white fir, are becoming established beneath the older-aged ponderosa pine. By this time, more small trees than larger trees occupy the site.

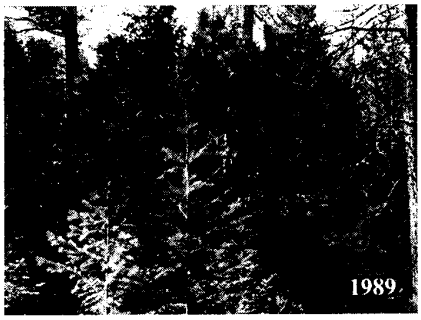


Figure 4

1989 Photo
By 1989, the forest has changed dramatically from the one that existed here in 1909. Over this 80-year period, small trees have established in dense thickets and fire-intolerant tree species now crowd the forest. During drought periods the overabundance of vegetation stresses the site, predisposing the forest to insect infestations, disease outbreaks, and severe wildfire.

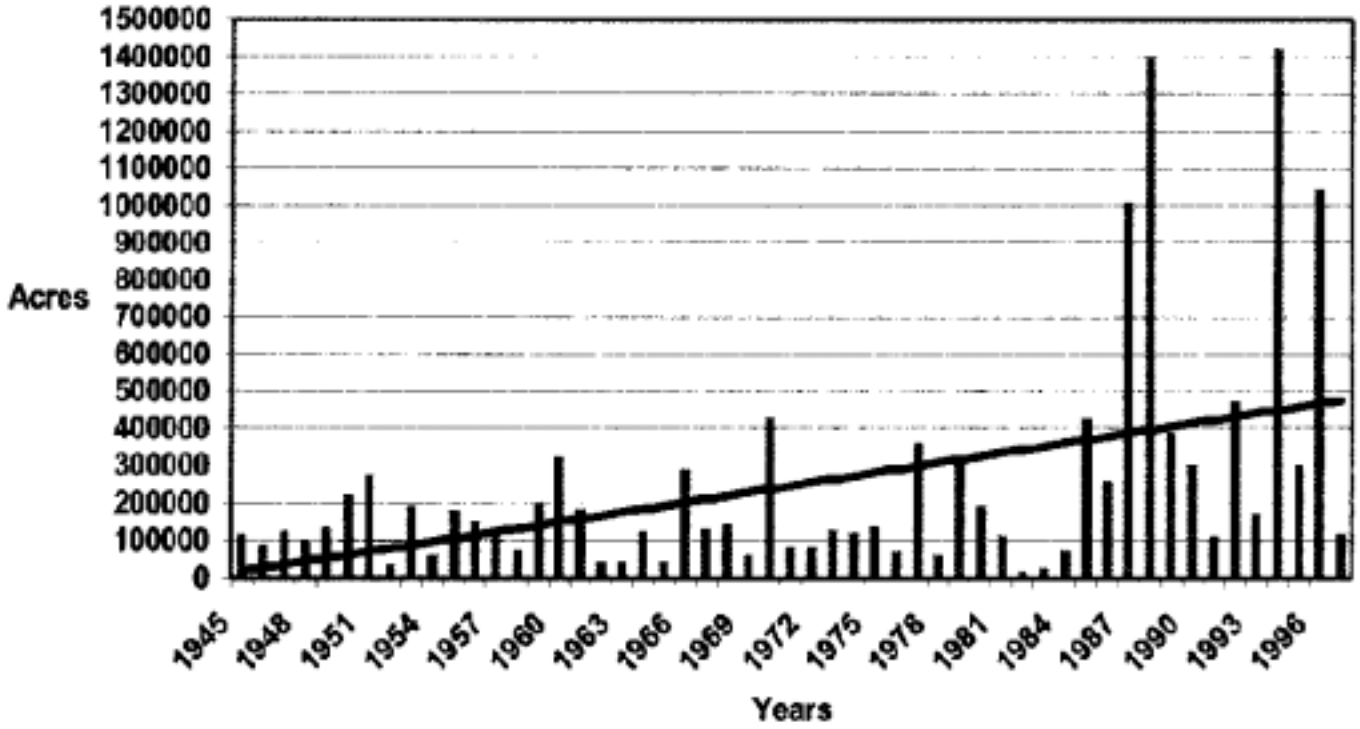
In the prolonged absence of periodic surface burning, vegetative growth compounds and dead fuels accumulate. Within the forest, this biomass – in the form of multi-layered tree canopies – can carry flames from the surface where dead branchwood burns up into the tree crowns. In drought years, when vegetation dries, these "ladder fuels" contribute to severe, high-intensity wildfires.

In the moister cedar /hemlock habitat types succession would continue toward the development of closed canopy stands dominated by Douglas-fir and grand fir, which are susceptible to root diseases. White pine and larch would fail to regenerate without forest openings and they would eventually become insignificant components of these stands. In fact, without either natural (fire or pathogen-caused) or human thinning, larch would drop out of most stands sometime in the future and not maintain the ecological role it had prior to Euro-American settlement and fire suppression (Zack 1995). Species adapted to open grown, drier ponderosa pine habitats will decline, and species associated with shade tolerant grand fir habitats will increase over historic levels.

In the long-term, forest conditions would continue to change over time. The cycle of forest growth and regeneration would continue. Only a limited amount of growth could occur in forest stands before they become overstocked and stagnant. At this point stands would become stressed and susceptible to insect and disease attacks, and eventually fire. Acting on their own, insects and diseases would begin to regenerate these forests by killing trees individually, or in pockets, over the course of many years.

Fire, on the other hand, is a much faster acting process that typically works in combination with insects and diseases to regenerate a forest, normally in a matter of *days*. In general, the Pipeline project area is lacking in forest regeneration (less than 10% of the acreage in small tree classes), but has an abundance of stands growing pole and medium size trees. Due to the overstocked nature of these stands it would be difficult for trees to become very large without some sort of reduction in competition.

With continued fire suppression and no stand treatments, this trend would continue and the discrepancy between size classes would continue to grow. Consequently, not only would the risk of fire continue to grow, but the risk of higher severity fire would continue to grow as well.



– National forest wildfire acres burned trend in the 11 Western states.

Graph from "Protecting People and Sustaining Resources in Fire-Adapted Ecosystems - A Cohesive Strategy" Report from General Accounting Office 2000.

Most of the acres of the project area are currently in need of some type of silvicultural treatment in order to restore forest health and assure sustainability (Kegely 1998).

Given the trend that:

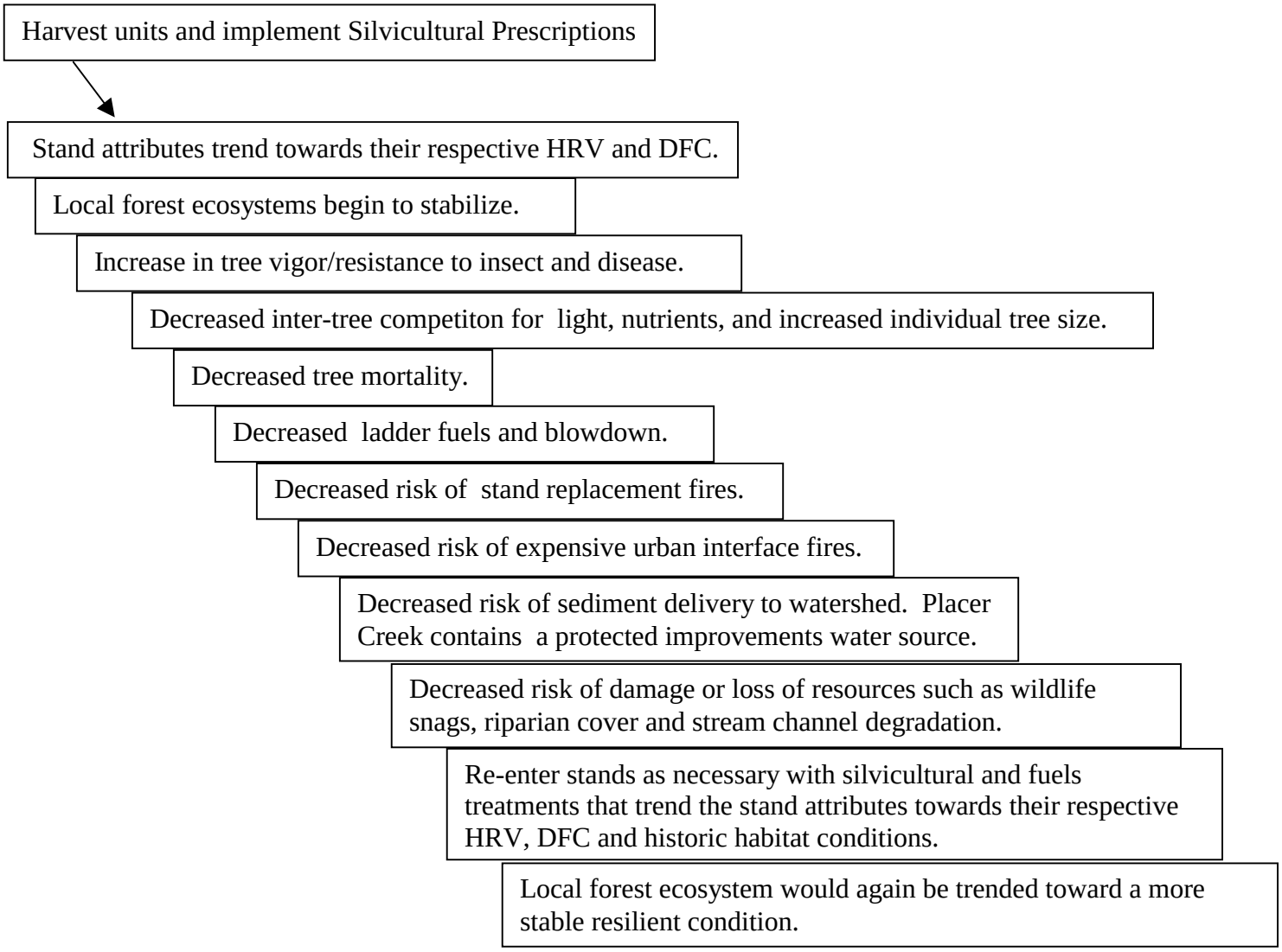
a) Insect and disease mortality in the project area is increasing,
b) Grand fir and Douglas-fir are regenerating in numbers outside the HRV, and
c) The increase in dead trees per acre mixed with the seedling to pole size regeneration, is creating a fuelbed conducive to stand replacement fires.

The question is when (not if) a stand replacement fire will occur in the project area, which lies in an urban interface setting?

Riparian area and bridge destroyed by the Mussigbrod fire, Western Montana during August of 2000.

Alternatives 2 and 3 – Proposed and Modified Proposed Action

General Flowchart



The Pipeline project area is considered an urban and rural setting adjacent to, or within an area of wildland vegetation that has high risk of fire (USDA 1996). Under these alternatives fires would continue to occur and continue to be suppressed. However, the reduction of stand densities and fuel loadings through silvicultural treatments would help control the spread and severity of fires when they do occur.

Development of more open grown, larger diameter ponderosa pine and larch would be promoted on drier habitat types. In general, stocking reduction on these sites would be emphasized to promote stand densities that more closely resemble those that occurred historically. Although Douglas-fir and grand fir would be maintained throughout the landscape, the primary objective would be to reduce the stocking levels of these species on dry sites. Reducing the level of these species, while promoting development of ponderosa pine and larch which evolved on these sites and are less

susceptible to insects and disease, would reduce the incidence of root diseases on Douglas-fir habitat types, and consequently, reducing the probability of stand replacement fires on these dry sites.

Larch and white pine would be favored on the moister habitat types. This would be accomplished by a combination of silvicultural treatments and prescribed burning. Where these species are already a major component of the landscape they would be favored in timber stand improvement treatments. Where they have been replaced, or are being replaced, larch, and white pine would be established in forest openings created by shelterwood and seed tree harvests followed up with adequate site preparation (either mechanical or with prescribed fire) for regeneration purposes. Planting of blister rust resistant white pine seedlings is needed to obtain substantial white pine regeneration, which was dominant in many stands prior to the advent of White Pine Blister Rust (Byler et al, 1994).

In the long-term, promoting the development of more open grown stands of larger diameter trees through the use of silvicultural treatments and prescribed burning would reduce the risk of high severity fires. These types of treatments would meet project goals and trend forest composition and structure toward those that more closely resemble historic patterns. Consequently, when fires do burn through these stands; they should burn with less intensity, be easier to control with a lower risk of urban interface fires and post-fire sediment flushes into Placer Creek and the Moyie River.

Alternative 2 Compared to Alternative 3: The primary difference in effects between the two action alternatives lies in tradeoffs between the cover forage ratios and the distribution of cover across the project area. The following table from Chapter 2 summarizes the differences.

Table 2-1 Comparison of Alternatives to Issues of Forest Health and Big Game Winter Range

	Alt 1	Alt 2	Alt 3
Acres left untreated (No Action)	555	0	0
Forest Health Issue			
Acres trended toward HRV - using *regeneration* ***** harvesting - with underburning	0	320	555
Forest Health Issue			
Acres trended toward HRV - using *intermediate** harvesting - no underburning	0	235	0

	Alt 1	Alt 2	Alt 3
Big Game Winter Range Issue			
Acres of *forage* created - using *regeneration* harvesting - with underburning	0	320	555
Big Game Winter Range Issue			
Acres of *cover* maintained - using *intermediate* harvesting - no underburning	0	235	0

* - Regeneration harvesting = seed and shelterwood cuts.
- Intermediate harvesting = commercial thinning and sanitation salvage cuts. See Silvicultural definitions Appendix C.

Alternative 2: Addresses the forest health issue by regenerating 320 acres (Units 1, 3, 4, 6, 8, 9) and thinning 235 acres (Units 2, 5, 7, 10). Regeneration cutting "quickly" trends a stand toward the HRV because it removes the dead and dying trees, most of the shade tolerant trees such as Douglas-fir and grand fir, and creates conditions favorable for desirable shade intolerant trees that are abundant within the HRV such as ponderosa pine, larch and white pine. The intermediate treatments still trend the 235 acres toward the HRV, but would do so in a slower two-step process, deferring the regeneration of Units 5 and 10.
Alternative 2 addresses the big game winter range issue by salvaging and thinning in Units 2, 5, 7 and 10; leaving a mosaic of cover and forage within the project area and keeping the 13 acres of critical deer winter range in Unit 5 intact. The regeneration of Units 2, 5, 7 and 10 would take place after 15 -20 years, when Units 1, 2, 4, 6, 8, and 9 have regenerated and are out of opening status. This "area regulated" management style would keep a mosaic of stands in different stages of development across the project area at any give time, however, numerous entries would be needed over time to maintain this "diversified portfolio" of stands.

Alternative 3: Addresses the forest health issue by regenerating all of the units and "quickly" trends them toward conditions within the HRV. This "pulse disturbance" management style concentrates management activities to a narrow time period and mimics the effects of fire(s) that historically burned through the area in that all but the larger trees would be removed and the stands regenerated to desirable, fire tolerant species, such as ponderosa pine, larch and white pine. The next entry into project area would not be for 5-10 years for overstory removals and precommercial thinning opportunities.
Alternative 3 addresses the big game winter range issue by creating abundant forage (555 acres), however, it does not leave a mosaic of cover and forage in the project area as proposed with Alternative 2.

FOREST HEALTH (Issue 1)
DIRECT, INDIRECT AND CUMULATIVE EFFECTS OF PROPOSED KV ACTIVITIES

Pre-Commercial Thinning and Weed/Release Treatment:
This would be a priority treatment in the existing regeneration units created from previous timber sales. Many of the planted trees (ponderosa pine, larch and white pine) are being out competed by other species such as lodgepole that is infected with Western Gall Rust (a fungal stem canker).

In order to trend the stand species composition toward values in the HRV, thinning the stands and favoring the ponderosa pine, larch and white pine is necessary at this point in the stand's development. A short-term (approx. five year) fire hazard is created with the pre-commercial thinning slash. All of the proposed pre-commercial thinning units are outside Lynx Analysis Units (LAU) where this treatment may pose a conflict with lynx prey. See page 4-22.

Aspen Regeneration:
Aspen clones throughout the western U.S. are experiencing a major population decline associated with the exclusion of fire and competition from coniferous trees. In order to regenerate these aspen clones, the parent colony of aspen must be slashed along with adjoining conifers, allowing sunlight to reach the forest floor. After slashing and burning the aspen clones, the root system sends up aspen shoots or root suckers. About 30,000 – 60,000 shoots per acre can be expected to regenerate after treatment.

Three aspen clones (each 1-3 acres in size) in Unit 5 have been identified for regeneration treatment. All treatment areas are located on drier sites adjacent to existing skid tails, away from riparian areas. Slash produced in the treatment would be piled and burned.

Ecosystem Burn:
Would be located in the north-central part of the analysis area, approximately 130 acres in size on a south-facing slope that is heavily used by big game for winter range. For the proposed location of the burn, see fig. 2-12.

The primary objectives for the ecosystem underburn are:

1) To reduce the risk of wildfire and trend stand attributes towards those in the HRV.
2) Improve browse quality and quantity on big game winter range.

Implementing the ecosystem burn would use prescribed fire to reduce the existing fuel loadings that consist of accumulations of litter, dead brush, and the thick pockets of sapling size trees that create ladder fuels. The burning operation would be carried out in early spring or late fall when the environmental conditions needed for a prescribed fire are optimal.
Usually, an underburn of this size and complexity would take 1-3 days to complete and the majority of the smoke would be dispersed within a day after ignition stopped.

Usually, the browse plant species resprout within two weeks after the burn. Growth rates and nutrition content within the browse plants are higher when compared to pre-burn conditions.

From a vegetative impact stand point, there are no measurable:
Irreversible commitments of resources, unavoidable adverse effects, or loss of long-term productivity associated with the pre-commercial thinning, aspen regeneration, or ecosystem burning activities. See Biological Assessments (BA) in Appendix B for further reference.

The cumulative effects of these projects, would contribute toward the vegetative restoration goals of the Pipeline EA.

Summary Table for KV Activities

Treatment	Acres	Stand Numbers
Pre-commercial thinning/weed and release	47	739-01- (114, 054, 078) 739-03-079
Aspen regeneration	8-10	739-01-028
Ecosystem burn	130	739-03- (024, 028, 036, 039)
Total acres treated	**185**	

There would be no measurable detrimental cumulative effects to the Pipeline analysis area ecosystem from any of the action alternatives, including post-sale and KV treatments to any existing or reasonably foreseeable future actions within the assessment area.

REASONABLY FORESEEABLE ACTIONS
(Pertaining to Forest Health Issue 1).

This section includes both federal and non-federal "Reasonably Foreseeable Actions." The federal actions discussed below include federal actions that are listed on the IPNF's Schedule of Proposed Actions (SOPA). These federal actions are currently at various stages in the planning process. Projects that may overlap or are adjacent to the Pipeline project area are:

1) Bonners Ferry Ranger District Salvage EIS.
2) District Overstory Removal EA.
3) Logging on adjacent private lands.
4) Gravel pit reactivation (County).
5) Current Timber Sale Activities

Actions that overlap with Alternatives 2 and 3

1) The Bonners Ferry Ranger District Salvage EIS is scheduled for FY 2001. A proposed action is being developed and is scheduled for release in the year 2000. Harvest of these dead and dying trees is proposed to reduce hazardous fuels, restore productive stand conditions and ecological functioning in areas affected by windstorms, insects, disease and other damaging events. The vegetative objectives of this proposal are consistent with the objectives of the Pipeline EA. The direct, indirect and cumulative effects of this project would contribute toward vegetative restoration and reduction of fire and fuels risk in the Pipeline project area.
   The proposed EIS operations are dependant on natural events, such as insect and disease infestations or rare wind events, and are subject to stringent operational parameters such as State of Idaho BMPs and INFS guidelines. The salvage is being designed to harvest only along roadsides and in areas of existing timber sale units. The direct, indirect and cumulative effects of this project would contribute toward vegetative restoration and reduction of fire and fuels risk in the Pipeline project area.

2) The Bonners Ferry Ranger District will also be preparing an Overstory Removal EA, which is scheduled for FY 2001. Initial scoping has been conducted for this project, but no proposed action has been developed at this time. This project will analyze alternatives to remove residual overstory from past harvests where establishment of regeneration has been certified. There is *one* potential overstory removal unit located in the Pipeline EA cumulative effects area, bordered by proposed Units 2, 3, and 4. Any proposed removals would be required to meet Forest Plan standards and protocols for snag management, INFS, BMPs, etc.
   The direct, indirect and cumulative effects of this project would contribute toward vegetative restoration and reduction of fire and fuels risk in the Pipeline project area.

3) Most of the accessible private land next to the project area has already been harvested. Currently the Idaho Department of Lands is aware of no new logging on private lands adjacent the Pipeline analysis area (Haase, 2000).
   Consequently, no direct, indirect or cumulative effects from private land logging are anticipated.

Boundary County may use the gravel pit located on Road 2781 if the permit is renewed. A potential for more truck traffic during logging operations exists. The handicapped hunter access during rifle season for elk and deer would take priority over rock crushing operations. No plans to use the gravel pit have been submitted at this time.

4) There are no active Forest Service timber sales in the project area. There has been harvesting on adjacent private lands in the last decade. The KV projects listed on page 4 - 10 have been included in the analysis of the proposed alternatives. All KV activities would occur within ten years of completing the timber sale, by law.

Cause and Effects Chart
Forest Health (Issue 1)

CAUSE

Regeneration harvest (seed tree or shelterwood) and underburn .

EFFECTS

Understory burn converts slash into available nutrients.

↓

Fuel loading reduced. Stand replacement fire risk lowered.

↓

Overstory trees have less tree to tree competition. Increased growth and vigor. Higher resilience to insect and disease attacks.

↓

Favorable conditions to regenerate white pine, larch, and ponderosa pine, which are well adapted to the site.

↓

Openings in forest canopy allow sunlight into the understory; permitting regeneration of larch, ponderosa pine and white pine.

↓

Stand attributes trended toward values in HRV.

↓

Repeat under burning as needed.

EFFECTS

Understory trees (Grand Fir, Douglas-fir, Western Red cedar) consumed in the underburn.

↓

Single story park-like stand created.

↓

Opening up the stand allows wind penetration. Isolated pockets of blowdown possible.

↓

Incidental overstory tree mortality from underburning activities. Snags for wildlife created.

FOREST PLAN CONSISTENCY
(Pertaining to Forest Health Issue 1).

All issues, alternatives and KV projects developed in the Pipeline EA are consistent with the direction from the Forest Plan for the Idaho Panhandle National Forests, August 1987.
The Pipeline project area lies within Management Area (MA) - 4, designated by the Forest Plan as "Lands designated for timber production within big game winter range". For a brief description of management objectives, see page 1-7.

- In the Forest Plan, refer to Chapter 3, pgs. 17-22 for details on the goals, objectives and management styles that should be used to manage lands within the MA-4 designation.
- See Chapter 1, page 1 of this EA for a list of other resource documents that support this EA.

Alternative 1 (No Action):
Under this alternative, the following points contradict management direction given in the Forest Plan:

- The opportunity to improve the quantity and quality of forage on big game winter range would be deferred.
- The current forest health issue concerning the increased tree mortality from insect and diseases would not be addressed or solved in any way.
- There is an increasing risk of severe stand replacement fires in urban interface scenarios.
- There is an increasing risk of severe fire related damages to wildlife habitat, watershed stability, and water quality.

Alternative 2 and 3 (Action Alternatives):
These alternatives comply with the Forest Plan guidelines by:

- Improving the quantity and quality of forage on big game winter range.
- Addressing the current forest health issue concerning the increased tree mortality from insect and diseases.
- Lowering the risk of severe stand replacement fires in urban interface scenarios.
- Lowering the risk of severe fire related damages to wildlife habitat, watershed stability, water quality and down stream fisheries.

BIG GAME WINTER RANGE (Issue 2)
General cause and effects flowchart

CAUSE

Regeneration harvest (seedtree or shelterwood) and underburn in big game winter range.

EFFECTS

- Openings in forest canopy allow sunlight into the understory.
- Understory burn converts slash into available nutrients.
- Increase in quantity and quality of browse plants.
- Repeat underburn every 5-10 years to rejuvenate browse plants.
- Reduction of winter starvation.
- Greater numbers of offspring.
- Winter range has greater carrying capacity and herd sizes increase.

EFFECTS

- Loss of hiding cover for big game. Approx. 15-20 years.
- Possible increase in winter mortality. If thermal cover is not within the vicinity.

EFFECTS COMMON TO ALL ALTERNATIVES
BIG GAME WINTER RANGE (ISSUE 2)

For critical mid-winter range, the amount of canopy cover in the target stands must be within a narrowly-defined set of values; i.e. 60% to 80%, so that the cover functions both to:

a) Intercept snow, and
b) Allow enough light through the canopy to allow understory vegetation, primarily Cedar and Pachistima to grow.

Approximately 391 acres (of the 555 acres of proposed treatment area) are capable mid winter range, only 13 acres are currently suitable (see table 4-1). Most stands fall out of suitable habitat because of insufficient stem diameter or canopy cover – generally a result of past management activities. However, much of the lower part of the project area provides microsites that effectively serve as critical mid-winter range, particularly in Units 5 and 10.

Direct and Indirect Effects

Alternative 1: The No Action Alternative would allow several of the stands that are currently too young to provide adequate snow interception to grow, but without some fire or silvicultural management the stand structure would not be optimized. Further, forest insect and disease pathogens would contribute to a decline in tree growth or stagnation.

In general, the project area is characterized by stands that are increasingly stressed by forest pathogens, which are not likely to continue to be good mid-winter habitat or to grow into it. The stands are gaining in biomass of dense boles faster than low-intensity fires can control. Stands that are currently in suitable condition may grow out of suitable condition if the understory becomes so dense that deer cannot maneuver in them, or if the overstory becomes too closed so that they provide snow interception but inadequate light for understory forage plant growth. There is still much winter range cover for white-tails and other ungulates, but the critical mid-winter stands are those that provide survival opportunities during severe winters. Since the herds are quite healthy at this time, the loss of even a fairly large number of animals will not jeopardize the health of the local herd, but it may not be socially acceptable. This is especially the case in this area because it has a special hunt access for the handicapped hunter program.

Alternative 2: The action alternatives treat Units 5 and 10, probably the stands most capable of providing excellent midwinter habitat because of topography and habitat type. These stands are currently now being heavily used, but are not in optimal condition. There are microsites within the stands that are better habitat than the overall stand. A prescription which proposes a sanitation salvage / commercial thin would select for the preferred microsites while treating part of the remaining stand. This strategy should allow the stands to remain in rotation for excellent midwinter cover and retain the best portions currently providing this cover. Other stands on the district treated in this way (i.e. East Westside Timber Sale) have resulted in ideal white-tailed deer habitat.

Generally, the commercial thin or sanitation salvage prescriptions maintain the stands as suitable winter habitat over time, although there may be a reduction in quality in the first 5 years after treatment. Conversely, these stands would be likely to be moving out of suitability if not treated anyway, since dense overstory will limit the amount of sunlight reaching the forest floor and subsequently reduce the resulting forage. Snow interception abilities of the stand are enhanced as

cover increases, which is a benefit up to the point that the animals have difficulty moving through the thickets and blowdown.

While harvest activities may temporarily displace deer from adjacent habitats, they will quickly move back to preferred stands once harvest activity subsides. Therefore, it would be desirable to conclude any sale activity at least two weeks before the start of deer season to accommodate disabled hunters. There are two options for maintaining hunting opportunities provided by the current disabled hunter program in the project area. The first is to find an alternative road to provide this opportunity. The second is to limit the operating season during the rifle/archery hunting seasons (deer and elk) plus two weeks prior to the opening to allow animals to return to the area after harvesting operations. Neither option would affect deer or elk occurrence in the long term in the project area, but would affect short-term occurrence.

Alternative 3: The main difference between the action alternatives once again lies in the treatment of Units 5 and 10. While shelterwood harvest of these units would provide a forage bonanza to white-tailed deer (and other ungulates) in the immediate future, it would come at the expense of the loss of critical mid-winter range that is essential to deer survival during especially harsh winters. In addition, creating openings in these stands adjacent to openings in other harvest units, as well as large openings to the east (previous activities) and south (private timberlands), would decrease security for other ungulates and may not be socially acceptable.

Cumulative Effects

There are no known connected actions or cumulative effects within this compartment which would detrimentally affect white-tailed deer or their habitat. Private land owners in the Moyie River valley continue to clear stands of suitable cover, putting the burden of winter range on National Forest System (NFS) lands. An analysis of the Moyie River Valley critical midwinter stands (project file) revealed a mixture of age classes and quality of stands on NFS lands such that deer habitat is not likely critically limiting in the next decade or two. During this time, it would be important to assess the condition of public and private lands in regards to deer habitat to make informed decisions on long-term and broadscale winter range management.

A cumulative effect map is on page 4-25.

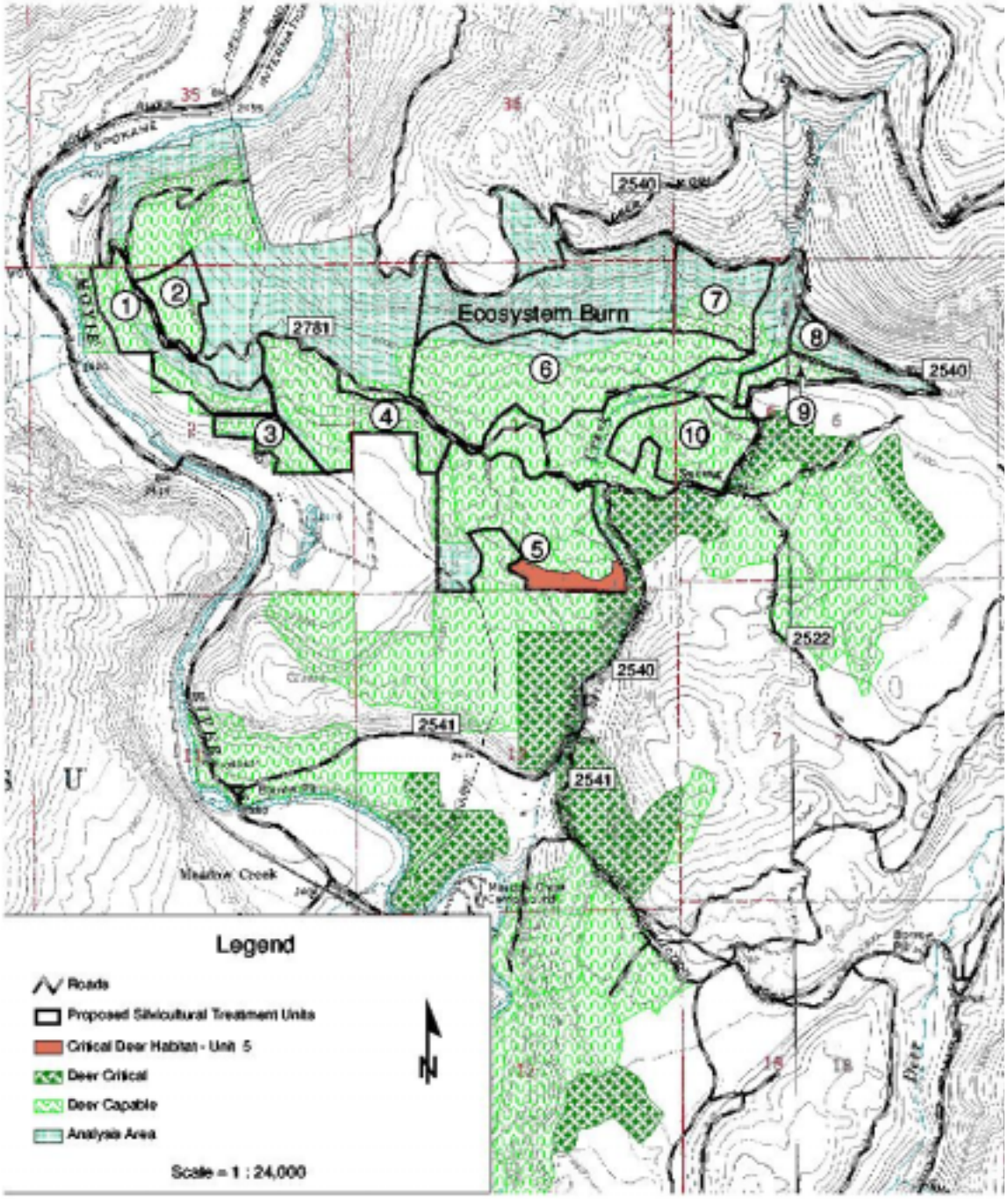
Determination of Effect

Because of the minimal short-term, and beneficial long-term, impacts of the proposed activities, there would be a beneficial impact on white-tailed deer and their habitat.

Table 4-1. Treatment Acres in Big Game Winter Range

Alt	Winter Range Total Acres in Placer Creek	Mid-Winter Total Acres	Winter Range Treated Acres	Mid-Winter Treated Acres
1	1859	331	0	0
2	1859	331	441	13
3	1859	331	441	13

Pipeline Project Area - Big Game Winter Range



Big Game Winter Range (Issue 2)
Effects of Proposed KV Activities

Direct, Indirect and Cumulative Effects of Proposed KV Activities

Pre-Commercial Thinning and Weed/Release Treatment:
Pre-commercial thinning the regeneration units from the early 1980's would have a beneficial impact for big game in the long run. The selected leave trees would grow faster and provide critical winter habitat characteristics sooner than if left untreated and left to grow into thick dark impenetrable thickets with no understory browse for big game.

All of the proposed pre-commercial thinning units are outside Lynx Analysis Units (LAU) where this treatment may pose a conflict with lynx prey (see page 4-22).

Aspen Regeneration:
The aspen colonies in the Pipeline project area are a valuable winter browse for big game and the buds are an important food source for grouse. Cutting and burning of the existing aspen stands would encourage sprouting of this valuable forage species. Likewise, underburning with prescribed fire in proposed units 1,3,4,6,7,8,9 would result in increased sprouting of more palatable shrub species, thus improving the forage value of non-critical winter range areas such as the Ecosystem burn area north of Unit 6 (See page 2-12).

Implementing this treatment would improve big game habitat by providing an increase in the quality and quantity of aspen trees in and adjacent to critical winter habitat.

Ecosystem Burn:
Would be located in the north-central part of the analysis area, approximately 130 acres in size on a south-facing slope that is heavily used by big game for winter range. See map on page 2-12.

The primary objectives for the ecosystem underburn are:

1) To reduce the risk of wildfire and trend stand attributes towards those in the HRV.
2) Improve browse quality and quantity on big game winter range.

Implementing the ecosystem burn would use prescribed fire to reduce the existing fuel loadings that consist of accumulations of litter, dead brush, and the thick pockets of sapling size trees that create ladder fuels. The burning operation would be carried out in early spring or late fall when the environmental conditions needed for a prescribed fire are optimal. Underburns of this size and complexity would usually take 1-3 days to complete and the majority of the smoke would be dispersed within a day after ignition stopped. Usually, the browse plant species resprout within two weeks after the burn. Growth rates and nutrition content within the browse plants are higher when compared to pre-burn conditions.

From a big game winter range stand point, there are no measurable:
Unavoidable adverse effects, irreversible commitments of resources, or loss of long term productivity associated with the pre-commercial thinning, aspen regeneration, or ecosystem burning activities. The cumulative effects of these projects, would contribute toward the vegetative restoration goals of the Pipeline EA.

REASONABLY FORESEEABLE ACTIONS (Pertaining to Big Game Winter Range Issue 2)

This section includes both federal and non-federal "Reasonably Foreseeable Actions." The federal actions discussed below include federal actions that are listed on the IPNF's Schedule of Proposed Actions (SOPA). These federal actions are currently at various stages in the planning process. Projects that may overlap the Pipeline project area:

1) Bonners Ferry Ranger District Salvage EIS.
2) District Overstory Removal EA.
3) Logging on adjacent private lands.
4) Gravel pit reactivation.
5) Current Timber Sale Activities

Actions that overlap with Alternative 2 and 3

1) The Bonners Ferry Ranger District Salvage EIS is scheduled for FY 2001. A proposed action has been developed and is scheduled for release in the summer of 2000. Harvest of these trees is proposed to reduce hazardous fuels, restore productive stand conditions and ecological functioning in areas affected by windstorms, insects, disease and other damaging events. The direct, indirect and cumulative effects of this project would contribute toward vegetative restoration and reduction of fire and fuels risk in the Pipeline project area. Because the proposed EIS salvage operations are dependant on rare wind events and stringent operational parameters (i.e. State of Idaho BMP's, INFS guidelines) described in the EIS*;* there will be a small chance of having any measurable direct, indirect or cumulative effects to the big game winter range in the Pipeline analysis area.

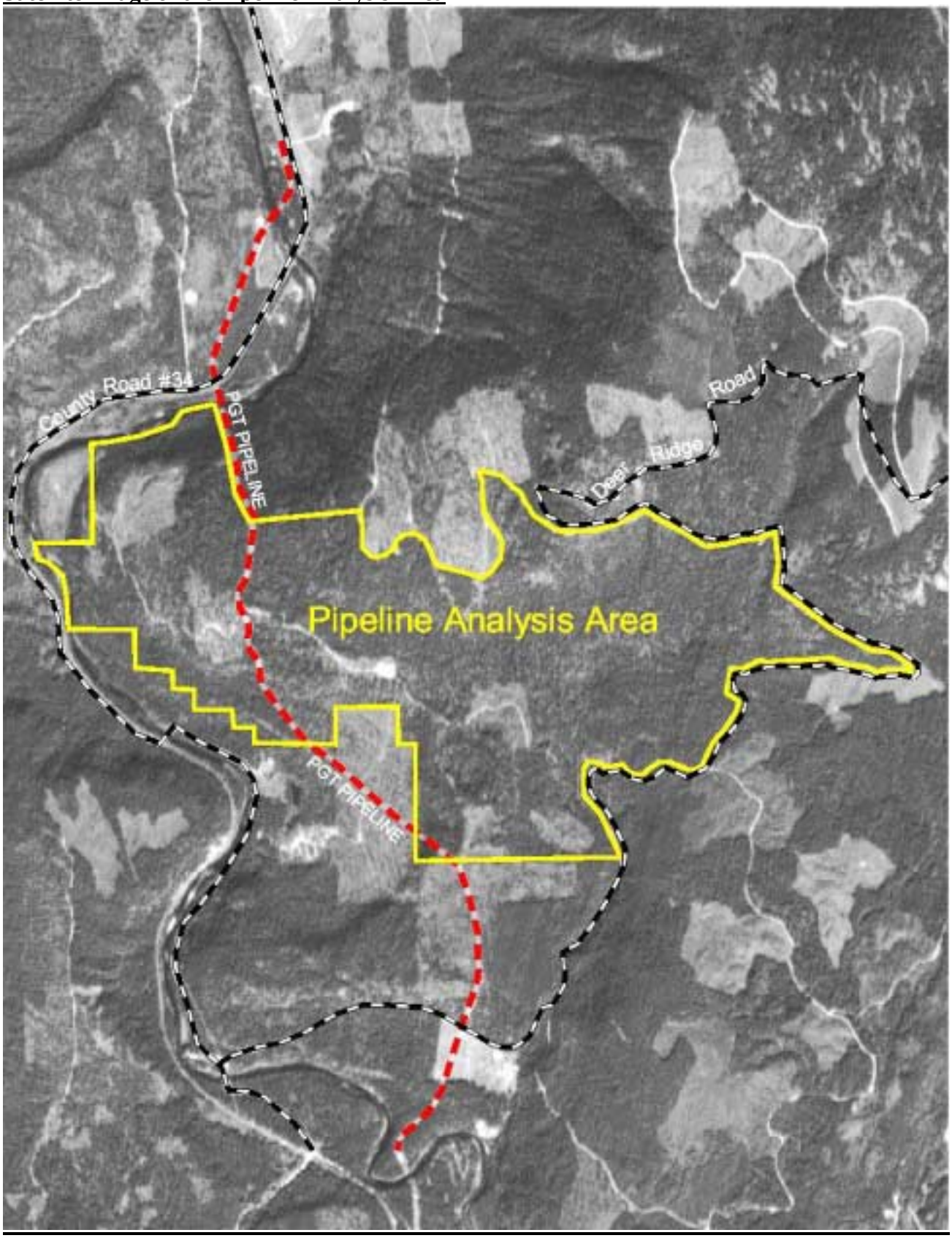
2) The Bonners Ferry Ranger District will also be preparing an Overstory Removal EA, which is scheduled for FY 2001. Initial scoping has been conducted for this project, but no proposed action has been developed at this time. This project will analyze alternatives to remove residual overstory from past harvests where establishment of regeneration has been certified. There is *one* potential overstory removal unit located in the Pipeline EA cumulative effects area, bordered by proposed Units 2, 3, and 4. Any proposed removals would be required to meet all applicable Forest Plan standards. The direct, indirect and cumulative effects of this project would contribute toward vegetative restoration and reduction of fire and fuels risk in the Pipeline project area.

3) Most of the accessible private land next to the project area has already been harvested. Currently the Idaho Department of Lands is aware of no new logging on private lands adjacent to the Pipeline analysis area (Haase 2000). Consequently, there would be no measurable direct, indirect or cumulative effects to the big game winter range resources.

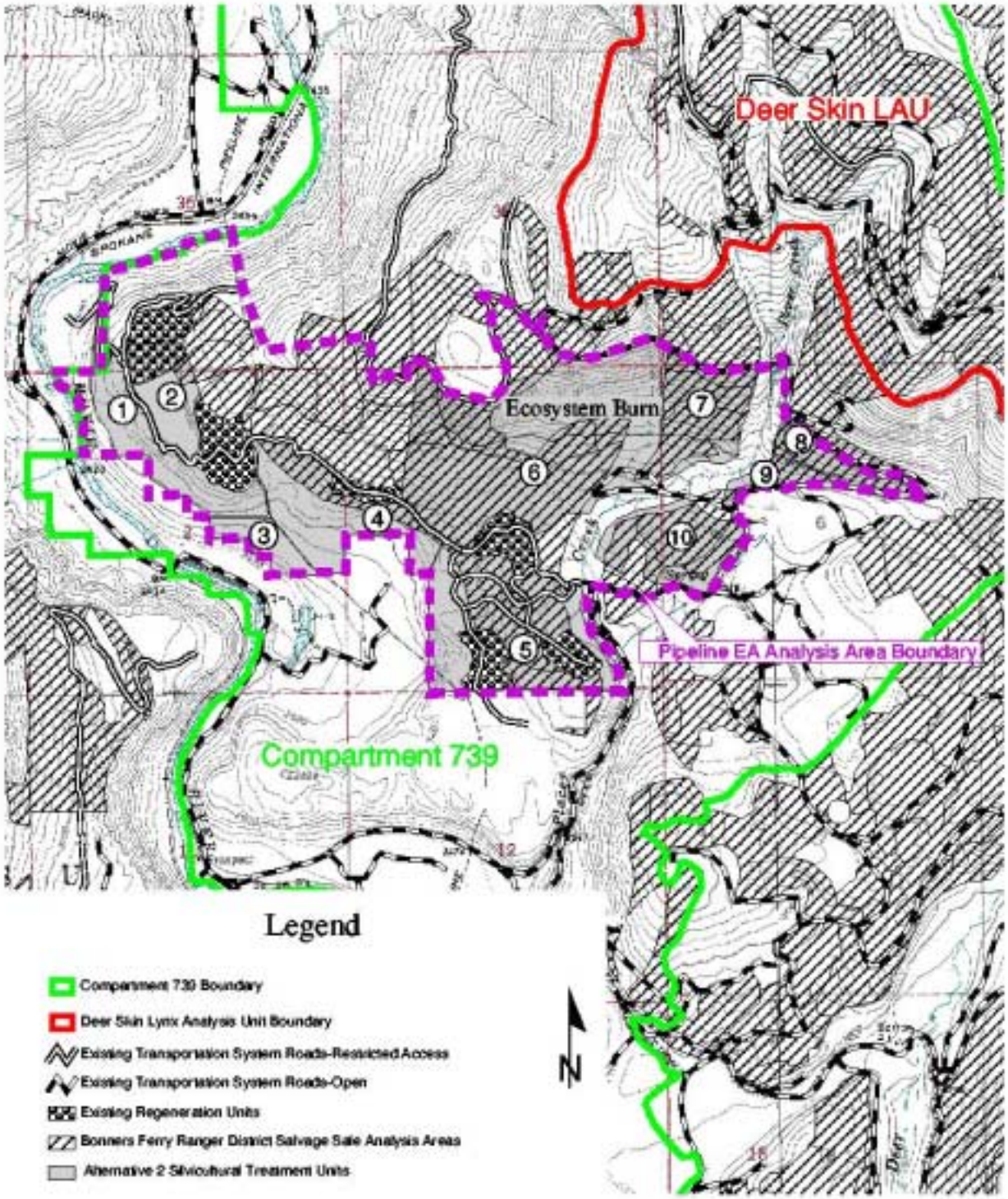
4) Boundary County may use the gravel pit located on road 2781 if the permit is renewed. A potential for more truck traffic, dust, and crushing equipment noise exists. *No* plans to use the gravel pit have been submitted by the County at this time. Therefore, there would be no measurable direct, indirect or cumulative effects to the big game winter range resources.

5) There are no active Forest Service timber sales in the project area. The KV projects listed on page 4-10 have been included in the analysis of the proposed alternatives. All KV activities would occur within ten years of completing the timber sale, by law.

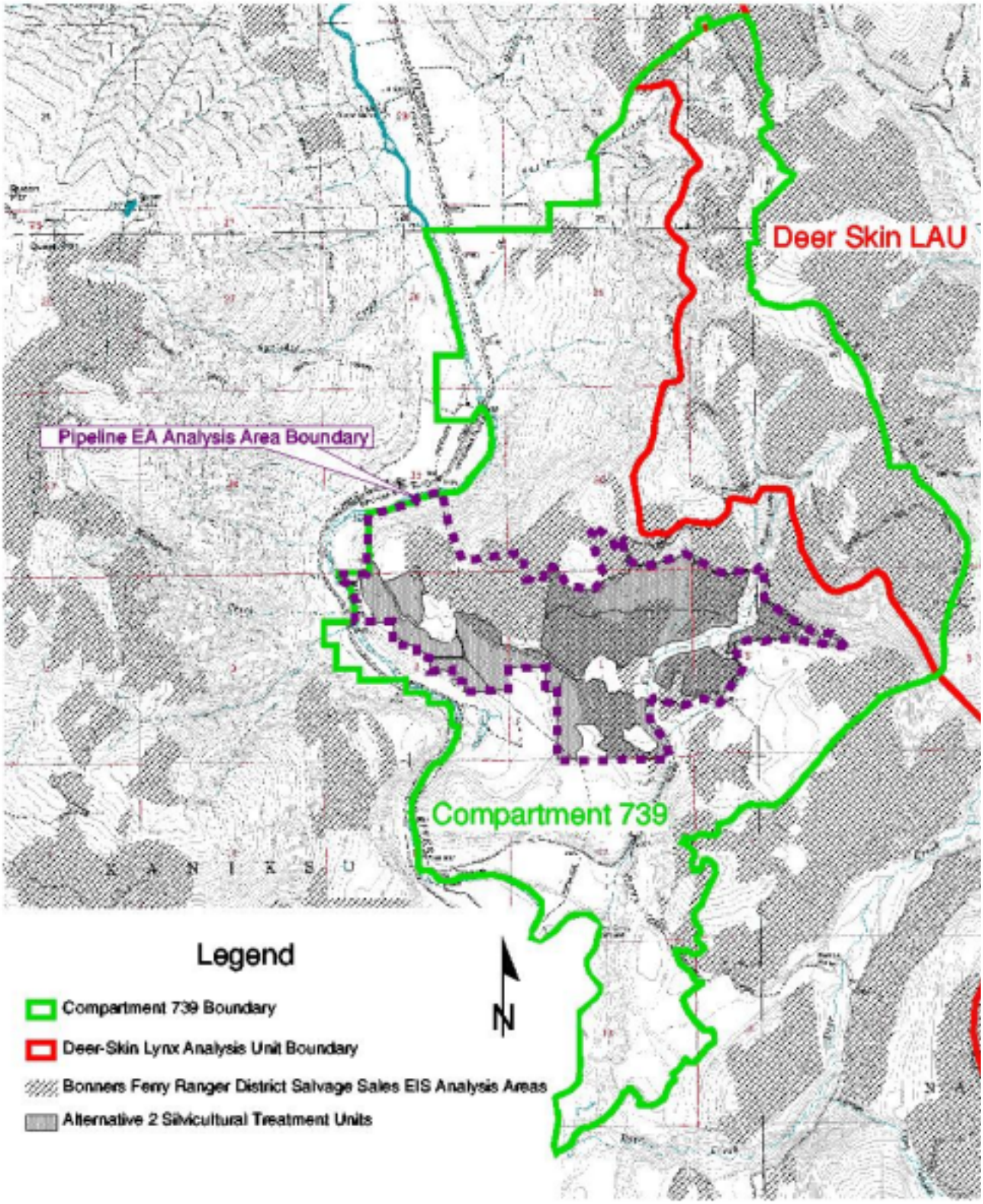
6) Satellite Image of the Pipeline Analysis Area



Pipeline EA Alternative 2 Silvicultural Treatment Units Versus
Bonners Ferry Ranger District Salvage Sales Analysis Areas Comparison Map



Pipeline EA Alternative 2 Silvicultural Treatment Units Versus
Bonners Ferry Ranger District Salvage Sales EIS Analysis Areas Comparison Map



FOREST PLAN CONSISTENCY

All issues, alternatives and KV projects developed in the Pipeline EA are consistent with the direction from the Forest Plan for the Idaho Panhandle National Forests, August 1987.
The Pipeline project area lies within Management Area (MA) - 4, designated by the Forest Plan as "Lands designated for timber production within big game winter range". For a brief description of management objectives, see page 1-7.

- In the Forest Plan, refer to Chapter 3, pgs. 17-22 for details on the goals, objectives and management styles that should be used to manage lands within the MA-4 designation.
- See Chapter 1, page 1 of this EA for a list of other resource documents that support this EA.

Alternative 1 (No Action):
Under this alternative, the following points contradict management direction given in the Forest Plan:

- The opportunity to improve the quantity and quality of forage on big game winter range would be forgone.
- The current forest health issue concerning the increased tree mortality from insect and diseases would not be addressed or solved in any way.
- There is a rising risk of severe stand replacement fires in urban interface scenarios.
- There is a rising risk of severe fire related damages to wildlife habitat, watershed stability, and water quality.

Alternative 2 and 3 (Action Alternatives):
These alternatives comply with the Forest Plan guidelines by:

- Improving the quantity and quality of forage on big game winter range.
- Addressing the current forest health issue concerning the increased tree mortality from insect and diseases.
- Lowering the risk of severe stand replacement fires in urban interface scenarios.
- Lowering the risk of severe fire related damages to wildlife habitat, watershed stability, water quality and down stream fisheries.
- Comply with INFS.
- Comply with Clean Water and Clean Air Act.

Chapter 5 - LIST OF PREPARERS

The following individuals participated in the formulation and analyses of the alternatives and the subsequent preparation of the Environmental Assessment.

Chad Baconrind - Fisheries Biologist

Pat Behrens - Forester/Certified Silviculturist

John Cleeves – Other Resources

Ned Davis - Civil Engineer

Anna E. Hammet - IPNF North Zone Botany Coordinator

Garry Harris – Hydrologist

Sandy Jacobson - Wildlife Biologist

Milton Loros III - Cartographic Specialist

Brett Lyndaker – Wildlife Technician

Doug Nishek - Presale Forester, Interdisciplinary Team Leader

Tom Sandberg - Archaeologist

Rob Steinhorst - Timber Management Assistant

Bill Terrill - Forester/Certified Silviculturist

Elaine Zieroth – District Ranger

Chapter 6 - PUBLIC INVOLVEMENT

Scoping is an integral part of the environmental analysis process and was used to identify issues associated with the proposed action. Elements of scoping include establishing the depth of analysis needed, initiating public involvement, identifying environmental issues, selecting an interdisciplinary team, exploring possible alternatives and their effects, and making task assignments (FSH 1909.15, Chapter 10).

The Pipeline EA was initiated to find out why so many trees in the project area were dying. Two field trips were conducted with the forest entomologist / pathologist. One trip was in 1992 and another in 1998. The trip findings concluded that the forest health is *poor* overall from overcrowded timber stands and that insects and disease mortality was on an increasing trend. Detailed trip reports are located in the Pipeline project folder.

Public scoping for this project was initiated July 14, 1998. A scoping letter was mailed to individuals and agencies (including the Kootenai Tribe of Idaho) on the IPNF's Quarterly Schedule of Proposed Actions, and adjacent landowners, informing them that an EA to address vegetation management needs in the Pipeline project area (Placer Creek) was being prepared.

The returned public comments ranged from "We want all commercial logging stopped on National Forests" to "Amen, it's about time something was done about those dying trees, please get them before they are only good for pulp". Most comments were neutral in nature and they just wanted to stay on the mailing list for the Quarterly Reports.

Landowners who live near the Project area, the District Ranger, and Project Team Leader visited the Pipeline project area on September 22, 1998.

The proposal included forest health and big game winter range as *driving issues* to treat roughly 350 acres with salvage logging and group selection cuts. At this time the project was titled the Pipeline *Salvage* Environmental Assessment (EA) and the assessment area encompassed nearly 800 acres.

In October 1999, the assessment area was increased from 800 to 1,100 acres with the proposed treatment area increased from 350 to 555 acres, and the project was renamed the Pipeline EA. The larger analysis area allowed the ID team to use broad *ecosystem management* styles to address the forest health and big game winter range issues.

The additional acreage added to the analysis area did not border any more private land nor did the driving issues for the proposal change. Therefore "rescoping" was not carried out.

Chapter 7 - LITERATURE CITED [1]

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1 Can be made available through the Bonners Ferry Ranger Station.

Appendix A

OTHER RESOURCE CONCERNS

Reasonably foreseeable actions discussed in the "Other Resource Concerns" section are:

1) Bonners Ferry Ranger District Salvage EIS.
2) District Overstory Removal EA.
3) Logging on adjacent private lands.
4) Gravel pit reactivation (County).

Other Resource topics are discussed in the following order:

BIODIVERSITY

A. Biological Factors

1. Noxious Weeds
2. Wildlife (Aquatic and Terrestrial)
    - a) Threatened or Endangered Species
    - b) Sensitive Species
    - c) Management Indicator Species
    - d) Snag Dependent Species
    - e) Native Plant Species
    - f) Neotropical Migrant Birds
    - g) Old Growth
    - h) Fragmentation
    - i) Linkages
    - j) Range

B. Social/Economic

a) Cultural Resources
b) Economics/Community Stability
c) Visual Resources
d) Recreation
e) Public Health and Safety
f) Access Management
g) Roadless Area
h) Minerals
i) Special Use Permits
j) Wood Substitute
k) Alternate Supply of Wood

BIODIVERSITY

A. Biological Factors

1. Noxious Weeds

Travel from timber harvest activities can introduce and distribute the seeds of noxious weeds. In the Pipeline assessment area the biggest concern for the spread of noxious weeds is from logging equipment. Any off-road logging equipment would be washed off prior to entering the sale area and off loaded into the units directly and not on the PGE pipeline ROW, which is the area most affected by noxious weeds at present. Prior to the purchaser operating in any of the units, the timber sale purchaser would spray any weed populations along the road shoulders and the PGE pipeline in an effort to reduce weed spread into the units. Forest Service would spray follow up treatments under the KV plan.
Ground disturbed areas, such as landings and especially road shoulders, provide suitable habitat for many weed species. Most of the noxious weeds are very aggressive and tend to dominate over natural vegetation for use of the habitat. A weed monitoring and control program would be implemented under the KV plan if funding is available. To prevent further infestation, only certified weed free seed would be used to seed road shoulders, temporary roads, skid trails, and landings. Monitoring and the environmental effects of weed control are covered in the Bonners Ferry Weed Control Projects EIS (USDA 1995).
No measurable direct, indirect, or cumulative effects from noxious weeds or spraying of noxious weeds are expected from implementation of any action alternative.

2. Wildlife

a) Threatened and Endangered Species - There are six threatened, endangered, or recently delisted wildlife species on the Bonners Ferry Ranger District. They include the grizzly bear, woodland caribou, gray wolf, bald eagle, lynx and peregrine falcon (delisted). Refer to the attached T&E Biological Assessment, found in Appendix B, for further detailed information

Woodland Caribou - There would be no direct or indirect effects to caribou or its habitat because the proposed actions are located outside the designated recovery area. Consequently, habitat effectiveness would not change from existing condition. No other cumulative effects are expected. For these reasons, the Pipeline project would have no effect on the woodland caribou or its habitat.

Grizzly Bear - There would be no direct or indirect effects to Grizzly Bears or their habitat because the proposed actions are located outside the designated recovery area. Consequently, habitat effectiveness would not change from existing condition. No other cumulative effects are expected. For these reasons, the Pipeline project would have no effect on the Grizzly Bears or their habitat.

Gray Wolf - Mortality risk is unlikely to change measurably in the project area because no new system roads will be constructed, and current access management is expected to continue.

The abundance of prey (deer, moose and elk) is unlikely to be measurably affected by treatments in this project. Because availability of prey species is not limiting wolf recovery in the district, it would therefore not affect the ability of the wolf to successfully recover.

None of the alternatives affect denning or rendezvous habitat, because there is no habitat clearly identifiable as either denning or rendezvous habitat.

There are no known connected actions or cumulative effects within this compartment that would detrimentally affect gray wolves or their habitat.

Based on the lack of mortality risk in the project area and immediate vicinity, and the maintenance of adequate prey base and habitat security, there would be no direct, indirect or cumulative effects to wolves or their habitat with any of the action alternatives.

Bald Eagle - The Pipeline EA is within the bald eagle recovery area, however, there is no suitable nesting habitat within the project area. The nearest known bald eagle territory is at Robinson Lake. No cumulative effects are expected because of the unlikelihood of direct or indirect effects from the project activities.

Lynx – The project is lower elevation than that normally used by lynx, and there is no available denning habitat in the project area. There is low elevation (less than 3200') habitat available for lynx in the project that will only be used in the event that hare populations at higher elevations are either low or non-existent. The project area lies approximately .5 mile outside the Deer-Skin Lynx Analysis Unit (LAU). There will be no further analysis for this species in this document. There would be no direct or indirect effects to Lynx or their habitat because the proposed actions are located outside the LAU.

b) Sensitive Species – The Bonners Ferry Ranger District contains habitat or populations for several sensitive wildlife species listed below. Refer to the attached Sensitive Species Biological Evaluation found in Appendix B.

Flammulated Owl – Within timber compartment 739 (see fig 4-24), there is a very limited amount of currently suitable flamulated owl habitat, despite nearly one-quarter of the land area being capable habitat. This project is likely to accelerate or trend capable (but not suitable) habitat toward suitability faster than the no action alternative would.
There are no additional adverse cumulative effects expected from any other planned or ongoing projects within the district. The proposed action would improve dry-site habitat on the district with expected long term increases in suitable flamulated owl habitat.
In summary, the direct, indirect, and cumulative effects of any alternative are not likely to trend the flammulated owl towards federal listing.

Black-backed Woodpecker – While the proposed actions may result in short-term reduction of black-backed woodpecker habitat, it would trend the affected stands toward long-term production and maintenance of habitat for this species.
The proposed ecosystem burn would be beneficial for this species through the creation of snags while not greatly affecting coarse woody debris.
The proposed action may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species.

Common Loon - Common loons are large lake-nesting birds. They require lakes with emergent vegetation that are at least 10 acres in size because of their need to have a large expanse of water to take off and land. There are no lakes near any of the proposed treatment units that meet this description, and, at the present time no loons are known to nest in Boundary County. For these reasons, there would be no direct, indirect, or cumulative effects on common loon or their habitat.

Boreal Toad – Preliminary analysis shows that Inland Native Fish Strategy guidelines concerning riparian habitat conservation areas within 150 ft. of the edge of wetlands would prevent sedimentation of toad breeding habitat. Because toads frequently breed in muddy-bottomed ponds (Nussbaum et al, 1983, p. 129), a small amount of sedimentation is not a great cause for concern for this species. The road density would not change as a result of this project, so mortality risk from vehicles would remain the same. For these reasons, there would be no direct, indirect, or cumulative effects on boreal toad or their habitat.

Coeur d'Alene Salamander - The proposed project incorporates design features (refer to INFS) that would protect moist sites such as inhabited by this species. As with boreal toad, this species tolerates disturbance and even muddy water to some extent, because it occurs in roadside ditches commonly in the central portion of its range. Therefore, the project has incorporated greater protection than it needs to maintain viability. For these reasons, there would be no direct, indirect, or cumulative effects on Coeur d'Alene salamander or their habitat.

Wolverine - Wolverines are likely to be transient in the area because of their wide-ranging nature. Consequently, the risk of human/wolverine interactions would be relatively low. None of the areas proposed for treatment include sites within many miles of suitable denning habitat, so the risk of disturbance during the sensitive rearing period is not a factor for this species. Access would remain as present, so the risk of mortality would remain the same. For these reasons, there would be no direct, indirect, or cumulative effects on wolverine or their habitat.

Fisher – Across the landscape, fisher habitat is maturing at a faster rate than it is being lost. The net result is an increase in fisher denning habitat along with a decrease in foraging habitat. Despite a general direction on the IPNF to trend stands toward a more seral state, there has also been an effort to preserve mature and old-growth stands, allow natural succession in riparian areas, and preserve and recruit large woody debris forest wide. While this management strategy may temporarily reduce fisher habitat at the local scale, habitat should improve for this species with time and should be maintained on a landscape scale.
There will be no changes to current management of existing road closures with any of the alternatives, so there will be no decrease in security for fisher.
Short-term reduction of fisher habitat will be offset by long-term improvements in habitat for this species, and would be almost immeasurable on a broader scale. The proposed action may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species.

Harlequin Duck – Staging and or nesting habitat may exist in the Moyie River on the western perimeter of the project area. None of the proposed actions would alter riparian habitat (see Inland Native Fish Strategy guidelines). No new roads or trails are expected to be within 1000 feet of any other suitable harlequin duck nesting streams.
In the conservation requirements for this species located in the wildlife BA, a timing restriction for proposed unit 1 would be mandatory. For these reasons, there would be no direct, indirect, or cumulative effects on harlequin duck or their habitat.

Northern Bog Lemming - Habitat for this species does not occur in the treatment areas, so no impacts would be expected. For these reasons, there would be no direct, indirect, or cumulative effects on northern bog lemming or their habitat.

Townsend's Big-eared Bat - Habitat for this species does not occur in the treatment areas, so no impacts would be expected. For these reasons, there would be no direct, indirect, or cumulative effects on Townsend's big-eared bat or their habitat.

Northern Goshawk – Warren (1990) recommends at least two suitable nest stands of at least 25 acres within a 5,000-acre analysis area. Optimal nest stand size is 125 acres, and nest stands should be within .6 miles of one another. Timber compartment 739 totals 5,691 acres (excluding private ownership) and contains five uniformly distributed suitable nesting stands of at least 25 acres (as well as two 20 acre stands). There are also a number of stands of near-mature timber in the area, which should provide adequate movement corridors between nesting stands.

The No Action alternative would trend the forest understory into dense thickets, hiding goshawk prey and impenetrable to foraging goshawks.

Proposed treatments in the Bonners Ferry Ranger District Salvage Sales EIS (Chapter 4 - 25) are designed to remove relatively small pockets of standing dead trees or down trees. These treatments would not alter vegetative condition and therefore not significantly alter northern goshawk habitat. These activities would have no negative effects on northern goshawk and their habitat. There are no additional adverse cumulative effects expected from any other planned or ongoing projects within the district. Short-term reduction of goshawk habitat will be offset by the long-term improvements in forest structure and overall habitat for this species. The proposed action may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species.

Northern Leopard Frog - Preliminary analysis shows that Inland Native Fish Strategy guidelines concerning riparian habitat conservation areas within 150 ft. of the edge of wetlands would prevent sedimentation of frog breeding habitat. None of the proposed treatment units contain suitable habitat, nor are near suitable habitat. For these reasons, there would be no direct, indirect, or cumulative effects on northern leopard frog or their habitat.

Peregrine Falcon - Habitat for this species does not occur in the treatment areas, so no impacts would be expected. For these reasons, there would be no direct, indirect, or cumulative effects on peregrine falcon or their habitat.

c) Management Indicator Species - The Bonners Ferry Ranger District contains habitat or populations for management indicator wildlife species listed below. Refer to the Wildlife Report (project file) for further detailed information.

Pileated Woodpecker - The proposed project incorporates design features that maintain minimum numbers of snags within the riparian buffers. In addition to this, numerous snags are being created outside of the treatment units. This is true over the entire Idaho Panhandle as well as the North Zone. Thus, even if snags were reduced on a portion of the landscape, the total number of snags is increasing at a more rapid rate than they are being removed. Further, fuel reduction in the form of removal of some dying trees is beneficial in the long term to this species because of the reduction of fire risk. Although this project and the others proposed for the Idaho Panhandle National Forests would make only a small decrease in fuel loading, it is an incremental beneficial effect that cumulatively over time would assist in reducing the risk of stand-replacing fires. For Pileated woodpeckers, stand-replacing fires are a negative impact because they reduce the canopy even though they also create large numbers of snags.
In this regard, the No Action Alternative would have negative effects on the Pileated Woodpecker habitat.
No treatments are proposed that would reduce old growth structure or integrity.
The proposed ecosystem burn would be detrimental to the Pileated Woodpecker in the short term, but beneficial in the long term by trending the vegetation structure towards values found within the HRV. For these reasons, there will be no negative direct, indirect, or cumulative effects on Pileated woodpecker or their habitat.

American Marten - Suitable habitat for this species does not occur in the treatment areas, so no impacts would be expected. For these reasons, there would be no direct, indirect, or cumulative effects on American marten or their habitat.

White-tailed Deer – Critical mid-winter range stands have a narrow canopy cover range (60-80%) so that they function both to intercept snow and also allow enough light through the canopy to allow understory vegetation, primarily cedar and pachistima, to grow. While over half of the project area is capable mid-winter range (391 acres), only 13 acres are currently suitable. See Chapter 4 – Big Game Winter Range for details. Most stands fall out of suitable habitat because of insufficient stem diameter or canopy cover – generally a result of past management activities. However, much of the lower part of the project area provides microsites that effectively serve as critical mid-winter range, particularly in Units 5 and 10.

There are no known connected actions or cumulative effects within this compartment *(739)* which would detrimentally affect white-tailed deer or their habitat.

Because of the minimal short-term, and beneficial long-term, impacts of the proposed activities, there would be a beneficial impact on white-tailed deer and their habitat.

d) Snag Dependent Species - The project would meet Forest Plan goals and objectives for cavity habitat, and Forest Plan standards would be met or exceeded in all alternatives. Adequate snags will be retained in timber harvest units. Any potential overstory removals included in the Overstory Removal EA, which is scheduled for FY 2001, would be required to meet Forest Plan standards for snag management. Consequently, the project will have no negative direct, indirect, or cumulative effects on snag dependent species. The Wildlife Report, which is part of the Project Files, contains more information.

3. Fish

a) Threatened and Endangered Species - The Bonners Ferry Ranger District contains habitat, or populations, for two Threatened and Endangered fish species listed below. Refer to the attached Biological Evaluation in Appendix B for more detailed information.

White sturgeon: White sturgeon do not currently inhabit any of the streams within the effects areas. This project will have no direct, indirect, or cumulative effect on white sturgeon or their habitat.

Bull trout: Bull trout do not currently inhabit any of the streams within the effects areas. This project will have no direct, indirect, or cumulative effect on bull trout or their habitat.

b) Sensitive Species - The Bonners Ferry Ranger District contains habitat, or populations, for several sensitive fish species listed below. There are several Refer to the attached Sensitive Species Biological Assessment, found in Appendix B, for further detailed information.

Burbot: Burbot do not currently inhabit any of the streams within the effects areas. This project will have no direct, indirect, or cumulative effect on burbot or their habitat.

Interior redband trout: - Interior redband trout do not inhabit any of the streams potentially affected by this project. This project will have no direct, indirect, or cumulative effect on interior redband trout or their habitat.

Westslope cutthroat trout: - Lower Placer Creek supports a population of Westslope cutthroat trout. Because all proposed management activities in the project area will be subject to Inland Native Fish Strategy (INFS) and State of Idaho BMP's. This project will have no measurable direct, indirect, or cumulative effect on Westslope cutthroat trout or their habitat.

Torrent sculpin: - Lower Placer Creek may support a population of Torrent Sculpin. Because all proposed management activities in the project area will be subject to buffer zones and practices found in the Inland Native Fish Strategy (INFS) and State of Idaho BMP's, this project will have no measurable direct, indirect, or cumulative effect on Westslope cutthroat trout or their habitat.

4. Plants

a) Threatened, Endangered Species, or Sensitive Species - No threatened, endangered or sensitive plants or Forest Species of Concern are known to occur within any proposed harvest units. There is no aquatic, peatland, deciduous riparian, cold forest, or subalpine forest guild habitat in any areas proposed for harvest under either action alternative.

Field surveys were conducted in August of 1999. Microsites of suitable habitat (wet springs) were targeted for intensive surveys, while cursory surveys were performed in proposed units that were identified as having suitable habitat.

No threatened, endangered, or sensitive plants or Forest Species of Concern were identified.

No impacts to any other sensitive species or Forest species of concern would occur from implementation of either alternative. Harvest and fuels treatment as proposed under either action alternative would not reduce habitat capability below its current level. Connected actions (road reconstruction, underburning, reforestation, riparian planting, and noxious weed control) would not lead to a loss of population or species viability or a trend to federal listing for any sensitive plant species.

For these reasons, there would be no measurable direct, indirect, or cumulative effects on Threatened, Endangered Species, or Sensitive Plant Species or their habitat. Refer to the attached Biological Evaluation in Appendix B for more detailed information.

5. Native Plant Species - In an effort to implement ecosystem management the Regional office has issued direction on the use of native plant species for revegetation projects. The basic policy requires the use of native plant seed in erosion control, fire rehabilitation, riparian restoration, forage enhancement, and other vegetation projects, to the extent practical. The purpose of this direction was to emphasize the importance of biodiversity, and to recognize the intrinsic value of native plant vegetation as a component of natural forest and rangeland ecosystems. This information is contained in a letter, dated June 8, 1993, written to the Region 1 Forest Supervisors by the Regional Forester. A copy of this letter may be found in the project file.

Any timber sales implemented under the Pipeline EA would consider use of native plant species as long as costs are reasonable and an adequate seed source is reasonably obtainable. No measurable direct, indirect, or cumulative effects to native plant species are expected from implementation of any alternative.

6. Forest Land Birds- Forest land birds include all the avian species sometimes collectively termed as 'neotropical migrant birds' and 'resident songbirds'. No birds in this guild are listed as a sensitive species, except for the flammulated owl, which is sometimes included because it is a migrant. This group of birds is not treated separately by species because they are an extremely diverse group of species, with widely divergent habitat requirements. Any treatment, including no action, affects some species in this group at the expense of others. It would be impossible to treat all the individuals in this group separately. However, some species are represented by other species discussed, including dry site species (flammulated owl), riparian species (harlequin duck), early seral stage species (lynx), wetlands (Coeur d'Alene salamander, northern bog lemming and harlequin duck), old growth (flammulated owl, fisher, Pileated woodpecker and northern goshawk), and snag dependent species (Pileated and black-backed woodpeckers).

Maintaining or trending habitats toward their historical range of conditions is presumed to provide for most habitat needs of the birds that have adapted to the Bonners Ferry Ranger District's ecosystem. Because of the detailed analysis for other species (discussed above) that share similar effects, species in this group will not be further analyzed in this document.

7. Old Growth - Old growth forests have a unique structure and composition that provide critical habitat for a wide range of plants, animals, and other biota. At present, the Bonners Ferry Ranger District is required to maintain approximately 14% of the total forested area of the district as old growth, as directed in a letter from the Forest Supervisor on May 7, 1991 (See project file). This mandate was made to insure that the IPNF, as a whole, could maintain at least 10% old growth. There is no proposed entry into old growth under any alternative, therefore, there would be no reduction in the amount of old growth on the Bonners Ferry Ranger District, and no measurable direct, indirect, or cumulative effects on old growth.

8. Fragmentation - Fragmentation occurs when an expanse of habitat is broken into two or more patches that are separated by different types of habitat. This would occur through natural disturbances such as fire, windstorms, hurricanes, and volcanic eruptions and through man caused activities like logging and road building. This creates habitats that are suitable to some species while being less suitable or unsuitable to others.
Each alternative affects fragmentation at varying degrees:

a) The No Action Alternative would trend the stand conditions toward a homogeneous closed canopy structure with abundant cover, providing the least fragmentation of all alternatives.
b) Alternative 2 would create a mosaic of openings and cover for big game.
c) Alternative 3 would regenerate much of the project area with shelterwood harvesting, creating large continuous openings with little cover until the units regenerate. However, all of the alternatives provide for adequate linkages between the fragmented habitats in and around the project area. Consequently, no measurable direct, indirect, or cumulative effects are expected from habitat fragmentation.

9. Linkages - Cover linkages between forested habitats allow species to travel between suitable habitats. Species differ in their ability to move between fragmented habitats. Some move freely while others will not cross even rather narrow gaps of open habitat.

The proposed action would not have a measurable effect on any linkages within or outside the project area. Consequently, no measurable direct, indirect, or cumulative effects on habitat linkages are expected.

10. Range - There are no range allotments within the Pipeline EA analysis area. For these reasons, there would be no measurable direct, indirect, or cumulative effects on these range allotments.

SOCIAL/ECONOMIC FACTORS

A. Cultural Resources

Cultural resource surveys of the project area have been completed as directed by the Cultural Resources Management Practices (Forest Plan, Appendix FF). The cultural resource inventories are on file for selective review at the Bonners Ferry Ranger Station. Numerous sites have been recorded, and a determination made to the extent of protection required. These sites would be protected under all alternatives. Any future discovery of cultural resource sites would be inventoried

and protected if found to be of cultural significance. A decision would be made to avoid, protect, or mitigate the impact to these sites in accordance with the National Historic Preservation Act of 1966. Currently, there are no known districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places that would be affected by the proposed actions. As such, the actions should not cause the loss or destruction of significant scientific, cultural, or historic resources. For these reasons, there would be no measurable direct, indirect, or cumulative effects on cultural resources.

B. Economics/Community Stability

The proposed sale is on productive forestland and could be offered with minimal investment. The Good Grief Addie Timber Sale was advertised for $135/MBF and sold for $161/MBF, the Katamount Timber Sale was advertised for $105/MBF and sold for $109/MBF, the Rock Bottom Timber Sale was advertised for $101/MBF and sold for $122/MBF. Both action alternatives are expected to follow these trends and would be economically viable. However, Alternative 3 would be more economical, since it would remove more volume per acre than with Alternative 2. Alternative 1, the No Action Alternative, would produce very little timber- related revenue for individuals , the county, or the federal government.

Given the proposed harvest volume, it is beyond the scope of this document to assess potential impacts to community stability in great detail. However, a general assessment could be made that the more volume of timber that is harvested within Boundary County the more jobs, both directly and indirectly related to the timber industry, would likely be created or sustained in Boundary County. Using these guidelines, the effects would be the same as in the previous paragraph. Again, implementation of the No Action Alternative would do nothing to help sustain community stability. Documentation of the analysis and considerations for community stability is contained in the Final Environmental Impact Statement for the IPNF Forest Plan. Further local demographic information is located in the project file.

C. Visual Quality

Proposed harvest treatments include sanitation salvage, commercial thin and shelterwood regeneration cuts. The visual quality objective for proposed harvest units is partial retention. Partial retention refers to landscapes that appear to be slightly altered by human activities. Noticeable deviations must remain visually subordinate to the landscape character being viewed. Under both action alternatives, regeneration harvests will concentrate on removing naturally occurring mortality, with inclusion of clumps and stringers of large leave trees that would blend with the surrounding landscape. All of the proposed units would be viewed from middle ground and would blend in with existing openings created by prior timber harvest on federal and non-federal lands. Sanitation salvage treatments would result in minor changes to forest structure and therefore have minimal impact on scenic integrity. The 1998 Forest Plan Monitoring Report (p.17) states, "…Where salvage harvest methods were employed and only the dead, dying or deteriorating trees in a stand were removed, natural appearing landscapes have resulted. The variety of color, form, texture and size produced, results in a high level of visual quality." Under the No Action Alternative, mortality would result in short-term negative impacts as dying trees turn from green to red. In the long-term, dead needles would eventually fall off the trees, and natural openings would be created. None of the action alternatives would have a measurable negative direct, indirect or cumulative effect on visual quality.

D. Recreation

The types of recreation use within the project area include hunting, fishing, wood gathering, driving for pleasure, berry picking, hiking, and similar outdoor activities. The only possible disturbance to any of these activities will be when the units are being logged and during some of the post sale activities, such as burning and grapple piling. All of these are very common practices in northern Idaho. Often, recreationists will use routes opened up for logging, especially in the winter, which can improve the experience. In all cases, the effects will be minimal and are not expected to greatly impair the recreation experiences in the project area. No maintained hiking trails will be disturbed by the implementation of any of the alternatives. Any of the action alternatives would benefit the handicapped hunter program because the improved browse would result in more animals and therefore a higher hunter success rate. No measurable negative direct, indirect, or cumulative effects to recreation are anticipated.

E. Public Health and Safety

1. Air Quality - The Clean Air Act amendments of 1977 set up a process, which included designation of Class I, II, and III areas for air quality management.

a) Class I - These areas include all international parks, national parks greater than 6,000 acres, and national wildernesses greater than 5,000 acres, which existed on August 7, 1977. This class provides the most protection to pristine lands by severely limiting the amount of additional manmade air pollution, which can be added to these areas. The Cabinet Mountains Wilderness is the nearest Class I wilderness area to the project area. The Cabinet Mountains Wilderness area is located to the southeast of the project area. Smoke created from the Pipeline project assessment area normally would be carried to the northwest by the prevailing southwest flows aloft and would not affect the Class I airshed.

b) Class II - These areas include all other areas of the country. These areas may be upgraded to Class I. A greater amount of additional manmade air pollution may be added to these areas. All Forest Service lands which are not designated as Class I are Class II lands. The land within the Decision Area is designated as Class II.

c) Class III - These areas have the least amount of regulatory protection from additional air pollution. To date, no Class III areas have been designated anywhere in the country.

The Clean Air Act requires the Environmental Protection Agency (EPA) to identify pollutants that have adverse effects on public health and welfare and to establish air quality standards for each pollutant. Each state is also required to develop an implementation plan to maintain air quality (Sandberg, et al, 1988). The EPA has issued National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, carbon monoxide, ozone, nitrogen dioxide, lead, and particulate matter less than or equal to 10 microns (PM 10). Idaho also has standards for these pollutants. Libby is a non-attainment area because of an excess of PM 10. Most likely, any smoke from the assessment area would also be pushed north of Libby by the prevailing winds.

The Forest Service is a party to the North Idaho Smoke Management Memorandum of Agreement, which sets out procedures to regulate the amount of smoke produced by prescribed fire.

Three types of burning could be used:

1) Underburning - Would be used in seed tree and shelterwood units. The objective would be to reduce fuel loading while protecting the residual overstory trees. Since the burning is deliberately slow, combustion is likely to be inefficient (Cramer, 1974); more smoke per acre of fire is often produced than with other methods.

2) Pile burning - Has the least effect on air quality. Woody debris is gathered and piled either mechanically or by hand, and the piles are burned in the late fall when there is little competition in the airshed. Moreover, quick removal of smoke from the air can be accomplished by burning piles at such a time as to send the smoke into a precipitating rain cloud (Cramer, 1974).

3) Landing pile burning - Is related to pile burning and the impacts are similar. Logging residues in excess of nutrient cycling needs and coarse woody debris (CWD) requirements are piled at the landing. Concentrating the fuel at the landing often cancels the need to grapple pile or underburn slash in a harvest unit.

A "Decision Analysis" matrix (USFS 1998) shown in Figure A-1 is used to stratify burns based on levels of potential emissions. This matrix identifies the appropriate emissions and dispersion analysis to use. Given that PM (particulate matter) emissions are not expected to exceed the threshold of 100 tons for any single pollutant. A "Second Level Analysis" using FOFEM (First Order Fire Effects Model) was conducted. FOFEM is an emissions production model for pile or broadcast burns for $PM_{2.5,}$ PM_{10}, and CO (Reinhardt, et. al, 1997). The FOFEM model inputs include fuel loading by size class, vegetation, density (herbaceous, shrub, and tree regeneration), anticipated fire intensity, fuel moisture, duff, depth, and season of burning. In theory, combinations of prescribed burns (especially underburns) if conducted during the same burning window would exceed the threshold of 100 tons, but in practice these types of burns are conducted in a manner where this threshold would not be exceeded. For example, Unit 6 (139 acres), is expected to produce an estimated 61 tons of emissions, more than any other proposed unit, would take at least one day to burn. Under a typical scenario no other burns would be conducted during this time. A summary of the FOFEM analysis is displayed in Tables A-1 and A-2.

A principal objective of the North Idaho Smoke Management Agreement is to "minimize or prevent the accumulation of smoke in Idaho to such a degree as is necessary to protect State and Federal Ambient Air Quality Standards when prescribed burning is necessary for the conduct of accepted forest practices..." The North Idaho group currently uses the services and procedures of the Montana State Airshed Group. The procedures used by the Montana Group are considered best available control technology (BACT) by the Montana Air Quality Bureau for major open burning in Montana. A Missoula-based monitoring unit is responsible for coordinating prescribed burning in North Idaho during the months of September, October, and November. This unit monitors meteorological data, air quality data, and planned prescribed burning and makes a decision daily on whether or not any restrictions on burning are necessary the following day.

Figure A-1. Decision Analysis for Smoke Modeling

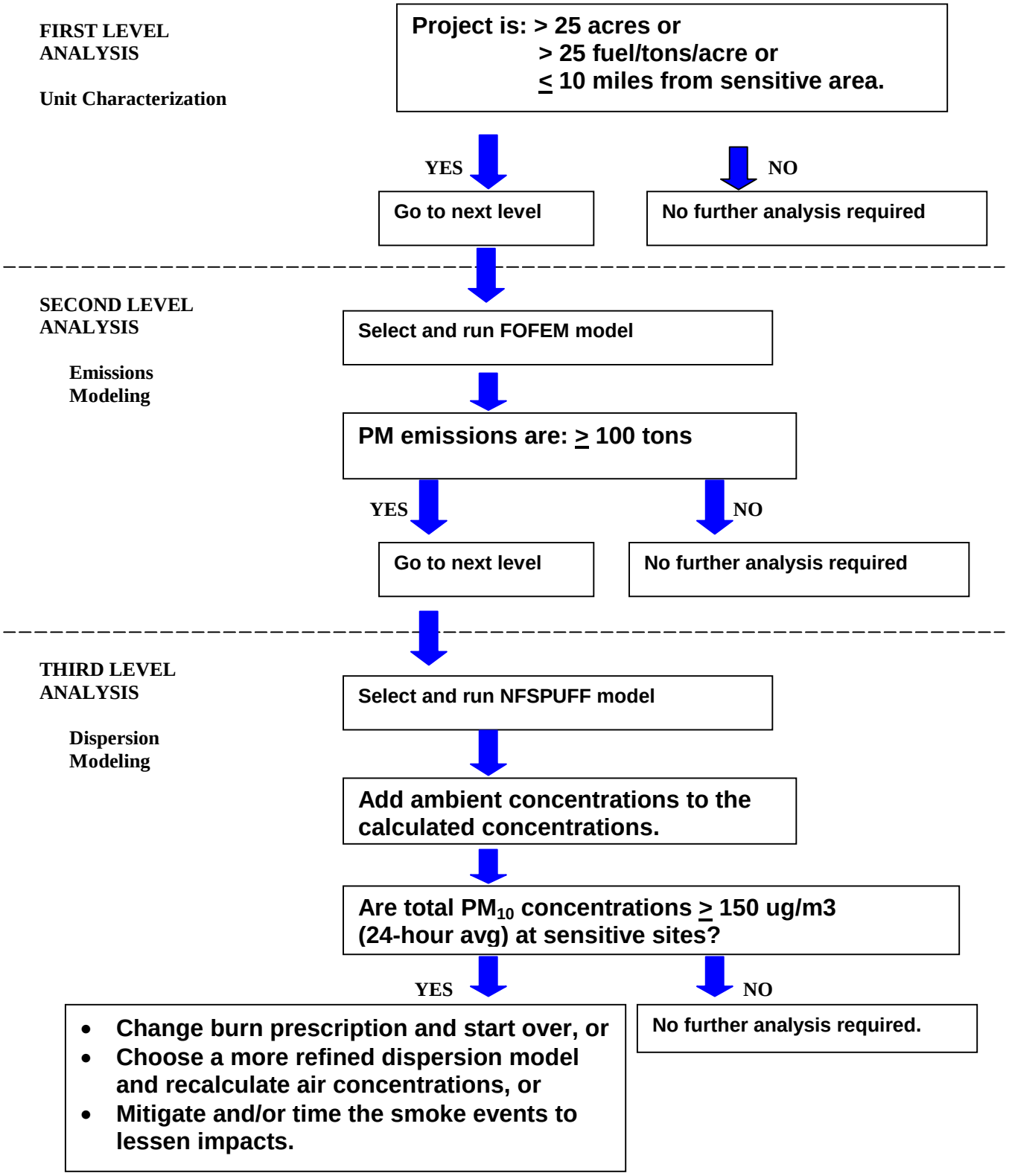


Table A-1 – Estimated Emissions (Alternative 2)						
Unit	Rx	Fuels Treatment	Acres	Total PM10 (tons)	Total PM2.5 (Tons)	Total Emissions (tons)
1	SW	Underburn slash	49	9.80	8.33	18.13
2	CT/SS	Grapple pile slash	25	0.20	0.17	0.37
3	ST	Underburn slash	19	4.69	3.97	8.66
4	SW	Underburn slash	72	14.40	12.24	26.64
5	CT/SS	Grapple pile slash	115	0.21	0.24	0.44
6	SW	Underburn slash	139	28.77	32.67	61.44
7	CT	Underburn slash	42	8.40	7.14	15.54
8	SW	Underburn slash	24	6.62	5.64	12.26
9	ST	Underburn slash	14	3.46	3.46	6.92
10	CT/SS	Grapple pile slash	54	0.57	0.48	1.05
Ecosystem Burn	UB	Underburn – no slash	129	4.39	3.74	8.13
Alternative 2 Totals			**682**	**81.51**	**78.07**	**159.58**

Table A-3 – Estimated Emissions (Alternative 3)						
Unit	Rx	Fuels Treatment	Acres	Total PM10 (tons)	Total PM2.5 (Tons)	Total Emissions (tons)
1	SW	Underburn slash	49	9.80	8.33	18.13
2	SW	Grapple pile slash	25	0.20	0.17	0.37
3	ST	Underburn slash	19	4.69	3.97	8.66
4	SW	Underburn slash	72	14.40	12.24	26.64
5	SW	Grapple pile slash	115	0.21	0.24	0.44
6	SW	Underburn slash	139	28.77	32.67	61.44
7	SW	Underburn slash	42	8.40	7.14	15.54
8	SW	Underburn slash	24	6.62	5.64	12.26
9	ST	Underburn slash	14	3.46	3.46	6.92
10	SW	Grapple pile slash	54	0.57	0.48	1.05
Ecosystem Burn	UB	Underburn – no slash	129	4.39	3.74	8.13
Alternative 3 Totals			**682**	**124.68**	**121.47**	**246.15**

The following would be design features of any alternative:

- No burning would be done that is not needed to meet silvicultural, fuel management, or wildlife habitat objectives.
- Broadcast burning would be done in the spring if possible.
- Restrictions on prescribed burning for local air quality reasons may be implemented by the Bonners Ferry Ranger District in addition to those imposed by the smoke management-monitoring unit.
- Roads may be watered or otherwise treated to reduce fugitive emissions.
- During logging activities signs would be posted to inform the public of log truck traffic. This requirement is automatically included in all timber sale contracts.

In practice, this would mean that a list of all prescribed burns planned for the fall burning season in the Placer Creek area would be forwarded to the monitoring unit through the Idaho Panhandle National Forest fire desk before September 1. Then daily by 8:30 a.m., the Bonners

Ferry Ranger District would inform the IPNF fire desk of all burning planned for the next day and the fire desk would forward this information to the monitoring unit.

The standards and guidelines listed above will result in no negative direct, indirect, or cumulative effects to air quality.

2. Effects on Minority Populations and Low-income Populations: The population of Boundary County includes an estimated 220 people in minority groups and 400 people of Hispanic origin. The Kootenai Tribe of Idaho was the largest minority group represented in the 1990 census.
The Kootenai Tribe was consulted about the proposed Pipeline EA and no cultural sites of any importance to tribal members were identified in the project area.
Based on experience with similar projects in the Bonners Ferry Ranger District, none of the alternatives would substanstially affect minority or low-income individuals, women, or civil rights. Implementation of this project is expected to provide job opportunities in Boundary County, including minority populations that may benefit economically. Small or minority-owned businesses could have opportunities to compete for some of the work associated with this project (see Social and Economic Overview of Boundary County, Idaho).

F. Roadless Area

There is no proposed harvest within inventoried roadless area. Consequently, there will be no direct, indirect, or cumulative effects to roadless areas.

G. Minerals

There are no mining claims within the assessment area. Consequently, there will be no direct, indirect, or cumulative effects on mineral resources.

H. Special Uses

Since lands/special uses activities are not a resource per se, there are no specific Forest Plan goals associated with the lands function. Goals, objectives and standards for the various Forest Plan MA's will determine the specific actions necessary to respond to the public's or other agencies' proposals for use of National Forest Lands.

One special use permit has been issued for a spring box/water intake located at the junction of Placer Creek Connection and Deer Ridge Road. The protection of Watershed and Aquatics Resources in this document will insure the protection of the spring box. Consequently, there will be no measurable direct, indirect, or cumulative effects on this special use.

I. Water Resources And Aquatics Monitoring: Core Issues

1). Hydrologic Integrity:

Hydrologic integrity addresses how water moves from rainfall to the ground, over and through the soil, through streams and lakes to the ocean. One major factor that affects hydrologic integrity on forested sites includes roads that intercept ground water and overland flow. These roads often increase the effective drainage density of a watershed by intercepting water and channelling it down ditches to stream channels (USDA Forest Service, 1999, pages 21-29).

Issue indicator: Road density in miles per square mile.
The direct, indirect and cumulative effects to the hydrologic integrity of Placer Creek are directly related to the chosen alternative.
When compared to Alternative 1 (No Action), the hydrologic integrity would be improved under Alternatives 2 and 3. The road package included with the proposed timber sale would include several items that would improve road drainage:

- Gabion baskets would improve cutbank stability along the weeping cut banks on the Deer Ridge Road (2540).
- A ditch relief culvert would drain water from this cutbank before it reaches Placer Creek.
- Several ditch relief culverts would be installed on Forest Road 2540.
- Overland flows and intercepted ground water would not be concentrated in ditchlines and below culverts as much as at present.
- Larger culverts would be installed at stream crossings.

2). Riparian Function:

Many aquatic and terrestrial wildlife species are dependent on riparian habitat for part of their life cycle. Riparian vegetation provides shade for streams, keeping temperatures lower. Low water temperature is important for many aquatic species. Riparian vegetation also filters sediment before it reaches stream channels. Forested riparian areas provide large woody debris to stream channels. This large woody debris is composed of trees which fall into the channel. This large woody debris provides structure in the channel helping to dissipate the energy of flowing water and control bedload movements in the system. Large woody debris is the source of much of the pool habitat in forested streams, particularly in Rosgen A or B channel types (Rosgen, 1996). Riparian function may be affected by riparian road construction, riparian timber harvest, or by stand replacing fires.

Issue Indicators: Riparian road density in miles per square mile.
Hydrologic openings in riparian areas.

Since no new system roads are proposed for the Pipeline EA and timber harvest will not occur in riparian zones, the number and size of hydrologic openings in the riparian habitat of the Placer Creek watershed would be the same for all alternatives. For these reasons, there would be no measurable direct, indirect, or cumulative effects toward the riparian function of Placer Creek.

3). **Mass Failure and Erosion:**

Mass failures can be major sources of sediment delivered to stream channels. These landslides often result in major changes to stream channel conditions as a large amount of sediment is delivered to the channel and becomes bedload. This large pulse of sediment may result in bank erosion and a wider channel as the stream adjusts to the increased bedload. Mass failures may also result in increased drainage density as new channels form in the scar left from a mass wasting site. Mass failures are often triggered by roads where they cross sensitive landtypes.
To a lesser extent, surface erosion may also increase sediment delivered to stream channels. Roads on landtypes susceptible to surface erosion may increase erosion by concentrating water below ditch relief culverts and down ditchlines to stream channels (USDA Forest Service, 1999, pp. 21-22.).

The Idaho Panhandle National Forests Land System Inventory (LSI) identifies landtypes by their risk of mass failure and erosion potential.

Issue Indicator: Road density on sensitive landtypes.

The direct, indirect and cumulative effects to the risk of mass failure and erosion near Placer Creek are directly related to the chosen alternative. The risk of mass failure and erosion would be reduced under Alternatives 2 and 3.
Sediment delivery from the slumping cut bank on Road 2540 near Placer Creek would be reduced by road reconstruction proposed for completion as part of the Timber Sale Contract.

4). **Stream Crossings**:

Stream crossings are often sources of sediment delivered to streams. Ditches at these crossings deliver water and sediment from road surfaces and cutslopes to stream channels. Undersized culverts may not handle stream flows, bedload, and large woody debris during a flood event. Such an event can lead to crossing failures. Road fill at the stream crossings may be delivered directly to the stream channel, resulting in a pulse of sediment which must then be routed through the stream system.

Issue indicators: Stream crossing frequency, measured as number of crossings per mile of stream; and net associated risk, which is the risk of culvert failure times the amount of sediment that would be delivered to the stream if the culvert failed. This indicator will be measured in tons of sediment per year.

For these reasons, the direct, indirect and cumulative effects to the risk of stream crossings in the vicinity of Placer Creek are directly related to the chosen alternative.
The number of stream crossings would increase by one under Alternative 2 and Alternative 3. After timber sale activities are completed, the number of stream crossings would decrease by one, back to the current number.
The current 36-inch culvert at Stream Crossing 5 on Forest Road 2540 (see Figure A-1) would be replaced by a 48-inch culvert. At the Placer Creek Crossing 11 on Forest Road 2541, a 36-inch culvert would be replaced by a 72-inch x 48-inch pipe. This culvert would be buried approximately 12-inches for continued fish passage.
Replacing the two undersized culverts in Placer Creek would greatly reduce the risk of failure for these pipes. As a result, the sediment delivery risk associated with these smaller pipes would be

reduced.

Alternative 1 (No Action Alternative)

- Continue with current number of stream crossings.
- Continue with the current and projected levels of sediment delivery to Placer Creek.
- Accept the risk of losing one or both of the undersized culverts in Placer Creek to a flood event. Approximately 59% of Placer Creek watershed is in a "rain-on-snow" zone (See watershed report).
- Accept the risk that many tons of sediment would be delivered to Placer Creek if one or both of the undersized culverts in Placer Creek failed from a flood event.

Alternatives 2 and 3 (Action Alternatives)

Both alternatives would activate a timber sale road package, reducing the risk of current and projected levels of sediment delivery to Placer Creek by:

- Upgrading crossings 5 and 11 (see page A-21) to larger culverts that would be less susceptible to failing during a flood event on Placer Creek.
- Upgrade crossing 11 to fish passable status.
- Install several additional ditch relief culverts on Forest Road 2540.
- Stabilize cut banks by installing gabion baskets on Forest Road 2540.
- Implement a temporary crossing of Placer Creek between Unit 10 and Unit 6 using an "armored ford" on the closed temporary spur Road 2540D. The crossing would only be used between June and Febuary, after the intermittent stream channel ceased to flow.
- The armored ford crossing will be removed after harvesting the East half of Unit 6 and before spring flows.
- These drainage improvements would reduce the amount of sediment delivered to Placer Creek and would help the stream channel to recover from the effects of past and current activities.

5). Cumulative Effects:

The cumulative effects of all management activities in a watershed may have a greater effect on hydrologic conditions over time than the analysis of an individual project would seem to indicate. Current watershed conditions may be measured and analyzed based on past activities in the watershed. A review of past watershed conditions in light of past activities can help us understand current watershed conditions and how the channel conditions are trending.

Issue indicators: Proper Functioning Condition (PFC) analysis and trend.

Alternative 1 (No Action Alternative):

- Continue with current number and quality of stream crossings.
- Continue with the current and projected levels of sediment delivery to Placer Creek.
- Accept the risk of losing one or both of the undersized culverts in Placer Creek to a flood event. Approximately 59% of Placer Creek watershed is in a "rain-on-snow" zone (See watershed report).
- Accept the risk that many tons of sediment would be delivered to Placer Creek if one or both of the undersized culverts in Placer Creek failed from a flood event.

Alternatives 2 and 3 (Action Alternatives)
Road improvements in the timber sale package proposed for both Alternative 2 and Alternative 3 would reduce sediment delivery to Placer Creek by:

- Replacing two culverts at crossings 5 and 11 (page A-21) with larger pipes, reducing the sediment risk for these crossings.
- Bank stabilization and a ditch relief culvert along the slumping cutbank on Forest Road 2540 would reduce sediment delivery to Placer Creek at this point.
- Additional ditch relief culverts located on Forest Road 2540 would reduce sediment delivered to Placer Creek at these points.
- This reduction of sediment delivered to Placer Creek would help the stream channel to recover from the affects of past and current activities.
- For these reasons, the direct, indirect and cumulative effects to Placer Creek are directly related to the chosen alternative.

Properly Functioning Condition will probably not be achievable, however, the proposed road package associated with implementing any action alternatives would lower the risk of sedimentation and trend the creek toward the PFC.
However, until the riparian portion of Road 2540 is relocated away from the creek and drainage is improved on the 1/2 mile section immediately southeast of the Placer Creek crossing, reaching PFC will be unattainable. Both these projects are beyond the scope of the Pipeline project.

The road relocation is beyond the scope of the project because the cost of such a relocation is too high to be supported by the revenues from the Pipeline EA; and the Road 2541 drainage improvement is beyond the scope of the project due to its location outside of the proposed Sale Area boundary. These road segments are the largest sources of sediment delivery to Placer Creek and have the highest direct effects to the stream channel.

6). Water Yield:

Changes in water yield may affect channel stability and equilibrium. Increases in peak flows may result in increased bank erosion, as well as channel scouring and deposition. Timber harvest that removes a large portion of the forest canopy may lead to increased peak flows because the trees are not present to intercept rain or snow, and fewer trees are using water from the soil in a process called transpiration.

Opening the canopy of a forest often results in higher peak flows occurring earlier in the season. Base flows are often reduced. Total water yield is usually increased.

Issue indicator: Hydrologic openings, measured as Equivalent Clearcut Acres (ECAs).
A measure used to describe decreases in canopy density over each area. A simplified example would be a 50 percent reduction of canopy over 100 acres would result in 50 equivalent clearcut acres. When analyzing ECA's for the project, the model described by George Belt in "Predicting Streamflow Changes Caused by Forest Practices Using The Equivalent Clearcut Area Model" (Belt, 1980) will be used. The ECAs will be used to compare alternatives.

Alternative 1 (No Action Alternative):
There are approximately 98 acres of openings in the current condition. The acreage would gradually decrease over 15 years as seedlings and saplings grow up and form a closed canopy.

Alternative 2 and 3 (Action Alternatives):
Equivalent Clearcut Acres would increase in the Placer Creek Drainage by approximately:

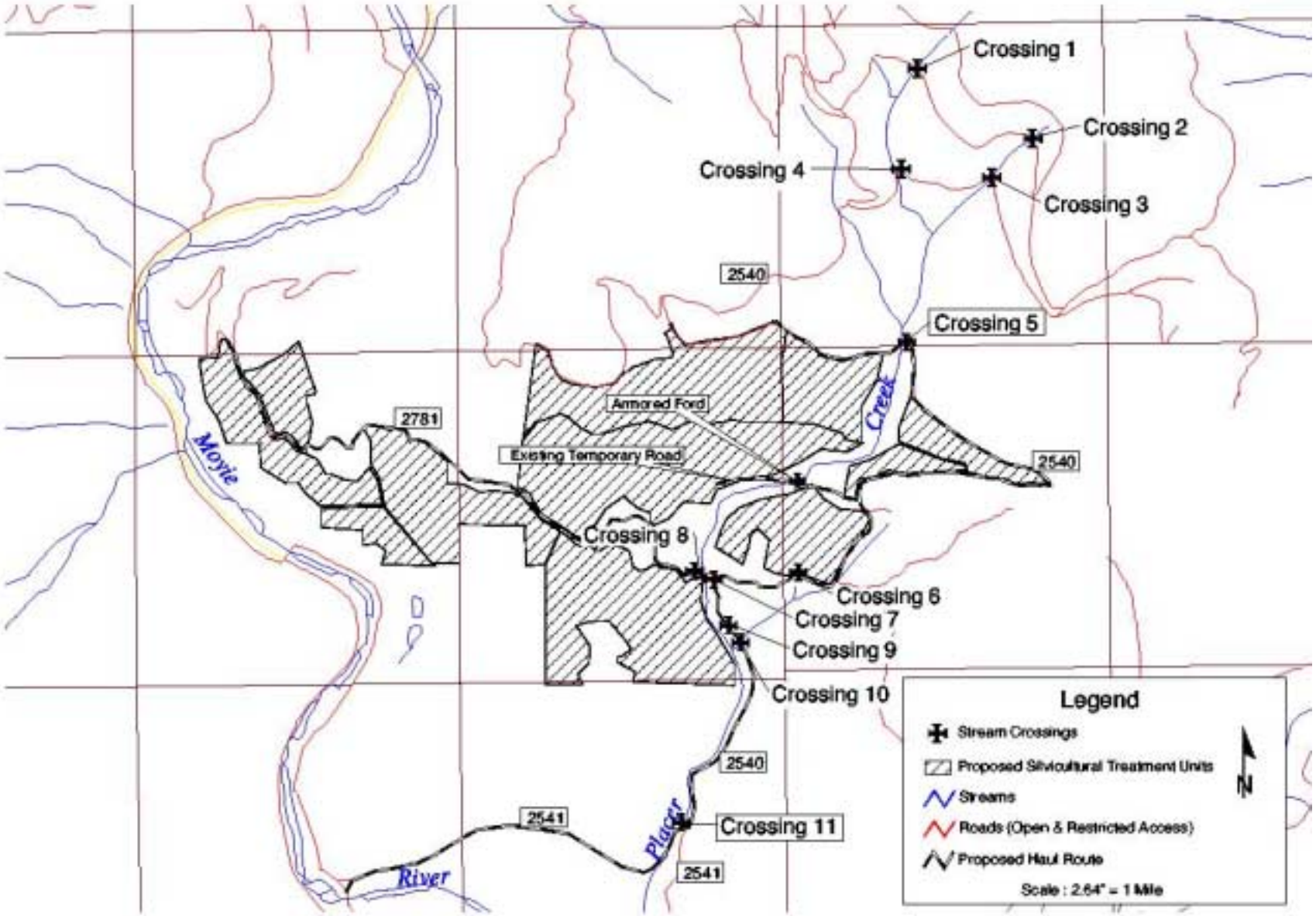
1) 102 acres for Alternative 2.
2) 133 acres for Alternative 3 (An increase of 23% over Alternative 2).

When compared to the current condition, the increase in ECAs would represent approximately:

- Three percent of the acreage of the Placer Creek watershed for Alternative 2.
- Four percent for Alternative 3.

This increase in ECAs would result in slightly increased peak flows in Placer Creek. A small temporary increase in peak flows may result from a reduction of canopy closure over the Placer Creek Watershed. Over time, the canopy closure would recover, particularly in the salvage and thinning units proposed for Alternative 2 (Ried,1993 pp. 60-61).
For these reasons, the direct, indirect and cumulative effects to the water yield in Placer Creek are minimal.

Pipeline EA Project Area Stream Crossings



APPENDIX B

- Biological Assessment (Wildlife) B-2
- Biological Assessment (Aquatics - Watershed and Fisheries) B-47 and 93
- Biological Assessment (Sensitive Plants) B-97

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File Code:2672.4 **Date: June 12, 2000**

Subject: Pipeline EA Biological Assessment/Evaluation

To: District Ranger

INTRODUCTION

USDA Forest Service policy (FSM 2672.4) requires the preparation of a Biological Assessment (BA) to evaluate proposed action(s) on listed species to determine whether any such species or habitat would likely be affected by the proposed action. The BA process is intended to comply with the requirements of the Endangered Species Act (ESA) so that Federal actions do not jeopardize federally listed species.

PROPOSED ACTION

The issues for the Pipeline Salvage Sale relating to wildlife are forest health related. Relative to wildlife issues, these are expressed for several species in terms of forest structure currently and compared to historical conditions. The species most affected by this is the white-tailed deer. There are no alternative driving issues resulting from threatened or endangered species concerns.

Biological assessments and biological evaluations are contained in this analysis, i.e. no separate document is being prepared. All the elements necessary to include under the ESA or Forest Service Manuals (FSM) 2672.4 are included in this document. The current species list is (SP#1-9-99-SP-483) October 28, 1999. There are no conservation requirements for threatened or endangered species for this project; however, there are management guidelines for some sensitive species. These are contained in a separate section below.

REGULATORY FRAMEWORK

The regulatory framework providing direction for the protection and management of wildlife habitat comes from the following principle sources:

- *The Endangered Species Act of 1973 as amended (ESA),*
- *The National Forest Management Act of 1976 (NFMA), and*
- *The Forest Plan for the Idaho Panhandle National Forests*

Section 7 of the ESA directs Federal agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any Threatened or Endangered species or result in the destruction or adverse modification of their critical habitat.

NFMA provides for balanced consideration of all resources. It requires the Forest Service to plan for diversity of plant and animal communities. Under its regulations the Forest Service is to maintain viable populations of existing and desired species, and to maintain and improve habitat of management indicator species.

The Forest Plan, in compliance with NFMA, establishes Forest wide management direction, goals, objectives, standards and guidelines for the management and protection of wildlife habitat and species, including: old-growth habitat, management indicator species, Sensitive species, and Threatened and Endangered species.

Direction concerning implementation of the ESA and NFMA can be found in FSM and various letters/memos from the Washington Office, the Regional Office and the Supervisor's Office.

LISTED SPECIES

On October 28, 1999 the U.S. Fish and Wildlife Service provided the Idaho Panhandle National Forests with a listing of threatened, endangered and proposed wildlife species that may be present on the Idaho Panhandle National Forests (Re: #1-9-99-SP-483). The species pertinent for the Bonners Ferry Ranger District are gray wolf, woodland caribou, bald eagle, grizzly bear, and Canada lynx (listed as threatened as of March 21, 2000).

Species Relevancy

Threatened, Endangered, Proposed and Sensitive (TES) species and other management indicator species (MIS) that are known to occur on the Bonners Ferry Ranger District were reviewed for their relevancy to the project by reviewing sighting records, survey records, planning documents and other sources. Relevancy was determined if there is evidence of species or habitat present within the affected area, and whether any such species or habitat could potentially be affected by the proposed actions. No further discussion or analysis is necessary for those species that are not found within the assessment area because of lack of suitable habitat or other compelling reasons.

Some wildlife species or their habitat are found to be present in the assessment area, but not measurably affected. This may be because they would not be impacted by the proposed actions, the impacts would be at a level which would not influence their use or occurrence, or their needs can be adequately addressed through the design of the project. Therefore, a detailed discussion and analysis is not warranted or required for those species determined not measurably affected (NEPA directs the agency to focus on a full and fair discussion on significant issues, and identify and eliminate from detailed study the issues which are not significant.) Supporting rationale is provided in the following section for these species.

Species considered present and possibly affected in a measurable way by the proposed actions are carried forward into a detailed discussion and analysis.

Table 1. Species Occurring on the Bonners Ferry Ranger District and Analysis Status

Species	Species or Habitat Present on District?	Species or Habitat Present in Project Area?	Species or Habitat Measurably Affected?	Species Further Analyzed?
Endangered				
Peregrine Falcon*	Possible	No	No	No
Gray Wolf	Yes	Transient	Yes	Yes
Woodland Caribou	Yes	No	No	No
Threatened				
Bald Eagle	Yes	No	No	No
Grizzly Bear	Yes	No	No	No
Canada Lynx	Yes	No	No	No
Sensitive				
Coeur d'Alene Salamander	Yes	Possible	No	No
Boreal Toad	Yes	Possible	No	No
Northern Leopard Frog	Possible	No	No	No
Common Loon	Yes	No	No	No
Harlequin Duck	Yes	Possible	Yes	Yes
Northern Goshawk	Yes	Yes	Yes	Yes
Flammulated Owl	Yes	Possible	Yes	Yes
Black-backed Woodpecker	Yes	Yes	Yes	Yes
Townsend's Big-eared Bat	Yes	No	No	No
Northern Bog Lemming	Yes	No	No	No
Fisher	Yes	Possible	Yes	Yes
Wolverine	Yes	No	No	No
Management Indicator				
Pileated Woodpecker	Yes	Yes	Yes	Yes
American Marten	Yes	No	No	No
White-tailed Deer	Yes	Yes	Yes	Yes
Other				
Forest land birds	Yes	Yes	No	No
Snag habitat	Yes	Yes	Yes	Yes

**The peregrine falcon was delisted under the Endangered Species Act because of recovery of populations on August 25, 1999. It will be treated as a sensitive species in this document.*

EXISTING CONDITION

An important concept in the existing condition descriptions and analysis is the difference between *capable habitat* and *suitable habitat.* The following definitions are helpful in distinguishing between these two terms and the concepts they are based upon.

Capable habitat: Refers to the inherent potential of a site to produce essential habitat requirements of a species. The vegetation on the site may not be currently suitable for a given species because of variable stand attributes such as unsuitable seral stage, cover type or stand density, but it has the fixed attributes that would enable it to provide those variables under appropriate conditions. Some examples of fixed attributes are slope, aspect, soil or elevation.

Suitable Habitat: Wildlife habitat that currently has both the fixed and variable stand attributes for a given species' habitat requirements. Variable attributes change over time and may include seral stage, cover type, stand density, tree size, stand age, or stand condition.

THREATENED, ENDANGERED & PROPOSED SPECIES

Gray Wolf

Habitat Requirements

Wolves are highly social animals requiring large areas to roam and feed. Conservation requirements for wolf populations are not fully understood, but the availability of prey and limiting risk of human-caused mortality are considered key components (USDI 1987, Tucker et al 1990). The risk of human-caused mortality can be directly related to the density and distribution of open roads. Wolves are predators of white-tailed and mule deer, elk and moose. In the Bonners Ferry Ranger District, white-tailed deer are the most numerous and widespread ungulate and would be considered the most important prey species. Elk and moose are available in some areas of the district in moderate numbers.

Reference Condition

The northern Rocky Mountain wolf (a subspecies of the gray wolf) was listed as Endangered in 1973. However, based on enforcement problems and a trend to recognize fewer subspecies of wolves, the entire species was listed as Endangered throughout the entire lower 48 states, except Minnesota, in 1978 (USDI 1987). In the past, substantial declines in numbers of wolves resulted from control efforts to reduce livestock and big game depredations. By the 1940's, the Rocky Mountain wolf was essentially eradicated from its range.

In 1994, final rules in the Federal Register made a distinction between Idaho wolves that occur north of Interstate 90 and wolves that occur south of Interstate 90. Gray wolves occurring north of Interstate 90 are listed as Endangered species and receive full protection in accordance with provisions of the Endangered Species Act. Gray wolves occurring south of Interstate 90 are listed as part of an experimental population, with special regulations defining their protection and management.

Existing Condition

The Bonners Ferry RD occurs north of Interstate 90. While the project area is outside of lands designated for wolf recovery, there is habitat available for gray wolves, especially in ungulate winter range. There are no sites within the project area that would be considered as rendezvous or denning areas, but some sites within traveling distance of foraging wolves might be used. Specifically, the closest high quality sites are near Round Prairie. Lack of suitable denning habitat is likely the limiting factor for year-round wolf use of the area.

There are no confirmed wolf sightings within the project area, but several reports of wolves have occurred on the district. Two sightings have a high probability of being wolves. One was in the Brush Lake area along Highway 95 in winter 1996; the other was several photographed tracks in the Boulder Creek area in 1997. Other unconfirmed sightings have occurred spread throughout most of the district.

Because the project area is winter range, it is expected that it could be within the foraging area for a future pack of wolves even if it is not presently used. The most important criteria for wolf management are the management of an abundant prey base and the minimization of the risk of illegal mortality. Although no specific population numbers are available, all harvestable species of ungulates are common and available enough to provide ample prey base for wolves. It is highly unlikely that the prey population limits wolf recovery in the area.
Illegal mortality results primarily from shooting deaths, occasionally associated with open roads. In Montana, wolves have been successfully increasing in areas with high open road density with very little illegal mortality. The productivity of the packs in Montana have not apparently been affected by near human disturbance based on the observation that numbers are increasing and at least one successful pack has denned within 300 yards of a dwelling (J. Fontaine, pers. comm. 1995).

Woodland Caribou

- ❖ There will be no further analysis for this species in this document because:

Habitat Requirements

The population is generally found above 4500 feet elevation in the Selkirk Mountains in Engelmann spruce/subalpine fir and western red cedar/western hemlock forest types. They are highly adapted to upper elevation boreal forests and do not occur in drier low elevation habitats except as rare transients. Seasonal movements are complex in this population and normally occur as altitudinal patterns moving to traditional sites for different seasons.

Reference Condition

The Selkirk caribou population was emergency listed as Endangered in 1983 and a final ruling of its status appeared in the Federal Register in 1984 (USDI 1994). The recovery area for the population is the Selkirk Mountains of northern Idaho, northeastern Washington and southern British Columbia, Canada.

Existing Condition

The area is not within the woodland caribou designated recovery area. There is no habitat for woodland caribou in the project area.

Bald Eagle

- For these reasons the project would have no effect on bald eagles and there will be no further analysis in this document.

Habitat Requirements

Bald eagles are winter visitors and year-round residents of northern Idaho. They are attracted to the area's larger lakes and rivers that provide most of their foraging opportunities (e.g. fish, waterfowl). Accordingly, bald eagles select shoreline areas with larger trees to pursue such activities as nesting, feeding, loafing, etc. Nesting habitat includes proximity to sufficient food supply, dominant trees, and within line-of-sight of a large body of water (often within 0.25 mile of water). Nest trees typically are large ponderosa pine, Douglas-fir, or cottonwood trees with open crowns in areas that are relatively free from human disturbance (Montana Bald Eagle Working Group 1991). However, several new territories in recent years have been located in areas of high human density, including several in the Idaho Panhandle.

Reference Condition

Bald eagles were undoubtedly common in the Idaho Panhandle historically because of the abundance of large water bodies with ample prey. The two major factors affecting the decline of the eagle in this area were probably the pervasiveness of the organochlorine pesticide DDT, and the loss or disturbance of nesting areas.

Existing Condition

At the time of federal listing, bald eagles were uncommon in this zone as designated in the Pacific States Bald Eagle Recovery Plan (page 29). Recovery areas in northern Idaho have contributed enough new territories to reach and exceed goals listed in the Recovery Plan. Originally, there was a target of zero territories in the area covered by the Bonners Ferry Ranger District. In Boundary County alone, there are now at least 11 territories, most of them discovered in the last decade. The majority of these nests are along the Kootenai River, outside of National Forest System lands.

Nesting, feeding and roost areas are protected on National Forest Lands through implementation of Forest Plan standards in accordance with the Pacific Bald Eagle Recovery Plan and the Montana Bald Eagle Management Plan. The entire district is within bald eagle recovery area.

There is no suitable nesting habitat within the project area. The nearest known bald eagle territory is at Robinson Lake. This pair uses the Round Prairie area for the majority of its foraging, although the Moyie River is sometimes used. Bald eagles typically prefer to nest along an associated body of water, which may be a large river such as the Kootenai. The Moyie River is too small and fast flowing in the project vicinity to provide suitable nesting or roosting habitat.

Grizzly Bear

- There will be no further analysis for this species in this document because of:

Habitat Requirements

Populations of grizzly bears persist in those areas where large expanses of relatively secure habitat exist and where human-caused mortality is low. Grizzly bears are considered habitat generalists, using a broad spectrum of habitats. Use patterns are usually dictated by food distribution and availability combined with a secure environment. Grizzlies commonly choose low elevation riparian areas and wet meadows during the spring and generally are found at higher elevation meadows, ridges, and open brush fields during the summer. During the late summer and fall, moist timber habitat types become increasingly important for bears (Volson, 1994).

Grizzly bears den for the winter from approximately November 1 through April 1 each year.

Reference Condition

The grizzly bear was listed as Threatened in 1975. The bear was originally distributed in various habitats throughout western North America. Today, it is confined to less than 2 percent of its original range, represented in five or six population centers south of Canada, including the Selkirk and Cabinet-Yaak ecosystems. Habitat loss and direct and indirect human-caused mortality is implicated in its decline (USDI 1993).

Noted naturalist Murie commented that the Priest Lake Area was one of the last strongholds for grizzly bears within northern Idaho (Layser 1978). Although it is unclear, it can be gleaned from this historical information that grizzly bears were undoubtedly more plentiful in the past than they are today. From the arrival of the first settlers into the area through the late 1970's, human access into areas occupied by grizzly bears has steadily increased, precipitating an increase in the frequency of human/bear encounters. These encounters have resulted in the death of some grizzly bears. The population estimate for the entire Selkirk ecosystem is unknown, but between the years 1985-1990, 26-36 bears were known to occur within a study area that composed approximately one-third of the ecosystem (USDI 1993).

Existing Condition

The area is not within either grizzly bear designated recovery area. There is limited habitat for grizzly bear in the project area.

Canada Lynx

Habitat Requirements

- There will be no further analysis for this species in this document because of the low probability of lynx occurrence and use.

Lynx occupy regions in North America of arctic or boreal influence. They are restricted to forested habitats within this region and are found from western Alaska to the eastern edge of Newfoundland. The northern boundary of this range coincides with the northern extension of the boreal forests. The southern boundary of lynx range is along the high elevation or boreal forest areas of the Cascades and Rocky Mountains into Washington, Idaho, Montana, Wyoming, Colorado, and Utah.

Lynx are considered a low-density species with home ranges averaging 24 square miles, depending on prey abundance. They occur primarily in moist, cold habitat types, where snow depths generally maintain depths of 3 ft or greater throughout the winter. On the Bonners Ferry Ranger District, these are generally above 4000 feet elevation. Even though lower elevations can be important in some instances, evidence suggests lynx tend to use these areas less because of competition with other predators and overheating in the summer. Although it is noted that lynx rely heavily on snowshoe hare as a primary food source, it is believed that other species such as red squirrels and grouse may play an important role in lynx ecology. Red squirrels are moderately common on the district, and three species of grouse plus one species of ptarmigan occur commonly above 4000' on the district.

Lynx habitat consists primarily of two structurally different forest types occurring at opposite ends of the stand age gradient, although they also use other habitats. Lynx require early successional forests that contain high numbers of prey (especially snowshoe hare) for foraging and late-successional forests (especially deadfalls) that contain cover for kittens and for denning (Koehler and Aubrey in Ruggiero et al., 1994, p. 86). The highest use occurs when these are in close proximity. Like most wild cats, lynx require cover for security and stalking prey; they avoid large open areas. Although lynx may cross openings less than 100 meters in width, they generally do not hunt in these areas (Koehler and Aubrey in Ruggiero et al., 1994, p. 88). In North Central Washington, lynx used areas with gentle slopes (less than 10%) in winter (McKelvey et al, page 307 in RMRS-GTR-30, 1999) and moderate to gentle slopes (less than 40%) in the southern Rocky Mountains (Apps, page 352. in RMRS-GTR-30, 1999).

Reference Condition

The lynx is one of the three species of wild cats that occur in the temperate forests of North America. Lynx populations in Alaska and most of Canada are generally considered stable to slightly dropping. The conservation of lynx populations is the greatest concern in the western mountains of United States because of the peninsular and disjunct distribution of suitable habitat at the southern periphery of the species' range. Both historic and recent lynx records are scarce, which makes identifying range reductions and determining the historical distribution of stable populations in the region difficult (Koehler and Aubrey in Ruggiero et al., 1994, p. 79).

Existing Condition

The project is lower elevation than that normally used by lynx, and there is no available denning habitat in the project area. There is low elevation (less than 3200') habitat available for lynx in the project that will only be used in

the event that hare populations at higher elevations are either low or non-existent. The project area lies approximately .5 mile outside the Deer-Skin Lynx Analysis Unit.

SENSITIVE SPECIES

Black-backed Woodpecker

Habitat Requirements

Black-backed woodpeckers nest in snags or in live trees with heart rot that are at least 5 inches in diameter. They often use clumps of snags for nesting, and are known to nest in spruce, lodgepole pine, aspen, ponderosa pine, Douglas-fir, and western larch (Thomas 1979, p. 381; Harris 1982, p. 52, 53, & 60). Their nesting habitat preferences are very broad during non-epidemic conditions, finding suitable nesting habitat in small, unremarkable snags in a variety of sites. Four of six known nests on the Bonners Ferry Ranger District occur in timber harvest units.

Reference Condition

The geographic range of the black-backed woodpecker extends south from Alaska to central California and Nevada and throughout most of the northern United States. Breeding densities of black-backed woodpeckers vary considerably in response to prey availability, increasing up to 7 times the normal level during beetle epidemics (Jackman 1975, p. 101). This species meets its highest population levels by a rapid response to outbreak conditions, either during epidemics or forest fires.

They are specialists in exploiting recent forest fires, and rapidly utilize new burns (T.Layser, pers. comm. 1995, Hutto, 1995). Burns 5 years old and newer do not occur in the project area, except for stands that were burned as part of a silvicultural prescription.

Existing Condition

Black-backed woodpeckers feed primarily on wood-boring beetles and specialize on large areas of recently killed, beetle infested timber. Habitat model results indicate there are stands of high quality foraging habitat present in the project area; this is the same reason that forest health is an issue for this project. This is an underestimate because of the difficulty of stand examiners noticing signs of low-level insect activity. Foraging habitat changes over time, and as stands mature, insect activity increases. Over the district, the acres of stands at risk for beetle activity is rapidly increasing because of the number of stands reaching high risk age. Insect outbreaks are occurring at or above their predicted levels, such as in the areas around the project area. Because of the wide latitude of available suitable nesting habitat (including the optimal burns), foraging habitat is considered limiting at this time. However, as noted, the availability of foraging habitat over the next few decades will grow at an increasing rate.

In general, snag density in the assessment area is moderate. There are few large snags available in portions because of logging and stand replacing fires earlier this century. Remnant western larch and ponderosa pine snags occur infrequently throughout the project area. Small diameter snags (<10 inches) are much more abundant.

Black-backed wooodpeckers are known to occur within 1 mile west of project area and are expected to occur in the project area as well.

Analysis criteria for this species is presence of burns less than 5 years old, presence of snags (greater than 5" dbh), and presence of diseased or damaged trees in stands for foraging habitat.

Boreal Toad

- ❖ No further analysis and discussion is warranted because of:

Habitat Requirements

Boreal toads require shallow water in ponds, lakes or slow-moving streams for breeding sites. Boreal toads lay their eggs in the warmest water available, typically less than 20 inches deep (Corkran & Thoms, p. 86 1996). Beaver ponds are often used for breeding. This species does not require much aquatic or emergent vegetation in its breeding habitat. After the brief spring breeding season, adult toads leave aquatic habitats and travel to a variety of upland habitats. Radio telemetry research on boreal toads in southern Idaho found that toads could travel up to 2 kilometers (about 1 mile) from their natal ponds; it also showed that toads avoided crossing clearcuts (Bartelt and Peterson 1994). Boreal toads in Colorado have been documented traveling up to 2.5 miles away (Loeffler 1998).

Tadpoles take at least 2 months to develop before they grow into juvenile toads and disperse from the breeding site into nearby upland habitats. Juveniles disperse from their natal ponds in late summer. The timing of dispersal depends on water temperature; in warmer water, tadpoles and juveniles mature faster. Much of the year toads are away from ponds in terrestrial forest and non-forest habitats. Toads hibernate in the winter in habitats that maintain a high humidity and above-freezing temperatures. It is important that toads be able to move among their seasonal habitats. According to Nussbaum et al. (1983, p. 128), optimal habitat probably has moderate to dense undergrowth in more humid regions. Steep road cuts can be a barrier to toads moving between seasonal habitats, although it can also provide a barrier-free travel corridor that then provides opportunities for road mortality. Juvenile toads are vulnerable to being killed by motorized vehicles when they are dispersing from their natal ponds.

Boreal toads are widespread and common on the Bonners Ferry Ranger District. They are known to breed from all but the highest elevations down to the Kootenai River Valley. There is no evidence of decline on the district; however, it is assumed that numbers were greater in the past primarily because of the loss of wetlands. An increase in roading, particularly in low elevation developed areas, has probably increased mortality from road kills.

Rationale for No Further Analysis

Preliminary analysis shows that Inland Native Fish Strategy guidelines concerning riparian habitat conservation areas within 150 ft. of the edge of wetlands would prevent sedimentation of toad breeding habitat. Because toads frequently breed in muddy-bottomed ponds (Nussbaum et al, 1983, p. 129), a small amount of sedimentation is not a great cause for concern for this species. Road density and restrictions would not change as a result of this

project, so mortality risk from vehicles would remain the same. Thus, adequate design criteria and mitigation measures are incorporated to protect boreal toads and their habitat.

Coeur d'Alene Salamander

- ❖ No further analysis is warranted for this species because:

Habitat Requirements

Coeur d'Alene salamanders are small salamanders that choose seeps and wet sites, usually with rock that contains deep fissures that enable them to moderate their temperature by avoiding outside air. It also occurs on the toe slopes of fractured sedimentary rocks (pedimonts) in the Moyie River drainage. This species occurs on Bonners Ferry Ranger District on the east side, but has not been recorded in the Selkirks because of inappropriate geology. Where it has been investigated, it has been found to be locally abundant but limited to appropriate microhabitats within its limited range.

Rationale for No Further Analysis

The proposed project incorporates design features that would protect moist sites such as inhabited by this species. As with boreal toad, this species tolerates disturbance and even muddy water to some extent, because it occurs in roadside ditches commonly in the central portion of its range. Therefore, the project has incorporated greater protection than it needs to maintain viability.

Common Loon

- ❖ No further analysis is warranted for this species because:

Common loons are large lake-nesting birds. They require lakes with emergent vegetation that are at least 10 acres in size because of their need to have a large expanse of water to take off and land. There are no lakes near any of the proposed treatment units that meet this description, and at the present time no loons are known to nest in Boundary County.

Fisher

Habitat Requirements

Fisher are medium-sized mammalian carnivores. They tend to be opportunistic predators, eating anything they can catch. Their major prey are small to medium sized mammals, birds, and carrion (Arthur et al., 1989, p. 680). Fishers are found only within North America and presently occur from southern Canada south into the northwestern states, California and the Great Lake States. Fishers occur most commonly in landscapes dominated by mature to old forest cover. Within the Pacific states and Rocky Mountains, they appear to prefer late-successional coniferous forests in the summer and mid to late-successional forests in winter.

Fishers prefer habitats with high canopy closure (greater than 80 percent) and avoid areas with low canopy closure (less than 50 percent) (Powell 1982). They also use riparian areas disproportionately more than their occurrence. In north-central Idaho, grand fir and spruce forests were preferred by fishers (Jones 1991) and elevations from approximately 3000 to 5000 feet were used. The habitat requirements of fishers are thought to be more associated with the physical structure of the forest and associated prey than with tree species. This structure includes the vertical and horizontal complexity created by a diversity of tree sizes and shapes, light gaps, dead and downed wood and the layers of overhead cover. Large diameter spruce and grand fir snags and large downed material are used for denning and foraging. Fishers tend to avoid non-forested areas. The home ranges for fishers vary with prey densities. Studies indicate that the mean home range for adult males is 40 square kilometers; this is nearly three times that of females, which is 15 square kilometers.

Fishers tend to avoid human presence and generally are more common where the density of humans is low and human disturbance is low. Fishers are easily trapped. Where populations are low, fisher populations can be jeopardized by the trapping of coyote, fox, bobcat and American marten (Powell & Zielinski in Ruggiero et al. 1994 p. 63). Habitat security, in the form of low road densities, reduces the risk of this occurrence because trapping areas are limited.

Reference Condition

No accurate estimates or records exist for historic wildlife populations, including American marten and fisher, for the geographic assessment area. Historic records do indicate that furbearers, including these two species, were trapped in the Priest Lake area (Lindsley 1889). It would be reasonable to infer the numbers of animals were greater than what occurs currently given the number of records within the last 10 years in the Geographic Assessment area.

Extensive alteration of forest structure as a result of natural and human-caused disturbances (i.e. reduction in canopy closure, snags, and down woody material) has altered the habitat value for fisher and marten. Generally, the openings created by human development and timber harvesting has reduced denning habitat value, whereas the increase in canopy cover brought about by fire suppression has expanded denning habitat quality.

To provide for high integrity fisher habitat within a watershed area, at least 45% of the capable fisher habitat should be classified mature and older forests (suitable denning habitat). Mature and older forests provide for higher amounts of dead and down material that support prey species. Moderate integrity fisher habitat would maintain 40-45% of the capable fisher habitat as suitable denning habitat. A watershed area with less than 40% of the capable habitat in suitable denning condition would be rated as low integrity habitat for fishers. Less than 2 miles of open road per square mile of area is recommended to reduce mortality risk (Heinemeyer and Jones 1994).

Existing Condition

Fishers are considered rare throughout most of Idaho. Most local biologists believe that fishers were extirpated from the area and are not currently abundant because of lack of time to restore the populations, rather than suppression from trapping or road mortality, or lack of suitable habitat.

Denning habitat can function as foraging habitat, but fishers can also use areas of lower seral stages to forage as well. Only 17% of the capable habitat is in currently suitable habitat in Compartment 739. These stands are all to the south and east of the project area. Stands are currently unsuitable for a variety of reasons, including having too small trees, trees of the wrong species (pending succession into more favorable species), or too few trees per acre. A disproportionate amount of the capable but currently suitable habitat is along the lower portions of the drainages, which are the better sites for fisher based on topography and elevation. Given the high amount of capable habitat and the trend of the district's forests towards older stands, habitat is likely being generated at a faster rate than the available amount of fishers can utilize.

There is no currently suitable fisher habitat within the project area. 455 acres out of a total of 663 acres of capable habitat (not currently suitable) are proposed for treatment. According to Jones, fisher avoid dry ponderosa pine habitats (pers. comm. 1993). The project area has a large area of drier habitat types intermixed by topographical areas of moist forest. Because the canopy cover of the drier types is higher than it would be under a natural fire regime, fisher may tend to use these dry stands more now than they would historically. The dry sites in Pipeline are also on steep slopes which fisher tend to prefer less than gentle slopes.

No sightings of fisher have been documented in the project area. No surveys will be conducted to determine presence as their presence will be assumed for analysis purposes.

Analysis criteria for fisher include maintenance of high canopy cover in suitable habitat, and maintenance of security habitat to reduce incidental take in trapping.

Flammulated Owl

Habitat Requirements

Flammulated owls are seasonal migrants that occupy home ranges in the northern latitudes during the spring, summer and fall. They are cavity nesters that depend upon naturally occurring or excavated cavities for nesting. Consequently, snags and other defective trees are an important component of their breeding habitat.

These owls are attracted to relatively open, older forests featuring ponderosa pine and Douglas-fir that are correlated with drier habitats. Reynolds and Linkhart (1992, p. 166) reported that all published North American records of nesting, except one, came from forests in which ponderosa pine was at least present, if not dominant. The flammulated owl's preference for ponderosa pine and/or Douglas-fir can also be linked to prey availability. Reynolds and Linkhart (1992, p. 168) noted a stronger correlation between prey availability and ponderosa pine/Douglas-fir than with other common western conifers.

Reference Condition

No population numbers exist for this species' historic condition. However, a geographic assessment of the Bonners Ferry subbasin determined that the historic amounts of dry site large/mature and old growth ponderosa pine and Douglas-fir were much more numerous than currently. This is due to several reasons. Low intensity wildfires that maintained these stands in suitable conditions for flammulated owls have been essentially eliminated by aggressive fire suppression. Timber harvesting has fragmented stands into smaller patches. These lower elevation, low

gradient areas are also disproportionately used for human development. These factors have dramatically reduced the amounts of suitable habitat for this species. There are no standards available to determine how many flammulated owls are adequate to maintain population viability for a given planning unit.

Existing Condition

Flammulated owl habitat is widespread, disjunct and uncommon. Flammulated owls in the Bonners Ferry district tend to occur in small areas of suitable habitat within larger stands of less suitable habitat, as well as larger areas of suitable habitat. There are few observations on the district of this species, in part because they are difficult to survey in the typical spring conditions encountered here. Because they are a dry site species, most of the habitat in the Bonners Ferry district is concentrated in the lower elevations.

Only 15% of the capable habitat within Compartment 739 is currently suitable (195 of 1,222 acres), and capable habitat is a low proportion of the total acreage of the compartment (19%). These numbers underestimate the amount of capable and suitable habitat present for several reasons. Because stand exams are weighted averages of the physical (i.e. slope) and biological (i.e. habitat type) features, microsites or variations in habitats that have value for flammulated owls are not always detectable. For example, the habitat type of any stand is based on the number of plots taken in the field exam. The stand habitat type doesn't reflect microsites of other habitats that may be present and would support flammulated owls. However, the trend of the analysis is still considered valid because the results of the modeling are consistent with what would be expected.

The primary reasons that capable habitat is currently unsuitable are small tree size, high canopy cover, or a low density of large trees. Stands that are unsuitable because of small tree size or a low density of large trees have the greatest likelihood of growing into suitable habitat given adequate time, particularly if low intensity ground fires reduce competition in the stands. Stands that are unsuitable because of a high canopy cover would not become suitable given time alone, but would require some disturbance such as beetles, wildfire or mechanical removal (such as from timber harvesting).

Harlequin Duck

Habitat Requirements

Harlequin ducks are rare, seasonal residents of whitewater streams in the northern Rockies. They are small sea ducks that winter in coastal areas and migrate hundreds of miles inland to northern Idaho, western Wyoming and western Montana to breed and rear young. Harlequins arrive in northern Idaho between March and May. After nesting begins in mid-May the males migrate back to the Pacific coast. Nesting continues through July, with the females rearing the young through late August or September, after which they return to the coast for the winter (Cassirer and Groves 1991, p. i, USDA 1992).They are generally associated with fast flowing streams which are 10 meters wide or greater during the breeding season (Cassirer & Groves 1990, p. 8).

Harlequins nest along clear, clean, swiftly flowing remote mountain streams located away from concentrated human activities. In northern Idaho these streams are usually associated with mature to old-growth western red cedar/western hemlock or spruce/fir forest stands (Cassirer and Groves, 1991, p. ii). Nesting habitat includes very low gradient stream sections with braided channels, intact riparian areas with dense streamside shrub growth, and rich aquatic insect populations (Cassirer and Groves, 1991, p. 7). Turbulent stream sections are used for security and feeding.

The presence of harlequin ducks is considered an indicator of high water quality (USDA 1992). Management activities that impact stream quality, including those that could increase water yield beyond the stream's capability,

have the potential to impact this species. Water quality standards relative to harlequins are primarily to protect their invertebrate food base and maintain hydrologic function. Harlequin ducks can also be affected by disturbance within approximately 200 feet (depending on density of streamside vegetation) of a nesting stream.

Reference Condition

Harlequins were likely to be much more common in historical times prior to disturbance at their breeding streams and sport fishing on their wintering grounds. They were probably never abundant because of the scarcity of suitable nesting streams and the ease at which metapopulations could be extirpated.

Existing Condition

Harlequins are known to nest along the Moyie River and its tributaries. There are no tributaries that may provide nesting or foraging habitat for the harlequin duck within the project area, but the Moyie River flows adjacent to it. The Moyie is likely to be a staging river where experienced nesters rest prior to returning to nesting streams. Staging occurs during the earliest part of the breeding season, and is not likely to be an issue after mid-May. However, it is possible that harlequins nest in unknown locations along the Moyie River itself. Placer Creek is small and intermittent, with a well-used road within 10-20 feet of a long section of it. It would be highly unlikely that it is used by harlequins.

The Forest Service and Idaho Department of Fish and Game have done monitoring surveys for harlequins along the Moyie River for several years. Additional monitoring for this project is not warranted.

Effects on this species from the project will be evaluated based on modification of habitat or disturbance to potential nesting sites, or in this case, likely staging areas.

Northern Bog Lemming

- ❖ No further analysis in this document is warranted because:

Bog lemmings inhabit moderate to high elevation wet meadows, fens/bogs, alpine sedge meadows, krummholz, spruce-fir forest with dense herbaceous and mossy understory, and mossy streamsides. This small mammal is representative of a restricted habitat that is very limited in the contiguous United States. While its habitat supports several other wildlife species, the sensitive or unique species that have been identified are mostly plants. Because of the scarcity of these habitats and the relative small size of the sites, they may be easily destroyed. Therefore, their monitoring and protection is essential to maintain the viability of the dependant species. They appear to be associated with alpine or sub-alpine habitats but they have been found in moist cedar/hemlock habitat on the Priest Lake Ranger District. They do not occur in the types of habitat proposed for treatment in this project.

The biggest threats to this species' habitat are activities that would dry out or damage the vegetation (trampling, compaction etc.) where this species lives. These could include timber harvest, livestock grazing or recreation use. Snowmobiles and skiers could compact the snow, creating barriers that would restrict the lemmings' movement over ground under the snow. Riparian/wetland Best Management Practices (BMP's) and Inland Native Fish Strategy guidelines would help protect habitat for this species during road building, logging and grazing where it occurs near perennial streams.

Rationale for No Further Analysis

Habitat for this species does not occur in the treatment areas, so no impacts would be expected.

Northern Goshawk

Habitat Requirements

Northern goshawks are large forest hawks and occur in northern Idaho year-round, although some migrate away from the area in winter. Goshawks are indicators of mature and old growth habitats such as park-like stands featuring a dense overstory of large trees and an open understory of grass or low shrubs. They are adapted to live in these forest stands and feed primarily on small mammals and birds (Warren 1990 p. 20). Northern goshawks avoid large open areas due to competition from red-tailed hawks and great horned owls (Crocker-Bedford and Chaney 1988; Reynolds 1983), and because of their secretive hunting strategies. Slope is an important site-predicting attribute for their nest stands on the Bonners Ferry Ranger District, with most nests on the district on slopes less than 40%.

Reference Condition

Much of the historic conditions noted for flammulated owls apply to northern goshawks as well. Historic numbers of goshawks were likely higher than they are today, because many of the species they prey upon were likely more numerous. This is because the habitat of their primary prey species was more plentiful than today. The draft Geographic Assessment for the Bonners Ferry area for forest structure indicates a greater proportion of old growth was present in the Bonners Ferry sub basin than currently occurs. Old growth is important for northern goshawks not only for prey species habitat but also for the large trees that provide the substrate for their substantial nest structures.

Another factor influencing the amount of goshawk habitat is the amount of understory vegetation that this generally moist area produces. Because northern goshawks require a combination of adequate understory to provide prey species, and adequate clearance for flight maneuverability, some stands that historically were suitable for foraging are no longer suitable because of increased density of understory.

At least three suitable nest areas should be provided per home range (5,000-6,000 acres) to provide long-term nesting habitat for goshawks on the landscape. The minimal stand size for goshawk nest sites is 30 acres, with all nest sites best located within 0.5 mile of each other (Reynolds, et al. 1992). Post-fledging areas have not been an issue on the IPNF because nesting habitat, not foraging habitat, appears to limit the numbers of goshawks. In this document, post-fledging areas would be considered the most suitable 400 acres around known territories, or territories located in this project.

Existing Condition

Northern goshawk habitat is widespread and abundant in the Bonners Ferry Ranger District, and on the North Zone GA area. As with most species, capable habitat is much more abundant than currently suitable habitat, with a total of 3,918 acres of capable and 220 acres of currently suitable within the compartment that contains the proposed units. The models tend to underestimate the amount of suitable habitat within stands that have microsites that goshawks are known to successfully use on the North Zone.

In the Bonners Ferry Ranger District, some capable habitat is not currently suitable because of small tree size, low density of large trees, low canopy closure, or a high density of understory vegetation. Habitat with a low density of large trees or small trees can frequently grow into suitable habitat over time.

The large amount of suitable goshawk habitat indicated by the model is confirmed by the number of known goshawk nesting territories. The model accurately predicts the areas of the district that have the highest concentration of known nests. The North Zone is well represented by northern goshawk territories as well, with over 25 known on the two other North Zone districts. There is one known territory within 1 mile of a proposed treatment unit.

Northern Leopard Frog

- ❖ No further analysis and discussion is warranted because:

Habitat Requirements

This species occupies marshes, wet meadows, riparian areas and moist, open woods. Leopard frogs apparently require a moderately high ground cover for concealment (Nussbaum et al. 1983, p. 180). Because this species attaches its eggs to aquatic vegetation, it prefers ponds or lakeshores that have fairly dense aquatic and emergent vegetation during the spring egg-laying season. Breeding habitat typically has water at least 20 inches deep (Corkran and Thoms 1996). This species probably hibernates in and spends all its life in and around ponds and lakes. There are no current records for this species in Boundary County, despite surveys last year specifically to investigate suitable habitat and suspected historical sites. It is known to occur just north of the Canadian border, and in the Clark Fork River, so there may be some remnant populations.

Rationale for No Further Analysis

Preliminary analysis shows that Inland Native Fish Strategy guidelines concerning riparian habitat conservation areas within 150 ft. of the edge of wetlands would prevent sedimentation of frog breeding habitat. None of the proposed treatment units contain suitable habitat, nor are near suitable habitat.

Peregrine Falcon

Habitat Requirements

Peregrine falcons nest in areas with abundant suitable-sized avian prey near large cliffs. Suitable cliffs generally have aspects favorable to spring warming. No suitable cliffs are present in the project area, and there are no known historic or current eyries in Boundary County. The nearest known eyrie is on the Clark Fork River, 50 air miles from the project area. Peregrines can range up to 10 miles from their nesting cliffs to forage. Records of peregrines in spring are rare but have occurred on the Kootenai National Wildlife Refuge. The Kootenai NWR has abundant avian prey and would be considered a prime foraging location for peregrines if they nest near the Kootenai River Valley. It is unlikely that peregrines nest within the project area because of lack of habitat, and

equally unlikely that they would incidentally forage in the area if they are ranging near the Kootenai NWR. Nesting peregrines are subject to disturbance at their nests, but foraging birds are so wide-ranging that disturbance is unlikely to be a major factor.

Rationale for No Further Analysis

Because of the lack of suitable nesting habitat, this species will not be furthered analyzed.

Townsend's Big-eared Bat

- No further analysis for this species will be included in this document because of:

Habitat Requirements

The geographic range of Townsend's big-eared bat extends throughout western North America, from British Columbia south to southern Mexico, eastward to South Dakota and western Texas with isolated populations in the southeast United States. Townsend's big-eared bats have been found in a wide variety of habitats, from arid juniper/pine forests to high-elevation mixed-coniferous forests (USDA, 1989 pg. 38). Caves and cave-like structures are a critical habitat for this species, both as hibernacula in the winter and as roosts for summer nursery colonies (ODF&W, 1987, pg. 27). They occasionally use bridges and old buildings for roosting and in some places have been known to use building attics as nursery sites (Perkins, 1992 p. 9). They are typically found in shrub-steppe or forest edge (Notes of MT Bats, 1992). Foraging habitat is not well known but preliminary data suggests they forage along cliff faces and along small stream corridors in forested habitats (Perkins, pers. comm.). Other foraging habitat may include forest edges and openings and riparian areas where flying insects are abundant and there are no obstructions to flight. Loss and disturbance of hibernacula and roosting habitat is the limiting factor for Townsend's big-eared bats.

Rationale for No Further Analysis

Natural cave habitat is virtually nonexistent on the Bonners Ferry Ranger District because of the lack of limestone. Caves or adits are not expected in the geological type that represents the area, and there are no known caves or adits in the project area. Townsend's big-eared bats are known from a single location in the Purcell Mountains with bats using the site for both a nursery colony and winter hibernaculum; this site is in a different geologic type than the project area. Since habitat does not exist, surveys for Townsend's big-eared bat are not warranted.

Wolverine

- Based upon these factors, no further analysis for wolverines is warranted:

Habitat Requirements

Wolverines are low density, wide-ranging species that inhabit remote forested areas, ranging over a variety of habitats. Wolverines tend to use lower elevations in the winter and higher elevations in summer, when these areas provide the greatest potential for a food supply (Hornocker and Hash, 1981, pp. 1292-1296 & 1300). The most important habitat for wolverines is denning habitat, because females are very sensitive to disturbance at this time. Current research and district records suggest that denning habitat is in high elevations, particularly cirque basins or avalanche chutes.

Wolverine mortality associated with human/wolverine interactions is considered one of the primary limiting factors in wolverine populations. Improved access increases the potential for human/wolverine interactions, which can lead to shooting loss or incidental take by trapping (wolverines are occasionally taken by trappers focusing on other furbearers such as bobcat and American marten).

Other factors with the potential to threaten local population viability of the species include reductions of "wilderness refugia" (large areas of habitat with limited human access), natural reserves, or food availability (Hatler, 1989, in Butts, 1992, p. 32).

Rationale for No Further Analysis

Wolverines are likely to be transient in the area because of their wide-ranging nature. Consequently, the risk of human/wolverine interactions would be relatively low. None of the areas proposed for treatment include sites within many miles of suitable denning habitat, so the risk of disturbance during the sensitive rearing period is not a factor for this species. Access would remain as present, so the risk of mortality would remain the same.

MANAGEMENT INDICATOR SPECIES

American Marten

- ❖ This species will not be further analyzed in this document because:

Habitat Requirements

American marten was selected by the Idaho Panhandle Forest Plan as a management indicator species. It represents species using mature and old growth habitats. Marten are closely associated with mature to old-growth timber stands, preferring moist habitat types where small mammals are more abundant. American marten prefer stands with greater than 40 percent canopy closure, and tend to avoid those stands with less than 30 percent closure (Warren 1990, Spencer 1981 in Warren 1990 p. 30). In addition to a closed canopy, marten require an abundance of large downed logs and snags. This provides secure resting locations, denning habitat and winter access to small mammals living beneath the snow (Patton and Escano in Warren, 1990, pp. 29-30). American marten are easily trapped and are highly vulnerable to over harvest in areas accessible by fur trappers. Because of habitat similarities with fisher, the American marten will be treated as a guild in this document with fisher.

Pileated Woodpecker

Habitat Requirements

This species nests and roosts in cavities in large diameter (20" dbh or greater) live or dead trees. It selects nest trees in clumps of snags in stands with at least 70% canopy cover (Bull & Meslow 1977). Research in Montana found that typical pileated woodpecker nest trees were in stands with a basal area of at least 100 square feet per acre (McClelland 1979, p. 283).

Pileated woodpeckers feed on beetles, carpenter ants and other insects in live and dead trees, logs and stumps. It is assumed that nesting stands are also used as foraging habitat. Since they will frequently use individual snags in "low" quality stands as well, the measure of nesting habitat underestimates the amount of foraging habitat.

Reference Condition

Pileated woodpeckers have specific requirements for nesting which make them appropriate indicators of old growth or late successional forest. They are year-round residents that prefer forests with tall, large diameter dead or defective trees for nesting. Nest cavities are usually located more than 30 feet above the ground. Pileated woodpeckers feed primarily on carpenter ants and other insects, excavated from deep within dead and decaying wood (Bull 1987, p. 472-479; Bull and Holthausen 1993, p. 13-19; Warren 1990, p. 10-17).

Because foraging habitat represents a wider ecological range of forest age structure, nesting habitat is considered the most critical and limiting feature for pileated woodpeckers. A pileated nesting area should be at least 100 contiguous acres with an overall canopy cover of at least 50 percent (Warren 1990, p. 16). The limiting factors for pileated woodpeckers are generally considered to be large snags, for nesting, foraging, or roosting.

Existing Condition

Virtually the entire project area could be considered capable habitat. However, most of the project area is currently too small DBH to provide suitable nesting habitat. Because of the widespread presence of snags (although they are not always large ones), foraging habitat does not appear to be limiting except in the regenerated stands where there are few to no snags and dead/down is unavailable due to brush.

Most stands in the analysis area at the lower elevations provide some snags and/or logs suitable for foraging sites. Several stands, especially in the drier sites, have the capability of becoming good pileated habitat but are not currently suitable because of the high density of trees which are inhibiting the growth of fewer, larger trees.

Criteria used to analyze pileated woodpecker habitat were the presence of large snags as assumed to be in stands of average dbh greater than 14", and patch size. In order to provide for dispersal of young, at least one 1000 ac home range with one 100 ac nest stand (of at least 0.5 on the HSI index value) is needed for every 2500 ac of capable habitat. At least 500 acres of foraging habitat is needed per nesting territory, so one home range with 500 acres of high quality nesting habitat will be used to determine the number of home ranges possible. See also the section on Snag Habitat (B-24).

White-tailed Deer

Habitat Requirements

White-tailed deer are very adaptable and prolific, and thrive in a variety of habitat types and seral stages. They are also tolerant to disturbances, such as agriculture and forestry practices, and prefer these areas if an adequate arrangement of cover and forage is available. Some of the largest white-tailed deer populations in Idaho occur in the Panhandle. In 1985, the Idaho Department of Fish and Game estimated that 99 percent of the State's population was found in the two northern regions.

Climatic factors affect the seasonal variation of forage quality and quantity, accessibility to foraging areas, and the energetic requirements to the animal (Pfingsten 1983). Winter is the most limiting and stressful period for big game. It is during this period when forage is scarce and travel is energetically very expensive because of snow accumulations. Consequently, in an effort to ameliorate conditions, deer are forced to concentrate on smaller, more confined areas known as critical winter range. These stands are characterized by gentle slopes and lower

elevations (3000' and lower) that accumulate relatively little snow. Elk, moose, and to a lesser extent, mule deer are better adapted to deeper snow depths than white-tailed deer. Skovlin and Vavra (1979) stated that elk have greater foraging ability than white-tails because of differences in size. They have higher browsing reach, greater mobility to seek foraging areas and greater strength to paw frozen snow to obtain low growing vegetation. Consequently, white-tails are generally found on the valley bottom and lower benches, whereas other big game species will make use of higher elevations, especially the windswept ridges and upper south-facing slopes.

Thermal cover is probably the most important component of this winter habitat (thermal cover is the collective arrangement of tree crowns that help moderate the effects of inclement weather). It also intercepts snow and reduces understory snow accumulation, thereby, increasing foraging opportunities. As winter temperatures decrease and snow depths increase, animals select these areas to minimize energy expenditures (Pauley 1990). At least 50 percent of the canopy structure is needed to provide the attributes of thermal cover. Optimal proportion of thermal cover on the winter landscape should be 50-70 percent (Jageman 1984).

The stands that have the greatest use on the Bonners Ferry Ranger District for critical mid-winter snow interception are dense with a high proportion of cedar in the understory

Reference Condition

Historically, white-tailed deer flourished in the 1800s, but by the early 1900s their populations were reduced to low numbers due to over exploitation by trappers, miners and settlers. White-tailed deer populations have rebounded to a point where they are the most abundant big-game species in northern Idaho. Idaho Fish and Game's 1986-1990 statewide goals for white-tailed deer were changed from emphasizing increases in populations to maintaining populations, harvest, and recreational opportunities.

Existing Condition

About half of the project area, except for the portions in Section 35 that are greater than 30% slope and the drier habitat types, fits the proper topography and habitat type to be capable, although not necessarily currently suitable, critical mid-winter stands. Critical midwinter stands represent fewer stands than deer use throughout the entire winter period, because they are the stands that deer would retreat to and survive in during very harsh winters. Of the stands proposed for treatment, only 15 acres are currently suitable critical mid-winter habitat.

Stands that are too dense are unsuitable for this type of winter cover, because deer cannot manuever in them and because forage plants cannot grow underneath them. Optimal mid-winter cover stands are necessary over time, but the nature of the stands makes them useful for a relatively short period of time. Thus, an area is limited on how much area can be in "target" condition at any given time and still maintain stands approaching target condition as others outgrow it. Another significant factor in the maintenance of these stands over time is that old growth-dependant species of plants and wildlife are frequently more rare and need as many stands as are currently available maintained as old growth. Fortunately, white-tailed deer and the other common ungulates are very adaptable and can tolerate many other conditions even if it is not optimal for maximizing their populations. Thus, the percentage of acreage to be managed for optimal condition depends in part on the needs of other species including goshawks, and to a lesser extent, fisher.

The area has had a special handicapped access big game (deer and elk) hunt for the past several years. The gate is locked with a combination lock which users can open to gain access. Handicapped users apply for access though the USFS.

The analysis criterion for this species is the amount of critical mid-winter habitat available.

OTHER SPECIES AND HABITAT

Forest Land Birds

- ❖ No further analysis for this species will be included in this document because of:

Habitat Requirements

Forestland birds include all the avian species sometimes collectively termed as 'neotropical migrant birds' and 'resident songbirds'. No birds in this guild are listed as a sensitive species, except for the flammulated owl that is sometimes included because it is a migrant. This group of birds is not treated separately by species because they are an extremely diverse group of species, with widely divergent habitat requirements. Any treatment, including no action, affects some species in this group at the expense of others. It would be impossible to treat all the individuals in this group separately. However, some habitat specialists are represented by other species discussed, including dry site species (flammulated owl), riparian species (harlequin duck), early seral stage species (lynx), wetlands (Coeur d'Alene salamander, northern bog lemming and harlequin duck), old growth (flammulated owl, fisher, Pileated woodpecker and northern goshawk), and snag dependent species (Pileated and black-backed woodpeckers).

Rationale for No Further Analysis

Maintaining or trending habitats toward their historical range of conditions is presumed to provide for most habitat needs of the birds that have adapted to the Bonners Ferry Ranger District's ecosystem. Because of the detailed analysis for other species (discussed above) that share similar effects, species in this group would not be further analyzed in this document.

Snag Habitat

Historically, ecosystems in north Idaho were shaped by disturbance patterns that altered the size and distribution of various structures across the landscapes. Forest succession, wind damage, insects and disease, fire and other disturbances created snags in areas that ranged in size from individual trees to small patches or stands to entire drainages (1,000 acres or larger). Consequently, snag densities varied across the landscape, from areas with low levels of snags to other areas with abundant snags. On the Bonners Ferry Ranger District, snag densities and species vary across the habitat type groups. Some habitat type groups, such as those containing white pine or Douglas-fir, have large numbers of snags relative to historic times. Other groups have many snags, but of smaller size than would be expected historically.

Recent studies indicate that viable woodpecker populations occurred in areas with about four snags per acre (Bull et al., 1997). Managing for viable populations of snag dependent species does not require providing for snags on every acre in any sub drainage or across the landscape. Bull et al. (1997) recommends providing snags every 5 to 25 acre stand to satisfy distribution needs. This project would maintain snags in riparian areas where those occur within treatment areas.

Region 1 Snag Protocol (Jan 2000) provides guidelines for managing snags. The protocol recognizes that healthy snag populations depend on conditions similar to historic levels, and that there may be a temporary loss in snags to reach this historic condition. The Pipeline project is attempting to mitigate this effect by retaining large snags wherever possible.

The recent beetle epidemic will continue to kill live trees for a year or two in the Boundary County area, thereby creating snags and areas of high snag densities. Under all action alternatives, some snags would be harvested and lost as habitat for cavity-dependent species. However, the potential effects on snags and down wood would be influenced by a number of factors. Concentrated pockets of snags would remain untreated and unaffected by any management across the landscape. Areas outside of proposed treatment areas are and will continue to provide snags in excess of numbers shown to support viable populations of cavity-dependent species. Areas would be reserved from treatment within Inland Native Fish Strategy buffers. These areas along with untreated stands would contribute to snags and cavity habitat.

Design features of the project were devised to ensure the retention and selection of snags at a level and distribution that has been shown to support viable populations of species that use snags and logs. Snags and snag replacements would be retained in all treatment units at levels recommended by scientific literature based on recent studies. Snag retention objectives exceed Forest Plan standards and snag retention levels developed by Thomas et al. (1979). Snag retention objectives, including compensation levels, are consistent with recent published data that suggests populations of cavity nesters were viable in stands of ponderosa pine and mixed conifer forests that contained about four snags per acre (Bull et al. 1997).

The project would meet Forest Plan goals and objectives for cavity habitat, and Forest Plan standards as well as Region 1 Snag Protocol guidelines would be met or exceeded in all alternatives.

ANALYSIS AND DETERMINATION OF EFFECT

Methodology

Level of Analysis

The level of analysis is dependent on a number of variables including but not limited to: the existing condition, the cause and effect relationship, the magnitude or intensity of effects, the contrast in effects between alternatives, the risks to resources, and the information necessary for an informed decision. The analysis is commensurate with the importance of the impact (CEQ 1502.15), the risk associated with the project, the species involved, and the level of knowledge already in hand (USDA Forest Service, 1992).

The geographic scope for the wildlife analysis varies by species. This analysis uses the following sources, which provide the primary direction, foundation and methods used to develop the analysis for potential effects on wildlife.

- Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin
- IPNF Forest Plan, including Forest Plan Monitoring

·Available Conservation Assessments and Strategies for wildlife species, or Management Plans. For this project, these include specifically:

- Grizzly Bear Recovery Plan
- Montana Bald Eagle Recovery Plan
- Woodland Caribou Recovery Plan
- Lynx Conservation Assessment and Strategy
- Idaho Bird Conservation Plan
- Townsend's Big-eared Bat Conservation Assessment
- Draft Harlequin Duck Conservation Assessment and Strategy
- Region 1 Snag Management Protocol.

(Some of these do not apply to threatened or endangered species, but provide overall conservation guidelines.) Additional scientific literature as appropriate, including predictive habitat models.

Indicators Used to Measure Effects

The table below displays the indicators that are used to measure effects on wildlife species. Indicators for each species vary and are based on those factors that could result in a measurable adverse or beneficial effect. For most species analyzed, appropriate habitat parameters were measured to distinguish suitable habitat (specific parameters for individual species are located in the project file).

Table 2. Indicators used to measure effects.

Species	Indicator
Endangered	
Gray Wolf	Measurable reductions in prey species or increases in access

Sensitive	
Black-backed Woodpecker	Changes to nesting/foraging habitat (dead & down)
Fisher	Changes to suitable habitat or increased access
Flammulated Owl	Changes to suitable habitat
Harlequin Duck	Reduced water quality and disturbance
Northern Goshawk	Changes to suitable nesting habitat and disturbance
MIS	
Pileated Woodpecker	Changes to nesting/foraging habitat (large diameter snags)
White-tailed Deer	Changes to critical midwinter habitat

Cumulative Effects Analysis Areas

Other Forest Service Project Areas included in the cumulative effects are:

1) Bonners Ferry Ranger District Salvage EIS.
2) District Overstory Removal EA.

For each species analyzed in this chapter, the cumulative effects area has been determined (Table 3). This determination is based on the species' relative home range size in relation to its available habitat, topographic features (watershed boundaries) which relate to how species move and utilize their home range, and boundaries that represent the furthest extent of effects.

The existing condition is a culmination of past activities, whether they are human-caused or natural events. The expected changes in habitat conditions (i.e. stand structure) resulting from present and reasonably foreseeable future actions were included in the information databases or were interpreted qualitatively. Therefore, the following analyses of species are a cumulative representation of past, present and reasonably foreseeable future actions, including these incremental actions. Other cumulative actions not represented (i.e. projects on industrial private forest lands and State lands) would be discussed in the cumulative effects area. The analyses assume that other ownerships do not contribute to the needs of the species except where specifically mentioned. Therefore, for purposes of this analysis, the burden of achieving habitat needs and species viability rests on National Forest lands.

The analysis cumulative effects areas are depicted below, by species. This level of analysis is also supplemented by completed habitat modeling for most species of concern in this project over the greater area of the North Zone of the IPNF (flammulated owl, northern goshawk, Pileated woodpecker, fisher, white-tailed deer).

Table 3. Cumulative effects analysis areas.

Species	**Analysis Areas**
Endangered	
Gray Wolf	Ranger District

Sensitive	
Black-backed Woodpecker	Compartment
Fisher	Compartment
Flammulated Owl	Compartment
Harlequin Duck	Compartment
Northern Goshawk	Compartment
MIS	
Pileated Woodpecker	Compartment
White-tailed Deer	Compartment

Field and Prefield Reviews. The project area and vicinity has been visited on the ground by several biologists a number of times over the past 3 years in direct planning for the sale. These reconnaissance trips have taken place during all seasons of the year. I have reviewed queries from the timber stand database in order to determine or predict the occurrence of suitable habitat for all species concerned. This input was reviewed by a journey level wildlife biologist with experience in the specific project area and the district as a whole.

Predictive models. Predictive models have been used to determine broad scale habitat suitability and capability for all species for which the methods were appropriate. Habitat was mapped using timber stand data base information and geographic information systems. Habitat modeled includes that for most of the affected sensitive species and management indicator species.

Surveys. Surveys have been done for most of the emphasis species on the Bonners Ferry Ranger District, to varying degrees. The project file contains a list of surveys done on the Bonners Ferry Ranger District in the last 10 or so years.

THREATENED, ENDANGERED & PROPOSED SPECIES

Gray Wolf

Effects Common to All Alternatives

Mortality risk is unlikely to change measurably in the project area because no new roads will be constructed, and current gate management is expected to continue.

The abundance of deer, moose and elk are unlikely to be measurably affected by treatments in this project. Because availability of prey species is not limiting wolf recovery in the district, it would therefore not affect the ability of the wolf to successfully recover.

None of the alternatives affect denning or rendezvous habitat, because there is no habitat clearly identifiable as either denning or rendezvous habitat.

Direct and Indirect Effects

Alternative 1: The no action alternative would not measurably change the habitat capability or the risk of mortality for the gray wolf. The habitat capability is tied primarily to the quality of the habitat for its ungulate prey. Since the assessment area has a moderate amount of good winter range, it will likely remain as good habitat well within tolerances of prey availability for wolves. (See the analysis of white-tailed deer for a more detailed explanation of habitat changes for the alternatives.) The risk of mortality would remain the same, which is low risk at this time, primarily because most of the project area is behind a gate closed year round.

Alternative 2: As noted, habitat quality for gray wolves is highly dependant upon the quality of its ungulate prey. Wolves will prey upon all the ungulate species that occur in the Pipeline area. Because the project area is generally moderate to good quality habitat for several species of ungulates, it would take significant reduction in ungulate habitat quality to affect the quality of the area for wolf use. The objectives of the action alternatives are to make the stands approach conditions similar to what would have occurred under historical fire regimes. This implies that healthy numbers of ungulates would be present as well, although some species that are thriving under the more dense current conditions may have had fewer numbers under historical conditions. This is likely the situation for white-tailed deer. A mosaic of later seral stage forest with dense cover, combined with reduced predator numbers, has undoubtedly led to a larger population than was present historically. However, the action alternatives are unlikely to reduce the numbers of ungulates down to a level that would affect either wolves or human hunters. Other features of the project design, including underburning and aspen recruitment, should mitigate any short-term loss.

Alternative 3: This alternative is similar to Alternative 2 except that regeneration (shelterwood) harvests in Units 5 and 10 would remove some critical mid-winter deer range. While this may cause a slight reduction in white-tailed deer numbers in the short term, it is unlikely to significantly affect the prey base for wolves since these stands would likely become more attractive to other ungulates, particularly moose.

Cumulative Effects

There are no known connected actions or cumulative effects within this compartment that would detrimentally affect gray wolves or their habitat.

Determination of Effect

Based on the lack of mortality risk in the project area and immediate vicinity, and the maintenance of adequate prey base and habitat security, there would be **no effect to wolves or their habitat** with any of the action alternatives.

SENSITIVE SPECIES

Black-backed Woodpecker

Effects Common to All Alternatives

The project is designed to maintain at least the minimum number of snags needed to support woodpecker populations. These guidelines would retain snags in treatment areas that are in addition to the large number of snags that are being created, but not removed, by the Douglas-fir beetle across the Bonners Ferry Ranger District as well as throughout northern Idaho and northeastern Washington.

Natural snag recruitment is also occurring. This recruitment is primarily in the smaller size classes of snags, which are used more by black-backed woodpeckers than some other species dependent on larger snags (see pileated woodpecker accounts).

Direct and Indirect Effects

Alternative 1: The no action alternative would result in an overall increase in habitat for black-backed woodpeckers from two major sources. First, as stands mature, an increase in insects and disease naturally occurs. On-site visits to the Pipeline area by entomologists in 1997 indicated that there is a large risk of increased insect infestations in the project area with no action. In the absence of low-intensity fires, stands in the project area are becoming more stressed because of crowding. This is occurring in all ages of stands.

Secondly, as biomass continues to accumulate the risk of an extreme stand-replacing fire event is more likely to occur. For black-backed woodpeckers, fires produce optimal habitat, at least for 3-5 years. So for the short term after a fire, this species would likely increase dramatically while it takes advantage of optimal conditions. If, however, the fire was very large and killed most trees, a population decline would occur following the fire. Typically there are unburned or lightly burned areas even in severe fires, and these areas would continue to provide some habitat.

Alternative 2: All action alternatives provide some similar effects to black-backed woodpecker. Since forest health in the sense of reducing the risk of uncontrolled wildfire and insect or disease epidemics is one of the objectives of the action alternatives, the action alternatives would reduce the habitat over time for this species. Currently there are many stands across the district suitable for nesting, and fewer for foraging. As time progresses and the forest conditions become more high risk for insect/disease situations or wildfire, habitat for this species would increase. With any of the action alternatives, availability of suitable habitat would be less (by design) than no action. Mitigation for this effect is that some of the units will be underburned.

Foraging habitat is increasing as a whole throughout the district as stands age, biomass increases, and stands become more high risk. The Pipeline area is at moderate to high risk currently. This suggests that even with treatment, there will likely be trees available for local black-backed woodpeckers, although some individuals may be displaced from habitat locally. Because of the widespread nature of the stands at risk, and the fact that there are many more stands than can be treated by timber harvesting, this effect may impact individuals but would not trend the species towards listing.

All non-merchantable snags and all snags greater than 14 inches in diameter would be left in all units, except those deemed hazard trees. At least 5 recruitment trees per acre would also be left in all units, which would meet snag recommendations in the Snag and Woody Debris Guidelines for 100% cavity nester population levels. Most units would far exceed this number of recruitment trees.

Alternative 3: While both action alternatives would increase average stem size at the expense of reduced live tree and snag densities, the silvicultural prescriptions in Alternative 3 (shelterwood vs. commercial thin) would almost certainly result in decreased live stems for snag recruitment as well as more existing snags being lost to incidental harvest or being removed as hazard trees.

Cumulative Effects

All proposed actions in the area (Pipeline, Bonners Ferry Salvage EIS) will, by prescription, temporarily reduce black-backed woodpecker nesting and foraging habitat in a limited number of stands. However, the Douglas-fir beetle outbreak has created favorable habitat conditions that will allow black-backed woodpecker populations to expand beyond current endemic low levels. The removal of some of the pockets of infestation would temper this expansion: however, populations would remain above existing levels. Consequently, the project design and mitigation measures, combined with the natural progress of the beetle outbreak, would continue to support populations of black-backed woodpeckers at expanded levels.

Considering the situation described above in the district as a whole, the cumulative effects on snags and dead/down woody material would not be significant to the black-backed woodpecker or other snag-dependent species. Further, control of the insect and disease conditions present could lead to larger snags (and eventually, to larger dead/down material) that are more limiting to snag dependent species on the district than is the number of snags.

Determination of Effect

While the proposed actions may result in short-term reduction of black-backed woodpecker habitat, it would trend the affected stands toward long-term production and maintainence of habitat for this species. The proposed action **may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species**.

Fisher

Effects Common to All Alternatives

Fisher and marten habitat is difficult to model because habitat requirements are not well understood and the timber stand database does not consistently characterize the amount of large woody debris these species require for denning and cover. Their generalist diet implies that they will forage in nearly any type of forested habitat provided there is sufficient ground cover to attract prey.

Because of their preference for older stands with dense canopy cover and large snags (used for maternal dens), suitable fisher habitat closely mimics that required for other old-growth indicator species such as goshawk and Pileated woodpecker. However, unlike goshawks, fisher prefer stands with congested understories for the cover these stands offer for hunting and avoiding predators.

Direct and Indirect Effects

Alternative 1: The no action alternative would preserve potential foraging habitat for fisher, and would probably bring stands into suitable denning condition more rapidly than treatment would. However, with this comes the increased risk of stand-replacing wildfire, which would effectively remove most burned-over areas from suitable fisher habitat for many years.

According to the results of the most recent habitat model, there is presently no suitable fisher habitat in the project area. However, two adjacent stands (totaling 53 acres) of suitable habitat lie immediately east of Unit 10. Capable habitat can be found in all the proposed harvest units except the area of the ecosystem burn, which is generally too steep and dry. Most of the remaining units do not meet the criteria of currently suitable habitat due to a lack of large diameter stems, insufficient overstory canopy cover, or both.

Alternative 2: Treatments would temporarily reduce some of these stands to less desirable denning habitat, which is more limiting than foraging habitat in the project area. Once again, a number of microsites exist throughout the project area that may be providing denning habitat for fisher. Commercial thinning in Units 5 and 10 would preserve hunting opportunities within these stands, while keeping intact components that produce suitable denning habitat.

Alternative 3: The most significant difference between the action alternatives regarding fisher habitat are the harvest prescriptions in Units 2, 5 and 10. While shelterwood harvests in these units may provide for better long-term production of habitat than no action, it would eliminate these stands from denning (and to a lesser degree, foraging) habitat in the short term. Commercial thin and/or sanitation salvage (Alternative 2) would trend these stands toward suitable habitat more rapidly than would shelterwood harvest. Alternative 3 would essentially remove all preferred microsites from the project area, further reducing potential hunting and denning stands.

Cumulative Effects

Across the landscape, fisher habitat is maturing at a faster rate than it is being lost. The net result is an increase in fisher denning habitat along with a decrease in foraging habitat. Despite a general direction on the IPNF to trend stands toward a more seral state, there has also been an effort to preserve mature and old-growth stands, allow natural succession in riparian areas, and preserve and recruit large woody debris forest wide. While this management strategy may temporarily reduce fisher habitat at the local scale, habitat should improve for this species with time and should be maintained on a landscape scale.

There will be no changes to current management of existing gates with any of the alternatives, so there will be no decrease in security for fisher.

Determination of Effect

Short-term reduction of fisher habitat will be offset by long-term improvements in habitat for this species, and would be almost immeasurable on a broader scale. The proposed action **may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species**.

Flammulated Owl

Effects Common to All Alternatives

Flammulated owls occur in habitats that are adapted to frequent, low-intensity forest fires. Ideal flammulated owl habitat is in the mid-range of canopy closure, 35-65%, a closure that results when underburns remove competing vegetation from larger trees. In the last decades of fire suppression efforts, these stands have closed in to a canopy closure that exceeds optimal for owls. This phenomenon is occurring in the Pipeline project area. In addition, crowded ponderosa pine stands do not produce trees as large as naturally spaced ones, so large snags are also fewer. A stand along Road 2538 in the Dawson Ridge area clearly shows the difference in thinned versus unthinned (and fire-suppressed) stands. For flammulated owls, the thinned stand would be better habitat because it has larger snags.

Direct and Indirect Effects

Alternative 1: No action, assuming a continued strategy of fire suppression, will continue to produce stands that are further out of the range of natural varibility and will continue to be less than optimum for flammulated owls. The general trend for untreated stands will be toward more stems of smaller size, as well as increased undergrowth and overstory canopy cover beyond that which flammulated owls prefer. Fire suppression will undoubtedly continue as a management strategy in the project area because of the proximity of dwellings and private land. Given the high risk to stands present in the Pipeline area, the likelihood of the large Ponderosa pines remaining alive to grow into large trees (or snags) is unlikely because of the stress currently present from nutrient competition, insect infestation, and increased site moisture. The snags produced by this scenario would be suboptimal for flammulated owls, although they could be used for other species.

Wildfire is still likely to occur, with more severe consequences. Snags produced by wildfire may be surrounded by too few green trees for flammulated owls.

This alternative has no impact to flammulated owls and their habitat in the short term, but in the long term is likely to trend the species towards federal listing if combined with large-scale similar lack of treatments in other portions of its range.

Alternative 2: The action alternatives provide considerable long-term improvement or maintenance of flammulated owl habitat. Not all units are capable of providing flammulated owl habitat because of habitat type. Generally the drier sites are capable, including those above the road 2781 and those in treatment Unit 1 and parts of Unit 4.

As discussed, the opening of some of the ponderosa pine stands and those with other more open-grown trees would benefit from thinning because the trees would eventually produce larger snags. The reduction of risk of insect infestation would also be a benefit. Insect infestation is not necessarily a negative impact to flammulated owl

habitat, however: it would not be beneficial if it decreases nearly all the available trees. The high risk of this occurrence in the Pipeline area indicates that flammulated owl habitat is at risk over time if not treated.

The action alternatives for units in capable habitat would be a beneficial effect to the flammulated owl and its habitat. Fire suppression efforts do not allow these sites to naturally maintain themselves in an evenly spaced, open canopy of trees. The salvage of timber in the project area will create a historical type habitat that is not currently available. In effect, treatment would mimic a mixed-severity fire in stands dominated by ponderosa pine. This will also benefit the northern goshawk by recruiting larger diameter type trees for nesting and available foraging opportunity. In addition, the prescribed underburn north of Unit 6 (which forms the bulk of capable flammulated owl habitat in the project area) would be an important step in improving this area for flammulated owl habitat by decreasing stem density and understory (shrub) canopy cover.

All non-merchantable snags and snags greater than 14" dbh will be retained in harvest units, except those deemed to be hazard trees. This should eventually result in a net increase in the total number of snags over existing condition, and provide for future nesting trees.

Alternative 3: The only differences between the action alternatives within capable flammulated owl habitat are the types of treatments in Unit 8 (22 acres) and part of Unit 7 (17 acres). While shelterwood harvest treatments would trend Unit 8 toward suitable habitat faster than no harvest, commercial thinning would probably bring Unit 7 into suitable habitat more rapidly than shelterwood harvest, and would provide marginal flammulated owl habitat in the interim.

Cumulative Effects

Within timber compartment 739, there is a very limited amount of currently suitable flammulated owl habitat, despite nearly one-quarter of the land area being capable habitat. Neither this project nor the proposed Bonners Ferry Salvage EIS affect currently suitable habitat. In fact, both actions are likely to accelerate or trend capable (but not suitable) habitat toward suitability faster than the no action alternative would.

There are no additional adverse cumulative effects expected from any other planned or ongoing projects within the district. The combination of the proposed action and the Bonners Ferry Salvage EIS collectively improve dry-site habitat on the district with expected long term increases in suitable flammulated owl habitat.

Determination of Effect

The action alternatives will result in long-term improvements in flammulated owl habitat. Thus, the proposed action will have a **beneficial impact on flammulated owls and their habitat**.

Harlequin Duck

Effects Common to All Alternatives

The most important factors in preserving harlequin duck nesting habitat are preservation of high water quality and limiting human disturbance. Current Best Management Practices on the district should continue to prevent deterioration of water quality. Disturbance originating from the Moyie River valley will probably remain unchanged.

Direct and Indirect Effects

Alternative 1: No action would continue the present rate of disturbance in the vicinity. This includes the Moyie River Road and the railroad, as well as boaters periodically floating the river. It is unknown if this level of disturbance is contributing to the low number of harlequin ducks on the Moyie. Habitat is probably not as great a factor in harlequin populations in this area as disturbance (or factors outside the scope of this project, such as harvesting ducks on their winter range), but habitat would remain essentially the same along the river as is currently present.

Alternative 2: Disturbance from the logging operation would be the most likely effect on harlequin ducks. Disturbance is possible where there would be salvaging of timber with the use of a skyline operation in corridors on the northwest side of the project area along the Moyie River. A buffer of 300 feet, and a limited operating season, would be placed along the east side of the Moyie River wherever salvaging opportunities occur in order to cause little disturbance to staging harlequin ducks. A limited operating season of no harvesting in proposed Unit 1 from April 1st through July 31st would be placed on the project. This limited operating season will also serve as a protection measure for the northern goshawk.

Alternative 3: There are no discernable differences between the action alternatives with regard to harlequin duck habitat.

Cumulative Effects

There would be no additional cumulative effects as a result of other projects within the district.

Determination of Effect

None of the proposed actions would alter riparian habitat (see Inland Native Fish Strategy guidelines). No new roads or trails are expected to be within 200 feet of any other suitable harlequin duck nesting stream. With the previously described disturbance protection measures in place, there would be **no impact to the harlequin duck or its habitat** from the project.

Northern Goshawk

Effects Common to All Alternatives

Much of the analysis for pileated woodpeckers applies to goshawks as well, since both species thrive on stands with large trees and large snags. Goshawks are more affected by stands that have heavy understory congestion, because it interferes with efficient hunting. If the understory is too sparse, prey have no hiding cover and are unlikely to be present in adequate numbers. Conversely, dense understory results in unsuccessful hunting as well as injuries to the goshawks (R.Reynolds, pers. comm. 1995).

Direct and Indirect Effects

Alternative 1: According to the results of the most recent habitat model, there is presently no suitable goshawk habitat in the project area; although two adjacent stands (totaling 53 acres) of suitable habitat lie immediately east of Unit 10. Capable habitat can be found in all the proposed harvest units except Units 7 and 8, which are generally

too steep. Most of the remaining units do not meet the criteria of currently suitable habitat due to a lack of large diameter stems, insufficient overstory canopy cover, or both. The no action alternative would further reduce the amount of both foraging and nesting habitat because of the closing-in of the understory. As stand health deteriorates, large uniformly-spaced stems would be replaced by more numerous, densely-packed smaller stems. Large snags would eventually disappear, trending these stands even further away from suitable goshawk nesting and foraging habitat. A large stand-replacing fire would remove the dense forests this species prefers, but small fire-produced openings may be beneficial for foraging.

Alternative 2: Treatments would temporarily reduce some of these stands to less desirable nesting habitat, which is more limiting than foraging habitat in the project area. While none of the stands in the project area are modeled as currently suitable, a number of microsites exist throughout Units 2, 5, 6, and 10 that are likely providing foraging, if not nesting, habitat for resident goshawks. Group selection and commercial thinning in Units 5 and 10 would create better hunting opportunities within these stands than presently exists, while preserving components that produce preferred nesting areas. Another opportunity for increasing foraging habitat would be to treat some of the aspen stands in Unit 5 to rejuvenate them. Treatment of aspen can ensure aspen stands remain viable over time, providing habitat for grouse and pileated woodpeckers as forage for goshawks.

In Unit 6, canopy cover within capable habitat is too low to be considered suitable, and present understory is occasionally too dense for optimum foraging habitat. Despite creating a short-term reduction in potential nesting habitat, treatment of this stand would probably result in better long-term conditions for goshawk.

Of the proposed harvest units, Unit 2 most closely aproximates the structural characteristics required for suitable nesting habitat. This stand is also within 800 m of a known goshawk nest. Commercial thin from below, along with selection salvage of lodgepole pine, should preserve potential nesting habitat in this stand, as well as improving goshawk foraging habitat by creating a more open understory. Also, thinning of regen units adjacent to Unit 2 should provide better foraging habitat than presently exists near the edges of these stands.

The majority of the known goshawk nests on this district are in stands that have had some type of timber harvesting. Many have skid trails directly beneath them. Commercial thinning tends to produce the kind of stand over time that this species prefers in that it reduces the number of stems but increases their diameter, and can reduce the amount of understory congestion as well. Since many stands on this district seem to be overstocked in the understory, this treatment would be favorable to this species. For goshawks, the more commercial thinning accomplished (as long as canopy coverage eventually returns to 60-70% or more), the more suitable habitat is being produced or maintained over time.

There is one known goshawk nesting territory about one-half mile from the proposed sale area. The potential disturbance to nesting goshawks would be partially ameliorated by the presence of a ridgeline between the nest stand and the project area. Even so, a limited operating season of no harvest from April 1st through July 31st would serve as a protection measure against disturbance for the northern goshawk.

Alternative 3: The most significant difference between the action alternatives regarding goshawk habitat are the harvest prescriptions in Units 2, 5 and 10. While shelterwood harvests in these units may provide for better long-term production of habitat than no action, it would eliminate these stands from nesting (and to a lesser degree, foraging) habitat in the short term. Commercial thin and/or sanitation salvage (Alternative 2) would preserve the structural characteristics of these stands that make them attractive as both nesting and foraging stands. Alternative 2 provides for long-term maintenance of goshawk habitat while keeping important components intact for the

immediate future. Alternative 3 would essentially remove all preferred microsites from the project area, further reducing potential hunting and nesting stands for the resident pair.

Cumulative Effects

Warren (1990) recommends at least two suitable nest stands of at least 25 acres within a 5,000 acre analysis area. Optimal nest stand size is 125 acres, and nest stands should be within .6 miles of one another. Timber compartment 739 totals 5,691 acres (excluding private ownership) and contains five uniformly distributed suitable nesting stands of at least 25 acres (as well as two 20 acre stands). There are also a number of stands of near-mature timber in the area which should provide adequate movement corridors between nesting stands.

There are no additional adverse cumulative effects expected from any other planned or ongoing projects within the district. The proposed Bonners Ferry Salvage EIS is not likely to greatly impact suitable goshawk habitat. The combination of the proposed action and the Bonners Ferry Salvage EIS may slightly reduce suitable goshawk habitat on a temporary basis, but will provide for the production and maintenance of goshawk habitat in the future.

Determination of Effect

Short-term reduction of goshawk habitat will be offset by long-term improvements in habitat for this species. The proposed action **may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species**.

MANAGEMENT INDICATOR SPECIES

Pileated Woodpecker

Effects Common to All Alternatives

The proposed project incorporates design features that maintain minimum numbers of snags within the riparian buffers. In addition to this, there are numerous snags being created outside of the treatment units that would not be treated. This is true over the entire Idaho Panhandle as well as the North Zone. Thus, even if snags were reduced on a portion of the landscape, the total number of snags is increasing at a more rapid rate than they are being removed. Further, fuel reduction in the form of removal of some dying trees is beneficial in the long term to this species, as outlined in the flammulated owl and northern goshawk sections, because of the reduction of fire risk. Although this project and the others proposed for the Idaho Panhandle National Forests would make only a small decrease in fuel loading, it is an incremental beneficial effect that cumulatively over time should assist in reducing the risk of stand-replacing fires. For pileated woodpeckers, stand-replacing fires are a negative impact because they reduce the canopy even though they also create large numbers of snags.

Direct and Indirect Effects

Alternative 1: As the stands age without treatment, two major changes in pileated woodpecker habitat would occur. The first is that trees will increase in size up to a point at which they will either burn or become stagnated from too much competition for nutrients. In the project area, the stands are tending towards becoming more stagnated at this time, especially the drier sites. The second major change is that as these stands either burn or become stagnated, the recruitment of new large snags is diminished. For these reasons the direct effect of the No Action Alternative would be negative for the pileated woodpecker.

Pileated woodpeckers depend on very large snags for nesting habitat. For our habitat types, these large snags tend to be quite old. Typically, old growth provides adequate numbers of snags and the dying or insect-infested part of living trees for foraging habitat. Thus, any action that increases the number of large trees will be beneficial for this species.

Alternative 2: Those units with sanitation/salvage, group selection, seed tree, or shelterwood prescriptions will tend to reduce the available habitat for pileated woodpeckers, at least for the short term. Some mitigation efforts are possible to reduce these effects (see below). Although the shelterwood stands are not considered currently suitable habitat (because of low canopy closure), if the large overstory trees are retained through a rotation they would become the largest "veteran" trees and then snags. Unfortunately, there is a tradeoff for pileated woodpeckers, because as the understory growth is reduced by the infestation of mistletoe from larch (a common occurrence), the understory will not reach the large size most preferred by pileated woodpeckers.

Some stands in this project area now are probably better pileated woodpecker habitat than they were historically (ie units 1 and 4). Pileated woodpeckers prefer stands with high canopy closure. As these dry site stands are growing in the absence of low-intensity understory burns, they are becoming better pileated woodpecker habitat. As these stands continue to progress with denser understory, the older pines will eventually become choked out and die (or become victim to stand replacing fires). This would result in a short-term pulse of good quality habitat for this species, but a long term loss in large Ponderosa pines. The prescription for these units will return the stands to a situation more closely resembling historical conditions, with a reduction in canopy closure and an associated reduction in habitat quality for pileated woodpeckers.
In general, all the action alternatives would be progressing the treated stands towards conditions more similar to what would have been present historically. The historical condition is assumed to have been generally good for pileated woodpeckers primarily because of large DBH snags. The short-term loss of some habitat would be offset by the factors mentioned above, especially reduction of the risk of stand-replacing fire instead of low intensity fire. The project area could increase in value for this species if the size of the trees were greater, leading to the opportunity for more large snags in the future.

Alternative 3: This alternative would be the most detrimental to pileated woodpecker populations because of the loss of canopy closure in shelterwood units, as well as the possibility of increased incidental loss of large snags during harvest operations.

Cumulative Effects

All proposed actions in the area (Pipeline, Bonners Ferry Salvage EIS) temporarily reduce pileated woodpecker nesting and foraging habitat in a relatively small number of stands. However, all of these actions would result in less dense stands of larger stems, ultimately providing the larger snags preferred by this species. The combination

of the project design and mitigation measures, along with the natural progress of the Douglas-fir beetle outbreak, would continue to support populations of pileated woodpeckers in the interim.

Determination of Effect

While the proposed actions may result in short-term reduction of pileated woodpecker habitat, it would trend the affected stands toward long-term production and maintenance of habitat for this species. No treatments are proposed that would reduce old growth structure or integrity. The proposed action **may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species**.

White-tailed Deer

Effects Common to All Alternatives

Critical mid-winter range stands have a narrow canopy cover range so that they function both to intercept snow and also allow enough light through the canopy to allow understory vegetation, primarily cedar and pachistima, to grow. While over half of the project area is capable mid-winter range (391 acres), only 13 acres are currently suitable. Most stands fall out of suitable habitat because of insufficient stem diameter or canopy cover – generally a result of past management activities. However, much of the lower part of the project area provides microsites that effectively serve as critical mid-winter range, particularly in Units 5 and 10.

Direct and Indirect Effects

Alternative 1: The no action alternative would allow several of the stands that are currently too young to provide adequate snow interception to grow, but without some fire or management the stand structure would not be optimized. Further, some forest health issues noted would contribute to a decline in growth or stagnation.

In general, the project area is characterized by stands that are increasingly stressed by forest pathogens, which are not likely to continue to be good mid-winter habitat or to grow into it. The stands are gaining in biomass of dense boles faster than low-intensity fires can control. Stands that are currently in suitable condition may grow out of suitable condition if the understory becomes so dense that deer cannot maneuver in them, or if the overstory becomes too closed so that they provide snow interception but inadequate light for understory forage plant growth. There is still much winter range cover for white-tails and other ungulates, but the critical mid-winter stands are those that provide survival opportunities during severe winters. Since the herds are quite healthy at this time, the loss of even a fairly large number of animals will not jeopardize the health of the local herd, but it may not be socially palatable. This is especially the case in this area because it has a special hunt access, the handicapped hunter program.

Alternative 2: The action alternatives treat Units 5 and 10, probably the stands most capable of providing excellent midwinter habitat because of topography and habitat type. These stands are currently now being heavily used, but are not in optimal condition. There are microsites within the stands that are better habitat than the overall stand. A prescription which proposes a group selection/commercial thin would select for the preferred microsites while treating part of the remaining stand. This strategy should allow the stands to remain in rotation for excellent midwinter cover and retain the best portions currently providing this cover. Other group selection/commercial thinned stands on the district (ie East Westside) have resulted in ideal white-tailed deer habitat.

Generally, the commercial thin or group selection prescriptions maintain the stands as suitable winter habitat over time, although there may be a reduction in quality in the first 5 years after treatment and in the groups. Conversely, these stands would be likely to be moving out of suitability if not treated anyway, since dense overstory will limit the amount of sunlight reaching the forest floor and subsequently reduce the resulting forage. Snow interception abilities of the stand are enhanced as cover increases, which is a benefit up to the point that the animals have difficulty moving around.

Shelterwood units are not currently in target condition. Treatments of these stands would not affect the existing condition.

None of the treatments will transform the existing situation from habitat to non-habitat except the groups of group selection; however, this type of treatment provides overall good habitat for other seasons of the year. The groups will eventually grow into cover, but do provide foraging habitat in the interim.

Cutting or burning of existing aspen stands should encourage sprouting of this valuable forage species. Likewise, underburning of thinned stands will result in increased sprouting of more palatable shrub species, thus improving the forage value of non-critical winter range areas. This type of habitat would also be greatly improved by prescribed underburning in the area north of Unit 6 by replacing decadent shrubs with more palatable forage species.

While harvest activities may temporarily displace deer from adjacent habitats, they will quickly move back to preferred stands once harvest activity subsides. Therefore, it is desirable to conclude any sale activity at least two weeks before the start of deer season to accommodate disabled hunters. There are two options for maintaining hunting opportunities provided by the current disabled hunter program in the project area. The first is to find an alternative road to provide this opportunity. The second is to limit the operating season during the hunting season (deer and elk rifle season) plus two weeks prior to the opening to allow animals to return to the area after harvesting. Neither option would affect deer or elk occurrence in the long term in the project area, but would affect short-term occurrence.

Alternative 3: The main difference between the action alternatives once again lies in the treatment of Units 5 and 10. While shelterwood harvest of these units would provide a forage bonanza to white-tailed deer (and other ungulates) in the immediate future, it would come at the expense of the loss of critical mid-winter range that is essential to deer survival during especially harsh winters. In addition, creating virtual openings in these stands adjacent to openings in other harvest units, as well as large openings to the east (previous activities) and south (private timberlands), would decrease security for other ungulates and may not be socially acceptable.

Cumulative Effects

There are no known connected actions or cumulative effects (including the Bonners Ferry Salvage EIS and District OSR project) within this compartment which would detrimentally affect white-tailed deer or their habitat. Private landowners in the Moyie River valley continue to clear stands of suitable cover, putting the burden of winter range on National Forest System lands. An analysis of the Moyie River Valley critical midwinter stands (in project file) revealed a mixture of age classes and quality of stands on NFS lands such that deer habitat is not likely to be critically limiting in the next decade or two. During this time, it would be important to assess the condition of public and private lands in regards to deer habitat to make informed decisions on long-term and broadscale winter range management.

Determination of Effect

Because of the minimal short-term, and beneficial long-term, impacts of the proposed activities, there would be a **beneficial impact on white-tailed deer and their habitat**.

SUMMARY OF CUMULATIVE EFFECTS FOR THE PIPELINE PROJECT

Table 4. Determination of Effects Summary, Bonners Ferry Ranger District, Analysis Area Scale.

Species	Alt. 1	Alt. 2	Alt. 3
Endangered			
Gray Wolf	NE	NE	NE
Sensitive			
Black-backed Woodpecker	BI	MI	MI
Fisher	NI	MI	MI
Flammulated Owl	NI	BI	BI
Harlequin Duck	NI	NI	NI
Northern Goshawk	NI	MI	MI
MIS			
Pileated Woodpecker	BI	MI	MI
White-tailed Deer	NI	BI	BI

NE= No Effect
MI = May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to the population or species.
BI = Beneficial Impact
NI = No Impact

CONSERVATION REQUIREMENTS

The following conservation requirements are mandatory for the determination of effect for the species analyzed in this Biological Assessment/Evaluation:

Threatened and Endangered Species: NONE.

Sensitive species:

Black-backed Woodpecker:

1. Use underburning or jackpot burning where possible for slash control. The objective is to produce some fire-killed snags for nesting and foraging habitat.

Northern Goshawk:

1. Restrict operations (limited operating season) from April 1st through July 31st to reduce disturbance effects during the nesting season. This restriction applies to Units 1 and 2.

2. Cut aspen boles such that the stand is rejuvenated for grouse habitat. This applies to Unit 5.

Harlequin Duck:

1. Restrict operations in Unit 1 (limited operating season) to reduce the possibility of disturbance during nesting from April 1 to June 15.

Management Indicator Species:

Pileated Woodpecker:

1. Retain all merchantable snags greater than 14" dbh, consistent with safety. Smaller snags are to be retained if they do not contribute to excessive understory congestion and are consistent with the unit objectives.

White-tailed Deer

1. To maintain disabled hunting opportunities, either limit operations to periods outside deer and elk rifle season plus two weeks prior to the start of elk season, or locate the disabled hunting program to another road during the time the sale is operating.

2. Protect individual clumps of western red cedar in Units 5, 6 and 10. This is to maintain the winter forage component of understory cedars in stands capable of providing critical mid-winter habitat.

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Route To: Pipeline EA Project File

Subject: Placer Pipeline Hydrology Report

To: Bonners Ferry District Ranger

Placer Pipeline Watershed Report

Existing Condition:

Moyie River:

The Moyie River Watershed covers approximately 496,000 acres, 74 percent of which is in Canada. The dominant land use in the Canadian portion of the watershed is timber management. Much of the land is in public ownership administered by the British Columbia Ministry of Forestry. Other influences in the watershed are the Canadian Highway 3/95 and railway which parallel the river for some distance. A natural gas pipeline and 500 k.v. powerline also parallel the river for some distance.

South of the Canadian border, there are two distinctly different portions of the Moyie River, above and below the confluence with Meadow Creek. The upstream section has a moderate gradient and meanders through a fairly broad valley. This section has a fairly uniform depth and velocity with little habitat diversity. Much of this uniformity is due to log drives and associated channel modifications. These log drives occurred in the early 1900s.

Large cedar trees were present along the river in the early 20th Century as evidenced by large stumps along the riverbank. These cedar were logged by homesteaders or burned around the turn of the century. These trees would have provided large woody debris recruitment for the Moyie River. Presently, the timber along the river is mostly too small to be effective as woody debris for a river this size. Woody debris recruitment adequate to provide protection for river banks and fish habitat is lacking.

Below the confluence with Meadow Creek, the Moyie River has a steeper gradient and becomes more confined as the river valley narrows. The river is deeply incised into the surrounding terrain and the channel is bedrock controlled. More detailed descriptions that are still representative of the Moyie River channel conditions and history are contained in the West Moyie and East Moyie analyses.

The State of Idaho has designated the Moyie River as a Special Resources Water providing the beneficial uses of domestic water supply, agricultural water supply, cold water biota, salmonid spawning, primary and secondary contact recreation. In addition, the Moyie River is used for hydropower electricity by the City of Bonners Ferry. No streams in the project area have been designated as "Outstanding Water Resources" by the State of Idaho.

Environmental Protection Agency regulations require that each State adopt an antidegradation policy as a component of its water quality standards. This policy stipulates that as a minimum, existing instream water uses and the level of water quality necessary for those uses be maintained and protected.

The Moyie River below the Moyie Falls dam is designated as a "Water Quality Limited Segment". The Water Quality Limited designation indicates that existing and designated beneficial uses may not currently be fully supported. The pollutant of concern is sediment and the priority for establishing total maximum daily load (TMDL) for pollutants is low.

The Three Mile and Moyie Springs water systems are located along the Moyie River just below the Moyie Springs dam. Both systems are classified as ground water systems which do not experience seasonal fluctuations in turbidity that are a concern to water quality.

In 1988, the Moyie River was only partially supporting the beneficial use of salmonid spawning which was related more to the lack of habitat than to water quality. The Pacific Gas Transmission Company conducted several fish habitat enhancement projects as required mitigation for their gas line project which crossed the Moyie River in 8 locations. Monitoring indicates that there has been a positive fisheries response to the enhancements compared to pre-treatment levels, although, there is great variability in fish populations from year to year, so the trend is not certain (Moyie River Fishery Enhancement Program 1995 Annual Monitoring Report). This monitoring was continued through 1997. The Moyie River is fully supporting the other beneficial uses.

Placer Creek:

Placer Creek has a large amount of gravel and cobble bedload, with fines covering this substrate in the pools. Banks appear stable and are well vegetated. Riparian vegetation includes cedar, hemlock, Douglas-fir and grand fir timber. Occasional alder may be found adjacent to the channel where there are openings in the canopy. The floodplain is forested in upper reach 2 and lower reach 3. Woody debris is fairly abundant. An ocular estimate reveals approximately 60 pieces per hundred meters averaging approximately 8 inches in diameter and 12 feet long. The channel is slightly entrenched and sinuous. Old channels are visible in across the floodplain. The Rosgen Channel Type is C-4 to B-4.

Forest Road 2540 crosses two tributaries to Placer Creek in section 1. These tributaries flow less than 1/4 mile from their sources at springs. The furthest south of these springs flows through an 18 inch corrugated metal pipe (CMP) which is open, but a little undersized. The outlet is 1 foot above grade. This spring water joins Placer Creek at the top of reach 2.

The upper spring flows through an 18 inch CMP at mile post two on Road 2540. This pipe has water bypassing the culvert and "piping" around the culvert. Water in the inboard ditch on Road 2540 flows for several hundred feet into this tributary channel. This channel and Placer Creek below the confluence of these channels, have fine sediment which covers the gravels in pools. The two springs provide most of the base flows in Placer Creek.

Road 2540 follows Placer Creek within the riparian area for over one mile. This road restricts high flows in some areas and is a source of sediment delivered to the stream channel.

A new inboard ditch has been cut for Road 2541. This ditch channels water for approximately 2,000 feet without ditch relief to Placer Creek. A large amount of sediment is delivered to the stream channel from this road. The Water Erosion Prediction Project (WEPP) model predicts approximately 20.5 tons of sediment would be delivered to Placer Creek from this road segment annually.

The 36 - inch culvert over Placer Creek on Road 2541 is undersized. This crossing has a high risk of failure. The rust mark in this pipe is at approximately 45 percent of capacity. Rust marks are often used as a rule-of-thumb for risk of culvert failure. If the rust mark is over 1/3 of the culvert capacity, it is probably undersized. This crossing is also outlet controlled. The outlet of this culvert has a pool which blocks approximately 1/3 of the outlet at moderate flows. The sediment risk for this crossing is estimated to be 2 tons per year.

Above the confluence with the two tributaries, there was old riparian timber harvest which has never reforested. Stumps are charred on the cut surface, indicating a fire after the harvest. The stumps are probably over 40 years old. Riparian vegetation includes alder, bracken fern and drier site shrubs and forbs. There is a lack of woody debris in the channel, perhaps one piece every 30 feet or more.

The flood plain is narrower in this reach, approximately 20 feet wide. There is a low terrace where the old floodplain existed. The lower channel developed a new floodplain approximately two feet lower than the previous one.

The channel in the upper reach has a much lower sinuosity than the forested reach. This channel is a Rosgen Channel Type of B-3 to B-4. Bedload is composed of large gravel and small cobble. This substrate appears to be highly mobile.

The Road 2781 crossing is a 48 inch diameter CMP which is open and appears to be large enough to handle high flows. The bedload in Placer Creek is composed primarily of large cobble. The channel is lacking in large woody debris.

Above the two springs, Placer Creek has an intermittent channel, below these springs Placer Creek is perennial.

Road 2781 was well built with rolling grades, though most of the open top culverts are plugged. There are several 20 foot to 50 foot long through cuts on this road. These cuts were constructed through the small, narrow, ridges that run north and south throughout the project area. Most of these ridges are found around depressions, and are not associated with headwater draws.

There is some slumping in the cut bank of this road from the switchback at the north end of the project area to the gas pipeline at the end of the road. This area has a moderate mass failure potential rating.

The landtype east of the regeneration unit at the southeast corner of the project area has a high rating for mass failure potential. Field reconnaissance revealed a scarp above Placer Creek at this point. Soil exposed by uprooted trees shows fine material that would be erosive and a "hummocky" hillside typical of some unstable landscapes.

Most of the natural gas pipeline right-of-way is well vegetated with forbs and grasses. The right-of-way is crossed approximately every 100 feet with a waterbar. Little surface erosion was visible along this portion of the pipeline right-of-way. The south aspect on this right-of-way has a population of noxious weeds. These weeds include goatweed and Canada thistle.

Landscape and Geographical Core Data

Table 1

Landscape/Geographic Characteristics	Moyie River	Placer Creek
Watershed Area	205 mi^2	3.9 mi^2
Federal Ownership	90%	92%
Stream Density	1.8 mi/mi^2	1.7 mi/mi^2
Sensitive Landtypes	26%	17%
Sensitive Snowpack	34%	59%
Streams Listed as Water Quality Limited	From Moyie Springs Dam to Kootenai River- pollutant is sediment.	None

Management Direction:

Table 2

Management Direction	Moyie River	Placer Creek
RHCAs	23%	19%

Table of Placer Ck Characteristics, Condition indicators, and Dominant Watershed Disturbances.

Table 3

PHYSICAL CHARACTERISTICS	**Drainage Area (miles^2)**	**Sensitive Landtypes (% or relative)**	**Sensitive Snowpack (% or relative)**
Placer Creek 17010105010306	3.9	17 %	59%
QUALIFICATIONS	**All or part listed as Water Quality Limited?**	**Watershed Status**	**Subwatersheds used for analysis**
	No	1-FAR/1-Not PFC	1701010501030600 1701010501030606
EROSION & SEDIMENT	**Estimated Annual Sediment (tons/miles^2/yr)**	**Road Density (miles/miles^2)**	**Sensitive Road Density (miles/miles^2)**
	69	4.9	1.1
HYDROLOGIC REGIME	**Estimated Peak Flow 2 (Q cfsm)^5**	**Current Runoff Modification (% of peak)^5**	**Hydrologic Openings (% of watershed)**
	7.1	7%	17%
	Channel Network Extension (as % of stream net or cumulative miles)	**Current Sediment Load Modification (%)**	
	16.6	165%	
CHANNEL CONFLICTS (by road or facility)	**Encroaching Road Density (miles/miles of stream)**	**Riparian Road Density (miles/miles of stream)**	
	6.2	2.9	
(inventoried within the scope of this project)	**Hydraulically Modified Stream (miles)**	**Direct Shade Reduced Stream (miles)**	**Road encroaching at bankfull stage (miles)**
	0.5	7.6	0.5
STREAM CROSSINGS		**Risk of failure (tons/year)**	**Stream Crossing Frequency (#/mile)**
14		30	2.2
		Number of migration barriers	
		1 waterfall - not a crossing	

Desired Future Conditions

Desired soil, water and riparian conditions are those that:

1) sustain diverse and desired biological communities and other beneficial uses of water under normal climatic conditions, and

2) are resilient when subjected to extreme climatic events or other disturbances, so that biological communities and other beneficial uses are minimally disrupted.

These conditions are maintained by ensuring the present and future supply of ecosystem structural elements that control:

(a) Landscape water storage and slow release functions (i.e. wetlands, floodplains, vegetative cover).

(b) Channel form and function (i.e. Riparian vegetation for streambank stability and large woody debris). This also implies minimizing alteration of the rates of ecological processes such as soil erosion, snowmelt and rainfall runoff, and sediment transport.

(c) Restore and maintain water quality within Idaho State water quality standards.

Regulatory Framework

Idaho Panhandle National Forest Forest Plan

Specific management objectives in the Idaho Panhandle National Forests Forest Plan pertaining to water resources are:

1. Management activities on Forest lands will not significantly impair the long-term productivity of the water resource and ensure that state water quality standards will be met or exceeded.

2. Maintain concentrations of total sediment or chemical constituents within state standards.

3. Implement project level standards and guidelines for water quality contained in the Best Management Practices.

4. Cooperate with the states to determine necessary instream flows for various uses.

5. Manage public water system plans for multiple use by balancing present and future resources with public water supply needs.

6. Activities within non-fishery drainages, including first and second order streams, will be planned and executed to maintain existing biota.

7. It is the intent of this plan that models be used as a tool to approximate the effects of National Forest activities on water quality values.

Specific management objectives in the Idaho Panhandle National Forests Forest Plan pertaining to soil resources are:

1. Soil disturbing practices will strive to maintain at least 80 percent of the activity area in a condition of acceptable productivity potential for trees and other vegetation.

2. Projects should strive to maintain sufficient large woody debris to maintain site productivity.

3. In the event of whole tree logging, provision for maintenance of sufficient nutrient capitol should be made in the project analysis.

Stiffer requirements for riparian protection have recently been adopted as Forest Plan amendments. The Inland Native Fish Strategy (INFS) requires that Riparian Habitat Conservation Areas (RHCAs) be delineated and classified in all forest watersheds. In addition to a number of general guidelines for their management, specific fish habitat objectives are assigned (number of pools/mile, water temperature, amount of woody debris, and others, (INFS EA pg. E-4 1995). For all RHCAs within the project area, the INFS default RHCA widths would apply to all projects within the area. Within these areas, riparian dependent resources receive primary emphasis in management decisions.

Clean Water Act

The Clean Water Act was written to protect the quality of our nations waters. The State of Idaho designates beneficial uses to be protected and water quality standards to be met. Best Management Practices are designed to minimize non-point pollution sources from activities such as forest practices. The Idaho Division of Environmental Quality (DEQ) has the responsibility under the Clean Water Act to designate water bodies where beneficial uses are not fully supported as water quality limited under Part 303(d) of the Clean Water Act. The Total Maximum Daily Load (TMDL) for each identified pollutant for each 303(d) listed segment is to be determined. Until the TMDL is determined for each water quality limited segment, the goal is to reduce the pollutants which impair beneficial uses.

The Moyie River is listed as water quality limited for 1.6 miles, from the Moyie Springs Dam to its confluence with the Kootenai River. The pollutant of concern is sediment. The flushing of this reservoir generated most of this sediment which has impacted two community water sources, the Three Mile and Moyie Springs systems, which drew their water directly from the river at the time (see the West Moyie EIS pages 3-17.)

Beneficial uses of the Pipeline area surface waters have been identified from Idaho Department of Health and Welfare designations, FS special uses records and from visual observation. No direct inquiries have been made to local residents to verify the source of their drinking and household water.

Table 1: Type and Location of Current Uses of Surface Water

Watershed	Salmonid Spawning	Agricultural Water Supply	Domestic Water Supply	Recreation: Primary/Secondary	Cold Water Biota
Moyie River	Partially Supported	Supported	Partially Supported	Supported, but at risk	Supported, but at Risk

Placer Creek	Present, West Slope Cutthroat	None identified, but present	None identified, but present	None identified	Not identified, but present

Executive Orders 11988 and 11990

The purpose of Executive Order 11988 is to protect floodplains on Federal lands. The purpose of Executive Order 11990 is to protect wetlands and their associated values on Federal lands. INFS Standards and guidelines as proposed for the Pipeline Project would help to protect wetland and floodplain values by restricting harvest, and requiring specific road management in the RHCAs.

Site Specific Design Criteria

1. Protect domestic water source (spring box). No harvesting activities would occur within 150 feet of this water source. The location of this spring box is adjacent to Placer Creek in the NE1/4 of the NE1/4 of Section 12, Township 63 North, Range 2 East. Harvest activities would be designed to protect water quality for this resource and downstream agricultural water use.

Core Issues:

Hydrologic Integrity

Hydrologic integrity addresses how water moves from rainfall to the ground, over and through the soil, through streams and lakes to the ocean. One major factor that affects hydrologic integrity on forested sites includes roads that intercept ground water and overland flow. These roads often increase the effective drainage density of a watershed by intercepting water and channelling it down ditches to stream channels (USDA Forest Service, 1999, pp21-29).

Issue indicator: Road density in miles per square mile.

Riparian Function:

Many aquatic and terrestrial wildlife species are dependent on riparian habitat for part of their life cycle. Riparian vegetation provides shade for streams, keeping temperatures lower. Low water temperature is important for many aquatic species. Riparian vegetation also filters sediment before it reaches stream channels. Forested riparian areas provide large woody debris to stream channels. This large woody debris is composed of trees which fall into the channel. This large woody debris provides structure in the channel helping to dissipate the energy of flowing water and controls bedload movement in the system. Large woody debris is the source of much of the pool habitat in forested streams, particularly in Rosgen A or B channel types (Rosgen, 1996.) Riparian function may be affected by riparian road construction, riparian timber harvest, or by hot, stand replacing fires.
Since no new system roads are proposed for the Pipeline EA and riparian timber harvest is precluded by the use of standard INFS standards and guidelines, the number and size of hydrologic openings in the riparian habitat of the Placer Creek watershed would be the same for all alternatives.

Issue Indicators: Riparian road density in miles per square mile.
Hydrologic openings in riparian areas.

Mass Failure and Erosion:

Mass failures can be major sources of sediment delivered to stream channels. These landslides often result in major changes to stream channel conditions as a large amount of sediment is delivered to the channel and becomes bedload. This large pulse of sediment may result in bank erosion and a wider channel as the stream adjusts to the increased bedload. Mass failures may also result in increased drainage density as new channels form in the scar left from a mass wasting site. Mass failures are often triggered by roads where they cross sensitive landtypes.
To a lesser extent, surface erosion may also increase sediment delivered to stream channels. Roads on landtypes susceptible to surface erosion may increase erosion by concentrating water below ditch relief culverts and down ditchlines to stream channels (USDA Forest Service, 1999, pp. 21-22.).

The Idaho Panhandle National Forests Land System Inventory (LSI) identifies landtypes by their risk of mass failure and erosion potential.

Issue Indicator: Road density on sensitive landtypes.

Stream Crossings:

Stream crossings are often sources of sediment delivered to streams. Ditches at these crossings deliver water and sediment from road surfaces and cutslopes to stream channels. Undersized culverts may not handle stream flows, bedload, and large woody debris during a flood event. Such an event can lead to crossing failures. Road fill at the stream crossings may be delivered directly to the stream channel, resulting in a pulse of sediment which must then be routed through the system.

Issue indicators: Stream crossing frequency, measured as number of crossings per mile.
of stream.
Net associated risk, which is the risk of culvert failure times the amount of sediment that would be delivered to the stream if the culvert failed. This indicator will be measured in tons of sediment per year.

Cumulative Effects:

The cumulative effects of all management activities in a watershed may have a greater effect on hydrologic conditions over time than the analysis of an individual project would seem to indicate. Current watershed conditions may be measured and analyzed based on past activities in the watershed. A review of past watershed conditions in light of past activities can help us understand current watershed conditions and how the channel conditions are trending.

Issue indicators: Proper Functioning Condition (PFC) analysis and trend.

Water Yield

Changes in water yield may affect channel stability and equilibrium. Increases in peak flows may result in increased bank erosion, as well as channel scouring and deposition. Timber harvest that removes a large portion of the forest canopy may lead to increased peak flows because the trees are not present to intercept rain or snow, and fewer trees are using water from the soil in a process called transporation.

Opening the canopy of a forest often results in higher peak flows occurring earlier in the season. Base flows are often also reduced. Total water yield is usually increased.

Issue indicator: Hydrologic openings, measured as equivalent clear-cut acres. Equivalent clear-cut acres, or ECAs, are a measure used to describe decreases in canopy density over each area. A simplified example would be a 50 percent reduction of canopy over 100 acres would result in 50 equivalent clear-cut acres. Only the ECA portion of the model described by George Belt in "Predicting Streamflow Changes Caused by Forest Practices Using The Eqiuvalent Clear-Cut Area Model" (Belt, 1980) will be used. ECAs will be used to compare alternatives. An estimate of actual increases in flows will not be attempted.

Alternative I (No Action)

Direct and Indirect Effects:

This alternative would have no direct effect on aquatic resources for the Moyie River and Placer Creek.

No timber would be harvested, so canopy patterns would not change. Since no ground disturbing activities would occur, no direct increases of sediment delivery to Placer Creek or the Moyie River would occur.

Two indirect effects could result from the No Action Alternative:

1. Lack of road maintenance could lead to some erosion of the road surface on roads that do not receive regular maintenance. This erosion would result from plugged open top culverts diverting water down the ditchline on Forest Road No. 2781. Since most of this road is outsloped with rolling dips, the effects of this erosion would be minimal. Little of this sediment would reach Placer Creek or the Moyie River since Forest Road No. 2781 is over 500 feet from the Moyie River and is only within 300 feet of Placer Creek at the crossing with the 48 inch diameter culvert.

Two Placer Creek crossings on Forest Road 2540 at the north end of the project area are currently a source of sediment delivery to stream channels. Ground water is intercepted by large road cuts. This water and associated sediment is delivered directly to the stream channel via the ditchline. These road cuts are slumping and plugging the ditch. Water is flowing across the road and eroding the fill in one location.

2. Delaying harvest in overstocked timber stands could result in an increase of the number of trees dying in the stands. An increase of dead material in these stands would increase the risk of a fire which would kill most of the vegetation. Such a high intensity fire would kill the riparian as well as the upland vegetation. With no vegetation to protect the slopes, erosion from the hillside would be delivered to the stream channel causing aggradation, bank erosion, and reduced channel stability.

Hydrologic Integrity

Hydrologic integrity would not change under the No-Action Alternative. Water would still be intercepted by the large cutbanks at the top of the Project Area and delivered down the ditchline to stream channels. Road density for both the Placer Creek and the Moyie River watersheds would remain unchanged.

Riparian Function:

Riparian function would remain unchanged under the No-Action Alternative, unless a stand replacing fire were to greatly increase the acres of hydrologic opening in the project area. The risks of a stand replacing fire would continue to increase as the tons per acre of fuels increase over time.

Riparian road density would not change under the No-Action Alternative.

Mass Failure and Erosion:

The risk of mass failure and erosion would not be expected to change under the No-Action Alternative. Since the road system would not change, road density on sensitive landtypes would not change from the existing condition.

Stream Crossings:

The number of stream crossings would remain the same as under the existing condition. Net associated risk would slowly increase as culverts reach the end of their designed life of 20 years, and some culverts become partially plugged with debris.

Cumulative Effects:

The project area includes several existing harvest units from the ComPlacerC Thin Timber Sale (1992), the Orser Creek Timber Sale (1990), and the Pipeline Timber Sale (1983). These harvests included several regeneration units. One regeneration unit, which is adjacent to Placer Creek, is immediately uphill of a landtype with a high risk factor for mass wasting. Timber was not harvested past the top of the escarpment and has not resulted in mass wasting though this area has survived two recent flood events.

No effects from the past and current management are anticipated to act cumulatively with the no action alternative. The water resources were not measurably affected by the previous timber sales. Much of the *private* land surrounding the Pipeline project area has been recently harvested. These harvests have not adversely affected the aquatic resources in the Moyie River.

Road construction and timber harvest in the Placer Creek watershed have resulted in a large increase in sediment delivered to the stream channel over base levels. Much of this sediment is a result of Deer Ridge Road 2540 which is adjacent to the creek for approximately 1 mile.

<u>Ongoing and Reasonably Foreseeable Activities:</u>

Ongoing activities include road maintenance for the Placer Creek Road; hunting, including two roads set aside for hunting by people with disabilities; firewood gathering; and other dispersed recreational activities. Maintenance of

Forest Road 2540 may lead to a periodic pulse of sediment delivered to Placer Creek since the road is adjacent to the creek in several locations.

The gravel pit on Forest Road 2781 is under permit to Boundary County as a rock source for gravelling local county roads. Run-off from this pit does not flow into any area streams, but is contained in a natural topographic depression.

No changes in the proper functioning condition of either Placer Creek or the Moyie River would occur under the No-Action Alternative, since no activities are proposed under this alternative. Currently Placer Creek is listed as functioning at risk due to high riparian disturbance and high watershed disturbance. Riparian roads and channel modifications in the lower reach of Placer Creek are at least in part responsible for that portion of the creek to be rated as not properly functioning. Placer Creek should remain in this condition for some time under the No-Action Alternative.

Water Yield

Since no activities are planned in the project area under the No-Action Alternative, no changes in water yield would be expected in the short term. Over time, the risk of stand replacing fire would increase as a result of increased fuel loads. Fuel loads would increase as trees die faster than woody debris is able to decay (Harvey et al., 1995.) Stand replacing fires would lead to a major decrease in stand densities. Such a decrease in canopy would likely result in higher peak flows. A large increase in peak flows may lead to greater channel instability in Placer Creek.

Alternative 2 (Proposed Action):

Direct Effects:

Alternative 2 proposes to harvest approximately 155 acres of commercial thin and sanitation salvage in the Placer Creek drainage. Canopy removal would average approximately 30 percent. Approximately 92 acres of shelterwood are proposed for the Placer Creek drainage. Canopy removal would average approximately 50 percent. Approximately 14 acres of seed tree harvest are proposed in the Placer Creek drainage. Canopy removal would average approximately 70 percent. Total ECAs for the Placer Creek watershed would be approximately 102 acres.

A temporary road would be reconstructed for approximately 400 feet to access a portion of Unit 10. One stream crossing would be constructed over Placer Creek. The creek has an intermittent channel at this location. The crossing would be an armored ford. This temporary road and crossing would be decommissioned after completion of project related activities, approximately 5 years after reconstruction.

The Inland Native Fish Strategy Environmental Assessment (INFS) recommends a Riparian Habitat Conservation Area (RHCA) of 300 feet slope distance out from the edge of the channel for perennial fisheries streams such as the Moyie River and Placer Creek below the springs (USDA Forest Service, 1995.) Intermittent streams, such as Placer Creek above the springs would have an RHCA of a distance equal to one-half site potential tree height, or approximately 60 feet slope distance from the edge of the stream channel.

The RHCA zones for this project would protect the streams from increased sediment delivery due to logging, and would preserve riparian trees for large organic debris recruitment. Large organic debris is important for maintaining channel stability and controlling sediment transport in high gradient systems such as Placer Creek.

The proposed ecosystem burn would not increase peak flows or sediment delivery. The proposed burn would occur on mid to upper slopes. Change in canopy closure would be minimal for this project. The small intermittent channel at the east edge of the proposed burn would be protected by the burn design. A small amount of bare mineral soil may be exposed in areas where the burn is hottest. These areas would have a small potential for surface erosion. Sediment from this erosion should be filtered by vegetation in the RHCA.

Indirect Effects:

Alternative 2 proposes to harvest approximately 155 acres of commercial thin and sanitation salvage in the Placer Creek drainage. Canopy removal would average approximately 30 percent. Approximately 92 acres of shelterwood are proposed for the Placer Creek drainage. Canopy removal would average approximately 50 percent. Approximately 14 acres of seed tree harvest are proposed in the Placer Creek drainage. Canopy removal would average approximately 70 percent. Total ECAs for the Placer Creek watershed would be approximately 102 acres.

The Pipeline Project Area comprises approximately 0.07% of the Moyie River watershed area. Harvesting such a small portion of the drainage would not produce a measurable change in the magnitude or timing of peak flows in the Moyie River.

Placer Creek would be able to absorb the small (approximately 1 percent) increase in peak flows. The main source of instability in Placer Creek is sediment and riparian roads, not flows.

Cumulative Effects:

The project area includes several existing harvest units from the ComPlacerC Thin Timber Sale (1992), the Orser Creek Timber Sale (1990), and the Pipeline Timber Sale (1983) that would be re-entered to remove dead, damaged or dying trees. These harvests included several regeneration units, including one unit adjacent to the landtype with a high risk factor for mass wasting adjacent to Placer Creek. Timber was not harvested past the top of the escarpment and has not resulted in mass wasting though this area has survived two minor flood events. An adequate riparian buffer was left unharvested along both the Moyie River and Placer Creek.

Reasonable foreseeable actions in the Pipeline analysis area for watershed includes road maintenance on Forest Road 2540, 2541, and 2781. The Bonners Ferry Salvage Environmental Impact Statement includes approximately 1400 acres of salvage harvest in the Placer Creek drainage. Since only dead and dying timber would be removed with the Bonners Ferry Salvage project, the canopy would only be reduced by what would be caused by the natural events requiring salvage logging. This harvesting should not increase ECAs beyond what would occur from the natural event (personal discussion, Dale Deiter, Bonners Ferry District Hydrologist)

The Bonners Ferry Ranger District is also proposing a district wide overstory removal project. The successfully regenerated shelterwood unit between Units 1, 2, 3, and 4 of the Pipeline proposal would qualify for this project. If selected, this overstory removal would harvest about a third of the seed trees in the unit.
The gravel pit on Road 2781 may be used by the county if they apply for a permit. As of 10/2000, Boundary County Road and Bridge Dept. had no immediate plans for the pit.

Effects Common to Action Alternatives

Hydrologic Integrity

Hydrologic integrity would be improved slightly under Alternatives 2 and 3. The proposed Pipedream Timber Sale road package that originates from the Pipeline EA would include several items that would improve road drainage. One item would be to improve cutbank stability along the weeping cut bank on Deer Ridge Road. A ditch relief culvert would drain water from this cutbank before it reaches Placer Creek. Several ditch relief culverts would be installed on Forest Road 2540. Overland flows and intercepted ground water would not be concentrated in ditchlines and below culverts as much as at present. Surface and subsurface flows would be closer to those under natural conditions.

Riparian Function:

Riparian road density would remain nearly unchanged under Alternatives 2 and 3. The existing temporary road that would be used to access Unit 10 would be decomissioned. This road crosses a small amount of riparian habitat. Only approximately 0.1 miles of riparian road would be decommissioned. Riparian function would remain unchanged from the current condition.

Mass Failure and Erosion:

The risk of mass failure and erosion would be reduced under Alternatives 2 and 3. Sediment delivery from the slumping cut bank on Road 2541 near Placer Creek would be reduced by road reconstruction proposed for completion as part of the proposed Pipedream Timber Sale.

Stream Crossings:

The number of stream crossings would increase by one under both Alternative 2 and Alternative 3 during timber sale activities. This crossing would be an armored ford and would not be at risk for failure. After timber sale activities are completed, this crossing would be removed and the number of stream crossings would be the same as under Alternative 1, the current condition.

The 36 - inch culvert at Stream Crossing 5 on Forest Road 2540 (see Figure A-1) would be replaced by a 48 inch culvert. At the Placer Creek Crossing on Forest Road 2541, a 36 - inch culvert would be replaced by a 72 - inch pipe. This culvert would be buried approximately 24 - inches for continued fish passage. Replacing these crossings with larger pipes would reduce the risk of crossing failure. The pipes would be able to handle higher flows and would be able to allow larger woody debris to pass through them. As a result, the sediment delivery risk associated with these pipes would be reduced.

Since the number of stream crossings would not change from the current condition after the project is completed, and two at-risk crossings would be improved, there would be a slight reduction of sediment delivery risk, or improvement in the trend toward channel stability for Placer Creek. No noticeable affects would occur in the Moyie River due to the small size of the project relative to the size of the watershed.

Cumulative Effects:

Road improvements proposed for both Alternative 2 and Alternative 3 would reduce sediment delivery to Placer Creek. Replacing two culverts with larger pipes would reduce the sediment risk for these crossings. Bank stabilization and a ditch relief culvert along the slumping cutbank would reduce sediment delivery to Placer Creek at

this point. Additional ditch relief culverts located on the riparian section of Forest Road 2540 would reduce sediment delivered to Placer Creek at this point. This reduction of sediment delivered to Placer Creek would help the stream channel to recover from the effects of past and current activities.

Properly Functioning Condition will probably not be achievable, however, until the riparian portion of Road 2540 is relocated away from the creek and drainage is improved on the 1/2 mile section of Road 2541 immediately southeast of the Placer Creek crossing. Both these projects are beyond the scope of the Pipeline project.

The road relocation is beyond the scope of the project because the cost of such a relocation is too high to be supported by the Pipedream Timber Sale; and the Road 2541 drainage improvement is beyond the scope of the project due to its location outside of the Pipedream Timber Sale Area and haul route. These road segments are the largest sources of sediment delivery to Placer Creek and have the highest direct effects to the stream channel.

The reduction of sediment delivery as a result of road improvements would have a potential beneficial effect, or improvement in the trend toward channel stability, for Placer Creek. No noticeable effects would occur in the Moyie River due to the small size of the project relative to the size of the watershed.

Water Yield

Equivalent Clear-Cut Acres would increase under Alternatives 2 and 3. The increase in ECAs for the Placer Creek Drainage would be approximately 102 acres for Alternative 2 and approximately 133 acres for Alternative 3. The increase in ECAs would represent approximately 3 percent of the acreage of the Placer Creek watershed for Alternative 2 and 4 percent for Alternative 3. This increase in ECAs would result in slightly increased peak flows in Placer Creek. A small temporary increase in peak flows may result from a reduction of canopy closure over the Placer Creek Watershed. Over time, the canopy closure would recover, particularly in the salvage and thinning units proposed for Alternative 2 (Ried,1993 pp. 60-61.) The slight increase in peak flows would not affect channel stability in Placer Creek. Channel instability in Placer Creek is primarily from increased sediment loads, not increased flows.

No measurable effects in the channel stability of Placer Creek would occur as a result of either action alternative. No noticeable effects would occur in the Moyie River due to the small size of the project relative to the size of the watershed.

Alternative 3 :

Alternative 3 is the same as Alternative 2 except units 2, 5, 7, and 10 would be shelterwoods rather than thinning or salvage units.

The proposed ecosystem burn would be the same as that in Alternative 2 with the same lack of measurable effects.

Direct and Indirect Effects:

Alternative 3 proposes to harvest approximately 247 acres of shelterwood in the Placer Creek drainage. Canopy removal would average approximately 50 percent. Approximately 14 acres of seed tree harvest are proposed in the Placer Creek drainage. Canopy removal would average approximately 70 percent. Total ECAs for the Placer Creek watershed would be approximately 133 acres.

This timber harvest would lead to a small increase in peak flows which would occur a few days earlier in the year. The increase in flows would be slightly higher than under Alternative 2. This small increase in peak flows would not produce measurable changes in the stream channel morphology. Any delay in the recovery of channel stability in Placer Creek that would result from increased flows would be more than mitigated by sediment delivery reductions due to road improvements.

Proper functioning condition would probably not be achievable for Placer Creek, unless Forest Road 2540 were relocated outside the Placer Creek floodplain and drainage relief were installed in the 1/2 mile of Forest Road 2541 east of the Placer Creek crossing. Both of these projects are outside the scope of the Pipedream Timber Sale, the road relocation project due to its cost, and the drainage relief project because it is outside of the sale area boundary.

A temporary road would be reconstructed for approximately 400 feet to access a portion of Unit 10, as in Alternative 2, including the same stream crossing.

The RHCAs would be the same as for Alternative 2.

No changes in channel stability due would be expected under Alternative 3. No effects to water resources would be expected.

The Pipeline Project Area comprises approximately 0.07% of the Moyie River watershed area. Harvesting such a small portion of the drainage would not produce a measurable change in the magnitude or timing of peak flows in the Moyie River.

Cumulative Effects:

The same activities in the evaluation area apply as described for Alternative 2. The main difference between the cumulative effects of Alternative 2 and Alternative 3 is that Alternative 3 has slightly higher ECAs than Alternative 2. This may lead to slower recovery of channel stability than under Alternative 2. Sediment delivery should not change since harvest activities are outside of the INFS RHCAs. INFS RHCAs are an adequate size to filter sediment generated from timber harvest activities (USDA Forest Service, 1995.)

Alternative 3 would have no measurable cumulative effect on water resources in Placer Creek and Moyie River, in combination with other projects in the analysis area. This is primarily due to road improvements included as part of the proposed project.

Effects of Related Activities:

Tree Planting -- Tree planting in openings created by timber harvesting would have no effect on the aquatic resources in the short term. Planting trees results in minimal soil disturbance. In the long term, planting would help to establish a forest canopy sooner than would natural regeneration in many cases. In the long run, this forest canopy would help moderate peak flows.

Thinning -- Precommercial thinning of forest trees is proposed in some of the existing overstory removal units. Thinning would be used to promote the survival and vigor of preferred Western Larch and Ponderosa Pine trees. Increasing the spacing of the remaining trees would allow these trees to grow faster. This project would not disturb the soil, or reduce the existing canopy of larger trees. Precommercial thinning of forest trees would not affect the aquatic resources in the Pipeline Project Area in the short term. In the long term, a thinned stand would often grow to a mature size faster than an overstocked stand. Trees would grow large enough to provide large organic debris recruitment to stream channels more quickly if the stand is thinned. This large organic debris would help to stabilize the channel in Placer Creek, helping trend the stream toward properly functioning condition.

Slashing Aspen -- Aspen located on upland sites scattered throughout the project area would be slashed. Slashing aspen encourages sprouting from the roots. This sprouting would increase the number of aspen trees and the size of the aspen patch. Slashed trees would remain on the site. No ground disturbing equipment would be used in this project.

The aspen treatment would occur outside of the RHCAs. Since small openings would be necessary to stimulate aspen growth, a slight increase in ECAs would be possible. These openings would be incorporated into the silvicultural prescription and would not open up these stands beyond what is proposed for these units.

Ecosystem Burn: This project would be designed so that damage to larger conifers would be minimal. No change in the forest canopy would be expected, so changes in peak flows would be minimal. The fire would be burned when soil moisture would be high enough to keep soil temperatures from getting hot enough to affect the soil structure and chemistry. Also, the duff would remain intact over much of the area. RHCAs would be avoided during the burning operations.

With no canopy removal, and little soil disturbance, no changes in peak flows or sediment delivery would be expected from this project.

Table 4
Comparison of Issues by Alternative

Issue	Alternative I	Alternative 2	Alternative 3
Hydrologic Integrity (Rd. Density mi/mi^2)	4.9	4.8	4.8
Riparian Function Riparian Road Density (Rd. mi/mi^2)	2.9	2.85	2.85
Mass Failure and Erosion (road miles on sensitive landtypes)	1.9	1.9	1.9
WEPP Road Erosion Model (tons/yr)	31	29	29
Stream Crossings # of Crossings	14	15/14*	15/14*
Net Associated Risk (Tons/Acre)	**30**	**16**	**16**
Cumulative Effects (PFC Trend + = toward PFC 0 = neutral - = away from PFC	0/-*	0/0*	0/0*
Water Yield (increase in ECAs in acres)	0	102	133

* short term/long term.

Compliance with the Clean Water Act

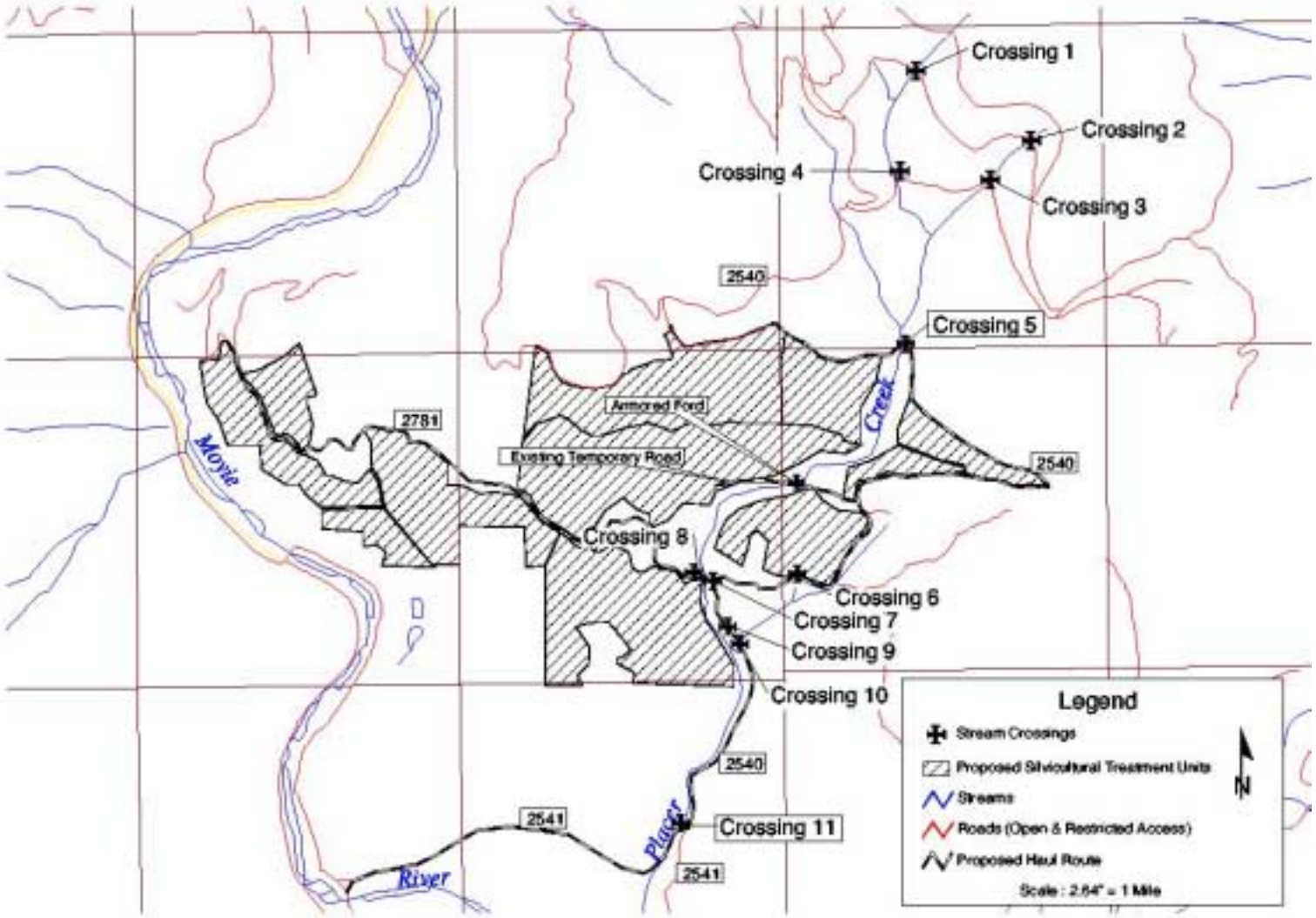
All alternatives would meet the requirements of the Clean Water Act, 33 U.S.C. §1251. Sediment, the pollutant of concern, would not be increased in the water quality limited segment on the Moyie River unless excessive fuel build-ups resulted in a stand replacing fire under the No-Action Alternative. All beneficial uses in the Moyie River and Placer Creek would be preserved.

Compliance with INFS

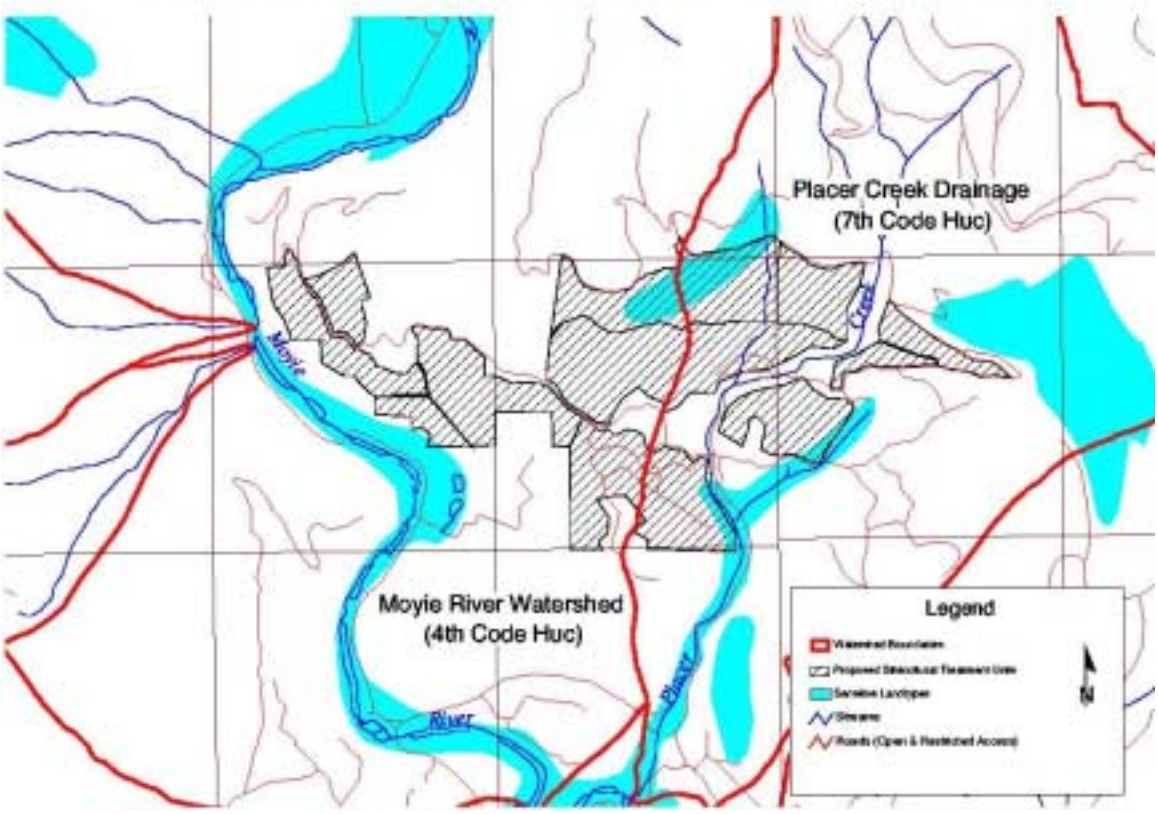
Alternative 2 would protect riparian management objectives by maintaining recommended INFS buffers along the Moyie River and Placer Creek. (The recommended RHCA is 300 feet for a fisheries stream; 60 feet for intermittent streams and wetlands less than one acre; and 100 feet for wetlands over one acre.)

Alternative 3 would protect riparian management objectives by the use of riparian habitat conservation areas recommended by INFS.

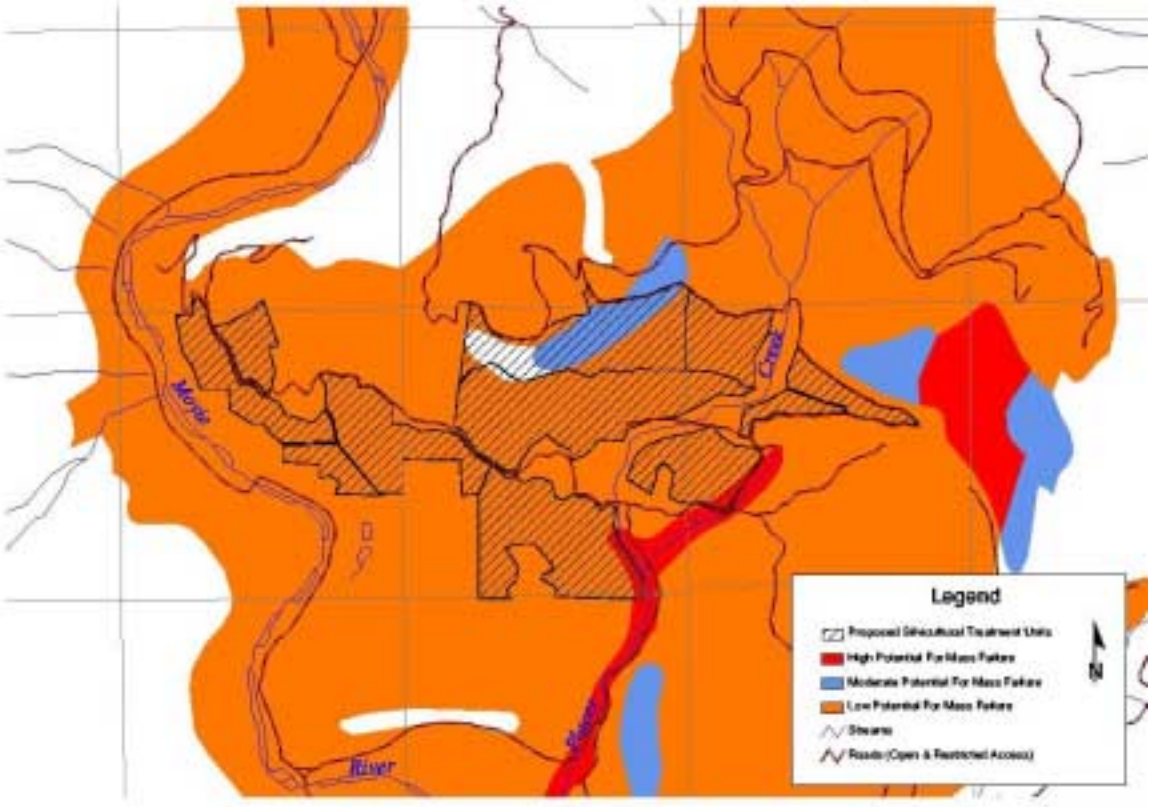
Pipeline EA Project Area Stream Crossings



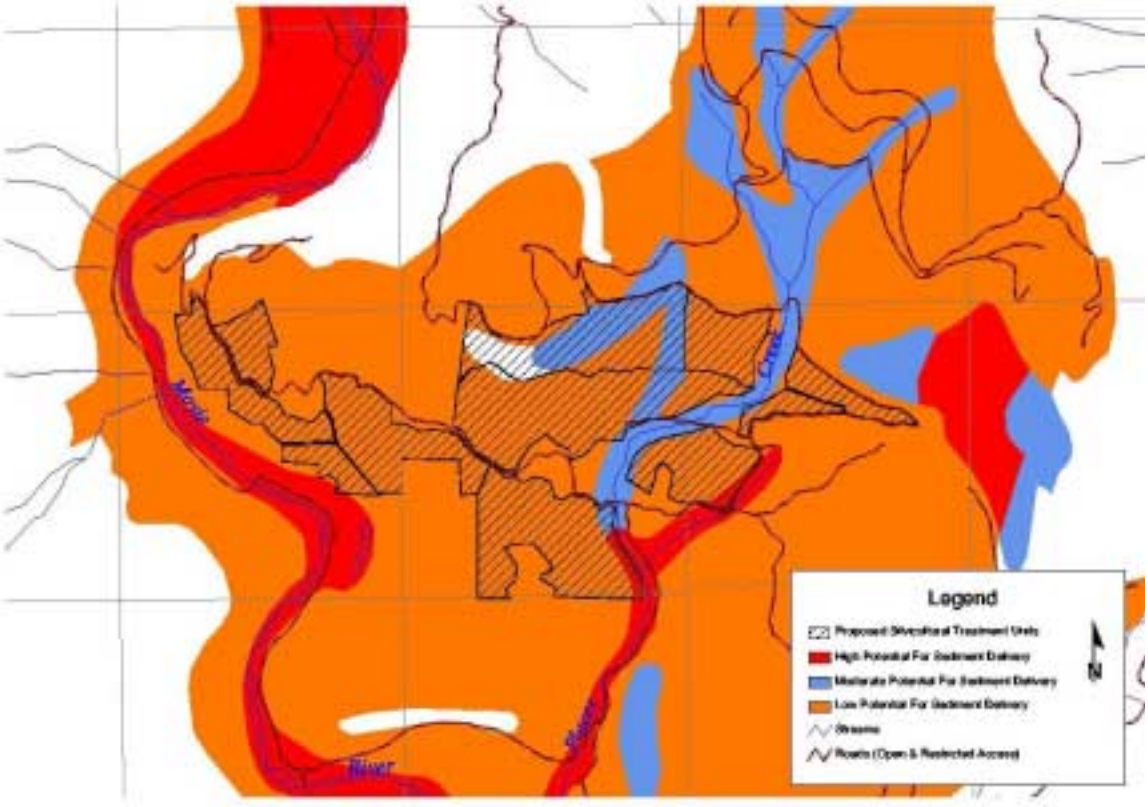
Pipeline EA Project Area Sensitive Landtypes



Pipeline EA Project Area Mass Failure Potential



Pipeline EA Project Area Sediment Delivery Potential



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Appendix A

Site-Specific Best Management Practices

PRACTICE 11.05 - Wetlands Analysis and Evaluation
Objective: To delineate wetlands within sale areas in order to prevent damage to facilities or degradation of soil and water resources.
Effectiveness: High
Compliance: FPA Rule 4.d.v(c) Meets
PRACTICE 13.03 - Tractor Operation Excluded from Wetlands, Bogs, & Wet Meadows
Objective: To maintain wetland functions and avoid adverse soil and water resource impacts associated with the destruction or modification of wetlands, bogs and wet meadows.
Effectiveness: Much of this mitigation consists of avoiding the impact [40 CFR 1508.20(a)]. The Forest Service has near-complete control over construction operations. Effectiveness is expected to be high.
Compliance: FPA Rule 3.h.3 - Meets
Implementation: At a minimum, the following specific protective requirements for wetlands identified on the SAM will be incorporated into C(T)6.61# (Wetlands Protection):

1. Soil and vegetation along lakes, bogs, swamps, wet meadows, springs, seeps, or other sources where the presence of water is indicated will be protected from disturbance which would cause adverse effects on water quality, quantity, and wildlife and aquatic habitat (FPA Rule 3.h.3].
2. An equipment exclusion zone shall extend a minimum of 60 feet from the wetlands, bogs, and wet meadows.

PRACTICE 13.04 - Revegetation of Surface Disturbed Areas
PRACTICE 14.14 - Revegetation of Areas Disturbed by Harvest Activities
Objective: To protect soil productivity and water quality by minimizing soil erosion.
Effectiveness: Revegetation can be moderately effective at reducing surface erosion after one growing season following disturbance and highly effective in later years. Effectiveness has been shown to vary from 10 percent on 3/4:1 slopes to 36 percent on 1:1 slopes to 97 percent on 1:1 slopes in later years (King, John G. and E. Burroughs. Reduction of Soil Erosion on Forest Roads. Intermountain Research Station General Technical Report, 1988).
Compliance: FPA Rules 3.d.3 & e.i, 2 - Meets
Implementation: All temporary roads, landings, and skid trails in the sale area will be seeded within one year after harvesting is completed. Seed mixes and fertilizer specifications will be incorporated into Timber Sale Contract provision C(T)6.601# (Erosion Control Seeding). Timber Sale Contract provision C(T)6.623# (Temporary Road, Skid Trail/Skid Road and Landing) will identify that scarification/ripping of compacted landings and closed roads will be a minimum of 4 inches, not to exceed 2 feet.

a. All temporary roads, landings, and skid trails will also be fertilized to give the new plants extra support in becoming established.
b. The standard Idaho Panhandle National Forests moist site erosion control seed mix will be used.

PRACTICE 14.06 - Riparian Area Designation
PRACTICE 15.12 - Control of Construction in Riparian Areas
Objective: To minimize the adverse effects on Riparian Areas with prescriptions that manage nearby logging and related land disturbance activities.
Effectiveness: Moderate
Compliance: FPA Rules 3.g.2, 3, & iv; 3.f.iv - Meets

Implementation: Riparian areas will be protected through the following requirements that will be incorporated into timber sale layout, or into the timber sale contract as identified below:
1. Provide the large organic debris, shading, soil stabilization, wildlife cover, and water filtering effects of vegetation along Class I streams [FPA Rule 3.g.i-3]. The following measure(s) are implemented during sale layout:

(a) A Stream Protection Zone that consists of a buffer of 300 feet slope distance from the edge of the channel for Placer Creek and the Moyie River. No timber harvesting activities shall occur within the Stream Protection Zone.

(b) A Stream Protection Zone which consists of a buffer of 60 feet slope distance from the edge of the channel for the intermittent tributaries to Placer Creek. No timber harvesting activities shall occur within the Stream Protection Zone.

2. Waste resulting from logging operations, such as crankcase oil, filters, grease and fuel containers, shall not be placed inside the Stream Protection Zones [FPA Rule 3.f.iv and TSC Provision B(T)6.34].

PRACTICE 14.11 - Log Landing Erosion Prevention and Control;
PRACTICE 14.12 - Erosion Prevention & Control During Timber Sale Operations;
PRACTICE 14.15 - Erosion Control on Skid Trails.

Objective: To protect water quality by minimizing erosion and subsequent sedimentation derived from log landings and skid trails.

Effectiveness: Moderate

Compliance: FPA Rules 3.e.i, 2; 3.d.3 - Meets

Implementation: The following criteria will be used in controlling erosion and restoring landings and skid trails so as to minimize erosion:

General:

1. Deposit waste material from construction or maintenance of landings and skid and fire trails in geologically stable locations at least 100 feet outside of the appropriate Stream Protection Zone [FPA Rule 3.f.3].
2. Skid trails and landings will be seeded with a mix specified in C(T)6.601#.

Landings:

1. During period of use, landings will be maintained in such a manner that debris and sediment are not delivered to any streams.
2. Landings shall be reshaped as needed to facilitate drainage prior to fall and spring runoff. Landings shall be stabilized by establishing ground cover or by some other means within one year after harvesting is completed [FPA Rule 3.e.2].
3. Landings will drain in a direction and manner that will minimize erosion and will preclude sediment delivery to any stream.
4. After landings have served the Purchaser's purpose, the Purchaser shall ditch or slope them to permit the water to drain or spread [Provision B(T)6.63 (Landings)].

Skid Trails:

1. Skid trails and fire trails shall be stabilized whenever they are subject to erosion, by waterbarring, cross draining, outsloping, scarifying, seeding, or other suitable means. This work shall be kept current to prevent erosion prior to fall and spring runoff [FPA Rule 3.e.i].
2. The spacing of water bars on skid trails will be designated by the sale administrator and/or watershed specialist. [Reference FSH 7709.56]

PRACTICE 14.19 - Acceptance of Timber Sale Erosion Control Measures Before Sale Closure
Objective: To assure the adequacy of required timber sale erosion control work.
Effectiveness: High
Compliance: No directly related FPA Rule
Implementation and Responsibility: Timber Sale Contract provision B(T)6.35 requires that upon the purchaser's written request and assurance that work has been completed, the Forest Service shall perform an inspection. One area that the Purchaser's might request acceptance for are specific requirements such as logging, slash disposal, erosion control, or snag felling. In evaluating acceptance the following definition will be used by the Forest Service: "Acceptable" erosion control means only minor deviation from established standards, provided no major or lasting impact is caused to soil and water resources. Certified Timber Sale Administrators will not accept as complete erosion control measures that fail to meet this criteria.

PRACTICE 15.03 - Road and Trail Erosion Control Plan
Objective: To minimize the effects of erosion and the degradation of water quality through erosion control work and road design.
Effectiveness: Moderate
Compliance: No Related FPA Rule
Implementation: Prior to the start of construction, the Contractor shall submit a schedule for proposed erosion control work as required in the Standard Specifications. The schedule shall include all erosion control items identified in the specifications. Erosion control work to be done by the Contractor will be defined in Standard Specification 204 and/or in the Drawings. The schedule shall consider erosion control work necessary for all phases of the project. The Contractor's construction schedule and plan of operation will be reviewed in conjunction with the erosion control plan by the TSA, district watershed specialist, and engineering to insure their compatibility before any schedules are approved. The Engineer will certify that the Contractors Erosion Control Plan meets the specifications of Std. FS Spec. Section 204.

PRACTICE 15.07 - Control of Permanent Road Drainage

Objective: To minimize the erosive effects of concentrated water and the degradation of water quality by proper design and construction of road drainage systems and drainage control structures.

Effectiveness: Moderate. Designed and controlled ditches, cross drain spacing, and culvert discharge prevent water from running long distances over exposed ground. Dewatered (dry) culvert installations and special drainage such as rock filter blankets and rock buttresses have been demonstrated effective on the Nez Pierce Forest (King and Gonsior, 1980; Rothwell, 1983; Anderson et. al., 1970).

Compliance: FPA Rules 4.c.v3; 4.d.3(a) & (b) - Meets

Implementation: The following items will be included in the timber sale contract provisions or road contract special project specifications.

1. Drainage ways shall be cleared of all debris generated during construction and/or maintenance which potentially interferes with drainage or water quality [IFPA Rule 4(c)(2), Timber Sale Contract Clause C(T)5.4, and Standard Road Specifications-Special Project Specification 204.04].

2. During and following operations on out-sloped roads, out-slope drainage shall be retained and berms shall be removed on the outside edge except those intentionally constructed for protection of road grade fills [IFPA Rule 4(c)(vi) and Timber Sale Contract Clause C(T)5.4].

3. Cross drains and relief culverts shall be constructed to minimize erosion of embankments. The time between road construction and installation of erosion control devices shall be minimized. Drainage structures or cross drains shall be installed on uncompleted roads which are subject to erosion prior to fall or spring runoff. Relief culverts shall be installed with a minimum grade of 1 percent [IFPA Rule 4(c)(v3) and Standard Road Specifications-Special Project Specification 204.1].

4. Cross drains and relief culverts will be installed so as to minimize concentrations of intercepted water (see also Practice 15.02 f.(3)).

PRACTICE 15.08 - Pioneer Road Construction

Objective: To minimize sediment production and mass wasting associated with pioneer road construction.

Effectiveness: Moderate

Compliance: No directly related FPA Rule

Implementation: The following contract specifications will be required:

1. Construction of pioneer roads shall be confined to the designed location of the road prism unless otherwise approved by the Contracting Officer (Std. FS Spec. 203.11).
2. Pioneering shall be conducted so as to prevent undercutting of the designated final cut slope, and to prevent avoidable deposition of materials outside the designated roadway limits (Std. FS Spec. 203).
3. Permanent culverts will be installed at wet crossings during the pioneer phase unless positive control of sediment can be accomplished during installation, use, and removal of the temporary structure.

PRACTICE 15.09 - Timely Erosion Control Measures on Incomplete Road and Streamcrossing Projects

Objective: To minimize erosion of and sedimentation from disturbed ground on incomplete projects.

Effectiveness: Moderate

Compliance: FPA Rules 4.c.2,3,iv; & 4.d.3 - Meets

Implementation: The following measures will be implemented during projects:

1. Temporary culverts, side drains, flumes, cross drains, diversion ditches, energy dissipaters, dips, sediment basins, berms, debris racks, or other facilities needed to control erosion will be installed as necessary. The removal of temporary culverts, culvert plugs, diversion dams, or elevated stream crossing causeways will be completed as soon as practical;
2. The removal of debris, obstructions, and spoil material from channels and floodplains;
3. Seeding with an erosion control seed mix approved for use on the Idaho Panhandle National Forests to minimize erosion.
4. Install drainage structures or cross drain uncompleted roads which are subject to erosion prior to fall or spring runoff. (Std Spec 204)

Erosion control measures must be kept current with ground disturbance, to the extent that the affected area can be rapidly "closed," if weather conditions deteriorate. Areas must not be abandoned for the winter with remedial measures incomplete.

PRACTICE 15.10 - Control of Road Construction Excavation and Sidecast Material
PRACTICE 15.18 - Disposal of Right-of-Way and Roadside Debris
See also **Practice 13.05**
Objective: To insure that unconsolidated excavated and sidecast material, construction slash, and roadside debris, generated during road construction, is kept out of streams and to prevent slash and debris from subsequently obstructing channels.
Effectiveness: High
Compliance: FPA Rule 4.c.3,iv; & 4.d.i,2,3
The slash windrow and other erosion control devices will not be place in existing stream channels or obstruct culver outfalls. Large limbs and cull logs may be bucked into manageable lengths and piled alongside the road for fuelwood.
Implementation: In the construction of road fills near streams, compact the material to reduce the entry of water, minimize the amount of snow, ice, or frozen soil buried in the embankment. No significant amount of woody material shall be incorporated into fills. Slash and debris may be windrowed along the toe of the fill, but in such a manner as to avoid entry into a stream and culvert blockage.

Where slash windrows are not desirable or practical, other methods of erosion control such as erosion mats, mulch, and straw bale or fabric sediment fences will be used. Where exposed material (excavation, embankment, borrow pits, waste piles, etc.) is potentially erodible, and where sediments would enter streams, the material will be stabilized prior to fall or spring runoff by seeding, compacting, rip-rapping, benching, mulching or other suitable means.

The following standard specs will be included in all road contracts that include clearing and excavation.
1. Standard Specification 201 (Slash Treatment)
2. Standard Specification 203 (Excavation and Embankments)

PRACTICE 15.13 - Controlling In-Channel Excavation

Objective: To minimize downstream sedimentation by insuring that all in-channel excavations are carefully planned.

Effectiveness: High

Compliance: SCA Rule 9,1(a) - Meets

Implementation: Location and method of stream crossings will be designed and agreed to prior to construction. The following items highlight some of the principal provisions incorporated into the TSC that will govern channel protection:

1. Construction equipment may cross, operate in, or operate near stream courses only where so agreed to and designated by the Forest Service prior to construction (B(T)6.5, B(T)6.422). Crossing of perennial stream channels will be done in compliance with the specifications in the Stream Channel Alteration Act Rules and Regulations and included in the project specifications.
2. No construction equipment shall be operated below the existing water surface except that fording the stream at one location only will be permitted, and work below the water level that is necessary for culvert bedding or footing installations will be permitted to the extent that it does not create unnecessary turbidity or stream channel disturbance [SCA Rule 9,1 (a) and Standard Road Specifications-Special Project Specification 204.04].
3. Wheeled or track laying equipment shall not be permitted to operate within 5 feet slope distance of the apparent high water mark of Class 2 streams and 75 feet of Class I streams. (C(T)6.6 Erosion Prevention and Control).
4. Construction of any hydraulic structures in stream channels will be in compliance with the Rules and Regulations pertaining to the Stream Channel Protection Act, Title 42, Chapter 38, Idaho Code).

PRACTICE 15.21 - Maintenance of Roads

Objective: To conduct regular preventive maintenance operations to avoid deterioration of the roadway surface and minimize disturbance and damage to water quality, and fish habitat.

Effectiveness: Moderate

Compliance: FPA Rule 4.d.i, 2, 3, iv, v - Meets

Implementation: For roads in active timber sale areas standard TSC provision B5.4 (Road Maintenance) requires the purchaser to perform or pay for road maintenance work commensurate with the purchasers use. Purchaser's maintenance responsibility shall cover the before, during, and after operation period during any year when operations and road use are performed under the terms of the timber sale contract (C(T)5.4 - Road Maintenance). Purchaser shall perform road maintenance work, commensurate with purchaser's use, on roads controlled by Forest Service and used by purchaser in connection with this sale except for those roads and/or maintenance activities which are identified for required deposits in C(T)5.411# and C(T)5.412#. All maintenance work shall be done concurrently, as necessary, in accordance with T-specifications set forth herein or attached hereto, except for agreed adjustments (TSC C(T)5.4- T301, 310).

1. Sidecast all debris or slide material associated with road maintenance in a manner to prevent their entry into streams [IFPA Rule 4(d)(i), Timber Sale Contract Clause C(T)5.4, and Standard Road Specification-Special Project Specification T108].

2. Repair and stabilize slumps, slides, and other erosion features causing stream sedimentation [IFPA Rule 4(d)(2), Timber Sale Contract Clauses C(T)5.4 and C(T)5.253, and Special Project Specification T108].

3. Active Roads. An active road is a forest road being used for hauling forest products, rock and other road-building materials. The following maintenance shall be conducted on such roads.

(a) Culverts and ditches shall be kept functional.

(b) During and upon completion of seasonal operations, the road surface shall be crowned, out-sloped, in-sloped or water barred, and berms removed from the outside edge except those intentionally constructed for protection of fills.

(c) The road surface shall be maintained as necessary to minimize erosion of the subgrade and to provide proper drainage.

(d) If road oil or other surface stabilizing materials are used, apply them in such a manner as to prevent their entry into streams [IFPA Rule 4(d)(3)] and Timber Sale Contract Clauses C(T)5.441 and C(T)6.341].

Effectiveness: These measures should effectively minimize erosion from roads.

3. Inactive roads. An inactive road is a forest road no longer used for commercial hauling but maintained for access (e.g., for fire control, forest management activities, recreational use, and occasional or incidental use for minor forest products harvesting). The following maintenance shall be conducted on inactive roads.

(a) Following termination of active use, ditches and culverts shall be cleared and the road surface shall be crowned, out-sloped or in-sloped, water barred or otherwise left in a condition to minimize erosion. Drainage structures will be maintained thereafter as needed.

(b) The roads may be permanently or seasonally blocked to vehicular traffic [FPA Rule 4.d.iv].

(c) Roads will be seeded, and fertilized twice.

(d) The roads may be permanently or seasonally blocked to vehicular traffic.

4. Abandoned Roads. An abandoned road is not intended to be used again. No subsequent maintenance of an abandoned road is required after the following procedures are completed:

(a) The road is left in a condition suitable to control erosion by out-sloping, water barring, seeding, or other suitable methods.
(b) Ditches are cleaned.
(c) The road is blocked to vehicular traffic.
(d) The department may require the removal of bridges and culverts except where the owner elects to maintain the drainage structures as needed.
2. For roads not in an active timber sale area road maintenance must still occur at sufficient frequency to protect the investment in the road as well prevent deterioration of the drainage structure function. This will be accomplished by scheduling periodic inspection and maintenance, including cleaning dips and cross drains, repairing ditches, marking culvert inlets to aid in location, and cleaning debris from ditches and culvert inlets to provide full function during peak runoff events (FSH 7709.15).

PRACTICE 15.24 - Snow Removal Controls

Objective: To minimize the impact of snow melt on road surfaces and embankments and to reduce the probability of sediment production resulting from snow removal operations.

Effectiveness: Moderate

Compliance: No directly related FPA Rule

Implementation: For Forest roads that will be used throughout the winter, the following measures will be employed:

1. The Purchaser is responsible for snow removal in a manner that will protect roads and adjacent resources.
2. Rocking or other special surfacing and/or drainage measures may be necessary, before the operator is allowed to use the roads.
3. During snow removal operations, banks shall not be undercut nor shall gravel or other selected surfacing material be bladed off the roadway surface. Ditches and culverts shall be kept functional during and following roadway use. If the road surface is damaged, the Purchaser shall replace lost surface material with similar quality material and repair structures damaged in blading operations.
4. Snow berms shall not be left on the road surface or shall be placed to avoid channelization or concentration of melt water on the road or erosive slopes. Berms left on the shoulder of the road shall be removed and/or drainage holes opened at the end of winter operations and before the spring breakup. Drainage holes shall be spaced as required to obtain satisfactory surface drainage without discharge on erodible fills. On insloped roads, drainage holes shall also be provided on the ditch side, but care taken to insure that culverts and culvert inlets are not damaged.

Appendix B

INFS Standards and Guidelines (USDA A7-13; 1995)

Only INFS standards and guidelines that apply to the range of alternatives for the Pipeline EA are addressed here; those standard and guidelines that do no apply were added into the project file. These INFS standards and guidelines are addressed with comments in *italics* as follows:

Timber Management (A-7)

TM-1. Prohibit timber harvest, including fuelwood cutting, in Riparian Habitat Conservation Areas, except as described below.

a. Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting in Riparian Habitat Conservation Areas only where present and future woody debris needs are met, where cutting would not retard or prevent attainment of other Riparian Management Objectives, and where adverse effects can be avoided to inland native fish. For priority watersheds, complete watershed analysis prior to salvage cutting in RHCAs.

b. Apply silvicutural practices for Riparian Habitat Conservation Areas to acquire desired vegetation characteristics where needed to attain Riparian Management Objectives. Apply silvicultural practices in a manner that does not retard attainment of Riparian Management Objectives and that avoid adverse effects on inland native fish.

Effectiveness: High. No harvest is to occur within the RHCAs.

Roads Management (A-7-8)

RF-1. Cooperate with Federal, Tribal, State, and county agencies, and cost-share partners to achieve consistency in road design, operation, and maintenance necessary to attain Riparian Management Objectives.

The proposed activities are all on National Forest lands, but have been coordinated with all those listed where applicable.

Effectiveness: High. This coordination is standard policy.

RF-2. For each existing or planned road, meet the Riparian Management objectives and avoid adverse effects to inland native fish by:

a. completing watershed analyses prior to construction of new roads or landings in Riparian Habitat Conservation Areas (RHCAs) within priority watersheds.

This project area is not within an INFS priority watershed nor are any activities proposed within RHCAs so no watershed analysis is required.

b. minimizing road and landing locations in Riparian Habitat Conservation Areas.

No new roads or landings are proposed within RHCAs and under the action alternatives, except for two crossings of intermittent streams for Alternative 2. These crossings would be removed when timber sale activities are completed. In this way, road and landing locations within RHCAs will be minimized. Therefore, all alternatives meet this standard.

Effectiveness: Moderate to High. Timing of the crossing removal depends on the timing of timber sale activities.

c. initiating development and implementation of a Road Management Plan or a Transportation Management Plan. At a minimum, address the following items in the plan:

1. Road design criteria, elements, and standards that govern construction and reconstruction.
2. Road management objectives for each road.
3. Criteria that govern road operation, maintenance, and management.
4. Requirements for pre-, during-, and post-storm inspections and maintenance
5. Regulation of traffic during wet periods to minimize erosion and sediment delivery and accomplish other objectives.
6. Implementation and effectiveness monitoring plans for road stability, drainage, and erosion control.
7. Mitigation plans for road failures.

The interdisciplinary team (IDT) evaluated access and road improvement needs within the project area. The project includes drainage improvements to Forest Roads 2140 and 2541.

Effectiveness: Moderate. Often activities occur for a few days during wet periods before a timber sale administrator or Forest Service Representative is able to top these activities.

d. avoiding sediment delivery to streams from the road surface.

1. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe.

This standard applies to the road drainage improvements proposed in Alternatives 2 and 3 on Roads 2540 and 2541.

Effectiveness: High. Roads would be constructed with this design.

2. Route road drainage away from potentially unstable stream channels and hillslopes.

This standard was applied by improving the cross drainage of haul routes. This will reduce the potential to concentrate water and deliver it to unstable slopes. Provided that road improvements in the action alternatives are conducted for No Action, all alternatives meet this standard.

Effectiveness: High. Improved road drainage would be part of the road package. Water would be far less concentrated below existing roads than at present.

e. Avoiding disruption of natural hydrologic flow paths.

Restoring slope hydrology would be accomplished through road reconstruction and maintenance, which would frequently cross drain ditch and road surface water and would prevent the diversion of channel flow down the road prism.

Effectiveness: High. Road reconstruction projects would restore the hydrologic flow paths in th3e Placer Creek Watershed by reducing the amount of water diverted down ditchlines and road surfaces to stream channels.

f. avoid sidecasting of soils or snow. Sidecasting of road material is prohibited on road segments within or abutting RHCAs in priority watersheds.

None of the proposed units are within priority watersheds, but this is a standard BMP included in the timber sale contract.

RF-3. Determine the influence of each road on the Riparian Management Objectives. Meet Riparian Management Objectives and avoid adverse effects on inland native fish by:

a. reconstructing road and drainage features that do not meet design criteria or operation and maintenance standards, or that have been shown to be less effective than designed for controlling sediment delivery, or that retard attainment of Riparian Management Objectives, or do not protect priority watersheds from increased sedimentation.

b. prioritizing reconstruction based on the current and potential damage to inland native fish and their priority watersheds, the ecological value of the riparian resources affected, and the feasibility of options such as helicopter logging and road relocation out of Riparian Habitat Conservation Areas.

c. closing, stabilizing, obliterating, roads not needed for future management activities. Prioritize these actions based on the current and potential damage to inland native fish in priority watersheds, and the ecological value of the riparian resources affected.

The proposed road reconstruction and maintenance described in Chapter 2, 3, and 4 originate from the above standards. The action alternatives would meet this standard. No Action would meet this standard if the needed reconstruction and maintenance were accomplished.

Effectiveness: High. Existing roads are proposed for reconstruction with the Timber Sale Contract, so the likelihood that the projects would be completed is high.

RF-4. Construct new, and improve existing, culverts, bridges, and other stream crossings to accommodate a 100-year flood, including associated bed load and debris, where those improvements would/do pose a substantial risk to, riparian conditions. Substantial risk improvements include those that do not meet design and operation maintenance criteria, or that have been shown to be less effective than designed for controlling erosion, or that retard attainment of Riparian Management Objectives, or that do not protect priority watersheds from increased sedimentation. Base priority for upgrading on risks in priority watersheds and the ecological value of the riparian resources affected. Construct and maintain crossings to prevent diversion of streamflow out of the channel and down the road In the event of crossing failure.

The proposed road reconstruction originates from the above standard. The action alternatives would meet this standard. No Action would meet this standard if needed reconstruction, and maintenance are accomplished.

Effectiveness: High. Two Placer Creek crossing would be replaced with culverst capable of handling a 100-year flood. The crossings on the temporary road would meet this same standard. This work would be done under the Timber Sale Contract.

RF-5. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.

The only crossing of a fish bearing stream is the Placer Creek crossing on Forest Road 2541. This crossing is not a fish barrier and would not become a fish barrier after the culvert is replaced.

Effectiveness: High. There are currently no crossings that are fish barriers in the project area. The proposed road design would maintain fish passage.

Fires/Fuels Management (A-11)

FM-1. Design fuel treatment and fire suppression strategies, practices, and actions so as not to prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could perpetuate or be damaging to long-term ecosystem function or inland native fish.

FM-2. Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of Riparian Habitat Conservation Areas. If the only suitable location for such activities is within the Riparian Habitat Conservation Area, an exemption may be granted following a review and recommendation by a resource advisor. The advisor would prescribe the location, use conditions, and rehabilitation requirements, with avoidance of adverse effects to inland native fish a primary goal. Use an interdisciplinary team, including a fishery biologist, to predetermine incident base and helibase locations during presuppression planning.

FM-3. Avoid delivery of chemical retardant, foam, or additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or, following a review and recommendation by a resource advisor and a fishery biologist, when the action agency determines that an escape fire would cause more long-term damage to fish habitats than chemical delivery to surface waters.

FM-4. Design prescribed burn projects and prescriptions to contribute to the attainment of the Riparian Management Objectives.

FM-5. Immediately establish an emergency team to develop a rehabilitation treatment plan to attain Riparian Management Objectives and avoid adverse effects on inland native fish whenever Riparian Habitat Conservation Areas are significantly damaged by a wildfire or a prescribed fire burning out of prescription.

The proposed fires/fuels management described in Chapter 2, 3, and 4 originate from the above standards. The action alternatives would meet this standard. The No Action Alternative would not meet this standard if wildfire without suppression were allowed.

Effectiveness: Moderate to High. Prescribed fire in the project area is designed to meet these standards. There is a small risk that wildfire in the Project Area may not meet some of these standards, particularly Standard FM-4.

General Riparian Area Management (A-12)

RA-1. Identify and cooperate with Federal, Tribal, State and local governments to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.

This project does not affect instream flows, therefore, this standard does not apply.

RA-2. Trees may be felled in Riparian habitat Conservation Areas when they pose a safety risk. Keep felled trees on site when needed to meet woody debris objectives.

None of the alternatives propose activities within the RHCAs so this standard does not apply.

RA-3. Apply herbicides, pesticides, and other toxicants, and other chemicals in a manner that does not retard or prevent attainment of Riparian management Objectives and avoids adverse effects on inland native fish.

Provided the BMPs listed in the Bonners Ferry Noxious Weed EIS are followed, all alternatives would meet this standard.

Effectiveness: High. Standards would be met as required by the Bonners Ferry Noxious Weed EIS.

RA-4. Prohibit storage of fuels and other toxicants within Riparian Habitat Conservation Areas. Prohibit refueling with Riparian Habitat Conservation Areas unless there are no other alternatives. Refueling sites within a Riparian habitat Conservation Area must be approved by the Forest Service or Bureau of Land Management and have an approved spill containment plan.

Effectiveness: High. This is a standard BMP that is part of the timber sale contract.

RA-5. Locate water drafting sites to avoid adverse effects to inland native fish and instream flows, and in a manner that does not retard or prevent attainment of Riparian Management Objectives.

Watershed and Habitat Restoration (A-12)

WR-1. Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to attainment of Riparian Management Objectives.

Effectiveness: High. Watershed restoration in the Placer Creek Watershed are included in the road reconstruction proposal.

WR-2. Cooperate with Federal, State, local, and Tribal agencies, and private landowners to develop watershed-based Coordinated Resource Management Plans (CRMPs) or other cooperative agreements to meet Riparian Management Objectives.

Effectiveness: Moderate to High. Cooperation at the multiple levels as listed occurred within the framework for developing the proposed activities of this project .

Fisheries and Wildlife Restoration (A-13)

FW-1. Design and implement fish and wildlife habitat restoration and enhancement actions in a manner that contributes to attainment of the Riparian Management Objectives.

The proposed road reconstruction proposed for the Pipeline Project originate from the above standard.

Effectiveness: High. Road improvements would be part of the Timber Sale Project.

FW-2. Design, construct, and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of the Riparian Management Objectives or adversely affect inland native fish. For existing fish and wildlife interpretive and other user-enhancement facilities inside Riparian Habitat Conservation Areas, assure that Riparian Management Objectives cannot be met and adverse effects on inland native fish are avoided. Where Riparian Management Objectives cannot be met or adverse effects on inland native fish avoided, relocate or close such facilities.

There is no user-enhancement facilities located or proposed and is not an issue within the proposed project. Therefore, this standard is not applicable to any alternative.

FW-3. Cooperate with Federal, Tribal, and State wildlife management agencies to identify and eliminate wild ungulate impacts that prevent attainment of the Riparian Management Objectives or adversely affect inland native fish.

Wild ungulate impacts will not prevent attainment of RMO's so this standard does not apply.

FW-4. Cooperate with Federal, Tribal, and State fish management agencies to identify and eliminate adverse effects on native fish associated with habitat manipulation, fish stocking, fish harvest, and poaching.

Cooperation at the multiple levels as listed occurred within the framework for developing the proposed activities of this project. Using the INFS Standard Widths Defining Interim RHCA's for the project activities, habitat manipulation does not apply. Fish stocking, harvest and/or poaching are all regulated by State management guidelines.

Effectiveness: High. Existing habitat would be preserved under this project.

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Reply to: 2672.4 Date: September 7, 2000

Subject: Biological Assessment for Pipeline Timber Sale

To: District Ranger

The U. S. Fish and Wildlife Service (USFWS) lists two fish species that occur, potentially occur, and/or habitat exists within the Kaniksu portion of the Idaho Panhandle National Forests as endangered or threatened under the Endangered Species Act (ESA) of 1973 (Biannual Forest Wide Species List: FWS 1-9-99-SP-483; October 28, 1999). The Kootenai River population of the white sturgeon (*Acipenser transmontanus*) is listed as "endangered" (Federal Register, Volume 59, No. 171, September 6, 1994) and the Columbia River Distinct Population Segment of bull trout (*Salvelinus confluentus*) is listed as "threatened" (Federal Register, Volume 63, No. 111, June 10, 1998). Four additional fish species are listed as "species of concern" by USFWS and as "sensitive" by the Regional Forester.

The purpose of this document is to analyze the effects of the proposed project, described below, on these six fish species. It was prepared in accordance with Section 7(c) of ESA, and manual direction to review all Forest Service activities to ensure that such activities do not contribute to a downward trend in population numbers or density of sensitive species and/or a downward trend in habitat capability, either of which might ultimately result in the need for federal listing (FSM 2672.1 and 2672.4).

Project Description

1) Trend approximately 555 acres towards more open grown stands of larger diameter, fire resistant tree species such as Ponderosa Pine and Western Larch, by reducing the number of trees per acre. These activities would begin to establish the stand characteristics that fire would have naturally created on these sites.

2) Re-establish Western White Pine as a major stand component by implementing silvicultural prescriptions such as salvage, sanitation, commercial thinning, shelterwood, seed tree harvesting.

3) Use prescribed fire and machine piling to reduce fuel loadings and encourage forage production for big game.

4) No new system roads will be constructed. Old temporary roads and skid trails will be reopened and then closed again after logging and burning operations.

5) Two stream crossings will be upgraded.

Location: The Pipeline Project Area is located on National Forest lands in portions of Township 63 North, Range 2 East (Section 1 and 2); Township 63 North, Range 3 East (Section 6); and, Township 64 North, Range 2 East (Section 35); Boise Meridian, Boundary County, Idaho. The project area is located along the entire length of Forest Service Road No. 2781, the Pipeline Road, and covers approximately 350 acres north and east of the Moyie River, and north and west of Placer Creek. The Pacific Gas and Transmission (PGT) Natural Gas Pipeline transects the project area, north to south. (see attached map)

Prefield/Field Review

Field reviews were conducted to inform interdisciplinary team members of proposals and changes throughout this project.

Analysis of Effects

Species	Habitat Present	Habitat Absent	Species Present	Species Absent
Endangered:				
White sturgeon *Acipenser transmontanus*		X		X
Threatened:				
Species	Habitat Present	Habitat Absent	Species Present	Species Absent
Bull trout *Salvelinus confluentus*	X			X
Sensitive/Species of Concern:				
Burbot *Lota lota*		X		X
Interior redband trout *Oncorhynchus mykiss gairdneri*	X			X
Westslope cutthroat trout *Oncorhynchus clarki lewisi*	X		X	
Torrent sculpin *Cottus rhotheus*	X		??	

Further explanations for above table: White sturgeon and burbot are not found in the Moyie River drainage above Moyie Falls Dam. Neither interior redband trout, nor bull trout, are known to inhabit the Placer Creek drainage, although bull trout have been documented in other Moyie River tributaries. Recent sampling by Idaho Department of Fish and Game indicates bull trout do not currently inhabit the mainstem Moyie River. A resident population of westslope cutthroat trout is currently occupying Placer Creek. Detailed information on torrent sculpin distribution is lacking, however, they are known to occupy the Kootenai River watershed.

Previous Activities: The project area includes several existing harvest units from the ComPlacerC Thin Timber Sale (1992), the Orser Creek Timber Sale (1990), and the Pipeline Timber Sale (1983) that would be re-entered to remove dead, damaged or dying trees. These harvests included several regeneration units.

Road construction and timber harvest in the Placer Creek watershed have resulted in an increase in sediment delivered to the stream channel over base levels. Much of this sediment is a result of Deer Ridge Road 2540 which follows the creek for approximately 1 mile.

Existing Condition: Below the Forest Road 2541 crossing, Placer Creek has a large amount of gravel and cobble bedload, with fines covering this substrate in the pools. Banks appear stable and are well vegetated. Riparian vegetation includes cedar, hemlock, Douglas-fir and grand fir timber. Occasional alder may be found adjacent to the channel where there are openings in the canopy. The floodplain is forested from the confluence with the Moyie River to the FR2541 crossing. Woody debris is fairly abundant. An visual estimate reveals approximately 60 pieces per hundred meters averaging approximately 8 inches in diameter and 12 feet long. The channel is slightly entrenched and sinuous. Old channels are visible across the floodplain. The Rosgen Channel Type is C-4 to B-4.

Above the Forest Road 2541 crossing, there was old riparian timber harvest which has never reforested. Stumps are charred on the cut surface, indicating a fire after the harvest. The stumps are probably over 40 years old. Riparian vegetation includes alder, bracken fern and drier site shrubs and forbs. There is a lack of woody debris in the channel, perhaps one piece every 30 feet or more. The flood plain is narrower in this reach, approximately 20 feet wide. There is a low terrace where the old floodplain existed. The channel in the upper reach has a much lower sinuosity than the forested reach. This channel is a Rosgen Channel Type of B-3 to B-4. Substrate is composed of large gravel and small cobble

Above the Forest Road 2540 crossing, Placer Creek is an intermittent channel; below this crossing, perennial springs feed Placer Creek.

Determination of Effects and Rationale

The Inland Native Fish Strategy (INFS) provides interim direction to protect water quality and fish habitat parameters, such as water temperature, sediment, pool frequency, and large woody debris. INFS requires a 300' Riparian Habitat Conservation Area (RHCA) buffer zone on the Moyie River, a perennial fishbearing stream. Implemented buffers are 300 feet slope distance minimum to comply with INFSH direction. Placer Creek is an intermittant channel upstream of FR2781 crossing and only flows water during high runoff periods. INFS requires a RHCA equal to one-half the site potential tree height for intermittant channels, which is approximately 60 feet for Placer Creek. Implemented buffers are approximately 75 feet slope distance at the closest point.

The RHCA buffers for this project will protect the streams from any increase in sediment delivery from logging, any decrease in stream shading, and will preserve riparian trees for large organic debris recruitment (LOD). LOD is important for maintaining channel stability and controlling sediment transport in high gradient systems, such as Placer Creek.

Increasing sediment can negatively affect fish and their life cycles. Elevated sediment levels restrict water flow in the interstitial spaces within the substrate where the eggs are oxygenated, effectively suffocating the eggs and potentially entombing fry. Sediment also decreases rearing habitat (by filling in pool habitat), reduces food supply (macroinvertebrates), and degrades spawning habitat.

The proposed ecosystem burn will not increase sediment delivery as this will occur on the mid to upper slopes, which is over 100 feet away from Placer Creek. The ephemeral draws will still have snow present in the spring and will act as buffers in those areas. Some bare mineral soil may be exposed in areas where the burn is hottest, however, these areas will have a small potential for surface erosion. Any erosion that may occur would be filtered by vegetation between the burned area and the stream and not expected to reach the channel.

A closed road will be reconstructed for approximately 400 feet to access a portion of Unit 10 and Unit 6. One stream crossing will be re-constructed on Placer Creek. Currently, this crossing is a ford, the creek is intermittant at

this location, and the reconstruction will be armoring the ford. This crossing will not be at risk for failure (see watershed report). This temporary road and crossing will be decommissioned after completion of project related activities. This road will be used in the winter, while under snowpack, and when the channel is dry. There is not expected to be any delivery of sediment to the channel from reconstructing this road for winter use.

There will be two crossings on Placer Creek upgraded with this timber sale, crossings 5 and 11 (see map). The 36 inch culvert at Stream Crossing 5 on Forest Road 2540 would be replaced by a 48 inch culvert and a 36 - inch culvert would be replaced by a 72 inch culvert at Forest Road 2541 (Crossing 11). Crossing 11, which is currently a migration barrier, will be buried approximately 24 inches to connect fish habitat above and below this crossing. Replacing these crossings with larger pipes would reduce the risk of crossing failure. The culverts would be able to handle higher flows, transport additional sediment, and would be able to allow larger woody debris to pass through them. A short term sediment pulse would result from the replacement of these culverts, however, replacing these crossings with larger pipes will reduce the risk of crossing failure, therefore reducing the long term sediment delivery risk.

Bank stabilization and ditch relief culverts along the slumping cutbank on Deer Ridge Road will reduce sediment delivery to Placer Creek at this point. Additional ditch relief culverts located on the riparian section of Forest Road 2540 will reduce sediment delivered to Placer Creek at this point.

Although the number of stream crossings will not change from the current condition after the project is completed, two at-risk crossings will be improved. Therefore, a reduction of sediment delivery risk and improvement in the trend toward channel stability for Placer Creek is expected. No noticeable effects will occur in the Moyie River due to the small size of the project relative to the size of the watershed.

The Pipeline Timber Sale will have no effect on white sturgeon and bull trout and no impact on burbot and interior redband trout, as these species are not present in the analysis area. Based on the above information, this project may impact westslope cutthroat trout and torrent sculpin individuals, if present, but will not likely result in a trend toward federal listing or reduced viability for the population or species, with longterm beneficial effects expected through reduction in sediment risk and increased habitat connectivity via upgrading crossings .

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File Code: ***2670*** *Date:* ***March 20, 2000***

Subject: Biological Assessment, Pipeline EA Project, Bonners Ferry Ranger District

To: District Ranger

I. Introduction

The purpose of this assessment is to evaluate and describe potential effects of Alternative 2 (the preferred alternative) of the Pipeline Project on threatened or endangered plant species, and to determine whether any such species or habitat is likely to be affected by the proposed action. This assessment was prepared in accordance with USDA Forest Service policy (FSM 2672.4).

On March 10, 1999 the US Fish and Wildlife Service provided the Idaho Panhandle National Forests (IPNF) with a listing of species (FWS 1-9-99-SP-158) which may be present in the Bonners Ferry Ranger District. The threatened species water howellia (*Howellia aquatilis* A. Gray) and Ute ladies'-tresses (*Spiranthes diluvialis* Sheviak) are suspected to occur in the district. Spalding's catchfly (*Silene spaldingii* Wats.) was proposed for listing as threatened in December of 1999. The extent of suitable habitat for this species in extreme north Idaho is unknown. No endangered or proposed Endangered plant species are known or suspected to occur within the district.

II. Proposed Action

The proposed project would implement harvest activities on Bonners Ferry Ranger District, in:

- T64N, R2E Section 35.
- T63N, R2E Sections 1 and 2.
- T63N, R3E Section 6.

Full descriptions of the proposed actions are contained in Chapter 2 of the Pipeline Environmental Assessment. Alternative 2 is the Preferred Alternative. It would:

6) Trend approximately 555 acres towards more open grown stands of larger diameter, fire resistant tree species such as Ponderosa pine and Western Larch. These activities would begin to establish the stand characteristics that fire would have naturally created on these sites.

7) Re-establish Western White pine as a major stand component by implementing silvicultural prescriptions such as: salvage, sanitation, commercial thinning, shelterwood, seed tree harvesting.

8) Use prescribed fire and machine piling to reduce fuel loadings and encourage forage production for big game.

9) No new roads will be constructed.

Maps showing the location of proposed treatment units are included in the Pipeline Project Environmental Assessment (EA). **A copy of the EA accompanies the Biological Assessment.**

The following connected actions would occur in conjunction with harvest activities:

Temporary Road Construction

A small amount of temporary road would be constructed to access units for harvest. Following harvest activities, the road would be returned to contour and seeded with native and desired non-native species to prevent erosion and minimize spread of noxious weeds.

Road Reconstruction

Maintenance and reconstruction on haul routes would occur, and may include replacement of undersize culverts, installation of drainage features, surfacing with gravel, brushing, blading and ditch cleaning.

Noxious Weeds Control

Noxious weeds treatments would be conducted in accordance with the Bonners Ferry Noxious Weeds Control Projects Environmental Impact Statement (EIS) (USDA 1995), and would be subject to available funding.

Reforestation

Planting native conifers in areas which are understocked following harvest would trend the stands toward the desired species composition.

A more detailed description of the Preferred Alternative, Alternative 2, is found in the EA. Alternatives 1 (No Action) and 3 are also discussed in Chapter II of the EA.

Features Common to All Action Alternatives

Several design criteria were established to minimize effects to natural resources during implementation of the proposed action (Features Common to all Action Alternatives). Site-specific **Best Management Practices (BMPs)** and **Inland Fish Strategy (INFS)** would be implemented to protect aquatic resources. Such protection measures include protection of any suitable habitat for water howellia and Ute ladies'-tresses which may occur in the analysis area. Restoration or maintenance that improves and enhances resource conditions for soil and water resources would be implemented "to the fullest extent possible".

III. Listed Threatened Plant Species

Water howellia - a member of the family Campanulaceae, is suspected to occur in the Priest River subbasin Ecosystem. According to the Conservation Strategy for *Howellia aquatilis* - Flathead National Forest (USDA 1994), there are currently 110 known occurrences of the species; most occurrences are in Montana and Washington, with only one known occurrence in Idaho.

Water howellia is an annual aquatic species restricted to small pothole ponds or the quiet water of abandoned river oxbows. It occurs at elevations from 10 feet in Washington to 4,420 feet in Montana. The species reproduces

only by seed; germination occurs in October, presuming the plant's habitat has dried sufficiently to expose the seeds to oxygen. Because of this restrictive habitat requirement, population numbers in a given year are directly influenced by the extent of pond drawdown at the end of the previous growing season (USDA 1994).

Ute ladies'-tresses - a member of the plant family Orchidaceae, is a Great Basin species. In north Idaho, the steppe zone of the Palouse Prairie, Rathdrum Prairie and canyon grasslands are considered potentially suitable habitat (Moseley 1998). Montane coniferous forest, subalpine coniferous forest and alpine zones are not likely places to find Ute ladies'-tresses (Moseley 1998). Its habitat in the Priest, Pend Oreille and Kootenai River subbasins is considered restricted to low-elevation, low-gradient streams and rivers and open, broad alluvial valleys dominated by mixed conifer/cottonwood, shrub and wet meadow grass and forb communities (Mousseaux 1998).

Ute ladies'-tresses, a perennial terrestrial species, is currently known from Colorado, Idaho, Montana, Nebraska, Utah, Washington and Wyoming; total population for the species is approximately 25,000 to 30,000 individuals (Mousseaux 1998).

IV. Proposed Threatened Plant Species

Spalding's catchfly - a member of the family Caryophyllaceae, is suspected to occur in the IPNF. Its habitat is in dry grassland habitats and grassland inclusions in ponderosa pine and Douglas-fir forest. Suitable habitat for this species is typically dominated by fescues (*Festuca* species) and other bunchgrasses, but also has a high density of forbs. Soil types on which it has been found include loam, silty loam, granitic, loamy basaltic and loess (USDI 2000). Soils in its habitat are characterized as deep to moderately deep.

Spalding's catchfly is a long-lived perennial species which reproduces only by seed (Moseley 1998). Individual plants often exhibit long periods of dormancy (one to three years), and may even experience dormancy within a growing season (Lesica 1997).

Timber harvest by itself is typically not a threat to these microsites, since they are usually sparsely if at all treed. Most threats to Spalding's catchfly and its habitat are due to overgrazing, soil compaction, exotic plant invasions, herbicide use, activities that impact the species' pollinators, and habitat conversion (Lorain 1991 and Lichthardt 1997). Wildfire and prescribed fires may also be detrimental, although one study indicates that some fires may benefit the species by removing heavy accumulations of duff and litter which impede germination and seedling growth (Lesica 1995).

V. On-Site Inspection

Floristic surveys of the analysis area were conducted in August of 1998. All plant species encountered were recorded during the surveys. The surveys targeted areas proposed for harvest activities. No occurrences of water howellia or Ute ladies'-tresses or suitable habitat for either species were identified. As mentioned above, any potentially suitable habitat for water howellia or Ute ladies'-tresses in the analysis area is under private ownership.

No occurrences of Spalding's catchfly were identified during the surveys. Much of the analysis area was characterized by the surveyors as having shallow, rocky soils in dry, Douglas-fir habitat types, and more mesic western redcedar and western hemlock habitats. Deeper-soiled dry grasslands were not encountered during the surveys. However, because the surveys were performed prior to the proposal for listing, potentially suitable habitat for this species was not identified or targeted for survey; floristic inventory of grassland inclusions was incidental and by no means thorough.

VI. Analysis of Effects

Water howellia - Water howellia has yet to be found in the Kootenai River subbasin ecosystem. The Kootenai River, Moyie River and Round Prairie Creek valleys have previously experienced habitat alteration from ditching, draining, farming and other activities that have likely reduced habitat capability for water howellia. Such activities are likely to continue.

There are no known occurrences of water howellia in the Bonners Ferry Ranger District. An 1892 sighting approximately 60 miles south of the Decision Area has not been relocated and is presumed to have been extirpated (Shelly and Moseley 1988). The likeliest habitat for water howellia in the Bonners Ferry Ranger District occurs in the Kootenai River and Moyie River valleys and in Round Prairie Creek. No suitable habitat for the species exists in or near the analysis area.

Ute ladies'-tresses - Ute ladies'-tresses has yet to be found in the Kootenai River subbasin ecosystem. The Kootenai River, Moyie River and Round Prairie Creek valleys have previously experienced habitat alteration from ditching, draining, farming and other activities that have likely reduced any habitat capability for Ute ladies'-tresses. Such activities are likely to continue.

Streams in the analysis area are conifer-dominated, with generally narrow riparian influence and abrupt transition from riparian to upland plant communities. Such conditions generally hold low potential to support Ute ladies'-tresses (Mousseaux 1998). The likeliest habitat for Ute ladies'-tresses in the Bonners Ferry Ranger District occurs in the Kootenai River and Moyie River valleys and in Round Prairie Creek.

Spalding's catchfly - This species has yet to be found in the Kootenai River subbasin ecosystem. The extent of suitable habitat in the subbasin is unknown at this time. Most of the proposed activities would have little potential to affect habitat for Spalding's catchfly. However, proposed underburning to enhance wildlife habitat could have negative effects, both directly from loss of individuals and indirectly from an increased risk of exotic plant species invasions.

The IPNF is currently conducting Forest-wide assessment of habitat potential for this species. Based on cursory aerial photograph interpretation, any occurrence of habitat for Spalding's catchfly in the analysis area is likely limited to small microsites surrounded by dry forest habitats. Areas proposed for timber harvest have low potential to support Spalding's catchfly. Approximately ** acres proposed for underburning to enhance wildlife habitat may contain microsites of suitable habitat.

Potentially suitable habitat for this species identified by the Forest-wide assessment would be surveyed; any occurrence of Spalding's catchfly and/or habitat determined to be suitable would be protected (see Required Mitigation below) from harvest or project-related activities.

VII. Determination of Effects

No sightings of water howellia or Ute ladies'-tresses have been documented in the analysis area or anywhere within the Kootenai River subbasin. There is no suitable habitat for either species in the analysis area. No cumulative effects from project implementation would be expected to occur.

Based on the above considerations, implementation of Alternative 2 would have **no effect** on water howellia or Ute ladies'-tresses or their habitats.

Based on the required mitigation of surveys and habitat protection (see below), implementation of Alternative 2 would be **not likely to jeopardize** Spalding's catchfly within its range.

VIII. Required Mitigation

In order for the above determination to remain valid, the following mitigation is required:

Any potential habitat for **Spalding's catchfly** identified in the analysis area that may be affected by proposed harvest activities must be surveyed prior to implementation of those activities. Occurrence of the species or suitable habitat may require dropping some units or activities, altering unit boundaries or buffering from activities within units.

Prepared by:

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APPENDIX C

GLOSSARY OF SILVICULTURAL PRESCRIPTIONS

INTERMEDIATE TREATMENTS

Treatments designed to enhance growth, quality, vigor, and composition of the stand after establishment or regeneration and prior to final harvest.

Thinnings

Precommercial Thinning (PCT) - Thinnings made purely as investments in the future growth of stands so young that none of the felled trees are extracted and utilized. The trees to be cut or retained are chosen on the predetermined basis or pattern with little or no regard for their position in the crown canopy. This technique can often be used in young stands that have not been thinned previously and are densely crowded. The arbitrary basis on which the trees are selected is justified in highly uniform stands that have not differentiated into crown classes (Smith, 1962).

Sub-commercial Thinning (SCT) - The intent of sub-commercial thinning is basically the same as precommercial thinning, i.e., an investment in the future growth of young stands. In sub-commercial thinning trees cut are normally between 3 inches and 6.9 inches d.b.h. All trees 7.0 inches d.b.h. and larger (i.e., those meeting typical sawlog standards) are left for later treatment. However, with sub-commercial thinning the felled trees are removed and utilized as posts, tree stakes or fiberwood (pulp, chipboard, etc.). Specifications for trees to be removed can be set up on standard spacing, or based on live crown ratios of the trees to be harvested. For example, the prescription may call for all coniferous species that have live crown ratios of less than 40% to be removed.

Commercial Thin (CT) - Intermediate harvest that does not result in regeneration. Used primarily with even-age systems prior to regeneration harvest, but would not eliminate opportunity to convert stand at a later date to uneven-age systems. The primary objectives of a commercial thinning are to stimulate growth of the residual stand, increase total yield, and utilize material that is suppressed. Treatment would remove approximately 1/3 of the stand, leaving larger trees evenly spaced with crowns free to grow before canopy closure occurs again.

Basal Area Thinning (BAT) - Intermediate harvest designed to reduce predominantly lodgepole pine stand susceptibility to infestation of mountain pine beetle by increasing bole temperatures. Treatment will remove up to 50% of the stand, leaving 80 to 90 square feet of basal area per acre. Larger trees will be left evenly spaced. Treatment is not designed to result in regeneration, however, some may occur. This treatment has been used successfully on the Flathead National Forest to reduce mortality in stands in the vicinity of mountain pine beetle epidemics.

Stand Improvement Treatments

Improvement Cutting (IC) - The fundamental characteristic of improvement cuttings is the elimination of poor trees in favor of the good. Stems removed include: (1) inferior species, (2) crooked, leaning, extremely limby, or otherwise badly formed trees, (3) overmature individuals, and (4) trees seriously injured by biotic or atmospheric agencies. The primary objective is to release pre-existing trees that are past the sapling stage (Smith, 1962).

Cull Tree Removal (CTR) - A timber stand improvement treatment that typically follows an intermediate harvest (i.e., commercial thinning, sanitation salvage,etc.). The treatment is designed to free potential crop trees from advanced cull regeneration. The undesirable cull trees are generally removed without regard to spacing. Potential crop trees would be those with good form and vigor, and live crown ratios of 40% or better.

Sanitation Salvage (SS) - The removal of trees to improve stand health by stopping or reducing actual or anticipated spread of insects and disease (**sanitation).** The removal of dead trees or trees being damaged or dying due to injurious agents other than competition, to recover value that would otherwise be lost (**salvage)**.

Release Treatments

Liberation Cutting (LC) - A type of release cutting designed to free a young stand of desirable trees from competition of overtopping trees that are suppressing them. The basic objective is to give the trees that are released enough light and growing space to grow adequately and develop into trees of the main canopy (Smith, 1962).

REGENERATION METHODS

A cutting method by which a new age class is created. Four regeneration methods often used in the Western U.S. are **Clearcutting, Seed Tree, Shelterwood**, and **Selection**.

Even-Aged Methods

Methods designed to regenerate a stand with a single age class

Clearcut (CC) - An even-aged regeneration method where all trees, regardless of size or merchantability, are cut clear from the stand. Planting of seral species (i.e., western larch, Douglas-fir, and blister rust resistant western white pine) is normally done and other species (i.e., western red cedar, western hemlock, lodgepole pine, and grand fir) seed in naturally. The size of the stand where this would be applied would vary but is generally limited to 40 acres or less.

Seed Tree (ST) - An even-aged regeneration method where a small number of trees per acre (TPA), normally 5-10, are left to provide seed to naturally regenerate stands. Interplanting may be done to increase species diversity, primarily with rust-resistant white pine. Seed trees are removed after regeneration is established. The size of the stand where this would be applied would vary but is generally limited to 40 acres or less.

Shelterwood (SW) - Even-aged regeneration method where trees are left to provide shelter and seed to naturally regenerate stands. These types of cuts where regeneration of the stand is the objective are termed **seed cuts.** The primary difference between the seed tree and shelterwood methods is the purpose of the trees being left behind. With a seed tree method the trees are left for seed only and with the shelterwood method trees are left not only for seed, but also for the shelter they provide the new seed crop. The following are some different types of shelterwood cuttings.

1) Uniform Shelterwood (USW) - Cutting is done uniformly throughout the stand; the trees are left on relatively even spacings. The number of trees left can vary considerably depending on environmental conditions, but normally is around 15-20 TPA.

2) Group Shelterwood (GSW) - Cutting is done in groups or patches. The GSW method will create an unsystematic distribution of cutting areas in an area (Smith, 1962). For this reason it may be favorable to adopt this method in visually sensitive areas.

3) Strip Shelterwood (SSW) - Cutting is done in fairly wide strips.

For all of these types of shelterwood cuttings overwood trees are removed after regeneration is established.

Two-aged Methods

Methods designed to maintain and regenerate a stand with two age classes due to the long-term retention of reserve trees in the stand.

Clearcutting with Reserves (CCR) - A clearcutting method in which varying numbers of reserve trees are not harvested to attain goals other than regeneration.

Seed Tree with Reserves (STR) - A seed tree method in which some or all of the seed trees are retained after regeneration has become established to attain goals other than regeneration.

Shelterwood with Reserves (SWR) - A variant of the shelterwood method in which some or all of the shelter trees are retained, well beyond the normal period of retention, to attain goals other than regeneration.

Uneven-aged (Selection) Methods

Methods of regenerating a forest stand, and maintaining, an uneven-aged structure, by removing some trees in all size classes either singly, in small groups, or in strips.

Group Selection (GS) - A method of regenerating uneven-aged stands in which trees are removed, and new age classes are established, in small groups. (Note: The group selection method is often confused with the clearcutting method. However, with the clearcutting method the entire stand is regenerated with one entry and with the group selection method the stand is regenerated through a series of evenly timed cutting cycles. For example, given a 100 acre stand and a 25-year cutting

cycle, approximately 1/4 of the stand, or 25 acres, would be regenerated every 25 years. The size of the groups would vary depending on regeneration objectives, but generally would range from 1-5 acres. With the clearcutting system the entire 100 acre stand would be regenerated with one entry).

Group Selection with Reserves (GSR) - A variant of the group selection method in which some trees within the group are not cut to attain goals other than regeneration within the group.

Single Tree Selection (STS) - A method of creating new age classes in uneven-aged stands in which individual trees of all size classes are removed more-or-less uniformly throughout the stand to achieve desired stand structural conditions.

Other Methods

Irregular Shelterwood (ISW) - This regeneration method stands in an intermediate position between even- and uneven-aged management. An irregular shelterwood varies from traditional uniform methods through variation in age structure an/or spatial structure of trees.

Shelterwood Prep Cut (SWP) - Prior to a shelterwood seed cut it is sometimes necessary to perform a prepatory cut. In practice this cutting will look very much like a commercial thin. However, a prepatory cutting differs in that the principle objective is to encourage development of thrifty crop trees and develop windfirmness in the stand, whereas the principle objective of a commercial thinning is to stimulate growth of the residual stand. Although some growth in the residual stand may occur following prepatory cuttings, they are normally applied in stands that have matured to the point where significant future growth is not anticipated.

APPENDIX D - LONG TERM MONITORING OF ECOSYSTEM CORE DATA

The Idaho Panhandle National Forest is currently implementing a process to monitor changes to a number of ecosystem conditions resulting from project activities and natural disturbances. The overall focus of this monitoring is to evaluate changes in ecosystem condition (structure, composition, and function). The following conditions (Core Data Monitoring Elements) have currently been selected for long-term monitoring: hydrologic integrity, wildlife security and public access, water yield, changes in forest structure outside the Historic Range of Variability (HRV), changes in species composition outside HRV, habitat loss and decline, and changes in landscape pattern. The analysis for each project considers project-related changes to these conditions and anticipated changes are described in project environmental analysis documentation. Table 3 displays core ecosystem conditions that will be monitored as well as information that will be used to monitor this core data, and units of measure that will describe these changes in core data. In some cases, there would be no "Project Related Changes" to core ecosystem data, as displayed in Table 3.

Table 3 - Project-Related Changes to Ecosystem Condition: Core Data Monitoring Elements

Ecosystem Condition Core Data Monitoring Element	Core Data To Be Monitored	Unit of Measure	Project-Related Changes
Hydrologic Integrity	Road Density	Miles/square mile	No new system road construction proposed under either of the action alternatives – there would be **no change** in road densities
Wildlife Security and Public Access	Open Road Density	Miles/square mile	Road closures or removal of existing road closures are not proposed under either of the action alternatives – there would be **no change** in open road density
Water Yield	Hydrologic Openings – Equivalent Clearcut Acres (ECA)	Acres	See Table 4, page D-2.
Changes in Forest Structure Outside HRV	Forest Structure by Size/Age Class Groups (seed/sap)	Acres	See Table 4, page D-2.
Changes in Species Composition Outside HRV	Forest Composition by Forest Cover Type Group (seral species)	Acres	See Table 4, page D-2.
Habitat Loss and Species Decline	TES Dry and Moist/Cold Site Habitat Restoration	Acres	None of the alternatives would result in habitat loss and species decline on these habitat types. Refer to Biological Evaluation.
Changes in Landscape Pattern	Landscape Pattern Measures (mean patch size and variability, edge density, etc.)	Acres % change	See Table 4, page D-4.

Table 4 displays the "Project Related Changes" to core ecosystem data under Alternative 2 and 3 where there is expected to be some measurable change in hydrologic openings (measured in ECAs), changes in forest structure by size/age class groups (acres converted to seedling/sapling), and changes in species composition by forest cover type group (acres converted to seral species).

Table 4 – Project Related Changes Outside HRV. (Alternative 2)

HUC	*HUC Acres	Equivalent Clearcut Acres (ECA)				Seedling-Sapling (acres)				Seral Species (Acres)			
Placer Creek		Exist. Cond.	Alt 2	Total	% Chg	Existing Condition	Alt 2	Total	% Chg	Exist. Cond.	Alt 2	Total	% Chg
1701010 5010306	2496	474	102	576	*21*	98	317	415	*323*	98	317	415	*323*

**National Forest Acres*

Table 4 – Project Related Changes Outside HRV. (Alternative 3)

HUC	*HUC Acres	Equivalent Clearcut Acres (ECA)				Seedling-Sapling (acres)				Seral Species (Acres)			
Placer Creek		Exist. Cond.	Alt 3	Total	% Chg	Existing Condition	Alt 3	Total	% Chg	Exist. Cond.	Alt 3	Total	% Chg
1701010 5010306	2496	474	133	607	*28*	98	555	653	*566*	98	555	653	*566*

**National Forest Acres*

FRAGSTATS: Landscape Structure Data

Growing concerns over loss of biodiversity have spurred land managers to seek better ways of managing landscapes at a variety of scales over both time and space. FRAGSTATS is a spatial pattern analysis program for quantifying landscape structure (USDA 1995). FRAGSTATS quantifies the size and distribution of different types of forest patches (e.g., old growth, forest openings, etc.). FRAGSTATS generates several landscape metrics that can be used to describe the characteristics of forest vegetation in a given area. The metrics that will be tracked as part of the IPNF Core Data Monitoring Elements are described below and listed in Table 4 and Table 5. At this point there are no Forest Plan Standards for the metrics list below, but this information is deemed important in tracking changes landscape pattern.

Mean Patch Size (ha) -This metric equals the average size of given type of forest structure. In general, smaller mean patch sizes for a given type of structure might be considered more fragmented than those with larger mean patch sizes for a given type of structure.

Patch Size Standard Deviation (ha) - This metric describes the variability of the mean patch size for a given type of structure.

Contrast Weighted Edge Density (m/ha) – Edges are simply places where two ecosystems come together. They are never a perfectly sharp line; there is always a transition zone from one set of environmental conditions to another. Because it is the difference between two ecosystems that creates edges and ecotones, it is generally thought that the edge effect will be greatest when two adjacent ecosystems are very different from one another (Hunter 1990). The greater the contrast, the more likely the adjoining habitats are to be very different in structure and in wildlife species they support. This tends to increase the species richness of the ecotone (Thomas et al, 1979). Contrast weighted edge density measures these differences. As an example, pole timber (Table 4) in Placer Creek has less than 6 meters of maximum-contrast edge per hectare. Thus, patches similar in structure surround pole timber stands in the landscape and any edge effects on this habitat are likely to be relatively weak.

Mean Core Area 1 (ha) - This metric expresses the effectiveness of mean patch size of a given forest structure. For example, the mean patch size of old growth stands (Table 4) in Placer Creek is currently 37 hectares with a mean core area of about 15 hectares. This means 15 out of 37 hectares are serving as effective old growth habitat.

Core Area SD 1 (ha) - This metric describes the variability of the mean core area for a given type of structure.

Table 4 – Pipeline EA - Changes in Landscape Pattern (FRAGSTATS Data)					
Existing Condition	**Mean Patch Size (ha)**	**Patch Size SD (ha)**	**Contrast Weighted Edge Density (m/ha)**	**Mean Core Area 1 (ha)**	**Core Area SD 1 (ha)**
SHRUB/SEED/SAPL	13.66	11.39	9.29	3.58	4.75
POLE	23.34	24.37	5.13	6.77	9.82
IMM/MED	47.27	62.58	12.38	16.13	24.64
MAT/LRG	24.48	26.1	8.17	7.69	12.07
OLD GROWTH	37.31	24.37	3.02	14.77	13.04
Alternative 2					
SHRUB/SEED/SAPL	19	18.93	11.05	6.01	8.61
%Change from Existing	*39%*	*66%*	*19%*	*68%*	*81%*
POLE	22.92	23.41	5.25	6.65	9.47
%Change from Existing	*-2%*	*-4%*	*2%*	*-2%*	*-4%*
IMM/MED	37.81	52.34	12.41	12.3	18.96
%Change from Existing	*-20%*	*-16%*	*0%*	*-24%*	*-23%*
MAT/LRG	22.98	21.03	8.46	6.32	7.74
%Change from Existing	*-6%*	*-19%*	*4%*	*-18%*	*-36%*
OLD GROWTH	37.31	24.37	3.07	14.76	13.04
%Change from Existing	*0%*	*0%*	*2%*	*0%*	*0%*

Appendix E

Date: August 14, 1998

Trip Report
Bonners Ferry RD
Idaho Panhandle NF's
July 16, 1998

On July 1, 1998, John Schwandt, plant pathologist, and Sandy Kegley, forest entomologist visited the Pipeline Salvage Site, Bonners Ferry RD at the request of Pat Shira. Pat had noticed several Forest Health problems and wanted our assistance in determining the extent of the problems and the future prognosis for the area. We were joined by Pat Behrens and tree markers Ed Koberstein, Nicole Waller, and Spike Loros.

Stand Description:

The area is about 100 acres of mixed conifer stands about 60-80 years of age. The upper 30-40 acres are rolling to level ground with a mixture of species including ponderosa pine, Douglas-fir, western white pine, and larch, with some cedar, grand fir and hemlock in moist draws. The bulk of the stand is a mostly west-facing slope that drops steeply towards the Moyie River. The stand is a major winter range for big game. There are a few remnant old-growth ponderosa pine scattered through the stand with multiple fire scars.

Forest Health Conditions:

The most noticeable problem was red needles in the lower crowns of the ponderosa pine. We also found many dead and dying ponderosa pine and Douglas-fir and several ponderosa pine with recently broken off tops.

The red needles in the lower crowns of the pine are classic needle cast symptoms; limited to older needles and most severe in the lower portion of the crown. Trees often show widely differing levels of infection, with severely infected trees growing adjacent to trees with very little infection. Trees are not usually killed because infections only kill older needles, leaving the current year's foliage to maintain the tree. This particular needle cast is probably Elytroderma needlecast caused by *Elytroderma deformans,* which is very common throughout the range of ponderosa pine. Even though the needle cast is widespread and has had an effect for many years (see trip report from 1992), it rarely kills trees, so is usually not a major management concern. However, repeated infection may weaken trees enough to become susceptible to other insects or disease.

We examined several of the dead and dying trees and found primarily armillaria root disease (*Armillaria ostoyae*) and western pine beetle (*Dendroctonus brevicomis*) acting both separately and together. We also examined several stumps of ponderosa pine, Douglas-fir, and western red cedar and found evidence of armillaria root disease on some of these.

Many of the trees killed by western pine beetle were older--last year's and previous years attacks --but we saw at least a few ponderosa pine with current attacks from the western pine beetle. The western pine beetle is often found in association with other agents stressing trees. However, it can kill trees on its own, especially following periods of drought or in densely stocked stands

where too many trees are competing for moisture, nutrients, and light. We found quite a few ponderosa pine tops that blew out last winter and are currently full of pine engraver (*Ips pini)* pupae and callow adults. The number of beetles in the downed tops could lead to additional tree mortality later this summer. The pine engraver is attracted to downed trees or small-diameter standing trees growing in dense stands. It will also readily kill the tops of trees. This bark beetle is probably responsible for the dead tops of other ponderosa pine observed in the stand. Many ponderosa pine were also attacked by the red turpentine beetle at the base, but this insect rarely kills trees by itself.

There were several pole-sized western white pine in the upper (more moist) portion of the stand and some of these had dead tops from white pine blister rust (*Cronartium ribicola*). In some of the upper stand, western larch had dwarf mistletoe (*Arceuthobium laricis*) which may create a problem in regenerating larch.

Much of what we saw, especially on the "face," was an over-dense stand which was historically primarily widely spaced ponderosa pine, and is now being converted to a mixed stand of Douglas-fir and ponderosa pine mostly due to lack of fire. The density of the stand and the needle cast and root disease make it very attractive to bark beetles. The rocky soil may contribute to some of the root disease problems as roots may create injuries as they grow around the rocks. Improving the forest health of this stand can be done best by creating a stand of desirable species at stocking levels that will maintain vigorous growth.

Management Alternatives:

Do-nothing:

We can expect tree losses to continue and probably increase as trees become increasingly stressed. The western pine beetle will continue to kill trees in the stand as long as it remains dense and the trees are weakened by root disease, needle cast, or drought. This will result in increasing fuels and fire hazard and may have an impact on wildlife and water quality if a fire gets started.

Salvage only:

Some salvage logging was going to occur in the few weeks following our visit. We discussed leaving the ponderosa pine slash from any green trees cut to help reduce possible losses from the pine engraver populations we observed in the down green tops. The slash will attract pine engraver beetles as they emerge from the currently infested down tops and, if there is enough new slash available, keep them out of standing green trees. Beetles that emerge from this newly created slash will overwinter. If no new slash is created next winter or early spring by logging or snow breakage, the pine engraver population in the area will be suppressed.

Although salvaging could be beneficial in the short term, it would be a continual process as trees continue to die and may actually result in increased root disease especially in the Douglas-fir. The basal area will probably not be reduced enough to lower the hazard to bark beetles, and a drought period may create an epidemic bark beetle situation where most of the larger ponderosa pine and/or Douglas-fir would be killed. This also does nothing in terms of changing the trajectory of the stand to more desirable species.

Thinning/Partial Cutting/Regeneration Harvest:

Thinning would lessen the threat of bark beetles but might create a stand more susceptible to blow down. We have also found that partial cutting in stands where species that are susceptible to root disease are left has frequently resulted in increased root disease losses.

From an insect and disease point of view, in order to improve forest health, the density of this stand needs to be decreased and the goal should be toward a more open stand of mainly ponderosa pine which is probably what covered most of the face area historically. Leaving islands or clumps of the most vigorous ponderosa pine on the face rather than even spacing should minimize risk of blowdown and decrease the likelihood of root disease spreading to the residuals. Leaving the most vigorous trees while removing much of their competition would also decrease their risk of succumbing to bark beetle attack. Much of the root disease appeared to be in intermediate and suppressed ponderosa pine (although there were some co-dominant trees infected) so increasing the vigor of the residual co-dominant trees by opening up the stand should help them resist root disease. Fire (underburning) should be returned to this system if at all possible to clean up the fuels and the competing understory and to remove the Douglas-fir regeneration.

Regenerating the upper part of the stand was also discussed. This area is also over stocked and could benefit from some removals. This area can support a much broader variety of species than the western face including western larch and western white pine. However, these species both need openings to regenerate successfully, and the current stand is converting to more shade-tolerant species. It may be possible to use openings being initiated by root disease to regenerate larch and white pine. However, the overstory of mistletoe-infected larch would need to be removed or girdled to prevent larch regeneration from becoming infected. Girdling the larch would create high-quality snags for wildlife.

We enjoyed our visit with the capable personnel at the Bonners Ferry Ranger District. If there is a need for additional assistance, please contact us.

/s/ Sandra Kegley
SANDRA KEGLEY
Entomologist

/s/ John Schwandt
JOHN SCHWANDT
Pathologist