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Department of
Agriculture

Forest
Service

March 20, 2006

Environmental Assessment (Corrected)

Trout Vegetation Management Project

Republic Ranger District, Colville National Forest
Ferry County, Washington

T37N, R32E Sections 1-2; 5-8; 11-12; 17-18
T38N, R32E Sections 2-22; 27-35
T38N, R33E, Section 7
T39N, R32E Section 31

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Corrections to the Environmental Assessment

1. Appendix A, Treatment Unit Information Table, Alternative B, omitted treatment units that do not have timber harvest treatments. Treatment Unit information for Units A through X, ZA, ZB, ZC, ZD, ZE, YA, and YB should have been included. These units were described in the EA (Environmental Assessment) as part of Alternative B (the Proposed Action) on EA pages 25 through 27; they were shown on the Alternative B map on EA page 23; and these treatment units were considered to be part of the Alternative B in all effects analyses presented in EA Chapter 3.

2. BMP (Best Management Practices), PT-10, Appendix B page 4, contains a provision "e" which was included in error. As stated in the EA, provision "e" requires: "Mechanized felling equipment would not be allowed to operate off of designated landings." This is clearly an error: The soil scientist did not include this provision in her report, and requiring all mechanized equipment felling equipment to remain on designated landings is clearly illogical because such a provision would eliminate the use of mechanized felling equipment for logging, Also, the EA on page 26 states: "… logging systems may include forwarder-processor systems …." Provision "e" of BMP PT-10 is hereby removed from Appendix B, BMP PT-10.

3. Mitigation Measure Soil, Water, Fisheries, #14 on EA page 34 is corrected to add text from BMP PT-12. The full text will now read: **Suspend logs during yarding in skyline/cable units. One end would generally be suspended to keep the forest floor intact. One-end suspension may not be feasible in the vicinity of rock outcrops and "knobs." Applies to Units 17, 20, 32, and 43.** This change makes the mitigation measure consistent with BMP PT-12.

4. Within Mitigation Measures Wildlife #1, #4, and #5, change the word "suspended" to "interrupted." The reason for this change is that the word "suspended" is not correctly used with regards to the Forest Service's Timber Sale Contract. In the event of discovery of important wildlife use of the project area, the Forest Service would interrupt only those project activities that would affect the species.

Chapter 1—Purpose And Need

PROPOSED ACTION

The Colville National Forest proposes to manage timber and hazardous fuels[1] in the Trout Project Area (see Project Area Map). The proposed action would treat 8,404 acres

[1] The terms "**fuel**" or "**hazard-fuel**" as used in this report mean combustible forest materials, including: ground fuels (materials lying beneath the ground surface including duff, roots, rotten buried logs, peat, and other woody fuels), surface fuels (materials lying on, or immediately above the ground, including needles or leaves, duff, grass, small dead wood, downed logs, stumps, large limbs, low brush, and small tree seedlings), and ladder fuels (small sapling and pole-sized trees, hanging branches, and other fuels which provide vertical ladder between surface fuels and the forest

to reduce hazardous fuels, 8,490 acres to improve forest health, and provide up to approximately 23,582 hundred cubic feet (approximately 12.3 million board feet) of sawlogs and wood fiber to the local economy.

PROJECT LOCATION

The project area is located approximately eight miles northwest of Republic, Washington, and is within the Republic Ranger District, Colville National Forest, Ferry County, Washington. See Location Map.

PURPOSE AND NEED

This action is needed because the Forest Service has management direction to:

a) Reduce the risk of stand-replacing wildfires

There is a **need to reduce hazardous fuels**[2] (ground fuels, ladder fuels, and forest crown continuity), **for the purpose of reducing the risk of large, stand-replacing fires**. The effect of reducing the risk of large, stand-replacing fires would be to: 1) decrease the probability that a future wildland fire would develop into, or be sustained as, a stand replacing or crown fire[3], 2) increase the ability to provide for public and firefighter health and safety during a wildland fire, and 3) increase the effectiveness and efficiency of protecting property within the WUI[4] (Wildland/Urban Interface)[5].

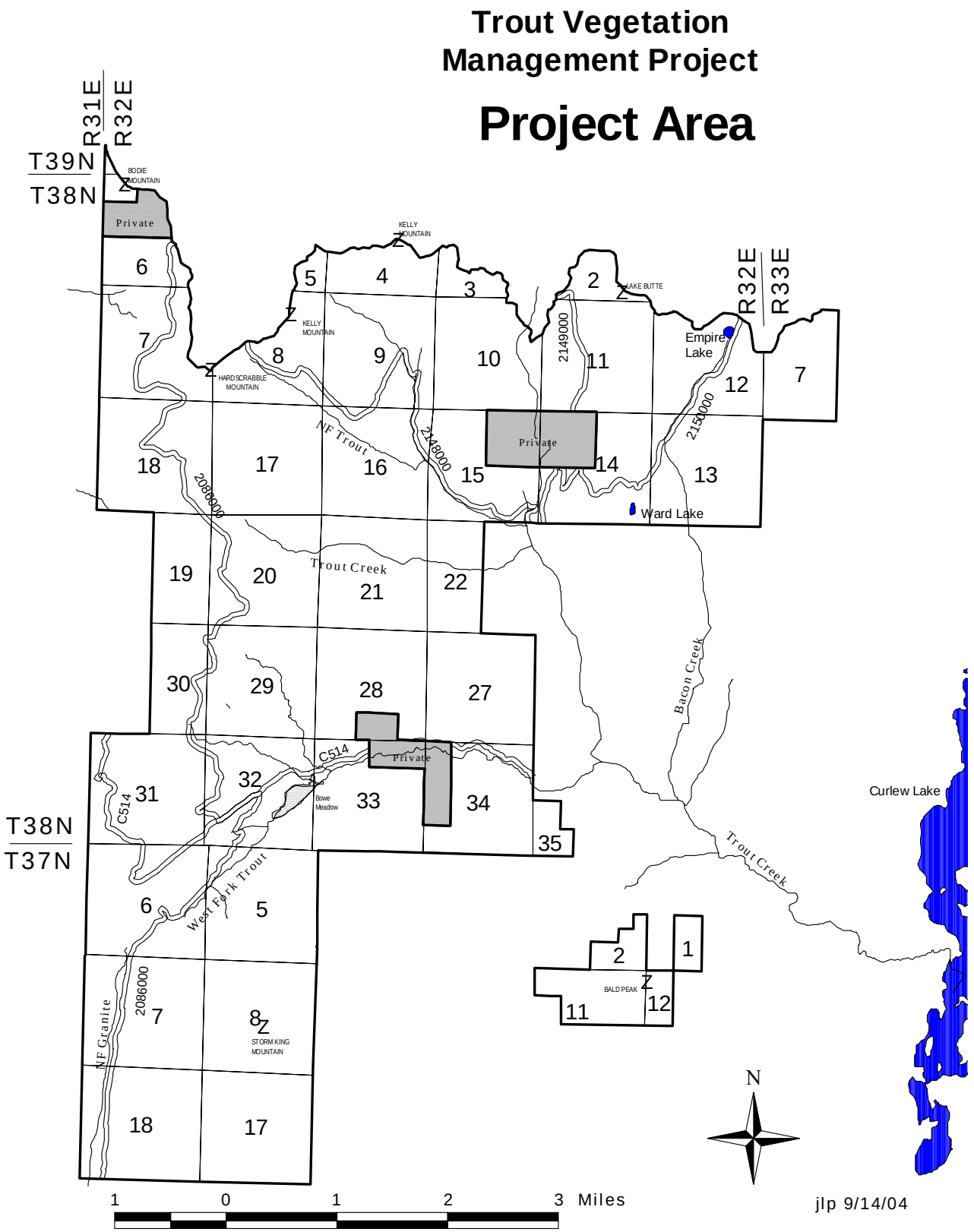
canopy).

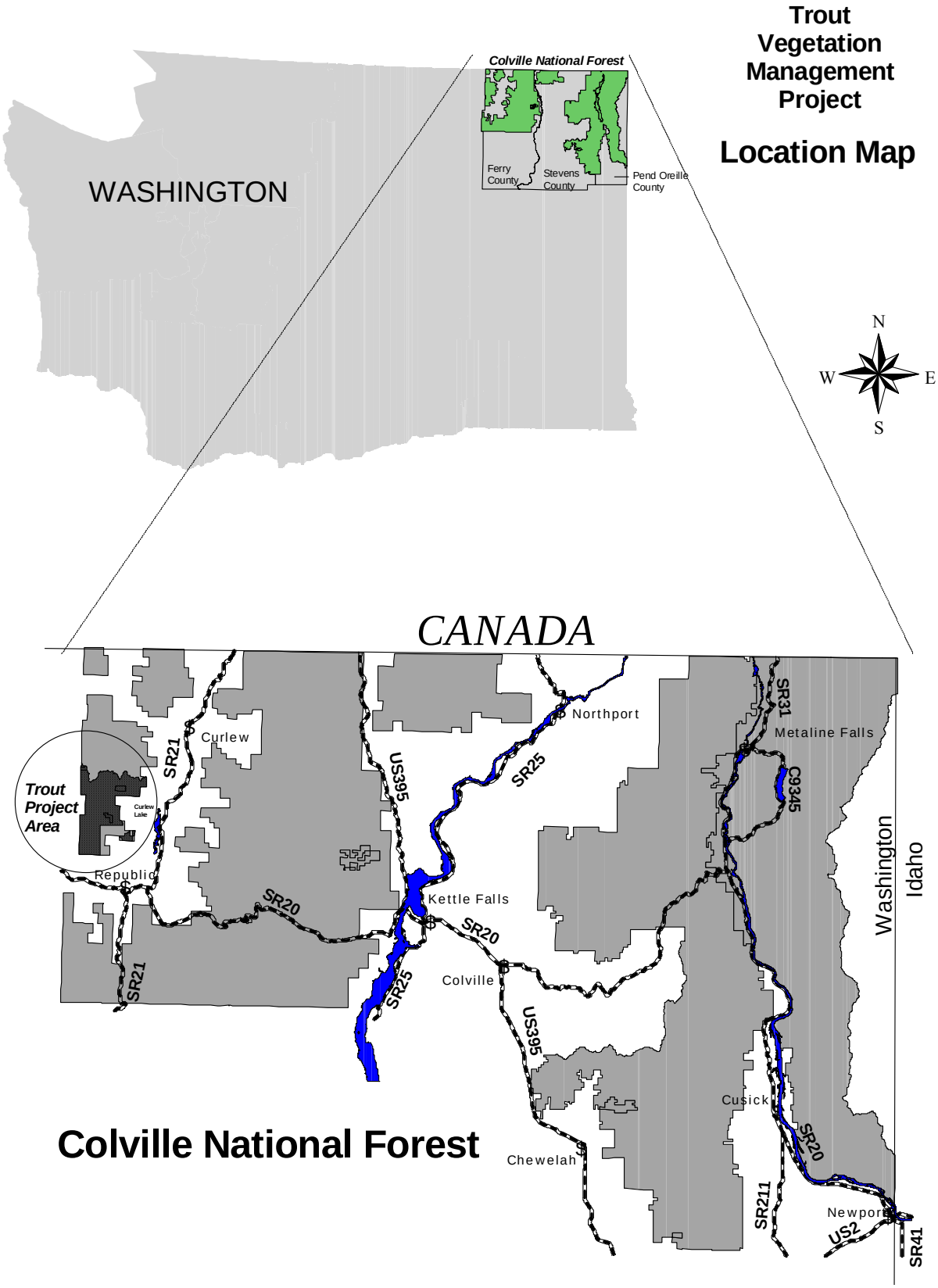
[2] 10-Year Comprehensive Strategy Implementation Plan, (Secretaries of Agriculture and Interior, Western Governor's Association, National Association of State Forester's, National Association of Counties, and Intertribal Timber Council, 2002).

[3] A **crown fire** is a fire that is sustained in the tree canopy. It requires a canopy that has enough density to provide a continuous load of fuel above the ground. Trees that are crowded together with interlocking branches are particularly susceptible to crown fire. A crown fire exhibits long flame lengths and showers of embers that contribute to spot fires ahead of the main fire. Crown fires are beyond the ability of firefighters to make effective direct suppression efforts. Attack with aerial retardants are generally not recommended due to their limited success. Retardant cannot penetrate heavy tree canopy, so the fire continues underneath the canopy as a surface fire until the canopy ignites and takes off again.

[4] **WUI** (Wildland-Urban Interface) includes those areas of resident human populations at imminent risk from wildfire, and human developments having special significance. These areas may include critical communications sites, municipal watersheds, high voltage transmission lines, observatories, church camps, scout camps, research facilities, and other structures that if destroyed by fire would result in hardship to communities. These areas encompass not only the sites themselves, but also the continuous slopes and fuels that lead directly to the sites, regardless of the distance involved.

[5] Cohesive Strategy priority. (USDA Forest Service, 2000) Salwasser, Hal; Bosworth, Dale N.; Lowe, John E.; 1995.


Trout Vegetation
Management Project
Project Area
R31E
R32E
R33E
T39N
T38N
T37N
BODIE MOUNTAIN
KELLY MOUNTAIN
LAKE BUTTE
HARDSCRABBLE MOUNTAIN
Empire Lake
Ward Lake
Curlew Lake
NF Trout
Trout Creek
Bacon Creek
West Fork Trout
NF Granite
C514
Bowe Meadow
BALD PEAK
STORM KING MOUNTAIN
Private
2088000
2148000
2149000
2150000
2086000
N
1 0 1 2 3 Miles
jlp 9/14/04


Trout Vegetation Management Project
Location Map
WASHINGTON
Colville National Forest
Ferry County
Stevens County
Pend Oreille County
N
W
E
S
CANADA
Trout Project Area
Curlew Lake
Curlew
Republic
Northport
Metaline Falls
Kettle Falls
Colville
Cusick
Chewelah
Newport
SR21
US395
SR25
SR31
C9345
SR20
US2
SR41
SR211
Washington
Idaho
Colville National Forest

Discussion: Wildfires are becoming increasingly expensive, dangerous to firefighters, and threatening to wildlife habitat, beneficial uses of water, and adjoining private land and property. During the past 75 years, fire suppression[6] has resulted in increased ground and ladder fuel conditions, and increased tree-crown continuity in portions of the Trout project area. As forest fuels have increased over time, the potential for high intensity crown fires has also increased. This includes biophysical environments[7] that can support low-severity surface fires. Therefore, there is a need to start the process of reversing this dangerous and expensive trend by reducing hazard-fuels. Over the long-term, hazard fuels reduction will offset and eventually reduce escalating fire suppression costs and create a more "fire safe" forest environment.

The health, resilience and productivity of fire-adapted ecosystems rely on periodic burning at ecologically appropriate frequencies. Today, many of the most serious wildfire threats and forest health issues occur in these fire-adapted ecosystems. Reducing forest fuels in these fire dependant ecosystems can make them more resilient to wildfires.

Most of the natural fuels proposed for burning in the Trout planning area are in Condition Class[8] 1 and moving towards Condition Class 2, or they are already in Condition Class 2. Reducing fuels in Condition Class 2 stands, and maintenance activities in Condition Class 1 stands, will be the focus in achieving the primary purpose as mentioned above.

The consequence of deferral is high: Allowing fire-adapted forests to develop into Condition Class 3 stands greatly increases the wildfire risk. The cost of fuel reduction and maintenance burning can be substantial; yet without fuel reduction treatments, fire suppression costs, public resource losses, private property losses, and environmental damages are expected to be significantly greater over time.

Objectives:

1. Reduce fuel hazard within the wildland/urban interface by maintaining a substantial portion of the WUI in Condition Class 1.
    - *Measurements*: Percentage of the wildland/urban interface in Condition Class 1.

---

[6] The term **fire suppression** refers to the act of putting out forest fires.

[7] **Biophysical environments** are made up of grouped plant associations based on similarity of disturbance regime characteristics. For example, landscape settings with low severity fire regimes (e.g., ponderosa pine or Douglas-fir plant associations) are distinguished from those with high severity fire regimes (e.g., subalpine fir plant associations). Biophysical environments are described by temperature and moisture regime and characteristic **late-seral** vegetation (e.g., "Warm, Dry, Douglas-fir Shrub" biophysical environment).

Seral refers to the stages that plant communities go through during succession. Developmental stages have characteristic structure and plant species composition. **Early seral** refers to plants that area present soon after disturbance or at the beginning of a new successional process (such as seedling or sapling growth stages in a forest); **mid seral** in a forest would refer to pole or medium sawtimber growth stages; **late or old seral** refers to plants present during a later stage of plan community succession (such as mature and old forest stages).

8 **Condition Class** is one way of determining a stand's potential risk to wildfire**.** **Condition Class 1**: Trees tend to be widely spaced, resulting in low intensity ground fires. Most large trees survive wildfire. **Condition Class 2**: Tree spacing is denser; fire occasionally reaches crowns. Heavy mortality occurs in small trees; and is light to moderate in large trees. **Condition Class 3**: Tree stands are dense with intense fire burning most tree crowns. Wildfire would cause heavy mortality to entire stand and the soil's organic layer may be removed.

2. Maintain stands in Condition Class 1, or reduce Condition Class 2 or 3 stands to the next lower condition class.
   - *Measurements*: Acres treated to maintain Condition Class 1 or reduce Condition Class 2 or 3 stands to the next lower condition class.

b) Improve forest health

There is a need to **remove diseased trees, reduce stand density, and modify tree-species composition for the purpose of improving forest health**[9]. This will have the effect of 1) improving tree growth, 2) reducing tree and stand susceptibility to damaging insects and diseases, and 3) improving the distribution of stand structures[10] across the forest landscape.

Discussion: The 1988 *Land and Resource Management Plan, Colville National Forest* (Torrence, 1988), as amended (hereafter referred to as the **Forest Plan**) directs that the Forest Service promote tree growth, have reduced insect and disease levels, and have stand densities that will sustain wood fiber production (Forest Plan pages 4-2, 4-18, 4-64, 4-65). For Forest Plan Management Areas[11] 3A, 5, 6, 7, and 8, the Forest Plan directs that insect and disease outbreaks be prevented or suppressed when Management Area values are threatened (Forest Plan pages 4-79, 4-93, 4-94, 4-100, 4-101, 4-104, 4-108).

Currently, the Trout project area has many acres of timber that are crowded and highly susceptible to a variety of pathogens. These include bark beetles, defoliating insects, dwarf mistletoes, and root diseases. As a result of these and other forest pathogens, significant tree mortality across the Trout project area is occurring in the short-term, and without stand improvements, there is a high probability of it continuing and perhaps increasing in the long-term. Stand treatments are needed to reduce susceptibility to continuing insect and disease-caused mortality over the longer-term.

In 1995, the Regional Forester amended the Colville Forest Plan (Lowe, 1995). This amendment requires that the Forest Service evaluate the project area to see if the abundance and distribution of Late and Old structure stands[12] is within the Historic Range of Variability[13]. Where there is a shortage of one or both of the large tree ("Late

[9] A **Healthy Forest** is defined as the condition in which the forest (trees, stands, and forested landscape) meets the desired conditions described in the Forest Plan.

[10] A **Structural Stage** is a stage in development of a vegetation community. Examples of structural stages include stand initiation, stem exclusion, understory re-initiation, multi-stratum without large trees, multi-stratum with large trees, and single-stratum with large trees.

[11] A **Forest Plan Management Area** is a unit of land allocated to emphasize a particular resource, based on the capability of the area.

[12] **Late and Old structure stands** refers timber stands classified as "Multi-strata with Large Trees" or "Single-strata with Large Trees" as part of the interim ecosystem standard required under Regional Forester's Forest Plan Amendment #2 (Lowe, 1995).

[13] **Historic Range of Variability** refers to the historical pattern and abundance of structural stages within watersheds, using pre-settlement (1800-1900) conditions as a reference point.

and Old") structural stages, the management direction is to maintain or enhance Late and Old structural stages in stands subject to timber harvest. In the Trout project area, there is currently a shortage of the single-stratum with large trees[14] in the warm, dry Douglas-fir biophysical environment. Therefore, within the warm, dry Douglas-fir biophysical environment, there is a need to manage timber stands in a manner that move them toward the single-stratum with large tree structural stage, thus moving the forest landscape toward the Historical Range of Variability.

Objectives:

1. Have all stands in Forest Plan Management Areas 5 and 7 growing well, with low insect and disease susceptibility. Stands in other Forest Plan Management Areas in a condition that will meet management objectives.
    - *Measurements*: Acres treated to improve forest health.

2. Have all structural stages within all biophysical environments within the Historic Range of Variability.
    - *Measurements*: Percentage of the warm, dry Douglas-fir biophysical environment in (or moving toward) Structural Stage 7 (single-stratum with large trees).

c) Help sustain local sawmills and communities

There is a need to produce sawlogs and other wood products for the purpose of helping sustain local sawmills and communities.

Discussion: The Forest Service has a multiple-resource mission that includes provision for a sustainable supply of wood from the National Forests. The Organic Administration Act of June 4, 1897 states that one of the purposes of the National Forests is "to furnish a continuous supply of timber for the use and necessities of the citizens of the United States." The Multiple-Use Sustained Yield Act of 1960 reinforced the Organic Act by stating: "It is the policy of the Congress that the National Forests are established and shall be administered for outdoor recreation, range, **timber**, watershed, and wildlife and fish purposes. (emphasis added)

The Forest Plan directs that wood products be provided (Forest Plan page 4-2, 4-63, 4-65, and Forest Plan Record of Decision page 4). Forest Plan Management Areas 5 and 7 have a management goal of providing wood products (Forest Plan pages 4-93 and 4-101), and Management Areas 3A, 6, and 8 permit scheduled timber harvest (Forest Plan pages 4-78, 4-99, and 4-107).

The Forest Plan Record of Decision recognized the importance of providing wood products to local economies (Forest Plan page 3-1, and Forest Plan ROD page 17). Ferry County is perennially rated among the highest in unemployment in the State of Washington. For instance, in April 2001, the Ferry County jobless rate was 17.4%, and it was reported that this was the highest rate in the state (Republic News-Miner, 2001). Ferry County was rated as high in dependence on resource employment, and low in

[14] **Single-stratum with Large Trees** refers to a condition where a single layer of medium or large early-seral trees is present. The understory is absent or sparse in clumps of seedlings and saplings. The "park-like" conditions found in some ponderosa pine, Douglas-fir, or western larch stands may exist.

economic resilience (Horne & Haynes, 1999). The sawmill in Republic, Vaagen Brothers Lumber Inc., once employed approximately 160 people (1990 data), closed in May 2003. One of the reasons cited for the closure is lack of a steady supply of timber (Republic News-Miner, 2003). While it may be too late for the timber from the Trout project to be processed by the local Republic sawmill, timber supplied by the National Forests is none-the-less very important to the local economy.

Objectives:

1. Sawtimber and other forest products are available to local markets.
    - *Measurements*: Board Feet of sawtimber offered for sale.

DECISION FRAMEWORK

Based upon the effects of the alternatives as they relate to Purpose and Need Objectives and Significant Issues, the responsible official will decide:

- *The specific areas, if any, that will be treated to reduce hazard-fuels and/or improve forest health.*
- *The specific activities that will take place on the areas selected for treatment. These specific activities include the silvicultural systems[15], logging methods, and fuel treatment methods.*
- *The specific design elements that will be included. Specific project design elements include associated actions such as road construction and reconstruction, and specific provisions such as Best Management Practices and mitigation measures.*
- *The monitoring that will be done during and after project implementation.*

MANAGEMENT DIRECTION

Forest Plan

The Forest Plan is the guiding management direction for the Trout project area. The Trout Environmental Assessment incorporates the Forest Plan by reference, and is tiered to the Forest Plan's FEIS (Final Environmental Impact Statement) (Torrence, 1988). The Forest Plan contains Standards and Guidelines and Management Area designations and prescriptions that apply to the entire Colville National Forest, including the Trout project area. Impacts of programmatic decisions contained in the Forest Plan are disclosed in the Forest Plan FEIS.

Forest Plan Management Areas within the project area are shown on the following map, Forest Plan Management Areas. Acreages of the various Forest Plan Management Areas within the Trout Project Area are displayed in Table 1 and displayed visually in Figure 1.

[15] A **silvicultural system** is a management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the fellings that remove the mature crop and provide for regeneration and according to the type of forest thereby produced.

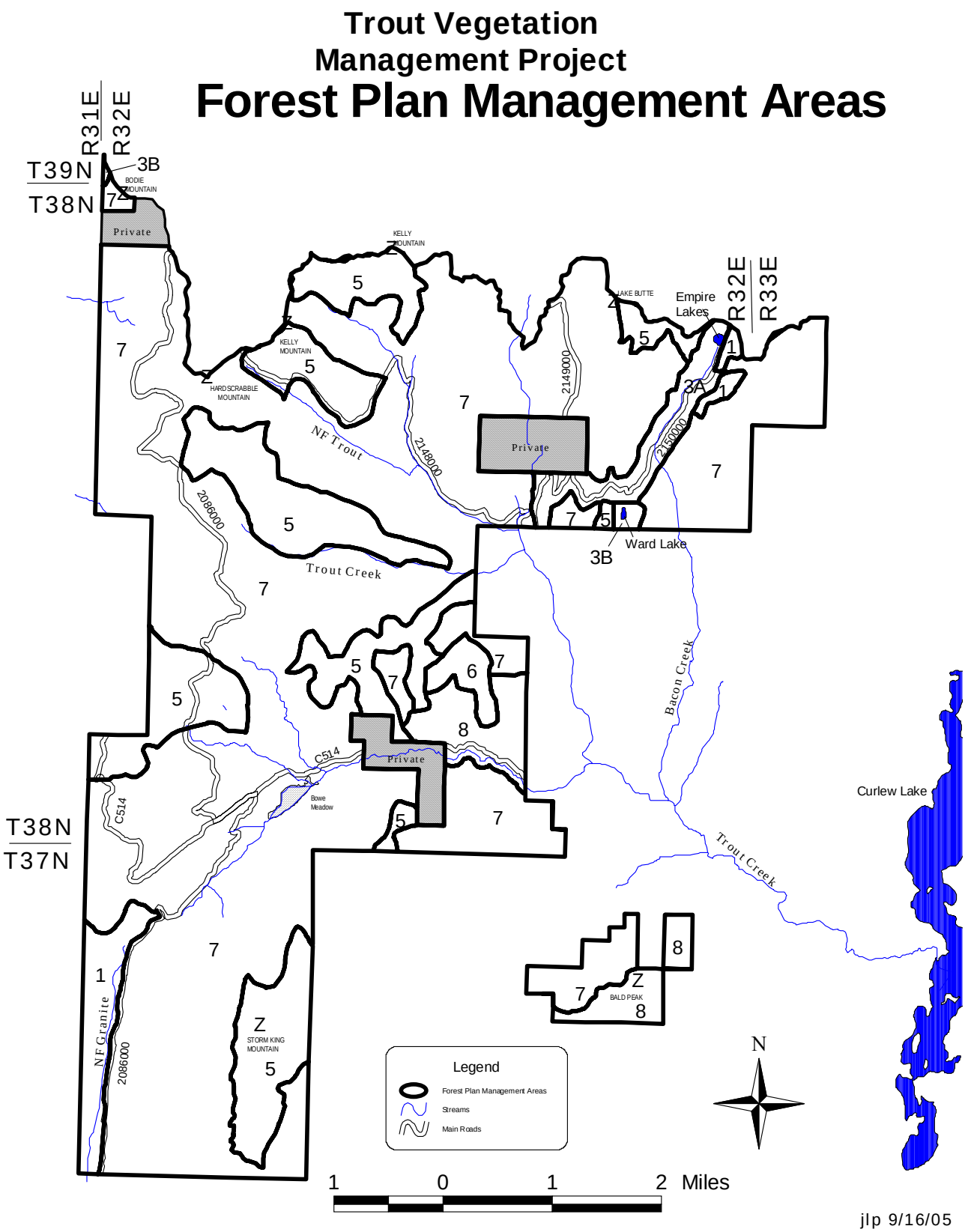

Trout Vegetation
Management Project
Forest Plan Management Areas
R31E
R32E
R32E
R33E
T39N
T38N
T38N
T37N
3B
BODIE MOUNTAIN
Private
KELLY MOUNTAIN
HARDSCRABBLE MOUNTAIN
LAKE BUTTE
Empire Lakes
NF Trout
2149000
2150000
2086000
Trout Creek
Ward Lake
Bacon Creek
C514
Bowe Meadow
Curlew Lake
BALD PEAK
STORM KING MOUNTAIN
NF Granite
Legend
Forest Plan Management Areas
Streams
Main Roads
N
1 0 1 2 Miles
jlp 9/16/05

Table 1. Forest Plan Management Areas within the Trout Project Area

Management Area	Acres	Percent of Trout Project Area
1	530	3%
3A	452	2%
3B	47	0%
5	3,298	17%
6	171	1%
7	14,024	73%
8	711	4%

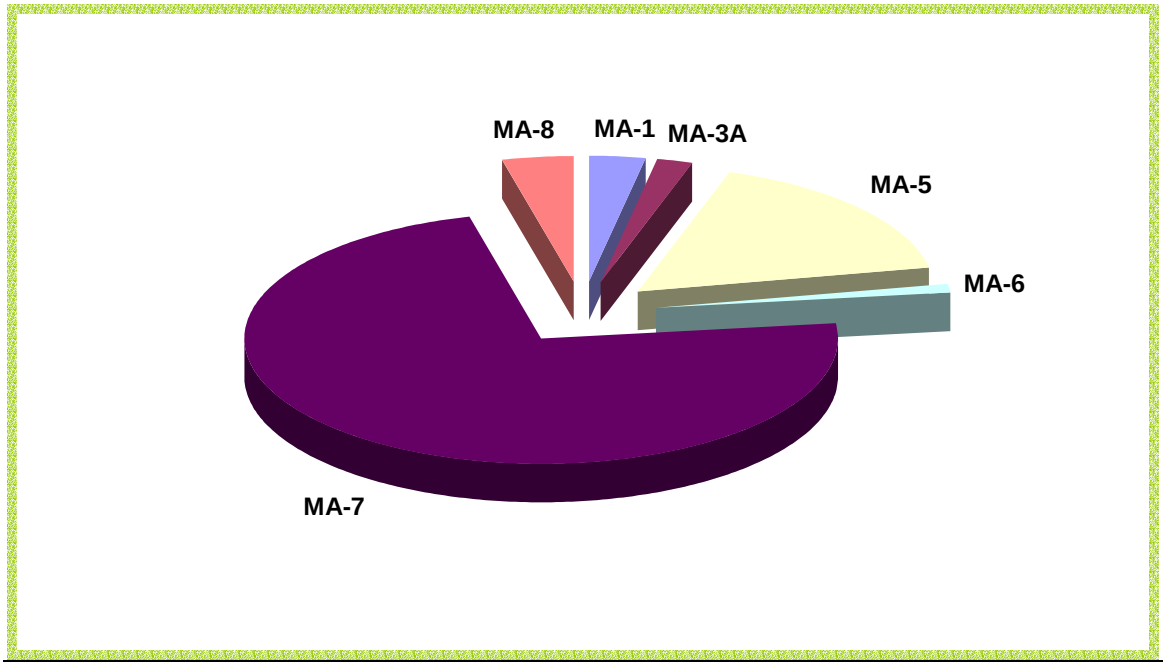


Figure 1. Percentage of Each Forest Plan Management Area within Trout Project Area

- **Management Area 1** emphasis is old growth dependent species habitat: Its goal is to provide essential habitat for wildlife species that require old growth forest components, and contribute to the maintenance of diversity of wildlife habitats and plant communities.
- **Management Area 3A** emphasis is Recreation: Its goal is to provide roaded and unroaded recreation opportunities in a natural appearing setting.
- **Management Area 3B** emphasis is Recreation/Wildlife: Its goal is to provide semi-primitive, motorized and non-motorized recreation in roaded or non-roaded areas while meeting objectives of wildlife management.
- **Management Area 5** emphasis is Scenic/Timber: Its goal is to provide a natural appearing foreground, middle, and background along major scenic travel routes while providing wood products.
- **Management Area 6** emphasis is Scenic/Winter Range: Its goal is to provide a natural appearing foreground, middle, and background along major scenic travel routes while providing for winter range management.
- **Management Area 7** emphasis is Wood/Forage: Its goal is to manage to achieve optimum production of timber products while protecting basic resources.

- **Management Area 8** emphasis is Winter Range: Its goal is to meet the habitat needs of deer (mule deer west of the Columbia River) and elk to sustain carrying capacity at 120 percent of the 1980 level, while managing timber and other resources consistent with fish and wildlife management objectives.

Management Requirements for Viable Populations of Existing Native Vertebrate Species

During the development of the Forest Plan, the Regional Forester directed that specific management requirement areas be established to address the habitat needs of wildlife species dependent on old growth/mature forest. Indicator Species dependent on old growth/mature forest specifically addressed by the Forest Plan were barred owl, pileated woodpecker, pine marten, and northern three-toed woodpecker. See Forest Plan Appendix K for more discussion of this topic. Maps depicting the various management requirement areas (also referred to as Management Requirement Units) are located in the Environmental Consequences--Wildlife section of this Environmental Assessment.

Barred Owl habitat needs were met with Management Area 1 and need not be discussed further here.

For pileated woodpecker, the minimum requirement is to have 300 acres of old-growth or mature stands per pair nesting area, and an additional 300 acres of foraging habitat, preferably as a contiguous unit. Forest Plan direction states that these areas shall be distributed with one unit every five miles. Within the nesting area, the mean average of $\geq$ 2 hard snags[16]/acre ($\geq$12" diameter) should be maintained, with 45 of these 600 snags having > 20" diameter. Within the feeding area, $\geq$ 2 hard snags (> 10" diameter)/acre are to be maintained.

To maintain viable pine marten populations, the management requirements were set to distribute one marten habitat unit, at least 160 acres in size per 4,000-5,000 acres, with a spatial separation of ~3 miles. For three-toed woodpeckers, the requirement of one unit larger than 75 acres per 2,000-2,500 acres, with a spatial separation of ~2 miles, was determined to be sufficient for maintaining continuity of a viable population. To accomplish both of these objectives on the Colville National Forest, three-toed woodpecker management requirement areas were combined with marten management requirement areas, and distributed on a grid system with one unit greater than 160 acres in size every 2-2.5 miles. This strategy provides for a greater number of marten management requirement units across the Colville National Forest than required by the Regional Forester, reduces the average dispersal distance between them, and, allows for greater marten movement across the landscape. By providing areas that are large enough to support at least 2 pair of three-toed woodpeckers, demographic viability would appear to be more certain. The snag densities prescribed for marten habitat also meet the management requirements for three-toed woodpeckers.

At grid locations where barred owl management requirement areas (MA-1 units) and/or pileated woodpecker management requirement units overlapped marten/three-toed

[16] A **snag** is a standing dead tree or the standing portion of a dead tree.

woodpecker management requirement units, the larger barred owl or pileated woodpecker areas were established due to the minimum requirements exceeding those for marten and three-toed woodpeckers.

Forest Plan Amendments

The Forest Plan includes amendments that are also management direction for this project. They are:

Regional Forester's Forest Plan Amendment #2 entitled *Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales* (Lowe, 1995). This amendment replaced the interim ecosystem standard and the interim wildlife standard from Regional Forester's Forest Plans Amendment #1 (Lowe, 1994). This direction was implemented to preserve future planning options concerning wildlife habitat associated with Late and Old structural stages, fish habitat, and old forest abundance until the Eastside EIS is completed. In this interim direction, the Regional Forester directed the National Forests in eastern Oregon and eastern Washington to maintain and/or enhance Late and Old Structural Stages in stands subject to timber harvest.

Inland Native Fish Strategy (Salwasser, Bosworth, and Lowe, 1995). This amendment replaced the interim riparian standard from Regional Forester's Forest Plans Amendment #1. The Inland Native Fish Strategy is hereafter referred to as "INFISH Direction."

Regional Forester's Forest Plans Amendment #2 and the INFISH Direction are hereafter collectively referred to as "Screening Direction" in this Environmental Assessment.

ROADS ANALYSIS

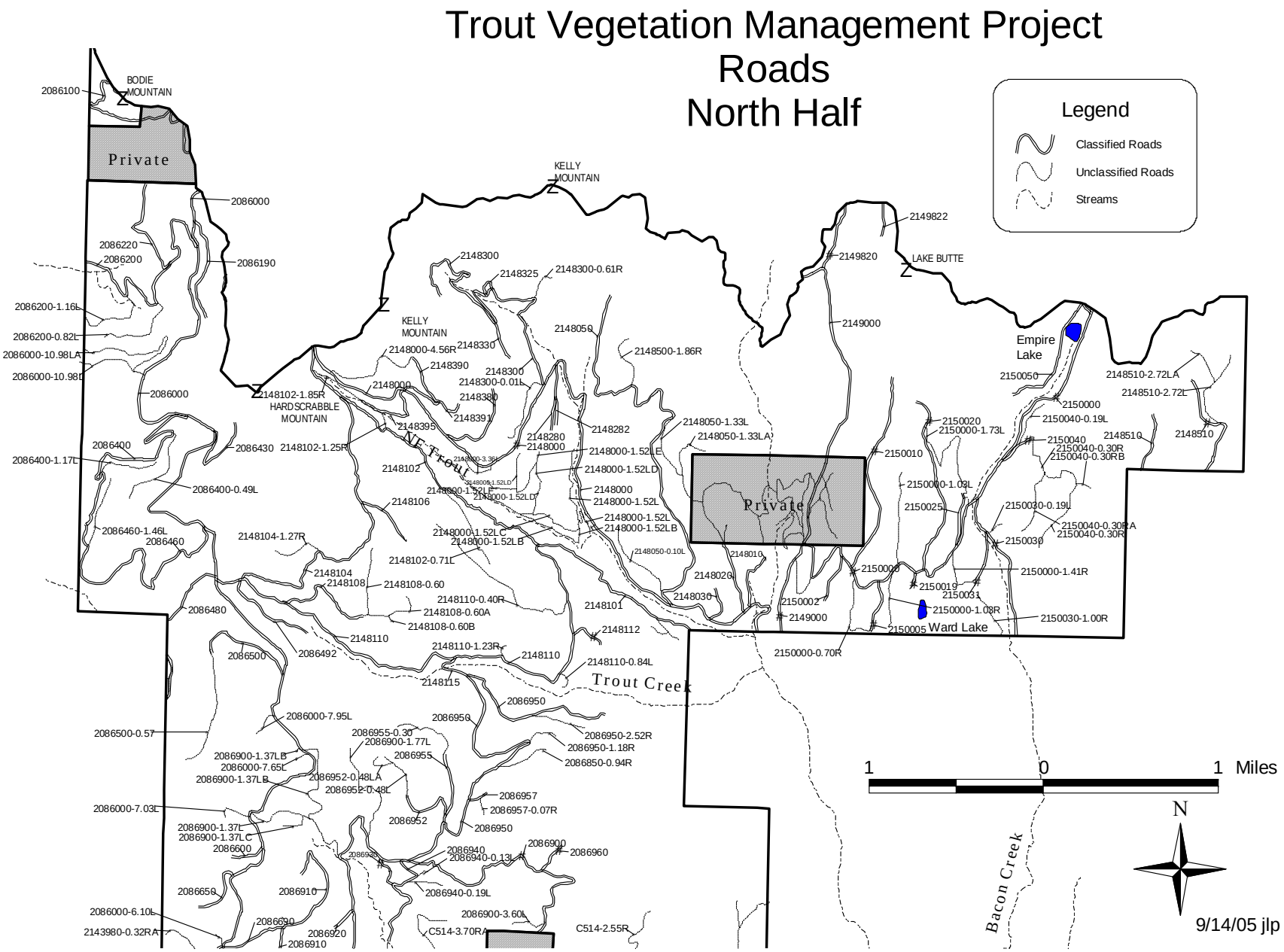
Roads Analysis, as directed in Forest Service Manual 7700 was conducted, both at the Forest-Scale and at the project scale.

The Forest-Scale Roads Analysis (Colville National Forest, 2005) examined the primary road system (roads with Maintenance Levels[17] 3, 4, and 5). In the Trout project area, Forest Roads 2148000, 2149000, and 2150000 were included in this evaluation.

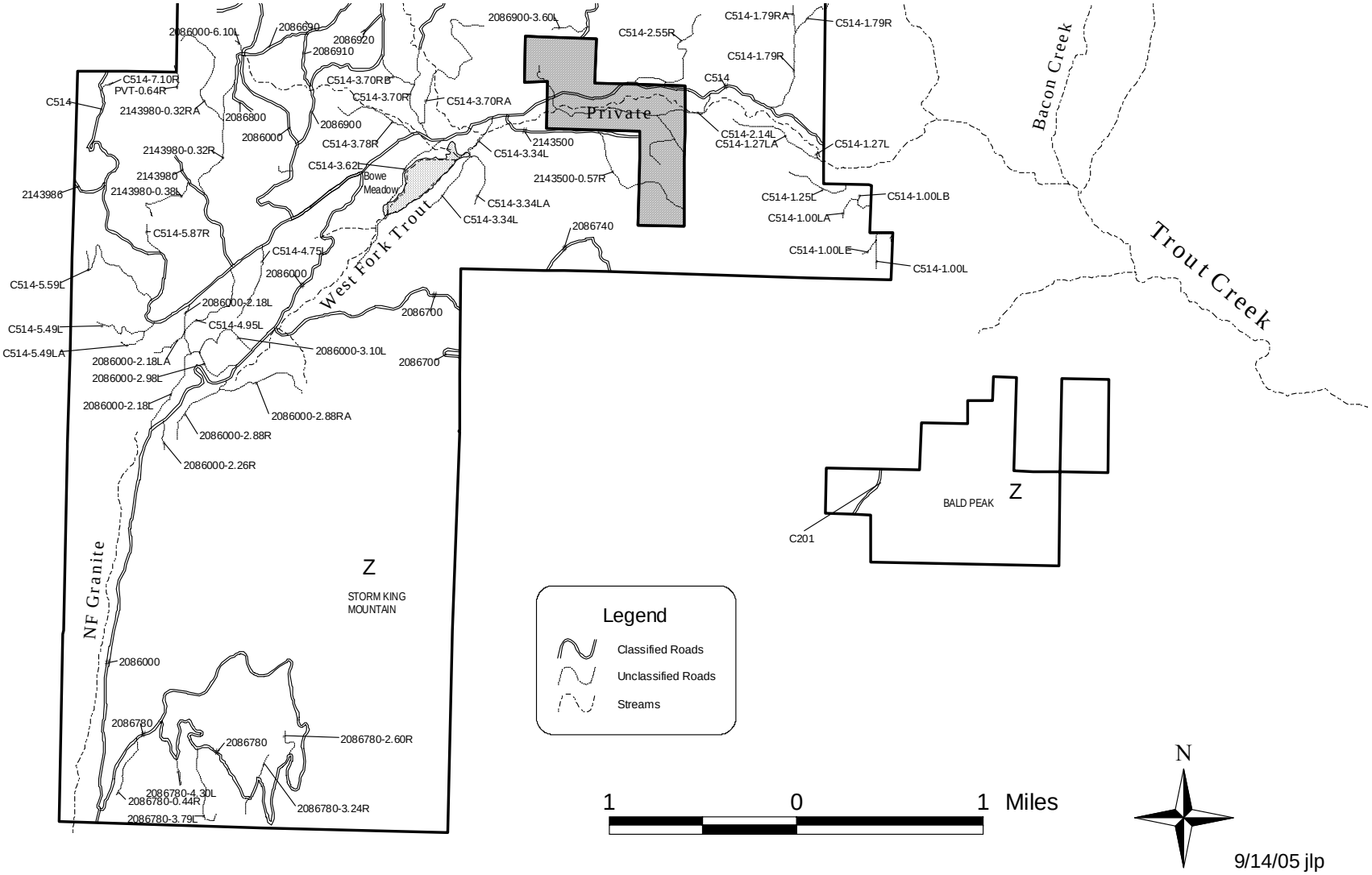
A project-level roads analysis was conduced by the Trout Project interdisciplinary team (Parker, 2005). This analysis provided information that was used in this Environmental

[17] **Maintenance levels** define the level of service provided by, and maintenance required for, a specific road. **Level 1** is assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. **Level 2** is assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. **Level 3** is assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. **Level 4** is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. **Level 5** is assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated.

Assessment. The Roads Analysis described the current situation with regards to all roads (classified and unclassified), identified issues, assessed benefits, problems, and risks, and described opportunities for the entire road system on National Forest System lands within the Trout project area. The Trout project area road system is shown on the following maps.


Trout Vegetation Management Project
Roads
North Half
Legend
Classified Roads
Unclassified Roads
Streams
BODIE MOUNTAIN
KELLY MOUNTAIN
LAKE BUTTE
HARDSCRABBLE MOUNTAIN
Private
Empire Lake
Ward Lake
NF Trout
Trout Creek
Bacon Creek
1 0 1 Miles
N
9/14/05 jlp

Trout Vegetation Management Project
Roads
South Half



PUBLIC INVOLVEMENT

The proposal was listed in the Colville National Forest Schedule of Proposed Actions[18] beginning with the Summer 2000 issue.

On January 10, 2002 the public was invited to meetings to help develop the proposed action for the Trout project.

The initial proposal was developed by the Forest Service and was provided to the public and other agencies for comment during a scoping period that began on April 30, 2002.

In August 2002, participants in the appeal of the Scatter Ecosystem Management Projects (Republic Ranger District, 2002) met to develop an alternative to the proposed action, as specified in the informal resolution agreement for the Scatter project. The participants submitted the results of that effort (Alternative C) on September 30, 2002.

After the Forest Service completed its evaluation of the project alternatives, it was determined that Alternative C had serious shortcomings that would likely preclude its selection by the Responsible Official. To rectify this situation, the Alternative C participants (Ferry County Board of Commissioners, Kettle Range Conservation Group, and The Lands Council) and the Northeast Washington Forestry Coalition were invited on July 13, 2005 to review the alternatives and begin a process to find a solution that would meet both the participant's concerns and the Forest Service's needs.

A field trip was conducted on August 3, 2005 to review, discuss, and work toward agreement regarding harvest units and marking prescriptions. Eight members of the Northeast Washington Forestry Coalition, including two members of Conservation Northwest/Kettle Range Conservation Group and one member of The Lands Council, attended this field trip.

The Forest Service Republic Ranger District met on August 19, and August 25, 2005 with Ferry County Commissioner Brad Miller, to discuss a draft proposal for the Trout Project that Commissioner Miller had obtained from David Heflick of Conservation Northwest/Kettle Range Conservation Group. The purpose of the meetings was to help Commissioner Miller and the Forest Service understand the implications of the changes being proposed by Mr. Heflick.

A meeting was held on September 28, 2005, with Tim Coleman of Kettle Range Conservation Group to hear and clarify his remaining concerns about harvest unit sizes, locations, and marking prescriptions.

Between August 4, 2005 and September 26, Trout project Silviculturist Mary Rourke and Conservation Northwest/Kettle Range Conservation Group representative David Heflick worked out a system by which harvest prescriptions would be displayed for representative timber harvest units.

[18] The **Schedule of Proposed Actions** is a quarterly publication that provides notice of upcoming proposals that may undergo environmental analysis and documentation.

The discussions between July 13 and September 26, 2005 resulted in proposed modifications to Alternative B that the Forest Service believes are acceptable to all parties involved (Forest Service, Conservation Northwest/Kettle Range Conservation Group, The Lands Council, Ferry County Board of Commissioners, and Northeast Washington Forestry Coalition). It should be noted that the proposed modifications to Alternative B occurred after the Interdisciplinary Team completed the environmental analysis presented in this Environmental Assessment. This proposed modified Alternative B will be presented to the public during the 30-day comment period, and depending on the comments received, will likely not be analyzed in detail (unless such analysis is warranted by further modifications and/or important questions that are not answered by or inferred from the current analysis).

ISSUES

Using the comments from the public and other agencies (see *Issues* section), the interdisciplinary team developed a list of issues to address.

The Forest Service assessed the project issues and determined that five were "significant" issues. Significant issues were defined as potential adverse effects directly or indirectly caused by implementing the proposed action that, along with the purpose and need objectives, will be the primary factors used in making the project decision.

In addition to significant issues, a number of other resource topics were addressed in the effects analysis. Issues not labeled "significant" issues are discussed below under the header "Other Issues"

Significant Issues

As for "significant" issues, the Forest Service identified five that were raised during scoping. These issues include water quality, wildlife, fish, soils, and noxious weeds.

Water Quality

The Proposed Action may degrade the water quality of Trout Creek and Curlew Lake by increasing sediment.

Measurements:

- Estimated percent sediment increase.
- Acres of treatment.
- Percent of basal area[19] removed.
- Miles of road constructed and reconstructed by subdrainage.

Wildlife

The Proposed Action may reduce habitat for old growth dependent wildlife species by reducing stand density, altering stand structure, and reducing snags and downed logs in

[19] **Basal area** is the area of the cross section of a tree near its base. The term is usually expressed in terms of square feet of basal area per acre.

"Late and Old" structural stage stands and Forest Plan-designated "Management Requirement" habitat areas.

The Proposed Action may reduce habitat for snag dependent wildlife species directly by reducing numbers of snags in timber harvest and fuel treatment units, and indirectly by increasing access for firewood gathering.

The Proposed Action may adversely affect Canada lynx (Threatened species) by reducing denning habitat as a result of timber harvest and fuel reduction activities.

The Proposed Action may adversely affect gray wolf (Threatened species) by reducing numbers of deer (primary prey for wolves).

Measurements:

- Acres of project activities in "Late and Old" structural stage stands and Forest Plan-designated "Management Requirement" habitat areas.
- Acres of canopy cover greater than 60% within Management area 6 & 8.
- Acres of new access for snags 200 feet on either side of the road.
- Change in acres of denning habitat.
- Miles of drivable road.

Fish

The Proposed Action may adversely affect fisheries (including red band trout, a Sensitive species[20]) in Trout Creek and Curlew Lake by increasing sediment.

Measurements:

- New road miles within RHCAs (Riparian Habitat Conservation Areas[21]) by subdrainage.
- Number of new and old road crossings.
- Acres treated by burning or timber harvest by subdrainage.
- Volume of traffic on haul routes in RHCAs.

Soils

The Proposed Action may adversely affect soil productivity by compacting soil and exposing soil to erosion.

The Proposed Action may adversely affect soil stability by logging, constructing new roads, or reconstructing roads in slump-prone areas.

[20] **Sensitive species** are those species which (1) have appeared in the Federal Register as proposals for classification and are under consideration for official listing as endangered or threatened species, (2) are on an official State list, or (3) are recognized by the Regional Forester to need special management in order to prevent the need for their placement on Federal of State lists.

[21] **Riparian Habitat Conservation Areas** are defined as portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines under the Inland Native Fish Strategy Forest Plan amendment (Salwasser, et al., 1995).

Measurements:
- Acres of treatment.
- Miles of road construction and road reconstruction in Land Types prone to slumping.
- Estimate of percentage of detrimentally disturbed soil[22] in each activity area.

Noxious Weeds[23]

The Proposed Action has the potential to increase the extent of noxious weeds by disturbing soil and providing access for seed transport to uninfested areas.

Measurements:
- Acres of bare soil created by proposed activities.
- Projected change in extent of noxious weed infestations, by weed species.

Other Issues

Table 2. Other Issue Disposition

Issue Statement (An *Issue* is defined as the potential cause-effect relationship resulting from project actions on resource, economic, or social conditions)	**Source(s) of Issue** (who raised it)	**Discussion**
Road building and road reconstruction are expensive, and may cost more than the receipts from the timber accessed by that road.	Stuart Buck (5/3/02 letter)	Analysis of this comment is included in economic analysis, and may be a factor in the decision.
Mechanized harvest systems are needed to operate profitably and should not be prohibited.	Daryl Rave (5/21/02 letter)	Use of mechanized harvest systems would be seasonally restricted in some areas to protect soils, but their use is not prohibited.
Sales should be offered in small portions (1-2 million board feet or smaller)	Daryl Rave (5/21/02 letter)	This is an administrative issue, not a resource issue.
Disagrees that moving toward HRV (Historic Range of Variability) is appropriate as a project objective.	Sharon Shumate, Ferry County Natural Resource Board (5/28/02 letter)	HRV is a component of "Eastside Screens" Forest Plan direction. Determining the appropriateness of Forest Plan direction is outside the scope of the Trout project.
Contends that "Ecosystem Management" and ICBEMP have replaced the Forest Plan. The Forest should be managed as directed by the 1989 Land and Resource Management Plan and the Ferry County Comprehensive Plan.	Sharon Shumate, Ferry County Natural Resource Board (5/28/02 letter)	This is an administrative issue, not a resource issue.

[22] **Detrimental soil conditions** may consist of: **Detrimental compaction**, defined as an increase in soil bulk density of 20 percent or more over the undisturbed level (for volcanic ash soils); **detrimental displacement**, defined as removal of more than 50 percent of the topsoil or humus enriched A1 or AC horizons from an area of 100 square feet or more which is at least 5 feet in width; or **detrimental puddling**, defined as a physical change in soil properties due to shearing forces that destroy soil structure and reduce porosity.

[23] **Noxious weeds** are plant species not native to the state which, once established, are highly destructive, or difficult to control by cultural or chemical practices (17.10 Revised Codes of Washington (RCW))

Issue Statement (An *Issue* is defined as the potential cause-effect relationship resulting from project actions on resource, economic, or social conditions)	**Source(s) of Issue** (who raised it)	**Discussion**
Private land should not be included in the environmental analysis (regardless of whether the landowner agrees).	Sharon Shumate, Ferry County Natural Resource Board (5/28/02 letter)	This is an administrative issue, not a resource issue.
Demands that Ferry County Natural Resource Board be included on the ID Team.	Sharon Shumate, Ferry County Natural Resource Board (5/28/02 letter)	This is an administrative issue, not a resource issue.
Smoke (from this project and others) adversely affects air quality, which may cause health problems in the community.	Sharon Shumate, Ferry County Natural Resource Board (1/30/02 letter)	Potential smoke impacts are substantially mitigated by following State guidelines. Effects of smoke are included in the Air Quality section of the Environmental Analysis.
Increased use of fire increases the chances of escaped fires, which has the potential to damage the soil surface and soil productivity.	Sharon Shumate, Ferry County Natural Resource Board (1/30/02 letter)	Potential impacts of escaped fire on soils are discussed in the Soils section of the Environmental Assessment.
Road building adversely affects recreation values.	Tim and Sue Coleman (5/31/02 letter)	Effects on recreational values are expected to be minor in this area because it is a roaded-natural ROS (Recreation Opportunity Spectrum) setting[24]. Effects are evaluated in Recreation section of Environmental Assessment.
Opposed to project objectives (specifically, the need to include a commercial timber sale).	David Heflick, Kettle Range Conservation Group (5/29/02 letter)	This is an administrative issue, not a resource issue.
Removal of large trees (>14" diameter) degrades wildlife habitat and increases fire risk.	David Heflick, Kettle Range Conservation Group (5/29/02 letter)	"Large trees" are defined by the Forest Service as ≥21" diameter, and there is no proposal to remove trees, larger than 21" in diameter. Effects on wildlife and fire risk from removing timber less than 21" diameter under the Proposed Action are discussed in the Environmental Assessment.
Reducing canopy closure, or salvage logging are at odds with the goals of restoration.	David Heflick, Kettle Range Conservation Group (5/29/02 letter)	Unable to identify the issue in this statement because the "goals of restoration" are undefined.
Removing old growth pine adversely affects wildlife habitat, and genetic and scientific resources.	David Heflick, Kettle Range Conservation Group (5/29/02 letter)	There is no proposal to remove old-growth pine. All live trees larger than 21" in diameter would be retained.

[24] **Recreation Opportunity Spectrum** refers to a system used to identify and analyze broad categories of recreation opportunity on National Forest system lands. It involves a Forest-wide recreation analysis of the physical setting (remoteness, size, and evidence of humans), social setting (use density and character), and managerial setting (managerial regimentation and noticeability) on the Forest. It is designated to provide an indication of the kind of experience the recreationist is likely to find in an area.

Issue Statement (An *Issue* is defined as the potential cause-effect relationship resulting from project actions on resource, economic, or social conditions)	**Source(s) of Issue** (who raised it)	**Discussion**
Grazing degrades water quality, soils, recreation, and wildlife habitat.	David Heflick, Kettle Range Conservation Group (5/29/02 letter)	Whether to allow grazing or not is outside the scope, but changes in grazing caused by the proposed actions and the effects of these changes are addressed in the Environmental Assessment.
Off-road vehicles contribute to degraded conditions.	David Heflick, Kettle Range Conservation Group (5/29/02 letter)	Regulating off-road vehicles is outside the scope of the Trout project. Mitigation is included that would reduce the potential for expanded off-road-vehicle use that could result from Trout project activities.
Fire may affect "species such as goshawk."	David Heflick, Kettle Range Conservation Group (5/29/02 letter)	Effects to raptors, including goshawks, are included in the Wildlife section of the Environmental Assessment.
Resources of concern that may be affected include: soils, sediment, wildlife, recreation, fisheries, unroaded areas, weeds, grazing, air quality, "etc."	David Heflick, Kettle Range Conservation Group (5/29/02 letter)	This is a collection of issues addressed elsewhere.
"Logging and road building have historically played a major role in contributing to the degraded watershed conditions."	Mike Petersen, The Lands Council (5/31/02)	This comment refers to past actions; the relationship to the current proposal is not sufficiently clear. The cumulative effects of adding proposed actions to the current effect of past activities are included in the Environmental Assessment.
Fishing opportunities have been reduced, and flooding of private property has occurred, because of past logging and road building on National Forests.	Mike Petersen, The Lands Council (5/31/02)	This is a comment about past activities, not the current proposal. The cumulative effects of adding proposed actions to the current effect of past activities are included in the Environmental Assessment.
Concerned about effects of "artificial stand conversion" on ecosystem components, wildlife habitat, wildlife linkage (corridors for MIS and TES species), hydrological processes, water temperature, riparian integrity, soil microorganisms, soil temperature, genetic diversity, bryophyte populations, ecological integrity, nutrient cycling processes, "etc."	Mike Petersen, The Lands Council (5/31/02)	The proposed action is not "artificial stand conversion."

Issue Statement (An *Issue* is defined as the potential cause-effect relationship resulting from project actions on resource, economic, or social conditions)	**Source(s) of Issue** (who raised it)	**Discussion**
Logging and cattle have devastated ground cover and soils in many areas.	Mike Petersen, The Lands Council (5/31/02)	This is a comment about past activities, not the current proposal. The cumulative effects of adding proposed actions to the current effect of past and on-going activities are included in the Environmental Assessment.
Concerned about the Bald Knob block.	Jim Pruitt (phone comment 1/29/02)	The cause-effect relationship on resource, economic, or social elements is not sufficiently clear.
OK with burning and/or logging.	Jim Pruitt (phone comment 1/29/02)	This is a supportive statement, no issue was identified.
Use a low intensity thinning prescription.	Ed Watt, Kettle River Advisory Board (letter 2/6/02)	This is a recommendation that does not identify an issue.
Concerned about possible impact to cultural resources.	Randy Abrahamson, Spokane Tribe (letter 2/27/02)	Cultural resource inventories have been completed and known sites will be avoided. Provisions will be included to protect sites discovered during project implementation.
No large trees should be removed. This not only for aesthetic value, it's also for the wildlife.	Nancy McCambridge (6/24/02)	"Large trees" are defined as ≥21" diameter, and there is no proposal to remove large live trees.
Cattle grazing has seriously degraded water quality in the Trout Creek watershed and, hopefully, will no longer be allowed in this project area.	Nancy McCambridge (6/24/02)	Whether to allow grazing or not is outside the scope of the Trout project, but changes in grazing caused by the proposed actions and the effects of these changes are addressed in the Environmental Assessment.

Chapter 2—Alternatives

In addition to the proposed action (Alternative B), the Forest Service also evaluated the following alternatives:

- *Alternative A, the No Action Alternative: The No Action Alternative is described as not implementing actions proposed under this environmental analysis. Actions to manage timber and reduce hazard fuels would not be implemented at this time.*

- *Alternative C: Alternative C is an alternative proposal jointly developed by the Kettle Range Conservation Group, The Lands Council, and the Ferry County Natural Resource Board (representing the Ferry County Board of Commissioners). This alternative was designed to address issues (as stated by the alternative proponents) of unroaded areas, soils, and noxious weeds. Because Alternative C avoids building new roads and avoids or reduces timber harvest in secluded areas, it is also responsive to the wildlife, water quality, and fish issues.*

DESCRIPTION OF ALTERNATIVES, INCLUDING THE PROPOSED ACTION

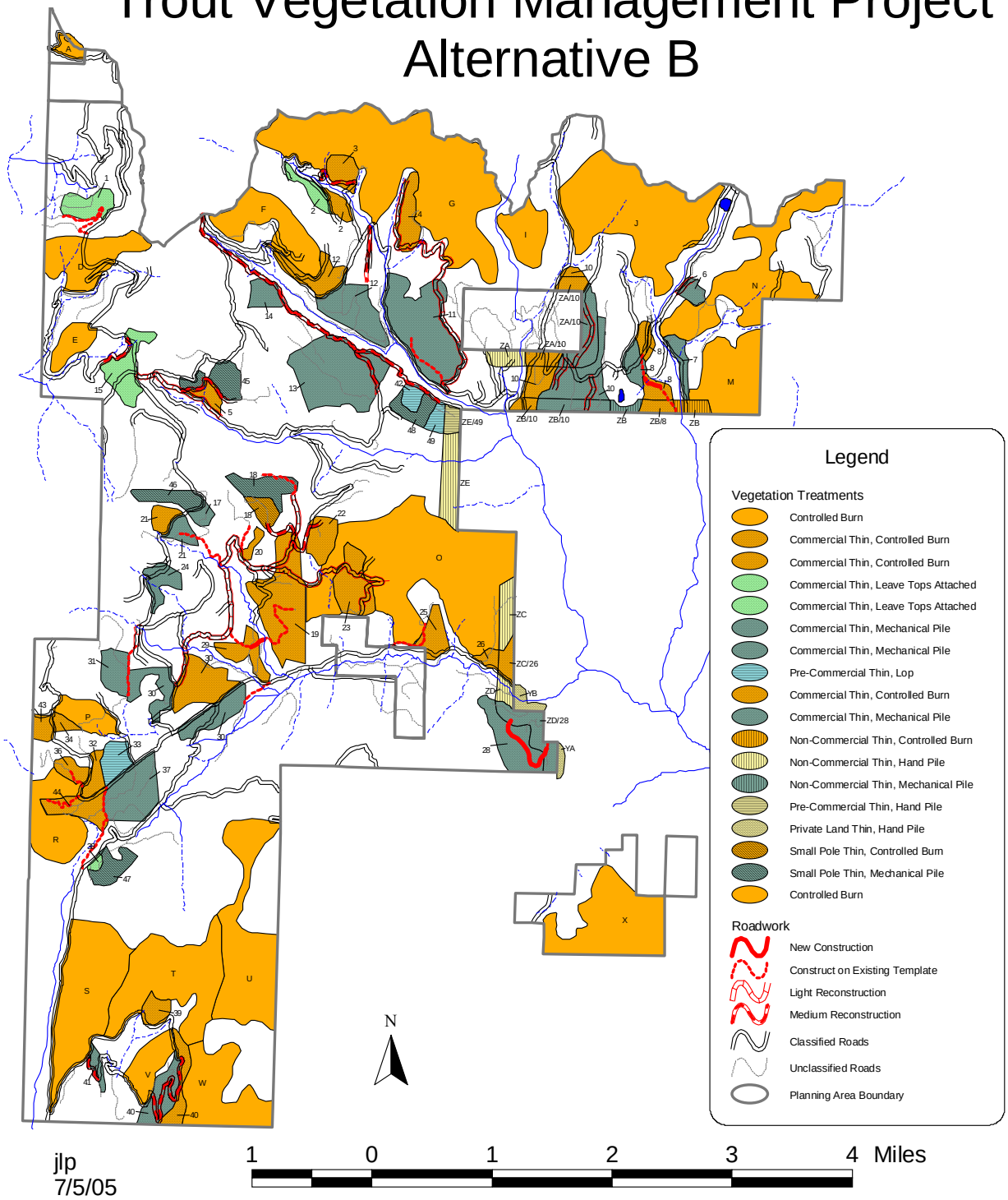
Alternative A

No Action
The No Action alternative is described as not implementing actions proposed under this environmental analysis. Actions to manage timber and reduce hazard fuels would not be implemented at this time.

Alternative B

The Proposed Action
Alternative B is the Proposed Action developed by the Forest Service to address the Purpose and Need within the constraints of the Forest Plan. The Proposed Action would utilize controlled burning, shaded fuel breaks, and thinning as the primary activities.

Trout Vegetation Management Project
Alternative B



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Proposed Timber Cutting Treatments[25]

Commercial Thinning (2912 Acres; Units 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 34, 36, 37, 38, 39, 40, 41, 43, and 44): Thinning is cutting and removing selected trees in a stand so that the remaining trees will grow faster as a result of reduced competition for nutrients, water, and sunlight. Trees to remove will include suppressed[26], intermediate[27] and some co-dominant[28] trees, genetically inferior trees left by past diameter limit cuts, and trees with forest pathogen infestations. Commercial Thinning implies that at least a portion of the trees to be removed meet Forest Service Timber Sale contract sawlog specifications [i.e., at least 7" dbh (diameter at breast height, or 4.5 feet above the ground), with 5" dib (diameter inside bark) top, or for lodgepole pine, 6" dbh with 5" dib top]. Leave-tree[29] spacing would vary, depending on tree size and management objectives (in stands of small trees, leave tree spacing may be as close as 20 feet; in stands of large trees, leave-tree spacing may be 50 feet or more). Thinned stands would have sufficient leave-trees to adequately occupy the site, except in instances where openings are desired in stands with multi-storied management objectives, or where insects or other natural disturbances have caused openings in the stand. Thinning treatments to achieve a multi-storied [30]condition will, in some cases, include small (1/4 to 2 acre) openings to encourage development of a new understory layer that may include western larch and/or ponderosa pine (both of which require unshaded conditions for survival and growth).

Salvage: Salvage means to cut and remove trees that are dead, dying, or severely affected by pathogens, including (but not limited to) dwarf mistletoe, bark beetles, root diseases, or defoliating insects. Where salvageable trees have commercial value and are not needed to meet wildlife requirements, Salvage would occur along with Commercial Thinning.

Small Pole Thin (265 acres, Units 18, 45, 46, 47, and 48). "**Small Pole Thin**" means to thin a stand in which most of the trees to be removed are smaller than Forest Service Timber Sale Contract sawlog specifications (i.e., smaller than 7" dbh with 5" dib top, or for lodgepole, 6" dbh with 5" dib top), but many of the cut-trees are large enough to

[25] **Eastside Screens** (Regional Forester's Forest Plan Amendment #2) applies to all timber cutting treatments in both action alternatives. The management objective is to encourage attainment of either single storied old growth (for the Douglas-fir plant associations) or multi-story old growth (for subalpine fir plant associations). Eastside Screening direction prohibits removal of live trees larger than 21" in diameter, and requires that minimum numbers of snags and downed logs be retained. See chapter 1 for additional information about "Screening Direction".

[26] **Suppressed trees** are those with their crowns in the lower layers of the canopy, the leading shoots are not free, and the trees are growing very slowly.

[27] **Intermediate trees** are those with their crowns in the lower layers of the canopy, but with the leading shoots free of overtopping trees.

[28] **Co-Dominant** trees are those with their crowns in the upper canopy, but are less free than the dominants. Dominant trees are those with their crowns in the upper canopy and are largely free growing.

[29] A **leave-tree** is a tree that would remain after logging or thinning treatment. A **cut-tree** is a tree that would be cut down in a logging or thinning treatment.

[30] **Multi-storied**, or **multi-stratum**, refer to a stand of trees with two or more canopy layers.

make wood products (poles, posts, pulpwood, hew-wood, etc.). For the purpose of evaluating effects, it is assumed that these treatments would be accomplished with a machine capable of severing, limbing, topping, and bucking the trees, followed by a machine capable of picking up products and transporting the products to the roadside or landing[31]. Leave tree spacing would be 20 to 30 feet.

Non-Commercial Thin (225 acres, units YA, YB, ZA, ZB, ZC, ZD, and ZE). "Non-Commercial Thin" means to thin a stand without removing any wood products. Most of the cut-trees would be smaller than Forest Service Timber Sale Contract sawlog specifications, but some may be larger. No trees would be removed because of access or Riparian Habitat Conservation Area restrictions.

Precommercial Thin (104 acres, units 33, 42, and 49). "Precommercial thin" means to thin a stand of sapling-sized trees[32]. Trees to be cut are too small to have any commercial value. Leave tree spacing is usually 12-20 feet.

Treatments in areas with Special Management Objectives

Treatments in Management Area 1 (Old Growth Dependent Species Habitat), or Barred Owl Forage, Pine Marten, and Pileated Woodpecker Habitat Areas (Appx. 780 acres; units or portions of units 10, 12, 14, 15, 28, G, R, S, ZA, and ZE). The management objectives in these units would be to speed development of the desired wildlife habitat, and to reduce fuels. The primary habitat component lacking in these areas is large live and dead standing trees. Thinning will be aimed at increasing the growth rate of the overstory and creating canopy layers. This will be accomplished by uneven-aged selection[33], removing intermediate, suppressed, and pathogen infested trees, or by underburning. Quarter-acre openings may be used to accomplish desired objectives. Whenever possible, standing deadwood greater than 12" in diameter will be protected. Target crown closure is 50% or greater (this will vary according to site-specific conditions).

Treatments in Lynx Habitat in the Bodie Lynx Analysis Unit (Appx. 847 acres; units or portions of units 1, 2, 5, 13, 14, 15, 17, 18, 20, 21, 22, 24, 30, 31, 37, 46, D, E, F, G, and U). In portions of the LAU that are capable of providing lynx habitat (as defined by plant association) the management objective for the Commercial or Small Pole Thinning units is to hasten development of lynx denning habitat . This will be accomplished by thinning to attain large overstory tree size, and opening up small areas while leaving clumps of trees for multistory stand structure. Isolated concentrations of downed trees will be left. In units treated with broadcast burning or underburning, the objective would be to enhance foraging habitat.

[31] A **landing** is any place where wood is gathered for further transport.

[32] A **sapling** is a tree generally 1.0 to 4.9 inches in diameter (dbh).

[33] **Uneven-aged selection** is the removal of selected trees or small groups of trees, from specified size and age classes over the entire stand area in order to meet a predetermined goal of size or age distribution and species composition in the remaining stand.

Treatments in Forest Plan Management Areas 6 and 8 (Mule Deer Winter Range), (Appx. 678 acres; Units or portions of units 25, 26, O, X, ZC, and ZD). The management objective for these units is to promote thermal cover[34] and improve browse plant vigor. Thinning is expected to release healthy trees to re-fill the overstory, while whipfalling and/or underburning would open the understory and reinvigorate the browse plants.

Logging Systems

Commercial Thinning, Salvage, and Small Pole Thin treatments will be either ground-based (approximately 3,046 acres) or skyline/cable systems (approximately 131 acres). Ground-based logging systems are those in which logs are transported to landings (sites where logs are loaded onto trucks) with wheel or track-mounted logging equipment. Such logging systems may include forwarder-processor systems, as well as those using bulldozers or rubber-tired skidders. Skyline logging is a system of cable logging in which all or part of the weight of the log is supported during yarding by a suspended cable.

Precommercial Thinning will be done by hand crews with chainsaws.

Helicopter yarding is not included in the Proposed Action alternative.

Associated Roadwork

The timber management activities described above would require new road construction (approximately 0.95 miles), reconstruction of **classified roads**[35] to improve drainage and public safety (9.52 miles light reconstruction and 7.38 miles of medium reconstruction), and reconstruction of **unclassified roads**[36] to make them suitable for use (approximately 6.72 miles). New road construction is in approximately 3 short segments, 0.13 to 0.67 miles in length. All newly constructed roads, and closed roads (according to pre-existing Road Management Objectives) that are re-opened (classified or unclassified) would be closed after completion of the project. All roads that were open (according to pre-existing Road Management Objectives) prior to the project would be left open.

Proposed Fuel Treatments

Controlled Burn (Underburn in timbered stands, Jackpot Burning where only the fuel concentrations will burn and the fire is unlikely to spread and underburn the stand; Broadcast Burn in non-timbered areas): (Appx. 6,263 acres, units or portions of units 2, 3, 4, 5, 8, 10, 12, 18, 19, 20, 21, 22, 23, 25, 26, 29, 30, 32, 34, 36, 39, 40, 43, 44, A, D, E, F, G, I, J, M, N, O, P, R, S, T, U, V, W, X, ZB) – Controlled burning introduces a low-intensity surface fire under prescribed conditions for the purpose of consuming surface fuels and seedlings, killing unwanted small-diameter

[34] **Thermal cover** is cover used by animals to lessen the effects of weather. For deer, thermal cover is defined as evergreen trees, 40 feet or taller, with crown cover 60 percent or greater, in areas three acres or greater with a minimum width of 300 feet.

[35] **Classified roads** are those roads within National Forest System lands planned or managed for motor vehicle access, including state roads, county roads, private roads, permitted roads, and Forest Service roads.

[36] **Unclassifed Roads** are those roads that are not intended to be part of, and not managed as part of, the National Forest transportation system such as temporary roads, unplanned roads, off-road vehicle tracks, and abandoned travelways.

saplings, and scorching low-hanging limbs. This kind of fire has a cleaning and thinning effect, and reduces the possibility of intense wildfires that would easily climb into the tree crowns. **Jackpot Burning** involves hand-lighting individual clumps and patches of surface fuels. Underburning, broadcast burning, or jackpot burning of natural fuels across the landscape typically creates a mosaic of burn patterns and rarely consumes 100% of the surface fuels as a wildfire might do in the heat of summer.

Whipfalling (3,497 acres, units or portions of units 1, 4, 6, 8, 10, 11, 12, 19, 24, 25, 26, 28, 30, 37, 40, A, D, O, R, S, YA, YB, ZA, ZB, ZC, ZD, and ZE) will be included in some controlled burning areas. **Whipfalling** is cutting and lopping sapling-sized trees in preparation for underburning, for the purpose of providing fuel to carry fire through the stand, and to aid in reducing ladder fuels where understory trees are not desired. The intent is not to thin the entire stand, but just to cut enough to enhance fire behavior to make the prescribed underburn effective in meeting the fuel reduction objectives.

Shaded Fuelbreak (Appx. 506 acres; Units ZA, ZB, ZC, ZD, ZE, YA, YB) - A **shaded fuel break** is a stand of trees where intensive hand or mechanical work reduces surface fuels, seedlings, saplings, and low-hanging limbs. The debris is either removed from the site, or placed in small piles for burning. Some overstory trees, usually from the smaller diameter size classes, may be thinned to increase space between tree crowns. The overall appearance of the canopy would remain intact and would not decrease aesthetic values.

The purpose of a shaded fuel break is to create a strip of land where a wildfire is deprived of surface and ladder fuels, causing the fire's rate of spread to slow, and also decreasing the likelihood that long flamelengths will advance fire into the overstory canopy. Such a fuel break can allow time for firefighters to arrive and suppress wildfires that otherwise could quickly spread and threaten adjacent property.

Mechanical Pile and Burn Piles in Woods (1,764 acres, units or portions of units 6, 7, 8, 10, 11, 12, 13, 14, 17, 18, 21, 24, 28, 30, 31, 37, 40, 41, 45, 46, 47, 48, and ZB). Mechanical Pile means that logging equipment would drop limbs and tops into small piles along the skid trail as it tops, limbs, and bucks logs. Sub-merchantable trees would also be severed from the stump, processed as needed, and dropped into piles in the same operation. These piles would be loosely piled concentrations of logging slash[37], and subsequent burning would resemble jackpot burning.

Leave Tops Attached and Burn Piles at Landings (168 acres, units or portions of units 1, 2, 15, and 38). Trees would be skidded or yarded to log landings with tops and limbs attached. The trees would be processed at the landing, and tops, limbs, and other debris would be piled at the landing for subsequent disposal by firewood removal, hauling off site, or burning. Where access and landing space permit, firewood removal by the public would be allowed. Removal of firewood is expected to reduce smoke emissions during prescribed burning and to provide fuelwood for the public.

[37] The term "**slash**" refers to vegetative debris remaining after logging.

Lop Slash to the Ground, Leave Debris to Decay (86 acres, units 33, 42, and 49). Old logs, logging debris, and/or small, unmerchantable cut-trees would be cut into pieces so they lie on or nearly on the ground, so that soil organisms will facilitate decay of the woody material. This treatment would be used where burning, skidding, or yarding would damage the residual stand, or where removal of the material is economically prohibitive.

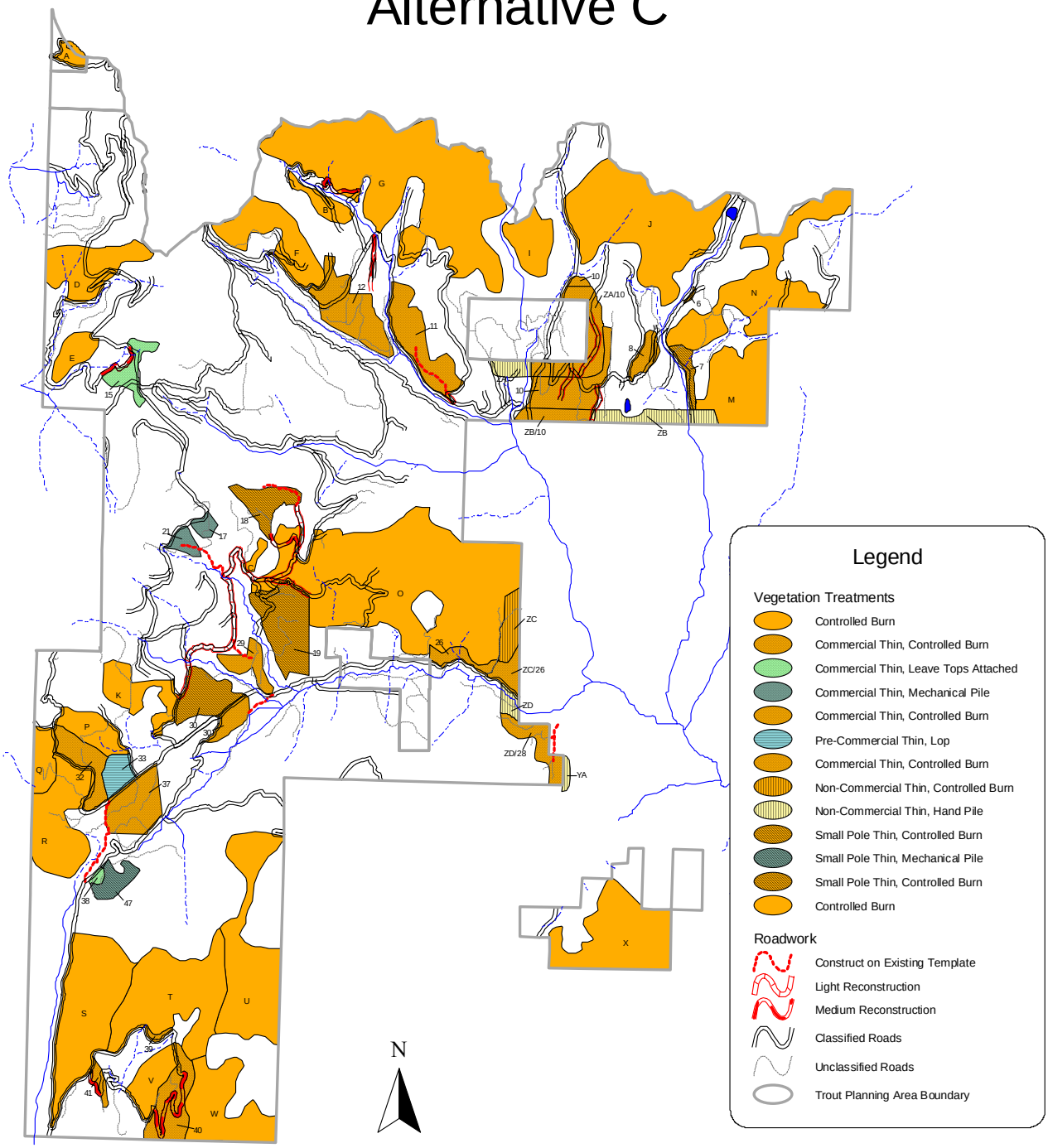
Reforestation

Western larch (also called tamarak) and ponderosa pine would be planted in openings as necessary to achieve objectives and keep stands fully stocked.

Alternative C

Alternative C is an alternative proposal jointly developed by the Kettle Range Conservation Group, The Lands Council, and the Ferry County Natural Resource Board (representing the Ferry County Board of Commissioners). This alternative was designed to address issues (as stated by the alternative proponents) of unroaded areas, soils, and noxious weeds. Because Alternative C avoids building new roads and avoids or reduces timber harvest in secluded areas, it is also responsive to the wildlife, water quality, and fish issues.

Trout Vegetation Management Project
Alternative C



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Alternative C Timber Cutting Treatments

Commercial Thinning (1,279 Acres; Units 6, 8, 10, 11, 12, 15, 17, 21, 26, 29, part of 30, 32, 37, 38, 39, 40, and 41): Thinning and Commercial Thinning would be as described for Alternative B, except that the cut/leave prescriptions would be as follows:

Table 3. Alternative C Commercial Thinning Unit Specifications

Unit #	Acres	Prescription Specifications
6	3	Restrict logging to within 100' of Road 2150. Max DBH 12" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, PP, ES.
8	35	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, PP, ES.
10	122	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, PP, ES.
11	144	Max DBH 12" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = DF, WL, PP.
12	154	Max DBH 12" except LP and mistletoe class IV[38] and higher. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, PP.
15	55	Max DBH 8" except LP, 16' spacing except for groups of 2-6 WL or DF or mix of each. Preferred leave species = WL.
17	18	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, ES.
21	26	Max DBH 12" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, SAF, ES.
26	34	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, PP, ES.
29	51	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Remove all LP. Preferred leave species = WL, PP.
30	38	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Remove all LP. Preferred leave species = WL, PP.
32	83	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, PP, ES.
37	118	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, PP, ES.
38	7	Preferred leave species = ES, SAF, WL.
39	8	Thin only along existing road. Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, PP.
40	117	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger. Preferred leave species = WL, PP.
41	18	Max DBH 10" except LP. Leave all groupings of 2-6 trees 10" and larger.

DBH = diameter at breast height (4-1/2 feet above the ground on the uphill side of the tree)
LP = lodgepole pine; WL = western larch (also called tamarak); PP = ponderosa pine; ES= Engelmann spruce; DF = Douglas-fir; SAF = subalpine fir.

[38] **Mistletoe class** refers to the Hawksworth mistletoe severity rating system. Under this system, the live tree crown is divided vertically into thirds. Each third is given 0 points if no mistletoe, 1 point for light infection, or 2 points for heavy infection. The points are then summed to determine the mistletoe rating for the tree.

Salvage: Salvage would not occur along with Commercial Thinning.

Small Pole Thin (410 acres, Units 7, 18, 19, part of 30, and 47). "**Small Pole Thin**" would conducted as in Alternative B, except that the cut/leave prescriptions would be as follows:

Table 4. Alternative C Small Pole Thin Unit Specifications

Unit #	Acres	Prescription Specifications
7	29	Remove only material smaller than TSC (Timber Sale Contract) sawlog specifications. Preferred leave species = WL, PP, ES.
18	72	Max DBH 8" except LP. Preferred leave species = WL.
19	168	Remove only material smaller than TSC sawlog specifications.
30	97	Remove only material smaller than TSC sawlog specifications. Preferred leave species = WL, PP.
47	44	Remove only material smaller than TSC sawlog specifications. Preferred leave species = ES, SAF, WL.

Precommercial Thin (44 acres, unit 33). Precommercial thinning would be conducted as described for Alternative B.

Treatments in areas with Special Management Objectives

Treatments in Management Area 1 (Old Growth Dependent Species Habitat), or Barred Owl Forage, Pine Marten, and Pileated Woodpecker Habitat Areas (Appx. 614 acres; units or portions of units 10, 12, G, R, S, and ZA). Treatments in these areas will be conducted as described for Alternative B, except that prescription specifications would adhere to the Alternative C prescription specifications given above.

Treatments in Lynx Habitat in the Bodie Lynx Analysis Unit (Appx. 501 acres; units or portions of units 12, 15, 17, 18, 21, 30, 37, B, C, D, E, F, G, K, O, and U). Treatments in these areas will be conducted as described for Alternative B, except that prescription specifications would adhere to the Alternative C prescription specifications given above.

Treatments in Forest Plan Management Areas 6 and 8, Mule Deer Winter Range (Appx. 688 acres; Units or portions of units 26, O, X, ZC, and ZD). Treatments in these areas will be conducted as described for Alternative B, except that prescription specifications would adhere to the Alternative C prescription specifications given above.

Logging Systems

Logging systems would be as described for Alternative B. Commercial Thinning, and Small Timber Thin treatments will be either ground-based (approximately 1,638 acres) or skyline/cable systems (approximately 51 acres).

As in Alternative B, Precommercial Thinning would be done by hand crews with chainsaws.

Helicopter yarding is not included in Alternative C.

Associated Roadwork

The timber management activities described for Alternative C would not require any new road construction, however, Alternative C would include reconstruction of classified roads to improve drainage and public safety (3.57 miles light reconstruction and 3.16 miles of medium reconstruction), and reconstruction of unclassified roads to make them suitable for use (approximately 3.10 miles). As in Alternative B, all closed roads (according to pre-existing Road Management Objectives) that are re-opened (classified or unclassified) would be closed after completion of the project, and all roads that were open (according to pre-existing Road Management Objectives) prior to the project would be left open.

Alternative C Fuel Treatments

Controlled Burn (Appx. 7,234 acres, units 6, 7, 8, 10, 11, 12, 18, 19, 26, 29, 30, 32, 37, 39, 40, 41, A, B, C, D, E, F. G, I, J, K, M, N, O, P, Q, R, S, T, U, V, W, X, ZC, and ZD/28) – Controlled burning would be conducted as described for Alternative B.

Whipfalling (3,252 acres, units or portions of units 6, 8, 10, 11, 12, 19, 26, 30, 37, 40, A, D, O, R, S, YA, ZA, ZB, ZC, and ZD.) will be included as described for Alternative B.

Shaded Fuelbreak (Appx. 425 acres; Units ZA, ZB, ZC, ZD, YA, YB) – Shaded fuel break activities would be as described for Alternative B, except that Alternative C prescription specifications would be as follows:

Table 5. Alternative C Shaded Fuelbreak Unit Specifications

Unit #	Acres	Prescription Specifications
ZA	136	Max DBH 10” except LP. Leave all groupings of 2-6 trees 10” and larger. Preferred leave species = WL, PP.
ZB	110	Max DBH 10” except LP. Leave all groupings of 2-6 trees 10” and larger. Preferred leave species = WL, PP.
ZC	84	Max DBH 10” except LP. Leave all groupings of 2-6 trees 10” and larger. Preferred leave species = WL, PP.
ZD	85	Max DBH 10” except LP. Leave all groupings of 2-6 trees 10” and larger. Preferred leave species = WL, PP, (plus ES in wet areas).

Mechanical Pile and Burn Piles in Woods (88 acres, units 17, 21, and 47). Mechanical pile treatments would be the same as described for Alternative B.

Leave Tops Attached and Burn Piles at Landings (62 acres, units 15, and 38). Leave Tops Attached treatments would be the same as described for Alternative B.

Lop Slash to the Ground, Leave Debris to Decay (44 acres, unit 33). Lopping treatment would be the same as described for Alternative B.

Reforestation

As in Alternative B, western larch (also called tamarak) and ponderosa pine would be planted in openings as necessary to achieve objectives and keep stands fully stocked.

Project Design Elements Common to all Action Alternatives

Project design elements and mitigation measures were developed to ease some of the potential impacts the various alternatives may cause. The mitigation measures would be applied to both action alternatives.

Soil, Water, Fisheries

BMPs (Best Management Practices) are the primary means used to reduce or eliminate potential adverse effects to soil, water, and fisheries resources. *General Water Quality Best Management Practices*, USDA Forest Service, Pacific Northwest Region, November 1988[39], is incorporated by reference (USDA Forest Service, 1988).

Project-specific soil, hydrology, and fisheries mitigation measures are incorporated into the general BMPs. Trout project BMPs are provided in Appendix B, and include the following site-specific provisions:

1. Reuse areas where the soil is already compacted. Applies all units, and includes special restrictions in Units 4, 10, 12, and 21 in Alternative B, and Units 10, 12, and 21 in Alternative C.
2. Minimize soil compaction on new areas by designating 130 foot minimum trail spacing for tractor logging equipment. Applies to all units.
3. Minimize soil compaction on new areas by designating minimum 40 foot trail spacing and effectively buffer the trail with logging slash or snow for CTL (Cut-To-Length) equipment. Applies to all units.
4. Minimize the compaction of CTL trails by buffering the soil with logging slash. Applies to all units.
5. Minimize the compaction of CTL and tractor trails by buffering the soil with snow or operating under frozen soil conditions. Applies to Units 31, 38, and 45 under Alternative B, and Units 6 and 38 under Alternative C. Also, if a CTL system is used, applies to Units 3, 10, 15 (portion that is an old plantation), 19 (above Road 2086900), and 22, in Alternative B, and Units 10 and 15 in Alternative C.
6. Prevent soil compaction on areas outside of designated landings and skid trails by keeping mechanized equipment on designated skid trials. Applies to all units.
7. Limit the slopes where tractors may operate to $\leq$ 35% (short pitches may be steeper). Applies to all units.

[39] The document *General Water Quality Best Management Practices* (USDA Forest Service, 1988) was written to facilitate understanding of Best Management Practices for protection of water quality in the Pacific Northwest Region. It is intended as a guide or checklist in development of specific BMPs for projects. It includes many of the key practices that are applicable in conducting land management activities. The practices listed are general, and are made specific at the project level.

8. Limit the slopes where CTL equipment may operate to ≤ 40% (short pitches may be steeper). Applies to all units.
9. Revegetate disturbed sites. Applies to all units.
10. Adequately drain skid trails and landings. Applies to all units.
11. Minimize erosion by avoiding activities during wet conditions. Applies to all units.
12. Avoid new user-created ORV (off-road vehicle[40]) trails by leaving skid trails in conditions that are not attractive to ORV users. Applies to Units 2, 3, 8, 10, 14, 15, 19, 30, 32, 33, 37, 38, and 44 units Alternative B, and Units 8, 10, 15, 19, 32, 33, 37 and 38 under Alternative C.
13. Minimize erosion from sensitive areas by applying special mitigation for highly erodible or potentially unstable sites. Applies to escarpments[41] in units 8, 10, 13, 14, 19, and 42 in Alternative B, and Units 8, 10, and 19 in Alternative C.
14. Suspend logs during yarding in skyline/cable units. **One end would generally be suspended to keep the forest floor intact. One-end suspension may not be feasible in the vicinity of rock outcrops and "knobs."** Applies to Units 1, 17, 20, 32, and 43 in Alternative B, and Units 17 and 32 in Alternative C.
15. Revegetate disturbed soils in skyline/cable yarding units. Applies to Units 1, 17, 20, 32, and 43 in Alternative B, and Units 17 and 32 in Alternative C.
16. Develop burn plans to protect soils. Applies to all units.
17. Avoid nutrient losses by prohibiting whole-tree harvesting[42] and overwintering slash[43]. Applies to Units 12, 13, 18, 21, 43, and 46 in Alternative B, and Units 12 and 18 in Alternative C.

Noxious Weeds Management

The Trout Environmental Assessment will only address the prevention of weed spread and/or the compounding of weed problems that could result from proposed activities. The Trout project will not address treatment of existing weed problems or the spread of weeds that would occur independently of the proposed actions. Treatment of existing weeds is addressed by the Colville National Forest Integrated Noxious Weed Treatment Environmental Assessment (Vaught, 1998).

Noxious weeds are present along many roads in this area, and in some locations are spreading from the roads to the adjoining forest or grassland. Weeds would be treated using chemical, biological, and manual methods, in accordance with the Colville National Forest Integrated Noxious Weed Treatment Environmental Assessment (Vaught, 1998) or whichever noxious weed treatment direction is in effect at time weed treatment takes place[44]. Treatment of noxious weed infestations will occur prior to closure and/or

[40] An ORV (**off-road vehicle)** is a motorcycle, dune buggy, four-wheel drive, snowmobile, or other vehicle that is designed to operate off of a road. May also be referred to in this document as an OHV (off-highway vehicle) or an ATV (all-terrain vehicle).

[41] An **escarpment** is a steep sloping area on otherwise gently sloping or level terrain.

[42] **Whole tree harvesting** means to skid or yard trees to the landing before severing limbs and tops from the tree.

[43] The term **overwintering slash** refers to leaving slash on the ground for at least one winter season.

[44] In October, 2005, the *Environmental Assessment for Integrated Noxious Weed Treatment, Colville National Forest, 1998*, and its accompanying Decision Notice, September 4, 1998, are the documents that analyze, disclose the effects of, and authorize noxious weed treatments on the Colville National Forest (Vaught, 1998). This document is

decommissioning[45] of roads. Follow-up monitoring and re-treatment of areas behind road closures and/or obliterated[46] roads will be conducted, at a minimum, once a year for the first two years after the treatment or until such time as it can be verified that the weed infestation has been effectively eliminated.

Establishment of noxious weeds will be minimal or may not occur at all where desirable vegetation becomes established on disturbed sites. Establishment of desirable vegetation would contribute to reduce the potential for erosion as well as providing forage for wildlife and livestock.

The following are the eight major objectives of the Colville National Forest Weed Prevention Guidelines. For more specifics under this plan, see Management Practices listed in the Colville National Forest Weed Prevention Guidelines (Vaught, 1999).

1. Education: Ensure public and employee knowledge of noxious weeds.

2. Project Need: Weigh the need of the proposed project against the risk of weed infestation.

3. Minimize Transportation of Weed Seed: Reduce the spread of existing weeds across the Forest and the risk of introducing new weed species to project sites and other areas of the Forest.

4. Incorporate Weed Prevention Measures into Project Planning and Design, and Special Use Permit Administration: Ensure that the risks of weed introduction and/or spread, and the mitigation required to minimize that risk are properly considered before ground disturbing activities begin.

5. Pre-Activity, Inventory and Analysis: Minimize the spread of existing weeds into new project areas.

6. Minimize Ground Disturbance and the exposure of mineral soil during project activities: Reduce the potential for weeds to become established on new sites and the need to conduct re-vegetation activities.

7. Re-vegetate Disturbed Areas: Re-establish desirable vegetation on exposed mineral soil due to project activity, fire, flood, or other disturbance to minimize the introduction and/or spread of noxious weeds.

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incorporated by reference.

[45] **Decommissioning** is defined as any activity that results in the stabilization and restoration of unneeded roads to a more natural state. Decommissioning includes applying various treatments, which may include one or more of the following: a) reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation; b) blocking the entrance to a road, installing waterbars; c) removing culverts, reestablishing drainage-ways, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed; and d) completely eliminating the roadbed by restoring natural contours and slopes; or other methods designed to meet the specific conditions associated with the unneeded roads (source of definition: Forest Service Manual 7703.2).

[46]) **Obliteration** means to completely eliminate the roadbed by restoring natural contours and slopes. Obliterating a road is one of several forms of decommissioning.

8. Monitor: Conduct project follow-up and review to determine success of weed treatments and re-vegetation efforts and detect new weed sites requiring treatment and make corrections as necessary. Monitoring is a part of every project and as such, needs to be covered in NEPA discussions, and planned for as part of implementation.

The mitigation measures identified here are those that address noxious weed concerns.

1. Noxious weed prevention will be conducted as prescribed in *Colville National Forest Weed Prevention Guidelines* (Vaught, 1999). This document sets forth the practices to be followed on the Colville National Forest to minimize the introduction of noxious weeds, minimize conditions that favor the establishment of noxious weeds, and minimize conditions that favor the spread of noxious weeds. This document is incorporated by reference.

   Inspect the following roads and the vicinity of the following treatment units and treat houndstongue, hawkweeds, and diffuse knapweeds prior to ground disturbing activities (e.g., road blading, road construction, road reconstruction, log skidding, burning):
   - Alternative B: Roads 2086000-10.98L, 2086900, 2086950, 2148050, 2148101, 2148102, 2148110, 2148300, 2148050-0.10L; Units 2, 3, 4, 6, 10, 11, 12, 13, 14, 19, 21, 24, 25, 30, 42, 46, 48, 49, ZE/49, A, D, E, F, G, and N.
   - Alternative C: Roads 2086900, 2086950, 2148050, 2148050-0.10L, 2148300; Units 6, 10, 11, 21, 26, 30, A, B, D, E, F, G, K, N, and O.

2. Seeding of grasses or other cover plants, using non-palatable or less palatable[47] species, is required where soil is disturbed by harvest, hazard fuel reduction, or roading activities. On those sites where the purchaser is not required to seed for erosion control, Knutsen-Vandenberg Sale Area Improvement funds or appropriated funds will be used to seed those sites. For seed mixes and application rates, see *Seeding and Planting Guide for the Colville National Forest* (Ortegon, 2000). The *Seeding and Planting Guide for the Colville National Forest* is incorporated by reference; it provides recommended seed mixes and application rates for disturbed areas such as roads, skid trails, or fire control lines.

3. Road closures will not be implemented until weeds have been treated. Treatment areas and methods shall be conducted in accordance with the most current Noxious Weed Management direction. Follow-up monitoring and re-treatment of areas behind road closures and/or obliterated roads must be conducted, at a minimum, once a year for the first two years after the treatment or until such time as it can be verified that the weed infestation has been effectively treated.

[47] **Non-palatable** or **less-palatable** species of vegetation are those plant species that are not preferred by grazing or browsing animals (including rodents).

4. All newly constructed roads and closed roads that have been re-opened shall be closed as soon as required project activity, wood gathering, and harvest activity are completed to minimize the opportunity for noxious weed establishment.

Timber Management

1. To reduce large tree mortality from prescribed fire, the Silviculturist and the Fire Management Officer may utilize slash pullback and/or raking around large or desirable trees as deemed necessary. In addition, duff beneath large ponderosa pine will be mixed (no roots should be exposed).

2. To reduce impacts to areas where burning would set back progression toward attaining old growth structure or impact young tree plantations, the Silviculturist and Fire Management Officer will identify the areas and employ strategic lighting or fuel clearing methods to reduce the potential of fire burning into these areas.

3. Removal of non-merchantable wood is allowed and encouraged in some cases. To minimize undesired effects (scaring of residuals, excessive openings, etc.) from the use of timber sale contact provision CT 211, the Silviculturist must approve units prior to removal of non-merchantable material.

4. In areas with high levels of active Douglas-fir bark beetles, spring burning would be delayed until populations subside or until the fall season. Monitoring should record results of secondary mortality following prescribed burns.

5. Harvest of additional tree mortality within units or along haul routes will be encouraged as allowed by USFS Forest Service Timber Contract provision for minor changes, except where such harvest is restricted by the Forest Plan. Harvest of additional trees must be reviewed and approved by the District Ranger.

Fuel Treatments and Air Quality

1. All controlled burning will be implemented in accordance with the Managing Competing and Unwanted Vegetation Final Environmental Impact Statement (Torrence, 1988) and the Washington State Smoke Management Requirements.

2. Controlled burn plans will be reviewed by resource specialists and approved by the line officer to ensure that safety and multi-resource objectives will be met.

3. An annual Human Health Risk Management Plan will be completed to reduce or minimize health risks to the general public and agency burning personnel from controlled burning. This includes written notification of landowners within ¼ mile.

4. Range allotment permittees will be notified of annual controlled burn operations that may occur within their allotment.

State groomed snowmobile routes and winter logging conflicts

1. If any snowpark or other snowmobile trailhead is plowed through, a new suitable location will be plowed by the contractor to allow for safe and efficient use by the snowmobiling public as well as the state groomer. If any snowmobile route made unavailable to snowmobilers, only one such route will be affected at a time. The local Tree Bender snowmobile club will be notified of any breached or closed routes.

Logging and recreation conflicts

1. No hauling will be allowed on weekends or holidays when activities are going to affect primary recreational access routes (County Roads 514, 517; Forest Roads 2148000, 2149000, 2150000, 2086000). This also applies to winter recreation snowmobile routes. Prohibit hauling on these routes in the period between the Friday before Memorial Day weekend through general rifle hunting season, and during the snowmobiling season (December 1-March 31) during the following time periods: 3:00 p.m. Friday (or the day before a federal holiday), through 8 p.m. Sunday (or the day of a federal holiday).

2. All haul routes will be signed to notify the public of timber hauling activities.

Dispersed Recreational Use

1. Protect important undeveloped recreational sites by requiring approval for log landings, equipment servicing areas, temporary roads and skid trails. Protected sites will be designated on a recreation site map that will be provided to the Timber Sale Administrator.

2. Within the immediate foreground of well-established dispersed camping sites, retain screening vegetation (usually conifer regeneration and /or understory hardwoods) in irregular patterns (varying both width and length of treatment areas) with groups and clumps. This applies to both timber cutting and prescribed burning operations. This will create thinning patterns that are natural appearing, thus reducing impact to dispersed camping sites.

3. Block and/or camouflage skid trails or machine access trails with logging debris (or other methods) within Management Area 3A (Units 6, 8, 10 under both action alternatives) and 3B (Unit ZB under Alternative B) to prevent off-road vehicle use. Off-road vehicle use in Management Areas 3A and 3B is appropriate under the Forest Plan only on designated areas or trails.

Road Management

1. In winter range (Forest Plan Management Areas 6 and 8), a gate or other entrance barriers will be installed (by the purchaser) on all new roads or any currently closed roads re-opened for project activities. These closures will be installed at the time of road construction/ reconstruction to limit vehicular access to project-related vehicles only.

2. Logging will be permitted in winter range (Forest Plan Management Areas 6 and 8), subject to the following conditions:
    a. Roads with winter-season road closures shall remain closed to **public** vehicular travel (purchaser and Forest Service administrative use related to the timber sale would be allowed).
    b. Within winter range during the winter season, only one harvest unit shall be operated at a time.

3. All roads currently closed, and all roads closed in conjunction with this project, will be periodically monitored for closure effectiveness. Road closure violations will be promptly reported and repaired.

Sensitive Plants

The following measures are required to avoid a "may affect" determination for USDA Forest Service (Region 6) sensitive species.

1. Revisit the blue-eyed grass population where road reconstruction is proposed. Clearly mark the rare plant site.
2. Validate that the kidney-leaved violet location is outside a nearby harvest unit.
3. Develop and implement a plan to monitor skullcap populations in the analysis area to evaluate the effects of fire on this plant.
4. If any other sensitive species are found in the project area while project activities are occurring, a botanist will be consulted as to measures required to protect the species and its essential habitat.

Wildlife

1. In the event an active goshawk nest is located, timber harvest and/or prescribed burning activities in the vicinity of the nest will be **interrupted** until the District Biologist can develop a nest site management plan.

2. Timber harvest and prescribed burning prescriptions will be developed with the objective of retaining the following wildlife habitat features (where currently present):

    a. Certain areas within Unit 23, near or adjacent to designated mule deer winter range (MA-8), will be identified and have browse cut and burned to open up and improve the understory range of visibility, and to reinvigorate browse plants. The rootstock for the browse[48] is to be conserved.

    b. In Unit 23, the identifying of trees and stems for thinning and removal will involve consultation and coordinationwith the wildlife biologist, to establish an interspersion of small ~ 3-acre patches of $\geq$ 60% canopy cover, in conformance with Forest Plan standards.

[48] "**Browse**" generally refers to hardwood shrubs that may be eaten (or browsed upon) by big game species of wildlife.

c. Maintain at least 8 mature limby Douglas-fir trees per acre within blue grouse habitat (open stands and along ridgetops within Units 4, 10, 11, 12, 18, 22, 34, 36, 43, 44, 45, 46, and ZE).

d. Maintain hiding cover around at least 50 percent of the perimeter of springs or other water sources, with no breaks in cover exceeding 600 lineal feet along the waters edge (Forest Plan standard for blue grouse).

e. Mitigate the potential loss of snags by leaving a buffer of leave-trees around groups or patches of snags. This buffer needs to be of sufficient size to eliminate the need for falling snags for safety reasons.

f. In MRU 4PW43DP, once **logging** is completed, the roads will be decommissioned and closed to discourage further use.

g. For Alternative B, mitigate for the loss of snags by inoculating 350 > 20" diameter live Douglas-fir or ponderosa pine trees with an appropriate native heart-rot fungus to encourage heart-rot, and, therefore, a potential cavity-nest tree. For Alternative C, mitigation for losses of snags would entail inoculating 180 > 20 inch diameter live Douglas-fir or ponderosa pine trees. In both instances, live > 20 inch diameter trees, selected for inoculation, would be located > 200 meters from any road opened for firewood accessibility, and, spatially distributed in similar proportional correlation with spatially distributed losses. Subsequent to inoculation, these trees will be monitored for five consecutive years to determine success.

h. Downed log densities would be managed to provide a minimum of 20 logs per acre (at least six feet long and >12 inches diameter) within mixed conifer stands, and 6 logs per acre in ponderosa pine stands.

3. Prescribed burning prescriptions will be developed to ensure retention of large downed woody debris. Fire consumption of downed logs ≥12" (≥8"for lodgepole pine) in diameter should not exceed three inches in total diameter reduction.

4. In the event that gray wolf, grizzly bear, North American lynx, peregrine falcon, Pacific western big-eared bat, Pacific fisher, great gray owl, bald eagle, common loon, or California wolverine activity is observed, suspected, or detected within the project area, the District and/or Forest Wildlife Biologist will be contacted. Project activity in the vicinity of the species' activities will be **interrupted** until a revised assessment can be completed regarding the effects of that activity on species use of the area.

5. Any raptor nest discovered prior to or during project implementation will result in the nest-site being afforded similar management direction as specified for goshawks in the Eastside Screens, i.e., 200 meter (appx. 30 acres) radius of security around the nest site during the pre-fledgling nesting period, and an inclusively adjacent 400 acre post-fledgling foraging/feeding habitat will be

defined. The nest tree will be protected and all project activities will be immediately **interrupted** within the radius of security during the nesting/pre-fledgling period as reported applicable for the respective raptor species in residence, and not resumed until the nesting cycle for the season has been completed. Any management prescription affecting the 400-acre post-fledgling foraging/feeding habitat will be modified to address the needs of the relevant species.

6. For the known great blue heron nesting site (within Unit 10), the Washington Fish and Wildlife-Priority Habitats and Species Management Recommendations would be followed. Human activities would be restricted within an established 300 meters (984 ft.) habitat protection buffer-radius around the periphery of the known nesting site and any other subsequently discovered sites or colonies. All management actions would be prohibited between February 15 and July 31. The use of pesticides will be prohibited within the nest-site radius of security and the foraging area (Ward and Empire Lakes and associated wetlands).

   Existing road access into the known great blue heron nest-site radius of security is via Forest Service Systems Road 2150002. Currently, this road is classified as "open" with a maintenance level of 2; and, is scheduled for improvement during the Trout Project. Improvements and use of the road when implementing the proposed Trout Project within the recognized 300 meter radius of security will be prohibited during the early pre-nesting and nesting dates of February 15 until July 31. It is recommended that following completion of the management actions the road into the radius buffer would be permanently closed during the same dates.

Public Safety in Conjunction with Burning Operations

Provisions taken to address public health and safety issues are considered on a case by case basis as each burn area is unique. Provisions typically include:

1. As needed, close roads and or trails to ensure a high level of public and employee safety.

2. Post caution signs on roads where traffic entering the general area will be warned of possible smoke intrusions, which can create reduced visibility along roads.

3. Following prescribed fire, check for hazard trees and or rolling debris that may reach roadways and trails and mitigating the hazards by removal. If not safe to remove, flag the area with appropriate flagging.

4. Burn when conditions are suitable for good smoke dispersal.

Visual Quality

1. Within the immediate foreground as viewed from Forest Roads 2086000, 2148000, 2149000, 2150000 and County Road 514 retain screening vegetation (usually conifer regeneration and /or understory hardwoods) in irregular patterns (varying both width and length of treatment areas) with groups and clumps. This applies to both timber

cutting and prescribed burning operations. This will create thinning patterns that are natural appearing, thus meeting the partial retention visual quality objective.

2. The immediate foreground areas of Forest Roads 2086000, 2148000, 2149000, 2150000 and County Road 514 may need stump mitigation, which would include flush cutting stumps or covering them with natural debris (to be determined after harvest).

3. Within the immediate foreground of Forest Roads 2086000, 2148000, 2149000, 2150000 and County Road 514**,** locate slash and/or burn piles behind foreground screening vegetation.

4. After a cutting unit has been accepted, pull all tags, flagging, etc. visible for 66 feet from Forest Roads 2086000, 2148000, 2149000, and 2150000, and County Road 514. No paint should be left visible within 66 feet of these roads or significant dispersed campsites.

5. For diversity of pattern and color, where reasonable to do so, route skid trails and directionally fall trees so as to maintain hardwood trees (aspen, cottonwood, birch). Also where reasonable to do so, avoid underburning patches of hardwood trees.

6. When re-closing roads, place the closure so that the berm is out of the "visible" approach area, addresses drainage pattern concerns, and uses plantings and boulder placement near the road entrance to eliminate access.

Range

1. If existing barriers are removed or breached, KV-SAI (Knutsen-Vandenberg Act/Sale Area Improvement) funds, or appropriated funds, will be used to restore the barriers.

2. The treatment of burning and harvest activity may result in increased cattle activity and use in areas near and around riparian areas. In the event that insufficient material is left and cattle use is resulting in unacceptable resource impacts then appropriated or KV-SAI funds will be used to replace barriers utilizing methods such a debris dispersal, temporary fencing, or the like. The use of natural materials near the site, such as logging slash, may be effective for only a short time, since the snow and harsh winter conditions seem to flatten the temporary barriers. The use of fencing materials is the most effective.

Cultural/Heritage Resources

1. Adjust boundaries to proposed treatment units or avoid through buffering site numbers 06210400048, 06210400057, 06210400063, 06210400064, 06210400065, 06210400124, and 06210400125.

2. Avoid sites located within treatment units. These sites are 06210400015, 06210400044, 06210400058, and 06210400170. Sites located within a unit may

be excluded from the unit during layout or marking. Trees cut near sites must be felled away form the site's location.

3. Insure mitigating for possible impacts from logging systems (i.e. roadways) by adequately buffering away from site number 06210400015.

4. Sites located within prescribed burn units, must be protected through a buffer using either hand lines or wrapping. Hand lines must create a perimeter around the sites of approximately 60 ft.

Project Design Elements for Alternative C

In addition to the Project Design Elements Common to all Action Alternatives, Alternative C would add the following project design elements:

- Proposed treatments will be scheduled to protect soils. All logging activities will be restricted to the months July through March when soils are either dry and/or frozen.

- Use of temporary snow roads will be encouraged and used where temporary roads are proposed.

- Prescribed fire applications will be timed to prevent damage to soils and, to the greatest extent possible, overstory trees.

MONITORING

Best Management Practices (Soil and Aquatic Resources)

Monitoring is included in the discussion of each BMP (Best Management Practice) in Appendix B.

Timber

- Monitoring should record results of secondary mortality[49] following burns.

- Monitoring will occur after harvest and fuel treatment activities to determine the success in attaining objectives and the need for further treatment (pre-commercial thinning, reforestation, etc.).

Fire/Fuels

- Prescribed burns are monitored until they can be declared out.

- The monitoring program will be conducted to evaluate the effectiveness of treatment options in meeting fuel management objectives. The District monitoring program includes establishing plots in representative units within the project area. There will be pre-burn, implementation, and post-burn monitoring of the sites in accordance

[49] **Secondary mortality** is the death of a tree caused by an agent or pathogen that kills a tree weakened by an initial disturbance.

with Republic Ranger District's Prescribed Burning Monitoring Plan and as required in Forest Service Manual 5100 – Fire Control, Chapter 5140 – Prescribed Fire.

Water

- Water quality monitoring for fecal coliforms and suspended sediment is recommended at the National Forest boundary on North and West Forks of Trout Creek bimonthly during the summer of the years of treatment.

Wildlife

- Intentions are to mitigate for the loss of snags by inoculating 350 > 20-inch diameter live Douglas-fir or ponderosa pine trees with an appropriate native heart-rot fungus to encourage heart-rot, and, therefore, a potential cavity-nest tree. Subsequent to inoculation, these trees would be monitored for five consecutive years to determine success.

- Monitor annually known and any incidentally discovered raptor and great blue heron nest sites for a minimum until two years following completion of the management actions to quantify productivity and reproductive success rates.

- Forest Service employees are to maintain an awareness of the potential presence of threatened, endangered, or sensitive species, and be observant during visits to the project area. Any known or suspected wolf, grizzly bear, bald eagle, lynx, peregrine falcon, wolverine, loon, Pacific western big-eared bat, fisher, or great gray owl activity within the Trout project area is to be reported to the District and/or Forest Wildlife Biologist.

Fish

- Riffle pebble counts and repeated monitoring of several benchmarked residual pool depth sites would be done on two stations in the Bowe/Hougland Meadow Reach of West Fork of Trout Creek and reaches 1 and 2 of North Fork Trout Creek to verify the conclusions drawn in this analysis about the amount of additional sediment introductions. The fisheries biologist will be contacted before harvest or burning activities begin and then after the activities are over. The intent is for the fisheries biologist to get a baseline before the activities to compare with the post activity measurements.

Noxious Weeds

- Conduct project follow-up and review to determine success of weed treatments and re-vegetation efforts and detect new weed sites requiring treatment and make corrections as necessary.

- Follow-up monitoring and re-treatment of areas behind road closures and/or obliterated roads must be conducted, at a minimum, once a year for the first two years after the treatment or until such time as it can be verified that the weed infestation has been effectively treated.

Range

- Close monitoring during prescribed burning will need to be ongoing and, when it has been found that barriers have been eliminated, they must be replaced either through fencing or placement and/or dispersal of debris, if available.

Sensitive Plants

- Monitor selected populations of sensitive plants in the analysis area to determine their population trends.

- Develop and implement a plan to monitor skullcap populations in the analysis area to evaluate the effects of fire on this plant.

SALE AREA IMPROVEMENT OPPORTUNITIES

The following listed activities were identified by the various resource specialists as Sale Area Improvements that could be funded under the Knutsen-Vandenberg Act. Listing such activities in this Environmental Assessment is required in order for KV-SAI (Knutsen-Vandenberg--Sale Area Improvement) funding generated by the sale of timber under this EA to be used for the listed Sale Area Improvement Activities.

Activities that are included in the selected action (including mitigation measures) for this environmental assessment (Trout Vegetation Management Project) may be funded with KV-SAI funds without further NEPA analysis; however, other activities must be the subject of separate NEPA analysis before they may proceed. It should be noted that "separate NEPA analysis" may include NEPA analysis that has already been completed (e.g., Tonata Allotment Management Plan, 1997; Bamber Cluster Range Allotments,2003; Swan Lake, Quartz, and Trout Creek Grazing Allotments Reauthorization, 2005; Integrated Noxious Weed Treatment, Colville National Forest, 1998).

- There is a need for 3 new and 7 reconstructed spring developments within the Trout project area to provide water access to cattle and wildlife and to help protect riparian areas.

- There may be a need for new fencing in order to change of unit boundaries within Trout Creek and Tonata grazing allotments. These improvements would supplement existing improvements for maintaining a coordinated grazing system within the allotments.

- There are some opportunities to improve several wet areas and stream watering areas. This can be accomplished by building a fence to restrict cattle use, then installing a spring development or by hardening the watering area by the use of rocks and brush.

- There may be a need to control noxious weeds where current weed infestations are affected by road construction, road reconstruction, timber harvest, or prescribed burning.

ALTERNATIVES NOT CONSIDERED IN DETAIL

There were no alternatives that were excluded from detailed consideration.

Tim and Sue Coleman, and Kettle Range Conservation Group suggested in scoping comments that a "Restoration-Only" alternative be considered. Interested parties that included Tim Coleman and Kettle Range Conservation Group later developed Alternative C. The stated goal of Alternative C was: "to restore much of the Trout Creek watershed to historic, pre-fire suppression forest conditions….". Alternative C was fully considered in detail: Therefore, Alternative C met the request for a "restoration-only" alternative.

COMPARISON OF ALTERNATIVES

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 6. Alternative Comparison

Comparison Element	Alternative B	Alternative C
Purpose and Need: Reduce Hazard Fuels		
Acres treated in the wildland/urban interface to reduce Condition Class 2 or 3 stands to the next lower condition class. (Source: Heckly, 5/11/2005 Fuels Report, page 25)	2671 acres	2580* acres (97% of Alt. B)
Acres treated in Fire Regime[50] 1 or 3 to reduce Condition Class 2 or 3 stands to the next lower condition class. (Source: Heckly, 5/11/2005 Fuels Report, page 25)	2741 acres	2279* acres (83% of Alt. B)

[50] A natural **fire regime** is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Throughout time, it has influenced vegetation by its variations in frequency, predictability, intensity, seasonality, and extent.

Fire Regime 1 is an area that historically had low-severity fires every 0-35 years and is located primarily in low elevation forests of pine, oak, and pinyon-juniper. **Fire Regime 2** is an area that historically had stand-replacement-severity fires every 0-35 years and is located primarily on low- to mid-elevation rangeland, grassland, or shrubland. **Fire Regime 3** is an area that historically had mixed-severity fires every 35-100 years and is located primarily in forests of mixed conifer, dry Douglas-fir, or wet ponderosa pine.

Purpose and Need: Improve Forest Health		
Acres treated to improve forest health. (Source: Rourke, 5/17/2005 Silviculture Report pages 13, 20)	Total 8490 acres Dwarf mistletoe 2752 acres Bark beetles 2128 acres Root disease 381 acres	Total 7555* acres (89% of Alt. B) Dwarf mistletoe 1587* acres (58% of Alt B) Bark beetles 1247* acres (59% of Alt. B) Root disease 231* acres (61% of Alt. B)
Acres of the warm, dry Douglas-fir biophysical environment in (or moving toward) Structural Stage 7 (single-stratum with large trees). (Source: Rourke, 5/17/2005 Silviculture Report page 19)	1709 acres	916* acres (54% of Alt. B)

* treatment is less effective due to smaller diameter limits

Purpose and Need: Produce Wood Products		
Mmbf (Million Board Feet) of sawtimber offered for sale. (Source: Besemann, 5/12/2005 Economics Report, page 2)	12.3 mmbf	3.2 mmbf (26% of Alt. B)
Net Timber Value (Product value delivered to mill compared to purchaser's cost of product removal). (Note: Units with road costs exceeding timber value: Alt B: 1, 5, 18, 48 Alt C: 15, 18, 19, 21) (Source: Besemann, 5/12/2005 Economics Report)	Est. Product Value: Alt. B = $4,096,701 Est. Purchaser Cost: Alt. B = $3,159,045 Net Timber Value: Alt. B = $937,656 (1400% higher than Alt. C)	Est. Product Value: Alt. C = $1,026,888 Est. Purchaser Cost: Alt. C = $964,371 Net Timber Value: Alt. C = $62,517 (note: Alt. C is deficit: Estimated value is less than minimum rates ($91,692), therefore timber selling value would have to be raised to minimum rates. If a purchaser was not willing to offer more than appraised value, the timber would not be sold.)

Comparison Element	Alternative B	Alternative C	Timber Harvest Units Contributing to Differences
Issue: Water Quality			
Estimated percent sediment increase. (Source: WEPP Erosion and Sediment Model, in Glines 2/22/2005 Soils Report, pages 20-22. Note: WEPP models predicts sediment along a linear profile and does not predict total sediment)	6- & 15-year recurrent storm events: 0 to 0.64 tons per acre. 30-year recurrent storm event: 0.47 to 17.96 tons per acre.	Same values predicted by model, but Alt C has fewer high-sediment-potential units	Alt. B = Lower Unit 8, Unit 11, Unit 24 Alt C = Unit 11.
Acres of treatment.	8,490 acres (12% more than Alt. C)	7,555 acres	
Percent of basal area removed. (Source: estimate by project Silviculturist Mary Rourke, 9/20/05)	30-50%	10-20%	
Miles of road constructed and reconstructed by subdrainage. (Source: spreadsheet 9/21/05 by James L. Parker in project file)	Bodie: 0.74 reconst. Turner: 0.42 reconst. Upper Granite: 1.34 reconst. NF Granite: 1.49 reconst. Bacon: 0.67 reconst., 0.15 new const. Lake Butte Fork: 2.11 reconst. NF Trout: 5.97 reconst. Trout (lower subdrainage): 0.35 reconst. Upper Trout: 2.31 reconst. WF Trout: 7.92 reconst., 0.80 new const.	Bodie: none Turner: 0.42 reconst. Upper Granite: 0.78 reconst. NF Granite: 1.49 reconst. Bacon: none Lake Butte Fork: 0.84 reconst. NF Trout: 1.49 reconst. Trout (lower subdrainage): 0.35 reconst. Upper Trout: 0.71 reconst. WF Trout: 4.40 reconst.	Alt B has new road construction to access portions of Units 8, 19, 28. Alt C has no new road construction.

Issue: Wildlife			
Acres of project activities in "Late and Old" structural stage stands and Forest Plan-designated "Management Requirement" habitat areas. (Sources: Late & Old acres—Parker, "Structural Stages" data tables in project file. Pileated Woodpecker and Pine Marten MRUs—Parker, "Wildlife Areas" data tables in project file.	"Late & Old:" 1104 acres (all activities) (5% more than Alt. C); 130 acres with timber removal (333% more than Alt. C) Pileated Woodpecker MRU: 157 acres with timber removal (171% more than Alt. C) Pine Marten MRU: 307 acres with timber removal (8% more than Alt. C)	"Late & Old:" 1054 Acres (all activities); 30** acres with timber removal Pileated Woodpecker MRU: 58** acres with timber removal Pine Marten MRU: 284** acres with timber removal	Alt B = Units 19, 28, 44, 48 Alt C = Unit 28 Alt B = Units 14, 28 Alt C = Unit 28 Alt B = Units 10, 12, 15 Alt C = Units 10, 12.
Acres of canopy cover greater than 60% within Management Area 6 & 8 (mule deer winter range). (Source: Luttich 2/25/2005 Wildlife Report, pages 10, 11. (Under Alt B, 90 acres of Unit 23 may result in average canopy cover <60%)	293 acres (33% of MA 6 & 8 in thermal cover following project)	383 acres (43% of MA 6 & 8 in thermal cover following project)	Alt B = Units 23, 25, 26, (Units 23 not in MA 6 & 8, but noted by Wildlife Biologist as used during winter by mule deer). Alt C = no timber harvest that would reduce crown cover below 60%.
Acres of new access for snags (200 feet on either side of the road). [Source: New Construction Road miles (0.95 mi. Alt. B; 0 Alt. C) from Gilmore 5/4/2004 Transportation Report; closed roads opened (6.01 mi. Alt. B; 3.54 mi. Alt. C) from Parker 7/6/2005 "Roads that would be Reconstructed or Constructed" Data Table. Miles of road x 5280 feet/mile x 400 foot width of wood gathering zone / 43560 sq ft per acre = acres affected. All of these roads would be closed following the project, but for the purposes of this comparison element it is assumed that roads would be open long enough for at least some access by wood gatherers.]	337 acres (96% more than Alt. C)	172 acres	Alt B = Roads accessing Units 1, 3, 6, 8, 10, 11, 15, 18, 19, 25, 28, 30, 31, 40, 41. Alt C = Roads accessing Units 10, 11, 15, 18, 40, 41.
Change in acres of denning habitat. (Source: Luttich, 2/25/2005 Wildlife Report, pages 81, 82.)	79 acres (193% more denning acres affected than Alt. C)	27 acres	Alt B = portions of Units 1, 15, 18, 21, 24 Alt C = portions of Units 18, 21.

Miles of drivable road (pickup trucks). (Source: Trout Roads Analysis (Parker, 9/15/05), New Construction Road miles (0.95 mi. Alt. B; 0 Alt. C) from Gilmore 5/4/2004 Transportation Report; closed roads opened (6.01 mi. Alt. B; 3.54 mi. Alt. C) from Parker 7/6/2005 "Roads that would be Reconstructed or Constructed" Data Table. All of these roads would be closed following the project, but for the purposes of this comparison element it is assumed that roads would be open long enough for at least some drivable access. This element does not account for closed roads that are accessable to all terrain vehicles, and it is assumed that all constructed and reconstructed roads would be used to some degree by ORVs following closure.	Level 2 & 3 (open classified roads) = 62.63 Open unclassified roads = 9.67 Level 1 (closed classified roads) re-opened/reconstructed = 3.02 Closed unclassified re-opened/reconstructed = 2.99 New road construction = 0.95 Total miles of drivable Road = 79.26 (5% more than Alt. C)	Level 2 & 3 (open classified roads) = 62.63 Open unclassified roads = 9.67 Level 1 (closed classified roads) re-opened/reconstructed = 2.64 Closed unclassified re-opened/reconstructed = 0.90 New road construction = 0.00 Total miles of drivable Road = 75.84	Alt B = Roads accessing Units 1, 3, 6, 8, 10, 11, 15, 18, 19, 25, 28, 30, 31, 40, 41. Alt C = Roads accessing Units 10, 11, 15, 18, 40, 41.
Issue: Fisheries			
New Road miles within RHCAs by subdrainage.	Bacon Creek: 0.02 miles WF Trout: 0.02 miles	None	Alt B = New roads to units 8 & 19 are partially in RHCAs. Alt C = no new roads.

Number of new and old road crossings. (Source: Examination of GIS map layer and tally on data form "Number of Road-Stream Crossings by Stream Class" by Parker, 6/22/05)	Existing road Crossings: 4 - Fish-Bearing streams 22 - Non Fish-Bearing streams 53 - Intermittent streams New Construction Crossings: 0 - Fish-Bearing streams 1 - Non Fish-Bearing stream 1 - Intermittent stream Reconstructed Crossings: 0 - Fish-Bearing streams 4 - Non Fish-Bearing streams 6 - Intermittent streams 81 Total Stream Crossings (3% more than alternative C)	New Construction Crossings: 0 - Fish-Bearing streams 0 - Non Fish-Bearing stream 0 - Intermittent stream Reconstructed Crossings: 0 - Fish-Bearing streams 3 - Non Fish-Bearing streams 3 - Intermittent streams 79 Total Stream Crossings	New road crossings: Alt B = roads to Units 8, 19. Alt C = none.
Acres treated by burning or timber harvest by sudrainage. (Source: Parker, "Activities in Subwatershed Divisions" data table)	Trout: 6051 acres (9% more than Alt. C) Granite: 1752 acres (27% more than Alt. C) Toroda: 455 acres (19% more than Alt. C) Upper Curlew Cr: 150 acres (same as Alt. C) Lower Curlew Cr: 71 acres (same as Alt. C)	Trout: 5569 acres Granite: 1378 acres Toroda: 381 acres Upper Curlew Cr: 150 acres Lower Curlew Cr: 71 acres	

Traffic volume on haul routes in RHCAs. (Haul Route = Road 2148000 above jct. with Road 2148050) (Source: Timber volume: Besemann, 5/12/2005 Economics Report, Appendix table "Economic Analysis Summary – Current Entry")	663 log trucks (2784 mbf)	213 log trucks (894 mbf)	Alt B = Units 2, 3, 11, 12, 13, 14, 48. Alt C = Units 11, 12.
Issue: Soil			
Acres of treatment.	8,490 (12% less than Alt. C)	7,555	
Miles of road construction and road reconstruction in Land Types prone to slumping. (Source: Glines 2/22/2005 Soils Report, page 6)	0	0	
Estimate of percentage of detrimentally disturbed soil in each activity area following treatment. (Source: Glines 2/22/2005 Soils Report, pages 34, 35)	Unit 31—15% Unit 33—10-15% Unit 38—17% Unit 39--<5% Unit 40—12% All other units: existing condition is <10% and is expected to meet Forest Plan Standards following treatment	Unit 31—Not treated Unit 33—10-15% Unit 38—17% Unit 39--10% Unit 40—12% All other units: existing condition is <10% and is expected to meet Forest Plan Standards following treatment	Alt B = Unit 31
Issue: Noxious Weeds			
Acres of bare soil created by project activities. (Source: Nash, 3/30/2005 Noxious Weeds Report, pages 14, 15)	470 (28% more than Alt. C)	366	
Projected change in extent of weed infestations, by species. Source: Nash, 3/30/2005 Noxious Weeds Report, pages 14-16 for individual weed species; page 17 for total increase)	Total estimated increase 69 acres, or 3.5% (117% more than Alt. C)	Total estimated increase 32 acres, or 1.6%.	Estimated soil disturbance: Alt B = 470 acres Alt C = 366 acres

** treated acres would be affected less, due to smaller diameter limits

Chapter 3--Environmental Consequences

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for the comparison of alternatives presented in the chart above.

CUMULATIVE EFFECTS DISCUSSION

In environmental analysis, three types of effects are considered: direct[51], indirect[52], and cumulative[53] environmental effects. Direct and indirect effects are described for the various topics below. Cumulative effects are also described affected resources, but because cumulative effects involve the additive effect of project actions on the effects from past, present, and foreseeable future actions, an overview of the cumulative effects analysis process is included here.

On June 24, 2005, the CEQ[54] (Council on Environmental Quality) provided guidance on the extent to which agencies are required to analyze the effects of past actions (Connaughton, 2005). This CEQ letter is incorporated into the Trout project by reference. CEQ interprets NEPA (the National Environmental Policy Act) and CEQ NEPA regulations on cumulative effects as requiring analysis and a concise description of the identifiable present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the project actions may have a continuing additive and significant relationship to those effects.

CEQ states that agencies are not required to list or analyze the effects of individual past actions unless such information is necessary to describe the cumulative effect of all past actions combined. Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.

For the Trout project, past activities were examined closely in order to understand the aggregate effects of past actions. A list of past action was compiled for Forest Service and non-Forest Service activities in the vicinity of the Trout project. This compilation included the following:

[51] **Direct effects** are caused by the action and occur at the same time and place.

[52] **Indirect effects** are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

[53] A **cumulative impact** is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

[54] The **CEQ (Council on Environmental Quality)** was created by the National Environmental Policy Act of 1969. The CEQ provided regulations under 40 CFR (Code of Federal Regulations) 1500 that tell federal agencies what they must do to comply with the procedures and achieve the goals of the National Environmental Policy Act.

Cumulative Actions--Timber Harvest

National Forest System Lands

From 1955 to 1999, there were 44 timber sales within the Trout project area. About 9,000 acres were treated with 2,660 of these acres receiving more than one treatment. The totals by logging type are:

Table 7. Past Timber Harvest on National Forest System Lands in Trout Project Area

Harvest method	Acres	Comments
Clearcut	355	
Clearcut with reserve trees	147	
Final harvest	1096	
Overstory removal	326	
Partial removal	1425	
Salvage	753	
Sanitation	524	
Selection	161	
Shelterwood	2224	
Special cut	684	Unknown method on lands we acquired from Boise Cascade
Commercial thinning	72	
Unknown methods	3891	Most of this was in the late 50's and 60's. Some of the later units showing unknown were subject to pre-commercial thinning.

There are no other timber harvest projects currently occurring or planned in the project area other than this proposal.

The Maple Timber sale on the Tonasket Ranger District is near the southwest corner of the project area. It was within the Granite Creek 6th field watershed. This sale was harvested in 1983 as an overstory removal.

Lands of Other Ownership

In 2001, the private land within the Trout project area boundary along the West Fork of Trout Creek was logged in a partial cut prescription.

The table below is based on Washington State DNR (Department of Natural Resources) Forest Practices Applications received as of October 24, 2002, and updated with DNR Forest Practices Applications received as of October 18, 2004. Only activities on applications 1999 to present are listed. Activities prior to 1999 are listed on the DNR printout (in the Trout Analysis File), but aerial photos provide a better source of information. It is not known from the applications whether the property was actually logged, except that activities on applications prior to summer 2000 are likely visible on 2000 aerial photos.

For activities between 1999 and 2001, there is no information available from the DNR data printout as to silvicultural system used. It is reasonable to assume that most private landowners partially cut their property. For activities between 1999 and 2001, where legally-described Sections lie across watershed boundaries, it was not possible to determine in which drainage the activity occurred.

Table 8. Timber Harvest and Road Construction on State and Private Lands in Vicinity of Trout Project Area, from DNR Forest Practices Applications, 1999-2004

5th Field Watershed	Total Acres of Timber Harvest Reported on DNR Forest Practices Applications, 1999-2004	Miles of New Road Construction Reported on DNR Forest Practices Applications, 1999-2004	Acres in watershed (or portion of watershed analyzed)	Percent of watershed (or portion of watershed analyzed) affected by Timber Harvest
Granite Creek[55]	1,380 – 1,532 acres	3.6 - 12.8 miles	13,585 acres	10 – 11%
Curlew Creek[56]	1,520 – 2,062 acres	3.6 – 9.2 miles	25,428 acres	6 - 8%
Toroda Creek[57]	2,343 - 2,643 acres	17.8 - 22.0 miles	20,782 acres	11 - 13%
By 6th Field Subwatershed				
Upper Granite (Trib. of Granite Cr.)	140 acres	0 miles	2,631 acres	5%
North Fork Granite (Trib. of Granite Cr.)	1,110 – 1392 acres	2.2 – 9.2 miles	10,954 acres	10 – 13%
Trout Creek (Trib. of Curlew Cr.)	1,910 acres	3.6 miles	22,720 acres	8%
Barrett Creek (Trib. Of Curlew Cr.)	178 – 330 acres	0 miles	2,708 acres	7 – 12%
Bodie Creek (Trib. of Toroda Cr.)	132 – 1,790 acres	1.9 – 9.5 miles	3,082 acres	4 – 58%
Turner Creek (Trib. of Toroda Cr.)	14 – 988 acres	0 – 6.7 miles	3,878 acres	0 – 25%
Cougar Creek (Trib. Of Toroda Cr.)	415 – 839 acres	1.9 – 12.5 miles	13,822 acres	3 – 6%
By 7th Field Subwatershed Division				
Upper Trout Creek	50 acres	0 miles	1,846 acres	3%
North Fork Trout Creek	25 acres	0 miles	2,923 acres	1%
South Fork Trout Creek	30 acres	0 miles	1,795 acres	2%
Bacon Creek	423 acres	1.0 miles	2,522 acres	17%
West Fork Trout Creek	210 acres	1.1 miles	6,114 acres	3%
East Fork Cougar Creek	139 acres	0.4 miles	2,231 acres	6%

[55] Includes activities only Upper Granite Creek and North Fork Granite Creek 6th field subwatersheds. Does not include activities in other 6th Field subwatersheds within the Granite Creek 5th Field watershed.
[56] Includes activities only Trout Creek and Barrett Creek 6th field subwatersheds. Does not include activities in other 6th Field subwatersheds within the Curlew Creek 5th Field watershed.
[57] Includes activities only Bodie Creek, Turner Creek, and Cougar Creek, 6th field subwatersheds. Does not include activities in other 6th Field subwatersheds within the Toroda Creek 5th Field watershed.

Cumulative Actions--Wildfires

There have been no large wildfires in the project area in the last 60 years. District records show 50 small fires since 1945 but all were less than 5 acres in size. Lightning is very common in the project area, especially in the Storm King area and wildfires are expected to continue.

Cumulative Actions--Prescribed Fires

There been no natural-fuels prescribed burns in the project area and none are planned in the near future. An undetermined amount of activity-fuels prescribed burning (logging slash disposal/site preparation burns) have been conducted in conjunction with timber harvest described above.

Cumulative Actions--Fuels Reduction

A small portion of private lands along the east boundary south of the West Fork Trout Creek Road have been treated since 2000 to reduce the accumulation of forest fuels. Ladder fuels and the majority of the material on forest floor (brush and downed limbs and trees) were removed. Fuels reduction also occurred on the private land along the south boundary along County Road 253 (T37N, R32E, Section 19). The district has the Storm King Fuels Reduction project in progress along the southern border of the project area. This project decision was signed in 2001 and consists of fuel reduction in a strip approximately 300 feet in from the National Forest boundary. Only chainsaws, handtools, manual piling, and burning the piles would be used for the Storm King project.

Cumulative Actions--Noxious Weed Management

Noxious weed control using a variety of methods (e.g. chemical, mechanical, manual, cultural, and biological) will be used on noxious weed populations both on and off non-National Forest System Lands. Implementation of the Colville National Forest 1998 Environmental Assessment for Integrated Noxious Weed Treatment will continue.

Cumulative Actions--Erosion Control

Approximately 1.5 miles of road in the main fork of Trout Creek were decommissioned in the mid 1990's. This was done through a combination of re-contouring some sections of road, ripping and seeding some areas, and blocking access in other sections. Colville National Forest Revegetation Guidelines will continue to be implemented. There are no specific projects planned for erosion control.

Cumulative Actions--Livestock Grazing

Livestock grazing has occurred in the project area since the area was settled in the late 1800's. The project area is within the Trout, Tonata, and Empire allotments. It is expected that numbers of livestock and grazing systems will continue in the project area in a manner similar to what they are today.

Cumulative Actions--Recreation

There are no developed recreation sites in the project area but there are dispersed sites at Ward and Empire Lakes as well as other locations scattered throughout the project area.

There is one trail in the southwest portion of the project in the Clackamas Roadless Area. There are no plans to develop recreation sites in the project area. It is expected that use will continue similar to what it is now.

Cumulative Actions--Mining

There are no current or proposed mining activities in the project although there are numerous claims. Expected future activity is minor prospecting on these claims. The only recent-past activity has been minor prospecting.

Cumulative Actions—Conclusion

As demonstrated above, the Trout project would take place in the context of extensive and ongoing logging, grazing, recreation, and fire suppression, activities, both on and off of National Forest System lands. While an effort was made to catalogue the individual actions, the Interdisciplinary Team realized that individual accountability for 100% of such past, present, and future activities was virtually impossible. Given CEQ's direction that suggests that it is not necessary to list and account for past actions on an individual basis, the ID team determined that recognition of the general extent and magnitude, over time, was sufficient to understand the additive effects of the Trout project actions for the various resources.

Cumulative effects discussions are included for each affected resource. See below the Cumulative Effects discussions for Timber, Fuels, Water, Wildlife, Fisheries, Soils, Noxious Weeds, Air, Range, Recreation, and Visual Quality.

ENVIRONMENTAL CONSEQUENCES BY RESOURCE OR TOPIC

Timber Vegetation

Information provided in this Environmental Assessment about the timber resource is excerpted from Trout Vegetation Management Project Silviculture Report by Mary Rourke, May 17, 2005. This full text of this report is incorporated by reference. The Silviculture Report describes the current and desired conditions with regards to timber abundance of stand structures across the landscape, tree stocking levels within stands, and insect and disease conditions. It also describes and compares the environmental effects associated with the various alternatives (Alternative A--No Action, Alternative B--Proposed Action, and Alternative C). Measures intended to mitigate adverse environmental effects are also included.

Existing Conditions

The timber-vegetation in the analysis area is in a stressed and overstocked condition. Much of the area is prone to insect and disease attacks and undesirable fire behavior due to excessive fuels. Insect and disease exists in the area in moderate to high endemic[58] levels. Some of the most severe disease problems are in the dry and moist Douglas-fir

[58] The term "**endemic**" refers to organisms constantly present in a particular region; said of a pathogen agent that is generally under control. In contrast, **Epidemic** refers to the rapid spread, growth, and development of diseases or insect populations that affect large number of a host population throughout an area at the same time.

biophysical environments, especially in multi-story old growth found on National Forest System lands. The Douglas-fir BEs (Biophysical Environments) are outside of HRV (Historic Range of Variability), overstocked and diseased. Global climate change is expected to increase problems in the future. There is a high risk of future fire in these areas whether they are treated or not, but restoration can limit the ecological damage caused by uncharacteristic fires (ground fire vs. crown fire).

Alternative A (No Action)

Taking no action would fail to reduce tree stocking and fail to begin to convert multi-storied acres to single storied stands in accordance with HRV. There would be no reduction in hazardous fuels to improve the fire resilience of the stand. Stand susceptibility to insect and disease attacks would be unchanged and would worsen over time. Tree and stand vigor would continue to decline.

Alternatives B and C

The main difference between the alternatives is the amount of acres being treated and the intensity of the treatment. The following discussion applies to both action alternatives.

The action alternatives treat 61 percent of National Forest land the project area in Douglas-fir BEs. Of that, 27 percent is being treated mechanically, with over half of that moving toward single-story old growth. The burning is expected to begin restoring an additional 34 percent.

Timber Harvest

Thinning with the aim of increasing tree vigor and growth, and reducing the probability of stand-replacing wildfire (crown fires) are the main vegetation treatments included in the action alternatives. In general, the objectives are achieved by mechanical vegetation treatments and prescribed fire. Treatments would be prescribed to increase tree and stand vigor by reducing the number of trees per acre. This will also reduce conditions favorable to forest pests, reduce crown bulk density (vol-wt/sq ft), canopy continuity and ladder fuels. Treatments would bring the landscape closer to historical mosaics as measured by HRV by targeting stands in the Douglas-fir BEs that aren't designated wildlife areas for a target structural stage of single-story old growth (Structural Stage 7).

The East-side Screening Direction prohibits harvest of green trees with a diameter of 21 inches or greater. A good percentage of large larch and Douglas-fir are infected with dwarf mistletoe. Leaving large infected trees in units, especially those where the future stand is the residual stand will result in continued infection of susceptible species in the understory.

Hazard Fuels Reduction

Burning for natural hazard fuels reduction is prescribed in both action alternatives. In general, prescribed burning coupled with mechanical vegetation treatments compliment the silvicultural objectives of the project (to move structure toward a mix represented by HRV, reduce the potential for damaging forest pests and uncharacteristic wildfire damage). Introducing fire into the stands where it has traditionally been present may help with nutrient release, balancing soil microfauna and restoring other ecological processes.

However, prescribed burning is unpredictable and can exacerbate forest pathogen problems and damage desirable trees.

In the short term, burning creates an additional stress on the stand. Burns that are too hot may burn tree tissue and encourage insect attacks. Anchor roots may be burned causing trees to fall over. Soil organic matter is volatilized and site productivity may be reduced if burning becomes too hot. However, burning within prescription is not likely to reduce soil organic matter to below recommended nutrient levels (nutrient requirements in the dry Douglas-fir stands are 10-15 tons per acre; 15-20 in the subalpine fir stands (Brown, 2003). Weakened trees become more susceptible to secondary pathogens like turpentine and Douglas-fir bark beetles. Since burning is an unpredictable process, a certain amount of damage is expected. On the other hand a fire may burn too lightly, have little effect on the stand and not achieve the treatment objectives. Because fire has been absent from the watershed for several rotations, some damage to the residual stand is inevitable as fire burns off layers of accumulated needle duff, seedlings, saplings, and mistletoe brooms. Mitigation measures (Timber Management) 1 and 2 should minimize detrimental effects due to fuels reduction activities.

Units scheduled for treatments that encourage SS7 (Structural Stage 7)will be underburned following harvest. This will reduce competition from unmerchantable seedlings and some saplings as well as reduce ground fuels caused by harvest. Reducing understory competition is expected to help increase the vigor of the residual overstory through time. Some mortality of trees that are heavily infected with dwarf mistletoe and thickets of understory trees are expected. Continued periodic (10-20 year intervals) underburns can help maintain stands in SS7.

Alternative B

Timber Harvest Treatments

Alternative B uses active management in the form of thinning and salvage harvests, mechanical fuels treatments and prescribed burns to modify species composition, stand structure and density, with the intent of achieving the purpose and need.

Alternative B would mechanically treat 3,506 acres, or nearly twenty percent of the land administered by the Forest Service in the Trout project area. Harvest would include 2,912 acres of commercial thinning to reduce density, treat fuels and insect/disease, 267 acres of small pole thinning, and 506 acres of thinning with the aim of increasing stand resistance to wildfire in the rural interface. 497 acres of thinning would occur in recently acquired lands that are currently in an overstocked and diseased condition. In addition, 190 acres of precommercial thinning and fuels reduction are proposed to reduce susceptibility to wildfire in the rural interface. This alternative would move 1,709 acres toward single story old growth structure. Approximately 200 acres would be spot planted with disease resistant western larch and ponderosa pine. Harvest is proposed in portions of five old growth habitat Management Requirement Units (MRU) to improve wildlife habitat in those areas.

Fuels Treatments -- Burning

Burning in Alternative B would include 6,263 acres of controlled burning. Many of the burn units that are timbered have some sort of mechanical treatment included. Commercial thinning coupled with prescribed burning is expected to better achieve fuels objectives in stands with closed or nearly closed canopies by breaking up canopy continuity and reducing crown bulk density as well as reducing ladder and ground fuels (Omi and Martinson, 2002, Graham et al.). Commercial or small pole thin treatments used in conjunction help to meet project objectives by reducing densities and the highly flammable dwarf mistletoe brooms, and moving stands closer to HRV. Alternative B proposes 2,744 acres of commercial thin followed by burn treatments, 329 acres of precommercial thin then burn treatments (includes shaded fuel brake non-commercial and precommercial thin) and 265 acres of small pole thin then burn treatment.

Most of the proposed burning without mechanical treatment is proposed in sites that are in rocky, non-timbered land or single storied dry biophysical environments. Burning without other vegetation treatments is expected to limit the ability of a wildfire to spread in the short term by burning the ground vegetation, killing seedlings and small saplings. This treatment is expected to help maintain stands in the single story condition described in HRV (Historic Range of Variability) in the in the northern part of the analysis area (Units G, I, and J) by clearing out clumps of seedling and small sapling ingrowth. Alternative B proposes 3,515 acres of burn only treatment.

With prescribed burning only, the treatments may eliminate smaller ladder fuels and increase the base to crown ratio, but there is usually not much effect to the larger understory or crown (Fule, et al., 2002; Graham, et al., 2004). Whipfalling can help eliminate competition and stress on the overstory by reducing densities and move the stands toward achievement of single story old growth. Alternative B proposes 3,497 acres of a whipfall then burn treatment.

Alternative C

Alternative C would commercially harvest 1,337 acres. In this alternative, Units 1, 5, 13, 14, 36, 42, 43, 44, 45, 46, 48 and 49 will not be treated. Units 2 (burn unit B), 3 and 4 (burn unit G), 20 (burn unit C), 22 and 23 (burn unit O), 31 (burn unit K), and 43 (burn unit Q) would be treated by prescribed fire only. Acres proposed for treatment in units 6, 8, 10, 11, 12, 15, 17, 18, 19, 21, 28, 30, 39 and 40 would be reduced. Unit 32 would include unit 34 and unit 26 would include unit 25. Units 7, 18, 19, 30, and 47 would be treated by a small pole thin and then underburned.

Two commercial harvest units are located in old growth habitat MRUs (Management Requirement Units) in Alternative C. Portions of units 14, 15, and 28 would not be treated. Harvest in these areas would allow reducing the pine component and basal areas down to a more sustainable level (80 sq.ft or less). This would open up growing space and release the overstory. This will not occur in Alternative C. The acres treated in Unit 28 are restricted to the WUI. Restoration of the rest of the unit would not occur.

Small pole thin and precommercial thinning to release the overstory, reduce crown densities and reduce crown continuity would not occur in Units 5, 11 (east part), the north part of 19, 42, 33, 45, 46, 48, and 49. These are all in the Douglas-fir BE except for 9 of 56 acres in unit 45, and 2 of 44 acres in unit 46. Small pole thin treatment would occur in Unit 19 and 30. These units are both in middle structure with dwarf mistletoe and bark

beetle infection. The small pole thin would help thin the understory, reduce ladder fuels and increase the height to crown average. However little would be done to release the overstory or reduce pathogens affecting overstory trees.

Timber Harvest Treatments

All commercial harvest units in Alternative C have diameter limits of 8, 10, or 12 inches. Diameter limits may require leaving a tree infected with dwarf mistletoe or other disease instead of a healthy vigorous tree.

In past trials and computer modeling efforts, diameter limits have not proven to be very effective in reducing fire hazard in any variable other than the ladder fuels and perhaps the height to live crown. Computer modeling by Regis Cassidy (1993) in dry mixed ponderosa and Douglas-fir stands, showed that while removing ladder fuels is effective in reducing the chance of crown fire from on-site ignitions, the potential for crown fires moving into the treated stands is not reduced with small diameter limit cuts. In fact the torching index (a measure of the potential for crown fire behavior) was not reduced to low with diameter limits less than 16-18 inches from a variety of basal areas. At basal areas greater than 124 square feet per acre the effect was even less. Under scenarios that looked at various BA (basal area) treatments, reduction to 80 sq. ft. BA/acre was relatively ineffective in reducing the torching index. Reductions to 50-60 sq.ft BA/acre density were more effective

Prescribed Burning

The research community agrees that potentially effective techniques for reducing uncharacteristic fire hazard include increasing canopy base height (to reduce crown fire ignition), reducing forest canopy continuity (to reduce crown fire spread), reducing surface fuels (to reduce spread and intensity of ground fires) and reducing canopy bulk density (to reduce crown fire spread) by reducing stem density and basal area (Peterson, et al., 2005). Alternative C proposes to use prescribed burning without prior mechanical treatment in Units 2, 3, 4, 20, 22, 23, part of 30, 31 and 43. Data shows these areas average from 500 to 1300 trees per acre less than five inches in diameter. With the burn only treatments the project objectives are not likely to be met.

This treatment will not bring stands toward HRV by reducing density and basal area. Such treatment will not affect canopy continuity and bulk density, or insect and disease problems such as dwarf mistletoe. Burning alone will not restore fire and disease resistant species to stands.

In prescribed burn units B, C, O, and Q, whipfalling is prescribed prior to burning. The intent is to provide fuel to carry the burn and to rid the stand of ladder fuels. However, those units have lots of volume and too much slash, and may prove too hot to handle without additional biomass removal.

Irreversible and Irretrievable Effects

The No Action alternative may result in the irreversible effect of loss of old growth structure and habitat if no management results in conditions that cause stand replacing fires in old growth. There are no irreversible or irretrievable effects associates with Alternatives B or C.

Cumulative Effects

Much of the private and state land in both watersheds has been harvested (most recently on State land in the east part of the area in the winter of 2004/2005) and is currently in early or middle structure. Future management of these areas is expected to keep lands in early and middle structure. Republic Ranger District to the north, has undergone timber harvest as recently as 2005. The Tonasket Ranger District last had harvest near the southwest part of the analysis area in 1983. The majority of old growth structure occurs on National Forest System lands. Therefore attainment of HRV percentages is reliant upon restoration of old growth stands within the Federal ownership.

Republic Ranger District has a high endemic rate of dwarf mistletoe (Paul Flanagan, Jim Hadfield personal communication). Past vegetation treatments often removed the older mistletoe infected overstory leaving an understory riddled with infection. The intent was to go back and treat the understory, however, funds to do so were lacking. These stands have aged, resulting in acres of stands of poor growth and vigor that are highly susceptible to crown fires. The problem is so severe on the District that the zone pathologist secured money to study and treat the mistletoe problem in old harvest units. 2,752 and 1,598 acres are expected to be treated to reduce dwarf mistletoe in Alternatives B and C respectively. While this is not a huge amount across the District (approximately 1%), this is a first step toward restoring these lands to a healthy vigorous condition.

Comparison of the Alternatives

Table 9 and Figure 2 show how many acres in each alternative are proposed to manage with the objective of converting the stand to SS7 (single story), and acres treated to reduce stocking in over-dense early structural stage stands. Target stand objectives are based on their biophysical environments, HRV, and the Forest Plan management objectives. In some cases, the attainment of the desired structural stage is expected to occur over the long term.

Table 9. Acres Treated by Alternative and Target Stand Objective

Alternative	Acres Treated to Improve Forest Health	Acres Moved Toward SS7 Target Condition	Acres Treated to Reduce Dwarf Mistletoe	Acres Treated to Reduce Bark Beetle Susceptibility	Acres Treated to Reduce Root Disease Susceptibility
No Action	0	0	0	0	0
Alternative B	8490	1709	2752	2128	381
Alternative C	7555	916[59]	1587	1247*	231*

[59] This is an overestimate as some of the units targeted for SS7 have diameter limits which will make treatments ineffective for conversion to current or future SS7 (unit 19 for example).

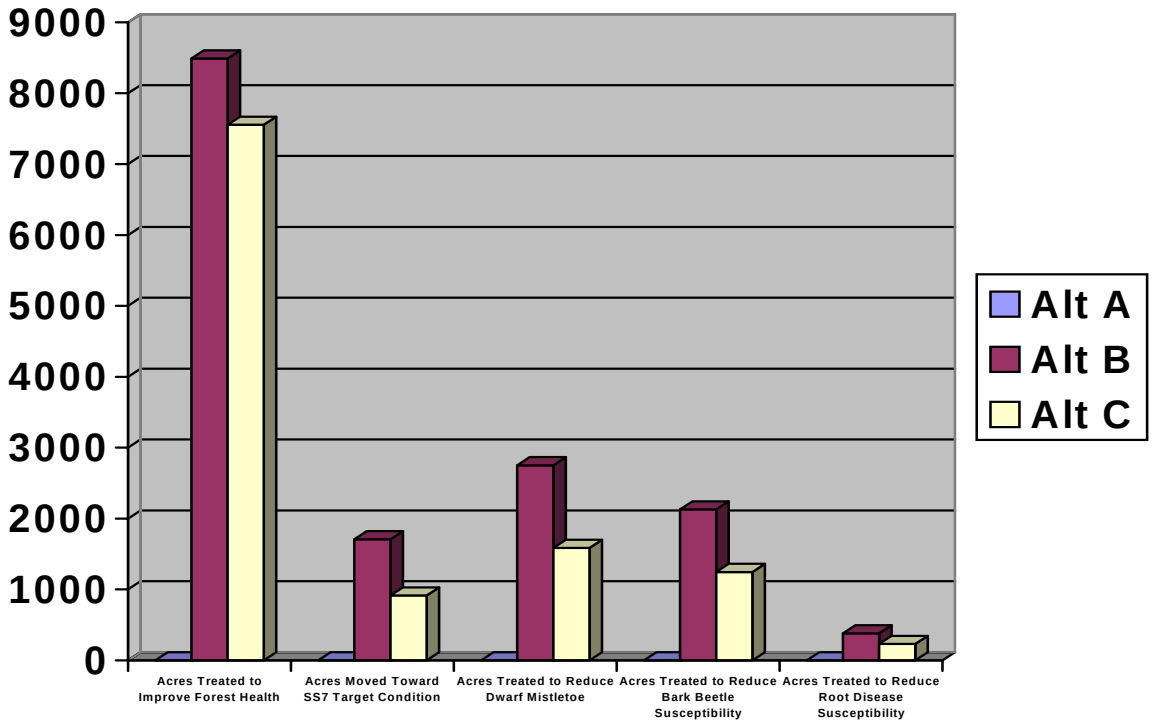


Figure 2. Acres Treated by Alternative and Target Stand Objective

The main silvicutural objectives for this environmental assessment are to reduced stand susceptibility to damage by forest pathogens and wildfire, meet Forest Plan standards including moving toward HRV, and increase vigor and resistance. This is best achieved by vegetative and prescribed fire treatments that reduce stand densities, incidence of insect and disease and stress on the at-risk stands of trees. Alternative B ranked highest. Alternative B treats the highest number of acres for restoration to HRV and reduction of insect and disease. Alternative B treats not only the understory but also the overstory for disease and fuels problems. Alternative B best achieves the silvicultural objectives.

Forest Fuels

Information provided in this Environmental Assessment about forest fuels is excerpted from Trout Vegetation Management Project Fuels Report by Reed Heckly, May 11, 2005. The full text of this report is incorporated by reference. The fuels report describes the current and desired conditions with regards to forest fuels and wildfire potential. It also describes and compares the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

Existing Conditions

Trout Fire Regimes and Vegetation

The vegetation within the Trout analysis area exhibits fuel conditions that are generally out of balance with the area's fire regime. The forests of the today do not exhibit the fire

resilience of the forests of the past. Well-intended fire exclusion efforts since the early 1900s have had the inadvertent consequence of allowing an accumulation of woody debris and timber litter, overstocking of trees, and thickets of crowded understory vegetation. Before the era of aggressive fire suppression, naturally occurring wildfires effectively kept the trees in the forest widely spaced, pruned of low-hanging branches, and consumed excess surface fuels on the ground. Since the vegetated environment had adaptations that allowed it to tolerate certain levels of fire, the forest could respond to disturbance with resilience. Fire suppression has interrupted those processes resulting in a currently unstable fuels condition. The fuels conditions have become "out of balance" in relation to the potential of the fire regimes that they occur in.

The role of fire in the history of Trout project area vegetation is exhibited in the species composition and stand structure of the timbered stands. Scattered throughout the Trout area are stands of timber where ponderosa pine or western larch exist as older remnant overstory trees. These two species are common dominant tree species in the Pacific Northwest because of their natural fire resistance. The very existence of ponderosa pine and western larch depend upon frequent disturbances that create openings in the forest canopy and renew suitable growing conditions for them to survive and perpetuate, conditions that are naturally created by the occurrence of fires.

Ponderosa pine is commonly found in the warmer southerly aspects, and western larch is commonly found in the cooler, moister northerly aspects throughout the Trout analysis area.

Western larch is commonly mixed with Douglas-fir and occupies sites that are cooler and moister than ponderosa pine. "It has been classified by various authors…as a subclimax species held indefinitely, chiefly by fire; and as an early seral or temporary species at least in northern Idaho and adjacent Washington…" (U.S. Department of Agriculture, Forest Service, 1965, 235-236).

Douglas-fir is a common tree throughout the Trout project area and defines many of the plant associations. Without underburning, ponderosa pine and western larch are replaced by the more shade tolerant but less fire resistant Douglas-fir.

The fire resistant, shade intolerant species of ponderosa pine and western larch only occur in dominant or codominant positions in Trout project area stands, and do not occur as understory species in any of these plant associations, indicating their poor ability to compete in the absence of disturbances that create openings and bare soil. The presence of shade-tolerant[60], fire intolerant species surrounding and overtaking the fire resistant, shade-intolerant[61] species indicate that the fire resistant species of trees are slowly being replaced. Without the disturbance regimes that maintained them, fire being the most

[60] **Shade-tolerant** refers to species of plants that can develop and grow in the shade of other plants. Generally these are fire-intolerant species (i.e., species of plants that do not grow well or die from the effects of too much fire).

[61] **Shade-intolerant** refers to species of plants that do not grow well in or die from the effects of too much shade. Generally these are fire-tolerant species (i.e., species of plants that can withstand certain frequency and intensity of fire).

widespread, ponderosa pine and western larch will gradually disappear from the landscape.

Stand Structure and Fuel Condition Class

Fuel Condition Class is a classification of forest fuels that describes the characteristics of vegetation and fuels in relation to fire regime. This classification is useful in that it indicates in a general way the degree to which a stand may be considered out of balance in regards to its vegetated state in relation to its fire regime.

Condition Class 2 or 3 categories describe stands where fire regimes have been interrupted; and as a result, vegetation becomes more susceptible to damage from fire, insect and disease. The Trout project area has extensive areas where the fuels condition class is inappropriate for its fire regime.

Surveys of the Trout Analysis Area reveal that condition class ratings are elevated to 2 or 3 in every proposed activity unit. In the absence of natural fires, many areas within the Trout planning area have become overgrown with shrubs and smaller diameter trees, (saplings and pole sized regeneration), creating stocking levels that are at risk to more severe and damaging wildfires. This buildup of natural fuels constitutes an additive factor in the intensity of summer wildfires when they do occur, adding to their resistance to control and likelihood of spreading. Accumulated fuels can provide a “fire ladder” allowing fire to gain access to the crowns of the dominant over-story trees. As ladder fuels increase over time, so does the potential for high intensity crown fires. When burning conditions are ripe as is common in the heat of summer, wildfires burning in such fuel conditions may easily destroy the stand, require high fire suppression costs, and threaten life and property values on neighboring private land. These kinds of fires have become increasingly dangerous and expensive to fight.

The following examples show some current problem forest fuel conditions common throughout the Trout project area. Each of these photographs were taken within stands that are proposed for treatment and are within two miles of homes on private land.

Figure 3. Examples of Current Fuel Conditions

Surface Fuels Downed woody debris (logs, branches, needles) tend to accumulate over time without mechanical treatment or the natural occurrence of fire, creating the fuel conditions that cause hot fires that easily damage overstory trees and are hard to control.	 Storm King 1022
Ladder Fuels Overstocking of small trees and brush creates a ladder of fuel from the ground into the treetops by which fire can "climb" into the crowns of overstory trees.	 Trout 80
Overstocking The physical spacing between trees is so close that branches are intertwined, creating a continuous network of fuels that are elevated above the ground. When conditions are right, a surface fire can become a crown fire, where the fire is sustained by fuels above the ground. Such crown fires are very difficult to control and spread quickly.	 Trout 250

Crown Fire Potential

As a result of the interruptions in fire regime and resultant increase in fuel condition class, the forest can develop increased potential of highly destructive crown fires. Fire suppression efforts are generally limited in effectiveness in slowing the progress of crown fires once they develop. They are dangerous events, both to firefighters and the public. In most cases, a crown fire stops when one of the factors in the fire environment changes; either weather, topography, or the fuel itself.

As the Fuel Condition Class increases, so does the Crown Fire Potential. A substantial percentage of the Trout project area exhibits elevated potential for crown fire.

Effects

WUI (Wildland/Urban Interface) Protection

Alternative A (No Action)

Indirect effects are that the fire hazards would remain elevated, and both WUI (wildand/urban interface) improvements and natural resource values would remain susceptible to destructive fires.

Overstocked stand conditions would continue to foster insect and disease problems, which accelerate dead fuel accumulations.

Cumulative effects of the No Action alternative include increased costs of fire suppression and private property insurance as fire risks increase.

Irretrievable effects may be experienced if a stand replacing fire occurs in areas where dominant fire resistant trees such as ponderosa pine and western larch are surrounded by dense thickets of Douglas-fir. Loss of pine and larch seed sources is likely in those circumstances. Replacement of mature pine and larch may exceed a human lifetime.

Effects Common To All Action Alternatives

Private properties along the National Forest boundary will become safer as hazardous fuel conditions are treated adjacent to their neighborhoods.

Crown fire and spot fires will be less likely near private improvements in case a fire spreads from the National Forest.

Fire suppression in the WUI can be attempted with greater success by ground forces. Air resources can more easily suppress fires where timbered canopies have been opened up to allow aerial retardants and water to penetrate to the ground.

Seedlings and saplings will be reduced in number so that dense thickets will no longer provide ladder fuels.

Dead and downed fuel accumulations will be reduced.

Tree canopies will be thinned and separated to reduce the capability of sustaining a crown fire.

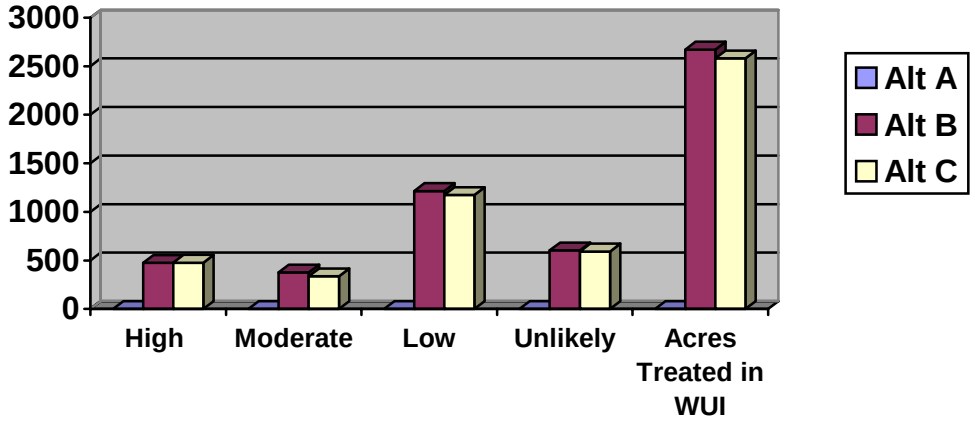
Effects unique to each alternative, and their differences

The following table shows the acres of elevated Crown Fire Potential within the WUI that would be treated by the project alternatives.

Table 10. Acres Treated to Reduce Crown Fire Potential by Risk Classification by Alternative

Crown Fire Potential	No Action	Alt B Proposed Action	Alt C	Percent difference between Alt B and Alt C
High	0	475	477	0.1%
Moderate	0	377	338	-1.5%
Low	0	1215	1173	-1.6%
Unlikely	0	604	592	-0.4%
Acres in WUI	0	2671	2580	-3.4%

Figure 4. Acres Treated to Reduce Crown Fire Potential by Risk Classification by Alternative



Crown Fire Potential and Diameter Limits

Alternative A (No Action)

The No Action alternative would do nothing but allow vegetation to continue sliding into a worse Fuel Condition Class with resultant increases in crown fire potential.

Indirect effects are that the fire hazard would remain elevated, and both wildand/urban interface improvement and natural resource values would remain susceptible to destructive fires. Overstocked stand conditions would continue to foster insect and disease problems, which accelerate dead fuel accumulations.

Cumulative effects involve a continuing elevation of fuel condition class. The build-up of fuels will contribute to greater fire intensities with greater impacts upon wildlife habitats, soil stability, and water quality.

Effects Common to both Action Alternatives

Each alternative does a full range of the same fuel reduction treatments, but in varying amounts.

Effects unique to each alternative, and the differences between them

Alternative B would reduce all levels of the fuel profile in 44% of the planning area. A combination of vegetation treatments and fuel disposal activities treat surface, ladder, and canopy fuels.

Alternative C attempts to solve complex forested stand problems while imposing diameter limits upon the cutting prescriptions followed by underburning only. Additional restrictions against the removal of trees down to a small diameter size remove flexibility in prescribing effective fuels and harvest treatments. Many dense stands have Douglas-fir understory trees that have grown to diameters over the minimum diameter specified in Alternative C. Diameter limits would hamper the ability to create adequate spacing and lessen crown fire potential.

Alternative C recommends underburning in Units 4, 6, 7, 8, 10, 11, 12, 18, 30, 31, 37, 40, and ZA/10 instead of mechanical piling. These units were not recommended for underburning in Alt B because of wildlife habitat concerns, thin-barked leave trees, or non-fire-resistant species. Underburning in these units will result in higher mortality because they are less suitable for this treatment. Additional canopy density remaining from diameter limit marking will also increase the amount of overstory mortality.

Each action alternative attempts to reverse the erosion of fuel condition class. Alternative B does more to reduce fuel continuity and produce a mosaic effect across the fuels landscape than Alternative C. While Alternative C is aggressive with underburning, it is unlikely to substantially reduce crown bulk density under a regime of diameter limits and minimal thinning, resulting in less preservation of fire dependent species. The benefits to vegetation from Alternative B will be positive for many decades in contrast to Alternative C, which will provide a positive benefit for only a decade or two, in less area.

Cumulative Effects of the Action Alternatives

The action alternatives would provide positive cumulative effects in the areas of fuel continuity and slowing wildfire spread, and species diversity.

The Trout Planning Area is an extension of a continuous timbered landscape for five miles in the Clackamas Inventoried Roadless Area to the southwest and west on the Okanogan-Wenatchee National Forest. With aggressive fuel reduction activities, a large fire expanding from the southwest or west would burn into a mosaic pattern of fuels which would slow spread and lessen the chance of extreme fire behavior in the Trout area.

Economics

The following is excerpted from Trout Environmental Analysis Economics Report by Larry Besemann, May 12, 2005. The full text of this report is incorporated by reference. The economics report examined the costs and benefits associated with wood products that would be removed under the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C).

The following issues were identified during the scoping process:

1. How much sawtimber and other wood products would be produced under each alternative.

2. What would be the cost (to the purchaser) of product removal compared to product value (delivered to the mill), for each alternative?

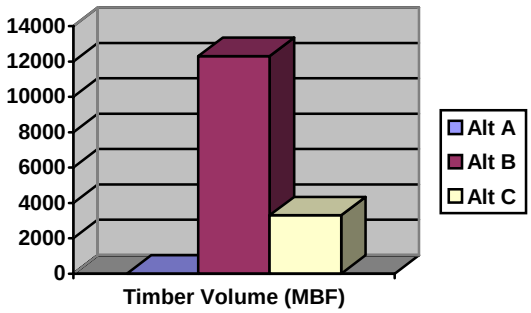
3. Which units will not have enough value to offset the cost of road construction/reconstruction?

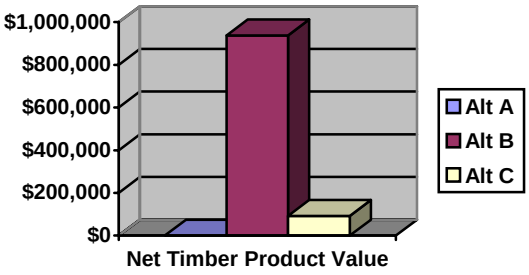
Table 11. Economics Summary

	No Action	Alternative B	Alternative C
Timber Volume	0	12.3 million board feet (23,600 CCF)	3.3 million board feet (6,300 CCF)
Logging Cost	0	$3,159,045	$964,371
Delivered Product Value		$4,096,701	$1,026,888
Net Timber Product Value	0	$937,656	$91,692*
Miles of Road Construction/Reconstruction not covered by Unit timber value	0	4.2	5.9
Units where value does not Cover Road Construction/Reconstruction costs	Not applicable	1, 5, 14, 18, and 42	15, 18, 19, and 21

*The net timber product value in Alternative C is actually $62,517. This value is less than the minimum value timber in this project can be sold for, and therefore the project is deficit. The minimum amount the timber products could be sold for would be $91,692.

Figure 5. Timber Volume and Net Timber Value Comparison





Both Alternatives B and C generate funds in excess of costs. The excess funds (Net Timber Product Value) can be distributed to several areas. Returns to the treasury from

receipts from selling timber is simply $0.50 per thousand board feet (MBF) or $0.26 per hundred cubic feet (CCF) and is the minimum distribution that is mandated. The remaining receipts can be distributed to the Roads and Trails Fund, which is 10% of receipts, the Salvage Sale Fund, which is generally 20% of the volume of nonsalvage sales, KV-SAI (Knutsen-Vandenberg Sale Area Improvements), and Retained Receipts under stewardship contracts. Typically, the distribution in order of priority is mandatory returns to treasury, roads and trails fund, salvage sale fund, mitigated sale area improvements, and remaining sale area improvements. Retained receipts under stewardship contracts generally take the place of sale area improvement funds.

Estimated costs for activities not included in the Timber Appraisal (above) are as follows:

Table 12. Estimated Costs for Activities Not Included in the Timber Appraisal

Work Item (unit of measure)	Cost per unit of measure	Alt B units of measure	Alt C units of measure	Alt B Cost	Alt C Cost
Underburn (acres)	$67	6263	7234	$419,621	$484,678
Pile Burn (acres)	$50	1973	215	$98,650	$10,750
Whipfall (acres)	$45	3497	3252	$157,365	$146,340
Precommercial thin (acres)	$120	86	44	$10,320	$5,280
Shaded Fuel Break following Commercial Thin (pruning, debris cleanup)(acres)	$150	263	248	$39,450	$37,200
Shaded Fuel Break wo/Commercial Thin (pruning, pre-commercial or non-commercial tree cutting, debris cleanup)(acres)	$220	243	177	$53,460	$38,940
Planting (acres)	$100	100	0	$10,000	$0
Mechanical Pile Commercial Thin Units (in addition to BD cost in appraisal)(acres)	$100	1515	44	$151,500	$4,400
Mechanical Pile Small Pole Thin Units (in addition to BD cost in appraisal)(acres)	$250	249	44	$62,250	$11,000
Snag Replacement (required mitigation)(trees)	$75	350	180	$26,250	$13,500
Barrier Restoration (required mitigation)(miles)	$5,000	4.7	3.4	$23,500	$17,000
Pre-Treatment for weed prevention (required mitigation)(miles)	$30	22.3	10.5	$669	$315
Total costs not included in Timber Appraisal				$1,053,035	$769,403

After returns to treasury, Alternative B could return receipts to the treasury ($0.26/CCF) and have $931,525 to distribute to the remaining funds. This amount could be used to offset approximately 88% of the cost of activities not included in the timber appraisal. The remaining work ($121,510) would have to be done with other funding.

After returns to treasury, Alternative C could return receipts to the treasury ($0.26/CCF) and have $90,066 to distribute to the remaining funds. This amount could be used to offset approximately 12% of the cost of activities not included in the timber appraisal. The amount of funding that would be required to cover the remaining work would be approximately $679,337.

Water

Information provided in this Environmental Assessment about hydrologic resources is excerpted from Trout Projects Environmental Analysis Watershed Report by Bert Wasson, May 23, 2005. The full text of this report is incorporated by reference. The watershed report describes the current and desired conditions with regards to sediment, water quality, and stream channel conditions for streams draining from the Trout project area. It also compares and describes the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

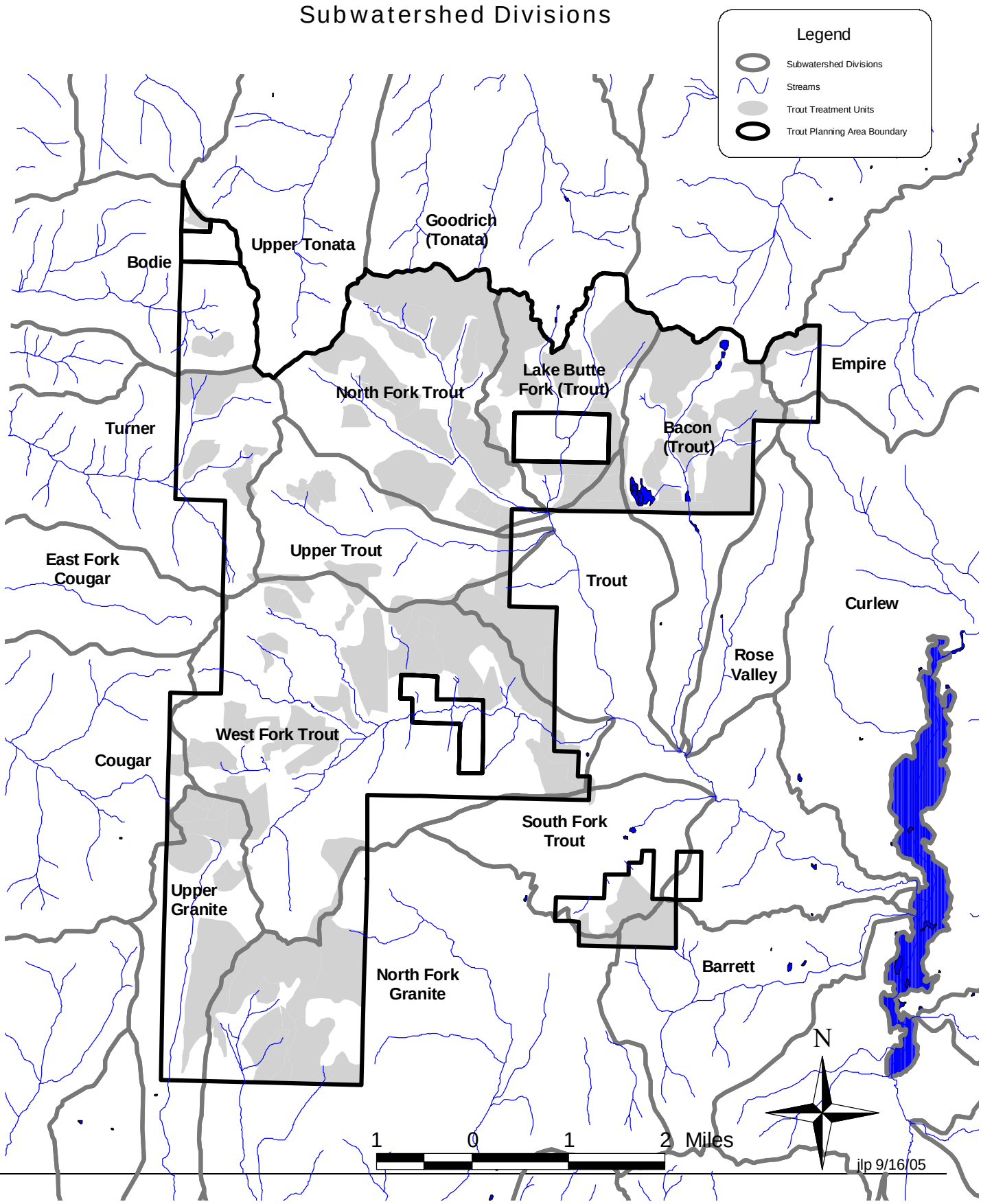
Existing Conditions

Existing conditions of water quality and sedimentation by drainage are:

> For Bodie, Turner, Cougar, Empire, Curlew, Upper Tout, (Lower) Trout (sub-drainage), South Fork Trout, Barrett, Upper Granite, and North Fork Granite Creeks, the Forest Hydrologist found no known water quality data or water quality problems. Two exceptions downstream of the National Forest were: (Lower) Trout (sub-drainage) has had significant grazing impacts downstream of the National Forest boundary, and Barrett Creek had elevated fecal coliform bacteria and nutrients reported in a 1988 study in the lower portion of the drainage during spring runoff.
>
> Bacon Creek – In Section 13, about ¼ mile of the intermittent portion of Bacon Creek has been impacted by livestock above the National Forest boundary. While streambanks have been disturbed, sediment is not moving offsite. The Empire Creek allotment is vacant now and the trend in the riparian area is towards improving bank stability and more thrifty riparian vegetation.
>
> Lake Butte Fork (of Trout Creek), - Water quality data was collected from 1998 to 2003 at various intervals near the confluence with Trout Creek. During that period, one dissolved oxygen reading exceeded the State criteria and one fecal coliform bacteria measurement exceeded the criteria. All other data met the criteria and the natural range of variability found on the forest.

Trout Vegetation Management Project

Subwatershed Divisions



North Fork Trout, - Water quality data was collected from 1966 to 2003 at various intervals. During that period there were 5 occasions when the fecal bacteria level exceeded the State criteria. Some of the livestock permittees have changed and additional fence constructed since the water quality was first tested. Even though North Fork Trout Creek was 303(d) listed by the State in 1998 as impaired for fecal coliforms, it was not recommended for listing on the 2002 list.

West Fork Trout, - Water quality data was collected at two locations from 1991 to 2003 at various intervals. During that period there were 5 occasions when the fecal bacteria level exceeded the State criteria but other parameters have met the State criteria. The creek has not been listed on the State's 303(d) list of impaired waters but was proposed for listing in the 2002/2004 listing cycle. No specific areas of impact have been identified.

From Colville National Forest Hydrologist's personal observations, there are a few areas in the 15 drainages where accelerated sediment is entering perennial streams. Stream crossings are mostly stable (no accelerated sediment) with adequate riparian vegetation. There are areas where livestock congregate in riparian areas and streambanks have been disturbed and sediment is mobilized at higher flows. However these areas are localized and are related to physical access by livestock. These areas are probable source areas for elevated fecal coliform levels and suspended sediment.

While North Fork Trout Creek was listed in 1998 for fecal coliform levels, the draft Colville National Forest Temperature, Bacteria and pH, TMDL (Total Maximum Daily Load) study indicates the creek currently meets the state standard (Draft Submittal Report, 2005). Allotment management has changed since 1998 and additional monitoring has occurred.

West Fork Trout Creek had elevated bacteria levels in 2003, but is not recommended for listing in the TMDL report. Grazing impacts are variable in the project area and generally meet the Colville National Forest Plan Standards and Guides.

Effects

Alternative A (No Action)

Under Alternative A, water quality and sedimentation are expected to remain as they are currently. The use of the roads would be similar to present use and there would continue to be a low level of accelerated sedimentation. Livestock grazing activity would remain the same in the three allotments with some contribution of wastes in the riparian area and disturbance of stream banks by hoof action. Sedimentation caused by livestock activity would continue at the present level.

The No Action Alternative would allow re-growth of vegetation to build up with no thinning or natural fire frequency to reduce vegetation. This could result in more stand-replacing wildfires, which would result in increased erosion and sedimentation.

Alternatives B and C

Alternative B proposes 0.95 miles of new road construction and one new stream crossing. Alternative C proposes no new road construction. Road Best Management Practices for drainage and soil stabilization/revegetation will be implemented. The new crossing structure will be installed using the conditions of the WDFW (Washington Department of Fish and Wildlife) Hydraulic Project Approval. Minor and temporary quantities of sediment (less than 3 cubic yards) are expected to enter the associated unnamed tributary of West Fork Trout Creek. Sediment resulting from the new stream crossing is expected to be short term and meeting laws and regulations.

Alternative B also proposes 14.1 miles of medium and 9.52 miles of light road reconstruction. Similar road BMPs will be implemented as for new road construction and the effects on the landscape will be less because the road profile is stable. Existing culverts on reconstructed roads (medium or light) will not be disturbed and no sedimentation is expected to occur at these crossings. Little or no soil erosion is expected from all of this roadwork and the disturbance is expected to remain within the clearing limits.

Alternative C proposes 5.91 miles of medium reconstruction and 5.57 miles of light reconstruction to access the treatment areas. The effects of this work would be similar to Alternative B, but of less total quantity.

Alternative B would treat 8,490 acres, and Alternative C would treat 7,555 acres, which include thinning and fuels reduction by broadcast or underburning. These treatments would introduce low and mixed severity fire onto the landscape over a 5-year period. Under low severity fire, 95% of the duff would remain and the fire would remain in the understory. Mixed intensity fires would consume up to 50% of the duff in places otherwise it would be similar to the low intensity fire. Riparian areas would be mostly unaffected except that a low intensity creeping fire might occur. It is expected that there would be no noticeable effects on erosion and sedimentation because the duff and infiltration capacity would remain functional. The combination of these treatments may have a slight effect of increasing the access of livestock to riparian areas, which in turn may slightly increase the bacterial level of streams. Livestock hoof action may reduce stream bank stability and mobilize bank sediments.

No direct pollution of streams is expected from the proposed activities (either harvest or burning). Water quality in the several drainages and Curlew Lake is expected to remain unchanged.

Cumulative Effects

Between 1955 and 1999 about 9000 acres of the Colville National Forest within the planning area have had various timber harvests and associated new roads. These activities have occurred over most of the drainages described above. Most of the soil disturbed during that time has revegetated and stabilized resulting in the current conditions described above and the trend is towards increased soil stability. Stream channel stability and water quality appear to meet the Forest Plan Standard and Guides as described in the “Existing Condition” section above. There are no other Forest Service timber harvest projects currently occurring or planned in the project area other than this

proposal. It is expected that there would be little difference in cumulative effects between the two alternatives.

Reviews of DNR forest practices applications received to date indicate a fairly steady level of harvesting and road construction off forest within the listed drainages. The Granite drainage has applications for 661 acres of harvest and 10.3 miles of road construction between 1999 and 2002. The Trout drainage including Barrett creek has applications for 783 acres of timber harvest and 3.6 miles of road construction for the same period. The Toroda drainage, in the headwaters of Bodie and Cougar creeks has applications for 2,109 acres of harvest and 18.4 miles of road construction for the same period.

Cumulative effects by drainage are as follows:

Bodie Creek Drainage, - In addition to Trout project treatments, DNR (Washington Department of Natural Resources) forest practices applications indicate a total of 840 acres of timber harvest and 5.3 miles of road construction in the Bodie drainage between 1999 and 2004. The cumulative effects of the proposed Forest Service treatments with these past treatments is considered undetectable since the needed roads are existing and there is little potential for site runoff to enter Bodie Creek.

Turner, - In addition to Trout project treatments, approximately 950 acres of timber harvest and 4.2 miles of road construction were scheduled off the National Forest in Sections 1, 2, and 12 in 1999. Also, 38 acres of timber harvest and 2.5 miles of road construction were planned in Sections 12 and 24 in 2001 and 2004. The cumulative effects of the proposed Forest Service treatments with these past treatments is considered undetectable since the needed roads are existing and there is little potential for site runoff to enter Turner Creek. Changes in water yield would be undetectable.

Cougar, - In addition to Trout project treatments, activities on private ownership submitted to DNR include 676 acres of timber harvest and 9.6 miles of road construction. These activities on private land were mostly in the lower part of Cougar Creek, and 1 to 2 miles from the headwaters where Forest Service activities will occur. Because the proposed activity impacts less than 10% of the drainage, cumulative effects of on the water resource are expected to be slight and non-polluting.

Empire, - Other than a portion of Burn Unit N (71 acres), there are no other known activities on private lands in the drainage and cumulative effects are not expected from the burn.

Curlew Creek, - Other than a portion of Burn Unit N (11 acres), there are no other known activities on private lands in the drainage and cumulative effects are not expected from the burn.

Bacon, - In addition to Trout project treatments, DNR forest practices applications in 1999 and 2002 showed 423 acres of harvest and 1 mile of road construction in the Bacon drainage. The cumulative effects of Forest Service activities would be slight since the creek is intermittent and spring flows might be extended a few weeks. Riparian area treatments will follow INFISH guidelines and accelerated sedimentation is expected to be minimal. The roadwork would not produce accelerated sedimentation into Bacon Creek. The Empire Creek allotment is currently vacant so livestock impacts are not an issue.

Lake Butte Fork (Trout), - In addition to Trout project treatments, there are no known activities planned on private land within the drainage. The proposed activity in both alternatives may increase livestock access to riparian areas and need to be mitigated with fencing. Otherwise, the activity will have no cumulative effects and is not expected to affect the riparian resource.

North Fork Trout, - In addition to Trout project treatments, DNR forest practices applications in 2002 showed 25 acres of harvest in the North Fork Trout Creek drainage. Cumulatively, the effects of the proposed activities on the National forest will exceed the effects of similar activities on private land. However, the sum of the effects is not expected to be detrimental to the riparian resources because of the BMPs and other mitigation that will be used.

Upper Trout, - In addition to Trout project treatments, DNR forest practices applications in 2002 showed 50 acres of harvest in the Upper Trout Creek drainage. The cumulative effect of either alternative is considered minor since it affects about 3% of the drainage.

(Lower) Trout (sub-drainage), - In addition to Trout project treatments, DNR forest practices applications in 2002 through 2004 showed 994 acres of harvest and 0.3 miles of road construction in the Trout Creek drainage. Cumulative effects are expected to be minor in terms of bacteria from livestock and sediment from soil disturbance. The proposed activities represent less than 10% of the drainage but conditions on private land have not been assessed.

West Fork Trout, - In addition to Trout project treatments, DNR forest practices applications in 1999 showed 210 acres of harvest and 1.1 miles of road construction in the West Fork Trout drainage. Cumulative effects are expected to be minor in terms of bacteria from livestock and sediment from soil disturbance. Annual streamflows would be expected to increase slightly due to the harvest, but peak flows would be unaffected on either alternative. The proposed activities represent less than 3% of the drainage but conditions on private land have not been assessed.

South Fork Trout, - In addition to Trout project treatments, DNR forest practices applications in 2003 showed 30 acres of harvest in the South Fork Trout drainage. Cumulatively, the proposed treatments would affect about 2% of the drainage and not have a noticeable effect on the riparian resources.

Barrett, - In addition to Trout project treatments, DNR forest practices applications between 1999 and 2002 showed 178 acres of harvest and 1.2 miles of road construction in the Barrett Creek drainage. It is not expected that there would be any noticeable cumulative effects from this treatment.

Upper Granite, - In addition to Trout project treatments, DNR forest practices applications in 2004 showed 140 acres of harvest in the Upper Granite drainage. Cumulatively, the effects of either proposed alternative would be minor on the riparian resources because it affects only about 5% of the drainage area.

North Fork Granite, - In addition to Trout project treatments, DNR forest practices applications between 1999 and 2004 showed 1392 acres of harvest and 9.2 miles of road construction in the North Fork Granite drainage. The cumulative effects of these similar proposals would be minor because it affects only about 10% of the drainage area.

The incremental effect of the fuels reduction projects on the soil and water resources, divided across the various drainages is expected to be slight and within the Forest Plan Standards and Guides. After assessing the current condition of the resource following past activities and prescribing highly effective BMPs for the proposed activities, it expected that there will be no adverse cumulative effects.

Wildlife

Information provided in this Environmental Assessment about forest fuels is excerpted from Trout Vegetation Management Project Terrestrial Wildlife Species Report by Stuart N. Luttich, February 25, 2005. The full text of this report is incorporated by reference. The wildlife report describes the current and desired conditions with regards to nine Management Indicator Species; waterfowl; migratory birds; and ten Threatened, Endangered, or Sensitive species. The report also describes and compares the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

Several threatened, endangered, or sensitive species that might occur on the Colville National Forest do not occur in the project area. There will be no impact to the species listed below from the implementation of this project, and these species will not be further addressed in this document.

- Northern Leopard Frogs have been documented on the CNF only from one location in the Pend Oreille Valley and amphibian surveys from 2000 to 2005 on the district did not encounter them;
- Common Loons, Clark's Grebes and Eared Grebes nest on large bodies of water, which do not occur in the area;
- Ferruginous Hawks and Sandhill Cranes do not nest in the area;
- The area does not contain large lakes that Pygmy Whitefish occupy;
- The project lies about 70 miles from the Woodland Caribou recovery area and does not contain adequate habitat;

Big Game

Existing Conditions

The Trout project area is not considered to be exceptionally favorable for providing mule deer winter range. Designated winter range (Forest Plan Management Areas 6 and 8) composes < 5% of the Trout project area, and < 2% of the designated winter range within the Republic Ranger District.

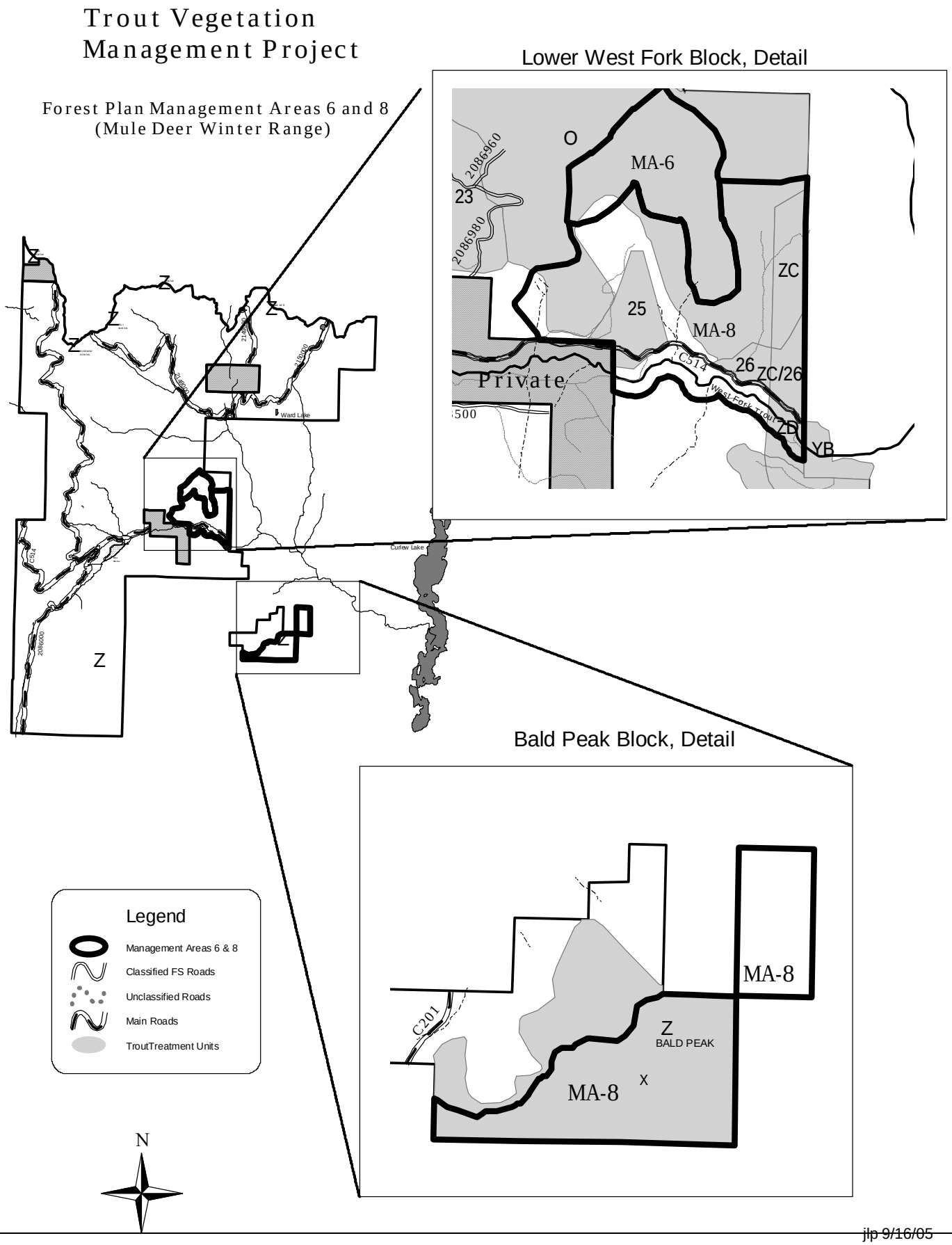
Approximately 383 acres (43%) of the designated winter range has been identified as providing winter thermal cover. Of these acres, 70 acres (8% of winter range) is classified as snow-intercept/thermal cover[62]. The nearly 500-acre balance (57%) of the designated winter range is categorized as forested and non-forested forage. The cover:forage ratio for the designated winter range within the Trout project area is 43:57, which is slightly less than 50:50 objective described in the Forest Plan.

Field surveys during the winter 2001/2002 tended to support the impression that the Trout project area does not provide particularly attractive mule deer or deer winter range. While a few tracks and deer were found throughout the Trout project area, the only true deer winter-yards were found on the southerly-southwesterly aspects of the ridgeline and benchlands within and adjacently west of the Management Area 6 & 8 block north of the West Fork Trout Creek. Subsequent, measurements of the habitat suggested the reason was primarily due to good feeding conditions where preferred ground-story browse has developed with an open under-story, but also with closed over-story to intercept snowfall and heat loss.

The current open road density in the Management Area 6 & 8 block north of the West Fork Trout Creek during the winter season is 0.64 miles/mi.^{2}, which is in excess of the $\leq$ 0.4 miles/mi.^{2} Forest Plan standard for mule deer in Management Areas 6 and 8. The reason is primarily due to 0.89 miles of County Road 514 within the southern boundary of the Management Area 8 block along West Fork of Trout Creek. The Forest Service does not have jurisdiction over County Road 514; thus compliance with the Forest Plan open road density standard is outside the Forest Service's control. All roads within the designated winter range block that the Forest Service does control are closed during the winter season.

Within the existing recognized forage areas, forage quality and quantity often appears to be in a declining trend due to having become over-developed into "old-age" woody browse. Much of the available browse and herbaceous forage are in need of treatment to rejuvenate individual plants and stimulate new growth. Understory thinning and prescribed burning, followed by seeding in suitable areas, particularly in areas having "dog-hair" and "pole-thickets" would greatly improve the overall capacity of the range to attract and hold mule deer (L. Bender, New Mexico State U., pers. com.; de Vos et. al. 2003).

[62] **Snow-intercept thermal cover** consists of multi-storied stands of evergreen trees with crown closure exceeding 60 percent, including an overstory of trees of 12 inch diameter or greater with crown closure of at least 40 percent.


Trout Vegetation Management Project
Forest Plan Management Areas 6 and 8 (Mule Deer Winter Range)
Lower West Fork Block, Detail
O
MA-6
23
2086960
2086980
ZC
25
MA-8
C514
26
ZC/26
Private
West Fork Trout
ZD
YB
Ward Lake
Curlew Lake
Z
Bald Peak Block, Detail
MA-8
C201
Z
BALD PEAK
X
MA-8
Legend
Management Areas 6 & 8
Classified FS Roads
Unclassified Roads
Main Roads
TroutTreatment Units
N

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Harvest and survey data collected by the Washington Department of Fish and Wildlife indicate that mule deer populations within the Trout project area, as elsewhere in Ferry County, continue to be in a declining trend. In addition, white-tailed deer (*O. virginianus*) continue to increase in proportion to mule deer in the overall herd composition. This is not just a short-term situation being brought about by severe weather or recent changes in hunting regulations, but a trend that has been occurring over several years (S. Zender, WDFW biologist, pers. com.).

Effects

Alternative A (No Action)

Under Alternative A, no action would be implemented to improve winter range conditions within or adjacent to the designated mule deer winter range units. Douglas-fir bark beetle infestations and vegetative congestion in the area would be expected to diminish the quantity and quality of existing cover and forage in the area under the No Action alternative. The existing cover:forage ratios would be further skewed away from the preferred 50:50 ratio.

Alternatives B and C

Prescribed burning activities conducted under both Alternative B and C are expected to provide a net beneficial effect for mule deer. While these activities may not provide an immediate measurable advantage in existing cover:forage ratios, the quality and quantity of forage available within existing forage areas should improve. Numerous studies have revealed the benefit to mule deer through the increased food and nutrition on recent burns, and, overall population levels not being affected by fire. Mule deer have been shown to neither abandon nor extend their home ranges after burning.

Under Alternatives B and C, cover and forage conditions both within and adjacent to the designated winter range are expected to improve and prove more attractive to wintering mule deer. Alternative B offers more mule deer winter range improvement through promoting the development of a healthier overstory, and less trees continuing to stand in varying states of disease and stages of mortality.

The net advantage to Alternative C would be in having controlled burning on an extra 943 acres, although 935 fewer overall acres would be treated. Overall, Alternative B would appear to provide the best opportunity for most expediently improving overall mule deer winter range and habitat.

Cumulative Effects

The cumulative effects by either of the action alternatives within designated Management Area 6 and 8 mule deer winter range will not be significantly different due to the relatively small amount of difference between the two alternatives coupled with the equally relatively small amount of designated mule deer winter range within the Trout project area, and the contribution of this range to the overall mule deer winter range within the Republic Ranger District. The relatively few acres being treated within the broader scale of landscape cannot be expected to generate any easily measured effect.

Pileated Woodpeckers

Existing Conditions

The Trout project area contains two designated pileated woodpecker reproduction and foraging habitat MRUs (Management Requirement Units). The existing pileated woodpecker MRUs are in compliance with Forest Plan direction regarding size, location and desired minimum snag densities.

Effects

Alternative A (No Action)

The No Action Alternative would not change current ecological trends in the habitat conditions, nor promote greater conformity with the current DecAID advisor[63].

Action Alternatives

One of the consequences resulting from the Trout project will be the reduction of multi-storied forest structures in areas having densely overdeveloped and overgrown understory ladder-type fuels, and promoting the eventual development of a more single-storied structural condition with larger trees. Larger old-growth single-storied conditions are generally considered more, rather than less, attractive to pileated woodpeckers.

Alternative B

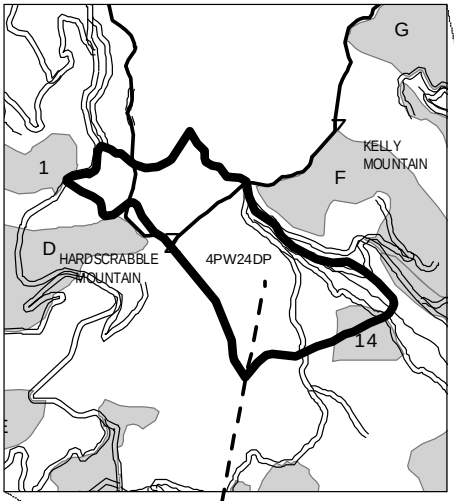
Alternative B will use commercial thinning to release and encourage the development of the remaining less-disease-infected trees, including trees with a diameter larger than 21 inches, and preserve and/or improve the development of old-growth functions. The resulting slash and deadfall will be selectively piled and burned. Intentions are to preserve the multi-structured stand conditions. However, protecting snags in compliance with Forest Plan standards can only materialize within the over-riding limitations imposed by U.S. Government-Office of Safety and Health Administration (OHSA) regulations.

Actions involving the thinning and removing of trees from an area risks the direct loss of snags from within the area since all snags within twice the radius of the height of the snag are subject to be being fallen for safety purposes. Mitigation is included that would protect snags that occur in groups or clumps, but this would not protect all snags within logging units. Along with exposing more of the snags for firewood cutting fairly well ensures that an undetermined proportion of all snags within a treated area will be subject to being fallen and/or removed.

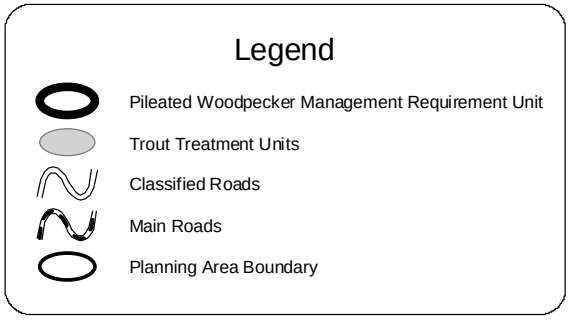
[63] The DecAID advisory tool (or Decayed Wood Advisor) is a synthesis of wildlife research and forest inventory data and represents new information regarding wildlife use and abundance of snags and down wood on forested landscapes across Oregon and Washington. Information about the DecAID advisory tool is available in the Trout project Analysis File at the Republic Ranger District.

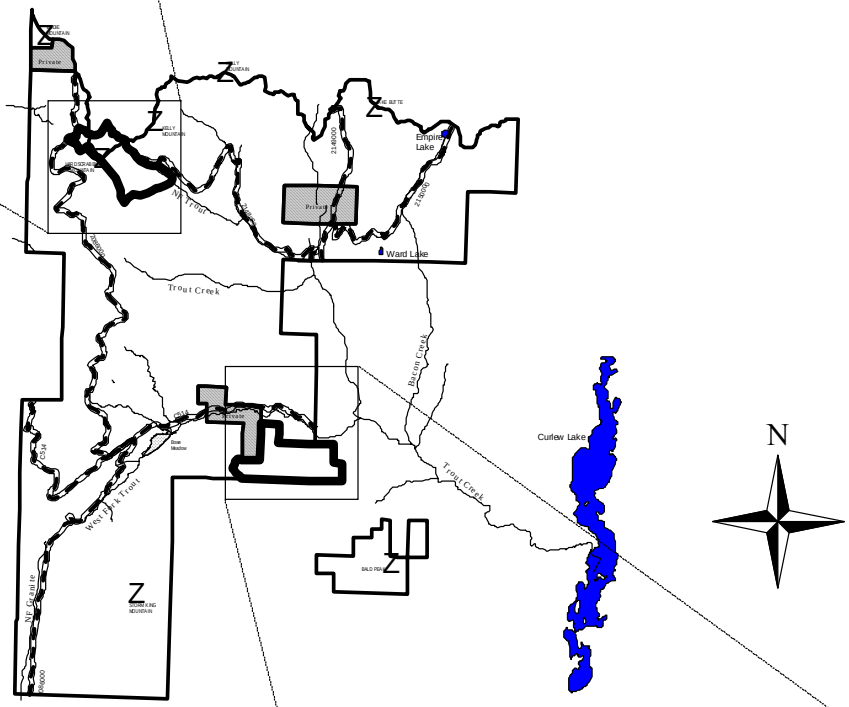
Trout Vegetation Management Projects

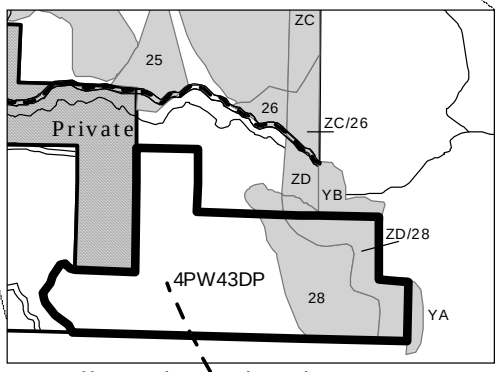
Pileated Woodpecker Management Requirement Units



Pileated Woodpecker Area
4PW24DP







Pileated Woodpecker Area
4PW43DP

A relatively minor proportion (11 acres) of the 352 acres in pileated woodpecker MRU 4PW24DP will be affected. If all snags larger than 12 inches in diameter were removed from these 11 acres, it would result in an overall snag density for the unit of 2.5 snags/acre for larger than 21 inch diameter snags, and 12.1 snags/acre for larger than 12 inch diameter snags, or an approximately 5% reduction in snag densities. While this loss of snags in the MRU still remains within acceptable levels for complying with Forest Plan standards for both nesting and foraging, the losses would only further lessen compliance with emerging suggestions in the DecAID advisor.

Within pileated woodpecker MRU 4PW43DP, Alternative B will apply to 146 acres of the total 436 acres. The 58-acre (13%) shaded fuel break along the Forest boundary will have further ground and ladder fuels reduced through hand-removing of seedlings and saplings, thinning of small diameter understory trees, and hand piling and burning the resulting slash and downwood.

Again, as in MRU 4PW24DP, if all 12 inch diameter and larger snags were to be removed from the 146 acres being treated in 4PW43DP, it would still result in the overall unit having snag densities of 4.7 snags/acre larger than 21 inches in diameter, and 21.1 snags/acre larger than 12 inch in diameter. These ratios remain well within levels for complying with Forest Plan standards. However, since the pretreated unit is only marginally within compliance when using suggestions emerging within the DecAID advisor, the further potential reduction in snags would result in the unit having less than 70% of the average snag levels found being used in the DecAID studies. This loss and these differences are considerable.

Only 0.05 miles of existing unclassified (non-system) roads will be restored for temporary use and 0.7 miles of temporary road will be constructed during the implementation of the thinning stage of the project. All restoration and construction will be in MRU 4PW43DP. Once logging is completed, the roads will be decommissioned and closed to discourage further use.

Applying the existing Forest Plan standards, Alternative B is not expected to have an important adverse effect on the pileated woodpecker MRUs within the Trout project area. The amount of affected area within 4PW24DP is relatively insignificant; and, while a larger proportion of area is being affected within 4PW43DP, the overall design and intentions are toward improving old-growth development. Furthermore, all roads being used to facilitate Alternative B will be permanently closed to access once the action is completed.

However, the same is not equally true when referencing the DecAID advisor. If the DecAID advisor is an applicable indication, the potential exists for the loss of at least one nesting pair in the short term. However, these losses may be more than equally compensated for through the natural creation of larger snags in the future by improving the growth potential of the remaining post-treatment stands.

In addition to promoting the growth and development of larger trees, reducing and eliminating ladder-fuels and stand-replacing wildfires is one of the primary objectives of

Alternative B and the Trout project. In this context, whatever favorable habitat stands to be gained in the absence of Alternative B also stands to be completely lost in the event of stand-replacing wildfire. Therefore, the greater long-term advantage for pileated woodpeckers might be in improving increased growth of larger diameter trees and clearing the understory of the potential for uncontrolled wildfires.

As Dr. Stephen L. Payne writes, "There must be a biotic imperative to the burning and extensive preparations, such as thinning, or other ecological engineering, are warranted in order to get the right mix of fires" (Tending Fires, 2004, pp 162). Fire alone will not be the universal solution. Other silvicultural activities, including thinning, are necessary. In this context, Alternative B may have an advantage over Alternative C.

Alternative C

Alternative C will use a combination of commercial thinning of trees smaller than 10 inch diameter, "whipfalling," and underburning on 13% (58 acres) of pileated woodpecker MRU 4PW43DP. The balance of the area will receive no treatment.

Pileated woodpecker MRU 4PW24DP will be totally unaffected.

Similar to Alternative B, and again assuming the eventual loss of snags within the prescription area, densities of snags larger than 12 inches diameter could be reduced by approximately13%, but still remain in compliance with Forest Plan standards. However, in referencing the DecAID advisor, the unit would have 9% less than the average found being used for snags larger than 12 inches in diameter, and, 15% less than found for snags larger than 21 inches in diameter.

Using the Forest Plan standards, Alternative C will not have an adverse effect on the pileated woodpecker MRUs within the Trout project area. The amount of area receiving treatment composes only a small fraction of the total. However, due to retaining more of the trees smaller than 21 inches in diameter, the improvements in old-growth characteristics may not come as quickly as under Alternative B.

With regards to the DecAID advisor, the potential exists for reducing the actively used habitat for pileated woodpeckers in MRU 4PW43DP. However, the loss is approximately 50% of what would be expected in Alternative B; and, the losses may be also more than equally compensated for through the creation of larger dimensional snags in the future by improving the growth potential of the remaining post-treatment stands.

In addition to promoting the growth and development of larger trees, reducing and eliminating ladder-fuels and the resulting threat of stand-replacing wildfires is one of the primary objectives of Alternative C and the Trout project, although the affected area in Alternative C is approximately 60 % less than in Alternative B. None-the-less, in this context, whatever favorable habitat stands to be gained in the absence of Alternative C also stands to be completely lost in the event of stand-replacing wildfire. Therefore, the greater long-term advantage for pileated woodpeckers might still be in improving increased growth of larger diameter trees and clearing the understory of the potential for uncontrolled wildfires.

Cumulative Effects

The cumulative effects resulting from the Trout project on pileated woodpeckers should not be of substantial importance. Neither Alternative B nor Alternative C should have any important negative impact on pileated woodpeckers within the prescribed areas or MRU units, and the prescriptions will likely improve future habitat conditions. Furthermore, the prescribed actions only complement similar actions on adjoining and adjacent National Forest system lands.

Barred Owl

Existing Conditions

The Trout project area contains a total of 530 acres of Forest Plan MA-1 (Forest Plan Management Area 1, old growth dependent species habitat), and 496 acres of barred owl foraging area, divided into two spatially separate areas. The Granite Creek MA-1 unit, located in the southwestern corner of the Trout project area, encompasses 451 acres, and is co-joined with a designated 294-acre barred owl foraging area. The Empire Lake/Bacon Creek MA-1 unit, located in the opposing northeastern extreme corner of the Trout project area, encompasses a total of 494 acres, and, is associated with a 202-acre barred owl foraging area. Distance between the two units/areas is approximately 8 miles, and, within the accepted dispersal distance being specified within the Forest Plan.

Effects

Alternative A (No Action)

Under Alternative A, no management related changes would be applied in the MA-1 or barred owl foraging areas. Natural processes would continue to dominate in this area. Existing conditions would be expected to stay the same or improve slightly over time. Changes in stand condition and/or progression toward the desired old growth conditions would be slow.

The risk of losing much of this area, including stands already in the desired condition, to stand-replacing wildfire will increase over time.

Alternatives B and C

Whipfalling and/or underburning are the only silvicultural activities proposed within the MA-1 areas or adjacent foraging habitats by either Alternative B or C. Therefore, neither of the alternatives should have any important impact upon the existing barred owl habitat conditions. Both Alternatives B and C would conduct prescribed underburning on virtually the same areas of MA-1 and barred owl foraging area. Less than 7% of Granite Creek MA-1 (31 acres) and 70% of the associated barred owl foraging area (206 acres) for a total of 32% of the designated Granite Creek barred owl habitat in the southwest corner of the project area will be underburned. These burns are designed for hazard-fuels reductions; and, are usually in the form of low intensity backing fires that are designed to consume ground fuels. Existing late, multi-storied structural stage habitat within the MA-1 would remain in its current structural stage. Barred owl foraging opportunities are expected to increase over time as a result of these burns.

Under the proposed prescriptions, few if any, existing snags, large downed logs, and overstory trees are expected to be lost. The fires are designed to reduce ground fuels, reduce competition and improve growth rates for existing overstory trees, establish more open understory conditions, and reduce the probability of stand-replacing wildfire in the future.

Over the long term, the treatments proposed under the action alternatives are expected to result in better and more stable habitat conditions for barred owls. However, the prescribed burning treatments pose a slight risk of stand-replacing fire, which would be considered an irreversible effect on existing barred owl habitat conditions.

Cumulative Effects

The cumulative effects will range between positive and neutral, due to no adverse effects being anticipated from Trout project. While, the loss of mature and old-growth forest conditions are continuing off the Trout project area and National Forest system lands, there are no additional losses anticipated from Trout project activities.

American Marten and Northern Three-Toed Woodpecker

Existing Conditions

The Trout project area contains nine designated marten/three-toed woodpecker MRUs (Management Requirement Units). Over the long-term, American marten/northern three-toed woodpecker habitat within the Trout project area tends to be gradually declining due to not addressing deteriorating timber stand conditions by insects, disease, and/or firewood removal.

Within the project area, existing insect and disease activity is increasing snag and downed log availability, but reducing canopy cover within several American marten/northern three-toed woodpecker MRUs. While the standing infected trees in many instances have the potential for improving the snag and downwood habitat for northern three-toed wood peckers, these potential snags still fail to conform with characteristics being currently documented for American marten. Despite increasing snag and downed log densities, canopy coverage below 50% decreases habitat suitability for marten and three-toed woodpeckers. This deterioration is interfering with meeting Forest Plan objectives.

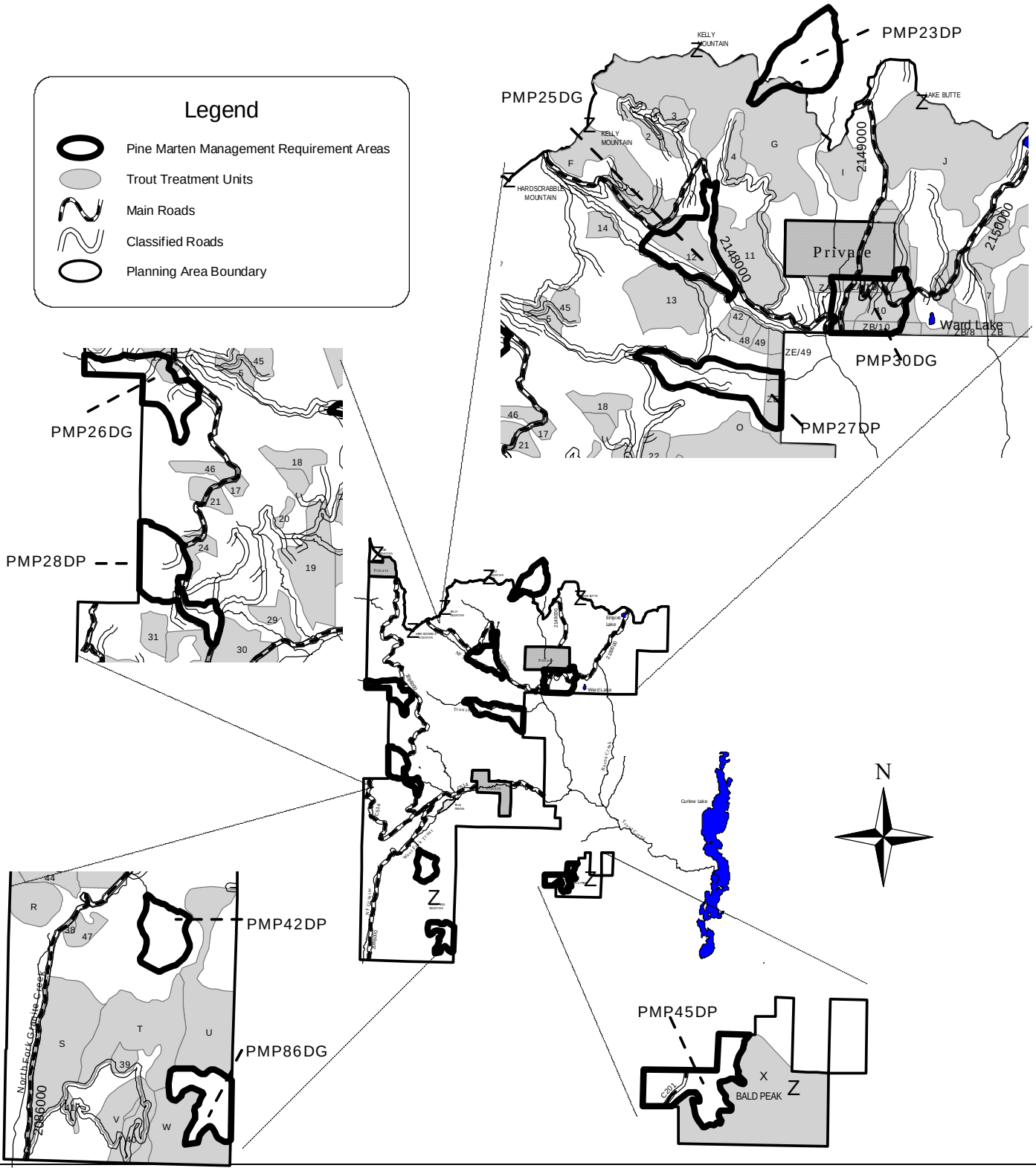
Effects

Alternative A (No Action)

Under the No Action Alternative, the existing conditions in and around the American marten/three-toed woodpecker MRUs will receive no direct habitat management. The opportunity to promote the development of mature and old-growth forest while, simultaneously discouraging stand-replacing fires would not be available.

Trout Vegetation Management Project

Pine Marten Management Requirement Units



Failure to selectively harvest and/or thin existing stands would not reduce or prevent losses of habitat from insects and diseases. Snag densities in American marten/three-toed woodpecker MRUs PMP25DG and PMP30DG will continue to not conform with either Forest Plan standards or the DecAID Wood Advisor due to the lack of available trees to contribute to that direction. Long-term opportunities to promote American marten and northern three-toed woodpecker habitat would be reduced. Existing conditions are expected to decline under the No Action Alternative as insect and disease conditions reduce canopy coverage within affected stands.

Effects Common to Alternatives B and C

Over the long term, the treatments proposed under either Alternative B or C are expected to assist in the stabilization and improvement of habitat conditions for American marten and northern three-toed woodpecker, and no irreversible or irretrievable effects are expected. However, the prescribed burning treatments pose a slight risk of stand-replacing fire, which could be considered an irreversible effect on the existing marten/three-toed woodpecker habitat conditions.

One of the consequences resulting from the Trout project will be changes that are intended to move forest stands from multi-storied forest structures with dense understory and ladder-type fuels, toward forest conditions with a more single-storied structural condition with improved growth and development of larger trees. Larger old-growth single-storied conditions are generally considered more attractive to American marten.

Of the nine marten/three-toed woodpecker MRUs within or partially within the Trout project area, six would have silvicultural actions under Alternative B, and four under Alternative C.

Both Alternatives B and C will result in underburning and/or thinning actions affecting between 19% (Alternative C, 320 acres) and 23% (Alternative B, 389 acres) of marten/three-toed woodpecker habitat – a difference of 69 acres. A major silvicultural difference is in the acres being proposed for commercial thinning and underburning vs. commercial thinning and mechanical piling. Alternative B would mechanically pile 212 acres, while Alternative C would underburn these acres. All of these acres are in PMP25DG (Unit 12, 91 acres) and PMP30DG (Unit 10, 121 acres). These mechanical piles are to be conserved and selectively targeted for not being burned in an attempt to compensate for loss of groundcover and ground dwelling prey habitat.

PMP23DP encompasses a total of 224 acres with 26 (12%) of these acres within the Trout project area. Both Alternatives B and C would underburn these acres with Unit G. No other timber or silvicultural action is being suggested for the area by either action alternative. This prescribed action should not adversely effect, and will more likely improve, the ability of the prevailing multi-structural forest habitat to attract and hold martens through groundfloor diversification.

Both Alternatives B and C should improve long-term marten and three-toed woodpecker habitat conditions. Alternative B would appear to provide the greater opportunities for maintaining natural snag and downed log densities and promoting a more healthy older-

aged dominant overstory through a more aggressive and/or targeted silvicultural and fuels management strategy.

Alternative B

In Unit 15, Alternative B proposes to commercially thin 22 acres (14%) of PMP26DG, and yard the fallen trees, with tops still attached. Subsequently, the resulting slash and felled non-commercial trees are to be piled and burned. The primary objective of the thinning is to remove the congestion within the "pole-sized" timber, and, promote the growth of the remaining more vigorous residuals. Improving the residual stand growth and development and suppressing the potential for uncontrolled wildfire on this relatively small area should be an added net advantage for marten.

In Unit ZE, Alternative B would implement a shaded fuel break along the National Forest Boundary in PMP27DP. Neither the number of acres being affected nor the activities on those acres are expected to adversely impact the future integrity of the marten/three-toed woodpecker MRU. The action is primarily in complying with needs for the wildland-urban interface. The effects on pine marten should be minimal.

The 218-acre PMP30DG is bounded on two sides by the National Forest boundary, and, as a result, stands to be significantly influenced by policies to control the potential spread of wildfire along the urban interface. While, both Alternatives B and C would treat 93% (202 acres) of the MRU (Unit 10), Alternative B is intended to moderate any potential negative impacts because mechanical piling, rather than underburning, would be done on a portion of the area. Mechanical piling and selective pile burning would preserve large diameter deadfall and create deadfall habitat opportunities on the groundfloor.

The Unit 10 thinning of overstocked understory and removal of diseased trees will promote the development of more desirable old-growth functions. The expected 30% loss in canopy cover is tolerable. While preferred snag densities will quite likely be temporarily further depressed on 13% of the total MRU, existing snag density for the entire MRU are already far less than ideal. This level of snag depression within a limited area is not considered unacceptable, and when combined with the degree of selective "pile and burning" associated with creating the required shaded-fuel breaks, the potential to further discourage marten inhabitation should be of marginal importance. Eventually, given enough time, a more desirable old-growth forest should develop (See Timber Effects discussion above). The overall net effect is not expected to significantly erode the habitat conditions for martens; and, to the contrary, will more likely create improvements for the future.

Alternative C

Alternative C would have no direct impact upon PMP26DG and PMP27DP; since no activities are being proposed within either unit.

While Alternatives B and C would affect the same number of acres in both PMP25DG (Unit 12) and PMP30DG (Units 10), Alternative C would take different actions. In Unit 12, Alternative C would replace 91 acres of mechanical piling and pile burning with 91 acres of underburning. Also, Alternative C would be more species selective by concentrating on removing diseased and infected lodgepole pines; and, in the absence of

lodgepole pines, thinning-out trees with a diameter smaller than 12 inches. Subsequently, the area would be underburned. Overall, after balancing the pros and cons, the effect on marten/three-toed woodpecker would likely be similar as found for Alternative B, with impact not being of any easily measurable importance.

A similar analysis and conclusion tends to follow for Unit 10 in PMP30DG. Commercial thinning and removal would apply only to trees with a diameter less than 10 inches. Again, the area would be underburned with no provision for selectively piling and burning of the slash. Any negative effect on pine martens would be difficult to measure.

Cumulative Effects

The cumulative effects resulting from the Trout project on pine martens should not be substantially different from those suggested above for pileated woodpeckers. Again, neither Alternative B nor C is expected to have any important adverse impact on American marten. Current existing conditions are often less than favorable; and these conditions will not begin to markedly improve until the level of competing understory growth is reduced and the development of larger trees is encouraged. The prescribed actions will likely improve future habitat conditions, and these actions only complement similar actions on adjoining and adjacent National Forest system lands.

Northern Bog Lemming

The Trout project area is not likely to contain suitable habitat for the northern bog lemming, thus the project will have no effect on this species. Northern bog lemmings occur in high elevation bogs, meadows, and riparian areas (spruce-fir communities), and are known from only a few locations on the Colville National Forest. There are no records of occurrence in Ferry County.

Beaver

No adverse effects to beaver or beaver habitat are expected to be associated with or result from any of the action alternatives, because beaver are not known to currently occupy habitat within or near any of the proposed activity sites, and activities would not occur within aquatic or riparian habitats.

Blue Grouse

Existing Conditions

Much of the Trout project area contains suitable and potentially suitable habitat for blue grouse. Currently at least 1,561 acres of winter habitat is available; however, fire suppression and clear-cutting over the past 80 years has led to a gradual loss of habitat conditions preferred by blue grouse, especially single-storied old-growth stands and open-forest ridgeline and ridgetop conditions.

Effects

Alternative A (No Action)

Habitat conditions for blue grouse are expected to continue to gradually decline as the remaining single-storied and open forest stand conditions undergo understory succession in the absence of restoration activities.

Alternatives B and C
Both Alternatives B and C will enhance blue grouse habitat conditions through prescribed burning and timber harvesting, which is designed to restore single-storied open forest conditions.

In both action alternatives, spring fires create the risk for a seasonal loss of nests and/or young blue grouse. However, loss of a few nests and/or young in the context of the overall picture would be considered as a temporary cost to be paid when compared to the net long-term advantage to be gained. These losses are not considered irreversible and irretrievable effects. Blue grouse production should increase over the long-term due to improved habitat conditions under the action alternatives.

Breeding and nesting blue grouse habitat will be protected from project activities by INFISH Riparian Habitat Conservation Area standards.

Cumulative Effects
The positive cumulative effects extending from the project actions within the overall landscape will be muted where similar actions are not being performed under similar ecological circumstances elsewhere, and, will complement where similar actions are being conducted. Within the context of the Republic Ranger District, the Burton Ecosystem Management Projects took thinning and/or underburning action on between 5,000 and 6,000 acres of a 20,666 acre project area; and the Scatter Ecosystem Management Projects is taking thinning and/or underburning action on ~ 5,000 acres of a 26,534 acre project area.

Franklin's Grouse

Existing Conditions
The Bodie Lynx Analysis Unit (see Lynx discussion below) represents the area having the greatest potential to provide Franklin's grouse habitat within the Trout project area. Approximately, 20 % of the Bodie Lynx Analysis Unit within the Trout project area (1,011 acres) is considered favorable habitat for Franklin's grouse.

Effects

Alternative A (No Action)
If no action were taken, no vegetative treatments (timber harvest or prescribed burning) would be conducted in the Bodie Lynx Analysis Unit. This alternative, while not reducing, would also not improve Franklin's grouse habitat conditions.

Alternatives B and C
Alternative B would introduce a combination of treatments on 1139 acres (34%) of the Franklin's grouse habitat within the Trout project area, while Alternative C would treat 742 acres (22%).

Controlled burning, alone or in combination with other treatments, carries the potential for incidentally encouraging favorable young lodgepole pine Franklin's grouse habitat on 390 acres under Alternative B, and 601 acres under Alternative C. Thinning alone (749

under Alternative B, and 141 acres under Alternative C) will not likely lead to improvement in Franklin's grouse habitat conditions.

The negative effect associated with thinning alone may be partially compensated for by the acres being burned, with the burning having the unintended consequence of regenerating growth and development of lodgepole pine. Alternative B would be expected to cause a small incidental net reduction in the existing Franklin's grouse habitat, while Alternative C would be expected to cause a small net improvement.

Cumulative Effects

During the past 20 years, a minimum of approximately 45,000 acres (20 %) of the 220,000-acre Republic Ranger District has been burned by major wildfires. Added to this number are numerous acres of clear-cuts and controlled burns usually tending to regenerate back into even aged lodgepole pine stands; and, similar fires and activities occurring off National Forest system lands. The total acres of Franklin's grouse habitat being affected by either Alternative B or C are relatively insignificant when compared to the total being affected by wildfires and associated activities. The Franklin's grouse habitat being created by wildfires alone is sufficient for conforming to Forest Plan standards and guidelines.

Other Woodpeckers

Existing Conditions

The 1999 Trout Vegetation Inventory found snag levels within mature and/or older timber stands of the Trout project area to be marginally in compliance with Forest Plan objectives, and far less than those being implied by the DecAID Wood Advisor.

Since 1999, the forest experienced a Douglas-fir beetle infestation. Considering the number of affected acres, a corresponding increase in snag densities would be expected. However, snag densities found during the summer 2002 remained virtually unchanged from those found earlier for the overall Trout project area, and about half of those documented earlier in the mature and older stands of timber. Based on the 2002 plots, compliance with the Forest Plan standards is not being met.

The reason is primarily related to the overall lack of available large live trees, compounded by most of the proposed treatment units having been formerly harvested when lower snag retention standards were the rule. Furthermore, the Trout project area is well-roaded and is quite attractive to local residents for cutting firewood.

Downed log densities within the mature and older forested stands appear to be in compliance with Forest Plan objectives.

Effects

Alternative A (No Action)

Under the No Action Alternative, the current levels of snag removal by firewood cutters would continue. Future snag levels will continue to decline in the accessible areas and

moved further from compliance with the Forest Plan direction. Roadside areas will most certainly not meet Forest Plan objectives.

The lack of timber harvest means that existing and anticipated insect and disease conditions will proceed naturally, and important increases in snag and downed log abundance in most stands can be expected. However, the benefit to woodpeckers will occur primarily in areas that are inaccessible to firewood cutting.

Alternatives B and C

Both Alternatives B and C will likely result in a net decrease in woodpecker habitat conditions through the intentional and unintentional loss and removal of snags. However, restoration of more open-type of forest conditions will benefit species such as the white-headed woodpecker, and Alternative B provides the higher level of open forest restoration. Considering all proposed treatments, approximately 45% of the Trout project area will be directly affected by Alternative B, compared to about 40% for Alternative C. Removal of trees in Alternative B will affect approximately 18% of the project area, compared to about 9% in Alternative C. The prescribed burning is not anticipated to adversely affect existing snag/downed log levels. While both Alternatives B and C are expected to have a negative impact upon snag and downed log availability for woodpeckers, the impact from Alternative C is expected to be considerably less than from Alternative B.

Given the magnitude of the Douglas-fir beetle infestation contrasted to the relatively smaller proportion of the area being proposed by either alternative for treatment and action, no major reason exists to believe either alternative would cause an important and significant depression in woodpecker numbers or habitat. In total, woodpeckers will likely experience a temporary adverse effect within the treatment areas when the prescriptions are being implemented; but within less than a decade any adverse impacts should be no longer noticeable, and the benefits, particularly if complemented with the suggested mitigation measures, should begin to become apparent.

Cumulative Effects

Between 1999 and 2004, applications were submitted to Washington Department of Natural Resources for harvesting timber from between 5,000 and 6,500 acres within the Granite, Curlew and Toroda Creek watersheds on non-National Forest System lands. While the Trout project area may have a temporary impact upon reducing snag densities, it is assumed that no action is being taken on lands of other ownership to encourage the growth and development of more mature and older forest structures, or the eventual development of larger snags and downwood.

Large Raptors (and Great Blue Herons)

Existing Conditions

Habitat for most of the large raptors is found throughout the Trout project area. While, cliff habitat is rarely found for cliff nesting species, such as golden eagles, peregrine falcons, and ferruginous hawks, late and old, multi-storied stands are available to provide habitat for red-tailed, Cooper's, and sharp-shined hawks, goshawks, great horned and great gray owls, bald eagles and others. The high number of large snags provides

potential nest-sites for golden eagles, osprey, and cavity nesting raptors, such as barred owls.

The accepted U.S. Forest Service (Pacific Northwest Region) protocol was used to survey all proposed Trout project timber harvest units for presence of goshawks during the summer of 2002. Goshawk presence was detected in five units (Units 1, 11, 30, 32 and 40), including visual fly-bys in three units (Units 1, 32 and 40). However, subsequent repeated nest surveys failed to account for any active or inactive nest sites within any of the units. While, responsive to the calls, the birds did not appear exceptionally agitated or territorially defensive, which would indicate a possible active nest within the immediate area. Therefore, the likelihood of an active goshawk nest or territory in any of the units is considered "low".

Beyond the unit boundaries, one active goshawk nest site was discovered within the headwater drainage of West Fork Trout Creek. The nesting pair successfully fledged one or two young. Repeated surveys of another nest-site, formerly active in 1992 and territorially active in 1993, in the headwater drainage of Turner Creek, between Horseshoe and Hardscrabble Mountains, failed to confirm any activity.

The presence of red-tailed hawks was documented in eight of the 40 units, including the visual sighting of pairs in five units (Units 10, 12, 22, 39 and 40). A Cooper's hawk was visually sighted in Unit 10; and, a sharp-shined hawk in Unit 32, plus the presence of another sharp-shined hawk was detected in Unit 39. No nest sites for red-tailed, Cooper's or sharp-shined hawks were found.

Finally, a barred owl nesting cavity was found in Unit 3.

In addition to the goshawk survey, an attempt was made to survey for the presence of great gray owls in the habitats most likely to be occupied by great gray owls. The surveys were conducted between early April and mid-May 2002. No great gray owl or other owl nests were found.

A large unoccupied, i.e. inactive, raptorial bird nest is located within a former clearcut harvest unit, now categorized as mule deer winter range. While, the history of this nest is not documented, judging from size, location on top spire of the tree, and appearances, the nest was likely originally built and used by either ospreys or bald eagles. The nest tree is a solitary, hollowed-out, dead and fire-charred 44 inch diameter Douglas-fir.

In Unit 10, an active solitary great blue heron nest was found less than one mile west of Ward Lake. The nest was positioned on a large diameter (estimated 18"-20") lateral branch, near the top – approximately 120 feet above the tree base – of an old-age ponderosa pine tree. No other active or inactive nests were found in the area. One or more great blue herons have been regularly observed at Ward and Empire Lakes during the summer 2002-2004 lake monitoring surveys.

Effects

Alternative A (No Action)

If no project actions were taken, existing conditions for nesting raptors and great blue herons will not be affected by management activities, and should remain unchanged over the short term. Over the long term (and in the absence of other disturbances), general habitat conditions within the Trout area will continue trending toward stand conditions with increasingly dense understories, and, less favorable conditions for most forest dwelling raptors that require relatively open understories to locate and secure prey. Habitat conditions for raptor species that hunt open areas will also decline over time as prey availability decreases. Fire exclusion has had more detrimental effects than benefits on raptor habitat. Snags and large trees needed for nesting raptors will continue to be lost to firewood cutting in most of the Trout area.

Great blue heron's recently establishing a nest-site in the vicinity of Ward Lake implies the habitat conditions are becoming increasingly more attractive to the birds. The No Action alternative would likely encourage, rather than discourage, this trend.

Alternative B and C

Both Alternatives B and C contain timber harvest and prescribed burning prescriptions designed to promote and restore single-storied open stand conditions. Restoration toward these habitat types will beneficially affect most forest dwelling raptors as a result of improving the abundance and availability of prey populations.

In the absence of mitigation measures, the great blue heron nest site in Unit 10 stands to be adversely affected by both of the action alternatives. However, the suggested mitigation measures, to prohibit activities in the nest vicinity during the nesting season (see Mitigation Measure on 6 on Page 41) should substantially alleviate any significant adverse effect resulting from the implementation of any of the action alternatives. Failure to address the suggested mitigation measures would add the risk of birds abandoning nesting sites and territories, and, the abandonment resulting in depressing productive and reproductive performance of the affected species. Improving road conditions often results in adding to the use of the roads for multiple reasons. Hunting and gathering, including the cutting of firewood, are only two of many different reasons.

Cumulative Effects

The Trout project involves some form of thinning and/or controlled burning on less than 4% of the 220,000 acres within the Republic Ranger District and less than 1% of Ferry County. Neither Alternative B nor Alternative C is expected to have an adverse effect on large raptorial birds within the context of Trout project area, and, therefore, even less likely within the Colville National Forest and general area of northeastern Washington.

Waterfowl

Existing Conditions

The Trout project area contains two insignificant interior forest ponds (less than 0.25 acres in size), a 25-acre Forest Plan Management Area 3B that contains wetland/waterfowl habitat, and another interconnected chain of three larger-than five-acre shallow ponds. The 25-acre Management Area 3B has been set aside for wildlife and recreation management. The area includes approximately five acres of open water in the form of two interconnected, small ponds and an additional 20 acres of wetland habitat.

The chain system of three interconnected small ponds is referred to as "Empire Lakes System." The area of open water on the three small ponds ranges from 1.2 to 4.5 acres – total area is 6.4 acres; and are within a 23-acre riparian wetland.

An approximately 42-acre wet meadow is within the West Fork Trout Creek Valley; but the meadow is not associated with any adjacent or near adjacent permanent or semi-permanent open water.

Observations during the summer breeding seasons of Year 2002-2004 had ruddy ducks and pied-bill grebes nesting and raising young on the Ward Lake area, and Barrow's goldeneye and ring-bill duck adults and ducklings being recorded on the Empire Lake system. In addition to the great blue heron, discussed above, adult Canada geese and blue-wing teals have also been documented on the lakes; and, no particular reason exists to suggest a greater variety of transitory species could not be using any of the lakes during seasonal migration.

Effects

Adherence to Forest Plan standards and guidelines will prevent adverse effects to waterfowl habitat conditions under all alternatives.

Migratory Birds

Existing Conditions

The Trout project area contains a variety of habitat types and conditions including upland and riparian forest habitats ranging from early successional to late successional forest stands; hydrological meadows; small open water ponds; and non-forested areas. Seven different biophysical environments have been described within the Area:

All of these diverse habitat types provide habitat for migratory birds. The bird communities found within this analysis area are typical of those present throughout much of the Colville National Forest and this portion of northeast Washington. Other than for great blue heron, in the context as described and addressed above, the Trout project area does not contain any unique bird species and/or habitats relative to this general portion of the Forest. The project area provides existing or potential habitat for approximately 160 species of birds. Many, if not most, of these birds are migratory in their either nesting within the area or passing through during spring and fall migrations.

Some key findings from the Trout Silviculture Report (Rourke, 2005) indicate that from a bird habitat perspective, single stratum old-growth forest is the habitat type in shortest supply and most in need of restoration in this area. Bird species requiring this habitat type have probably undergone the greatest decline over time in this area. Other forest types are in good supply, with some overstocked stands and areas in need of treatment to address insect and disease outbreaks. Riparian habitats are generally in good condition and relatively stable.

Effects

Alternative A (No Action)

Under the No Action alternative, the continued loss of single storied old-growth habitats will continue to result in local populations of the terrestrial bird species requiring this habitat type to decline as individuals are either displaced to other areas with more suitable habitat or succumb to loss of nesting habitat and increased risks from predation.

Alternative B and C

Both Alternatives B and C involve restoration activities in the form of commercial thinning and prescribed fire, which will promote a net improvement for future single storied old-growth habitat-type conditions. All proposed timber harvests under the action alternatives are designed to retain existing snags and downed logs to meet Forest Plan direction. Therefore, no important adverse effects to cavity nesting bird habitat should be associated with timber harvest under either of these two alternatives. Alternative B offers the highest level of open forest restoration among the action alternatives.

Management actions (thinning and prescribed fire) conducted for restoration of open forest habitats may reduce or eliminate habitat for some terrestrial bird species currently present within the treatment areas. The relatively minor percentage of habitat being treated under either action alternative will not create a significant impact on population levels of these birds.

Restoration activities in open forest habitats conducted during the breeding season may also temporarily reduce reproductive success for representative species of the desired open forest habitat. Conducting burns during the breeding season with no provision for the protection of these areas could potentially result in reduced reproduction for those species. The exact level of this impact is difficult to predict. The proposed activities will be treating only a small fraction of the landscape per year (500 to 5000 acre burns are not considered a major loss in any one watershed during any one year), and a fire traveling at 3 mile/hour (mph), while a relatively fast speed for a prescribed spring fire burn, the rate of travel is relatively slow enough to allow most adult birds to escape unharmed. The actions and project could quite likely destroy some nests and eggs, and, perhaps young, if implemented during the nesting and reproductive season, however, despite this probability, the losses will be more than compensated for by the benefits derived in having more restored acres.

Cumulative Effects

The cumulative impacts resulting from either action alternative on migratory birds should not be substantial. Both action alternatives could be interpreted as furthering the future development of single stratum, older forest conditions; however, while restoration of single stratum, older forest conditions continues to be one of the major objectives resulting from many of the management projects within the Colville National Forests and the National Forest system, the ranges of migratory birds encompasses lands both on and off the National Forest system, including lands beyond the bounds of the United States. The averse impacts are most substantial where forests are being cleared and replaced with other forms of development, and these forms of developments tend to be most prevalent off National Forest System lands, and, are certainly not associated with the Trout project area.

Gray Wolf (Endangered Species)

Existing Conditions

Negligible evidence exists to suggest any wolf pairs or packs have established a breeding or relatively permanent territorial presence on the Republic Ranger District. For purposes of this analysis, transient single wolves traveling within the context of a larger landscape are assumed to have the potential to use any of the National Forest System lands within the Trout project area.

Throughout the Republic Ranger District, including the Trout project area, mule and white-tailed deer would likely compose the greater biomass of the available ungulate prey base. Other wildlife species, such as snowshoe hares (*Lepus americanus*), are often in sufficient abundance to provide an alternate or supplemental source of prey.

The Trout project area contains habitat to fit the general description for preferred wolf denning habitat or rendezvous sites. Potential seclusion habitat occurs in several locations within the Trout project area.

Effects

No adverse effects on wolves are expected to be associated with any of the alternatives. While both action alternatives benefit mule deer, either would also be detrimental to the cover favored by white tail deer, thus the prey base for wolves would not change under either action alternative. Therefore, as a result of removing and lessening the understory and causing less predatory stalking and hiding cover, the No Action alternative might prove overall most favorable for wolves, while either of the action alternatives might prove less favorable, with Alternative B being the least favorable.

Cumulative Effects

The major factor limiting the spatial and numerical expansion of wolves into northeastern Washington remains conflicts with the continued expanding establishment of human residential and industrial developments, including agriculture, ranching and livestock husbandry. Wolf populations in the absence of extrinsic interference will usually expand both spatially and numerically to the limits of the prey base. And, given the current developing trends, following the re-introduction of wolves into the Yellowstone and adjoining ecosystems, those limits are not yet apparent. The State of Idaho is now reported to have 55 different packs of wolves, in contrast to decades earlier, when few or no wolves were present; and, dispersing transients are infrequently reported in the Colville National Forest and northeastern Washington (Myers, personal communication). While, a prey base for wolves does exist, wolves have not yet been found to have established a permanent presence in either the Trout project area or the Colville National Forest. However, none of the alternatives are designed to promote permanent human developments and infrastructures. Therefore, none of the alternatives within the project area should influence wolf inhabitations within or beyond the bounds of the Trout project area and National Forest system lands.

The overall conclusion is that the no action alternative will have no effect to gray wolves, and both action alternatives may affect but are not likely to adversely affect gray wolves or their habitat.

Grizzly Bear (Threatened Species)

Existing Conditions

The Grizzly Bear Recovery Plan (USDI - Fish and Wildlife Service, 1993) identifies "grizzly bear ecosystems" that contain specific recovery areas. The recovery plan classifies areas by "Management Situations" based on the needs of the bears and the capabilities of the areas to supply those needs. Individual grizzly bears that live outside specified recovery areas continue to be protected, but these areas are not managed as grizzly bear habitat. The Trout project area does not lie in a recovery area. It also does not provide the level of solitude to be considered good grizzly bear habitat. Confirmed grizzly bear sightings have not been recorded within the Trout project area or most of the Republic Ranger District during the past decade. Certainly, the potential exists for grizzly bears to temporarily occupy or pass through the Trout project area, but the probability is low.

Effects

The No Action Alternative through the preservation of existing conditions would probably do more to discourage, rather than encourage use of the Trout project area by grizzly bears. Vegetative congestion within the ground- and under-stories will continue to discourage improvements in mule deer habitat. The leading fire and post-harvest adapted and/or dependent floral food sources for grizzly bears will become increasingly less available.

Since, grizzly bears do not regularly occupy habitat within or adjacent to the Trout project area, no anticipated adverse direct or indirect effects to any known grizzly bears are expected to result from any of the action alternatives. None of the activities proposed under the action alternatives will reduce the potential of the area to be used by grizzly bears. To the contrary, opportunities for improved grizzly bear habitat will be created through removal of the understory and groundstory to promote the development of the overstory are expected to increase – not decrease - foraging attractions should the occasional grizzly bear visit the area. In comparing the action alternatives, Alternative B would seem to provide the greatest improvement in habitat, and, therefore, offer the greatest opportunity for improving attraction to the area.

Cumulative Effects

Under the Regional Forester's Forest Plan Amendment #2 (screening direction), guidelines were adopted to maintain travel corridors for wildlife. All current and future projects on the Colville National Forest will retain at least 400-foot widths for corridors. Maintenance of these travel corridors during future project activities should provide sufficient habitat to allow grizzly bears passage into and through the area.

Controlled and wild fires, and silvicultural practices occurring on and off the Trout project area and National Forest system lands are not thought to be having detrimental impact on grizzly bears. The major impediment to improvement in the grizzly bear population, is associated with conflicts and mortal contacts resulting from the establishment of increasingly greater human presences and permanent land and industrial developments, including home residences, in otherwise unimproved, free and open grizzly bear range. Increasing human presence increases the potential for conflict and

confrontation; and those conflicts and confrontations often prove mortal for bears. None of the proposed Trout project actions would create or encourage permanent human presence or habitation within either the project area or the Colville National Forest. Any human activities resulting from or associated with the Trout project would be brief, temporary, and transitory in nature. As a result, cumulative effects would not occur.

The overall conclusion is that the no action alternative will have no effect to grizzly bears, and both action alternatives may affect but are not likely to adversely affect grizzly bears or their habitat.

Bald Eagle (Threatened Species)

Existing Conditions

Bald eagles are not known to currently nest or winter within or adjacent to the Trout project area; nor are bald eagles known to use the project area to find prey and forage. Migrating birds might pass over the area while flying to and from elsewhere. The nearest known bald eagle nest is at Curlew Lake, is off the Colville National Forest, and, is approximately three miles east of the Trout project area. A large raptor nest, either bald eagle or osprey, is located within the Trout project area; but this nest has no history of being used or occupied during the past decade. The nest is approximately 13 miles from the nearest large body of water.

Effects

The entire Trout project area is not expected to regularly accommodate the presence of bald eagles in any context. Therefore, no direct or indirect effect is expected from any of the alternatives on bald eagles.

Cumulative Effects

The indiscriminate use and application of DDT (dichlorodiphenyltrichloroethane) and related organochlorine insecticides, resulting in egg shell thinning, is now commonly recognized as the primary cause in the earlier collapse of bald eagle populations in North America. With the removal and preventing the use of DDT and related organochlorine agents, bald eagle populations have been in a steady state of recovery.

Fire and silvicultural practices have not been an impediment to improving bald eagle populations. Since Forest Service policies provides for a radius of protection around bald eagle nest sites, and neither DDT or any other organochlorine pesticide is involved in the implementation of the any of the alternatives, the cumulative effects resulting from any of the action alternatives is functionally neutral.

The overall conclusion is that all alternatives are expected to have no effect to bald eagles.

North American Lynx (Threatened Species)

Existing Conditions

Historical records, including conversations with trappers, suggest relatively high numbers of lynx were once found in the Hardscrabble, Bodie, and Kelly Mountain areas during the

1950s (U.S. Forest Service-Republic Ranger District files). However, hair-snagging surveys, in cooperation with the U.S. Interior-Bureau of Land Management, and independent winter track surveys during 2001-2003, were not able to provide the necessary definitive evidence to demonstrate lynx are currently present within either the Trout project area or the Bodie LAU (Lynx Analysis Unit). These observations do not imply the animals are not present, nor that the habitat lacks the capacity to support the presence of lynx: The observations only demonstrate that surveys have not been able to confirm or discover reliable irrefutable evidence of presence. Given the current and historical circumstances, the potential for lynx to be found or eventually found within the Bodie LAU is not an unreasonable expectation.

The Bodie LAU was established because of having met the criteria for delineation, and to enhance potential lynx movements between the Kettle Crest and the Cascades Mountains in the Okanogan/Wenatchee National Forest to the west. However, the capability of the habitat to develop a resident lynx population of any long-term and/or permanent significance is considered low.

Nearly all forested stands within the plant associations identified as potential lynx habitat, as well as many "non-lynx habitat" stands within the Bodie Lynx Analysis Unit have been documented to support varying densities of snowshoe hares, thus providing varying qualities of lynx foraging habitat. Other habitat within the Lynx Analysis Unit (such as that identified as denning habitat) support alternative prey sources, such as red squirrel and grouse.

The common component of denning habitat is large woody debris, either downed logs or root wads. Within the Bodie LAU, approximately 1,855 acres are available as potential denning habitat. The denning-acres constitute 25 % of the lynx habitat within the Bodie LAU and 15 % of the entire Bodie LAU. These areas, generally, have not been harvested for timber, but may have been burned by past wildfires. Important to note that not every acre of potential denning habitat in the Bodie LAU will currently have the structural components necessary for good lynx den sites, but that this habitat represents those areas with the highest probability of being currently able to provide denning habitat.

The only major travel corridor for the Bodie LAU within the Trout project area would seem to be ridgelines and saddles connecting Bodie, Hardscrabble and Horseshoe Mountains along the western boundary of the project area, and the boundary separating the Colville National Forest (Republic District) and the Okanogan/Wenatchee National Forest (Tonasket District). This boundary basically follows the divide separating the Toroda Creek drainage from the Trout Creek drainage. The ridgeline divide continues south to Storm King Mountain, where the Granite Creek, Cougar-Toroda Creek, and Trout Creek (West Fork) watersheds are split into three different directions.

Large proportions of nearly all LAU travel corridors within the Bodie LAU have been subjected to varying amounts and types of timber harvesting activities. Few areas retain the aboriginal pristine state. However, the regenerating current status of these areas would not seem to preclude lynx traveling between or in search of denning and foraging habitat.

About 41 miles of open road exists within the Bodie LAU for an average open road density of 2.15 mi/mi^2. Current information suggests that lynx might not be directly avoiding or displaced by most low-use forest roads. Roads can still negatively affect lynx by inviting access and allowing human disturbance into denning habitat and result in increasing incidental or illegal human caused mortalities. Plowing or packing snow on roads or snowmobile trails in winter may allow competing carnivores to access lynx habitat thus increasing competition for prey. Although, 23 miles of the 41 miles of open road are groomed and maintained by the State of Washington for snowmobile use, all 41 miles are available for travel.

Effects

Alternative A (No Action)

The No Action Alternative would result in none of the proposed management activities being implemented within the Bodie LAU. Existing lynx habitat conditions and trends would not be altered or affected.

Alternatives B and C

Alternative B would treat 457 acres (6%) of the lynx habitat within the Bodie LAU, while Alternative C would treat 240 acres (3%).

In Alternative B, all 79 acres of treatment in denning habitat will have understory stand reduction in the form of commercial and small-pole thinning, followed by piling and selective burning of the piled material. An estimated 4% of the existing Bodie LAU lynx denning habitat would be affected. Any negative impacts on lynx denning habitat are within guidelines and standards, are not significant, and, should be of a temporary nature. Denning habitat would be reduced by 1%, from 25 % to 24%.

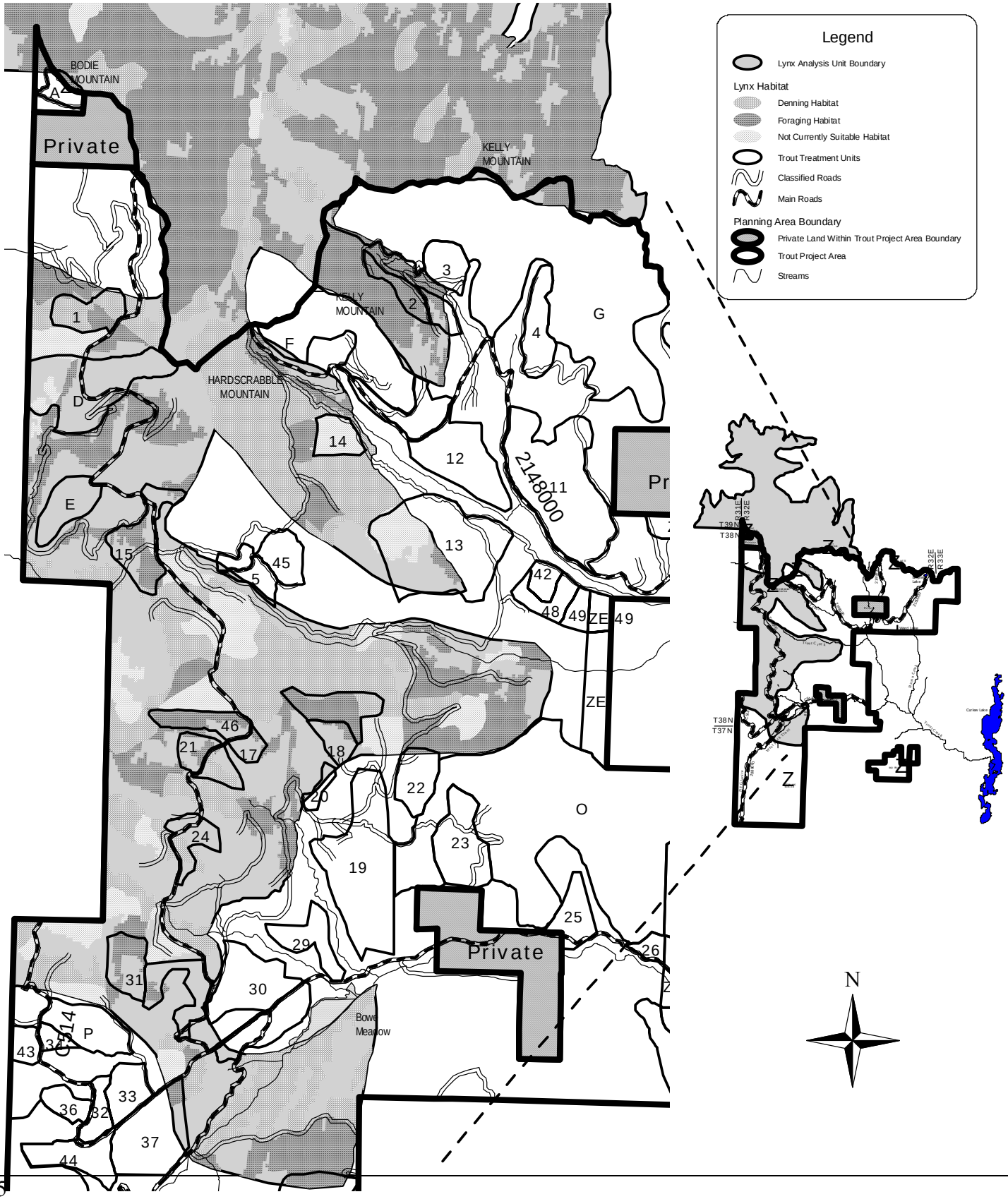
In Alternative C, approximately 1% (27 acres) of the denning habitat will have commercial thinning, followed either by piling and selective pile burning (12 acres), or by controlled underburning (15 acres). Any negative or positive impacts on lynx denning habitat would be very difficult to substantiate. The denning proportion would remain virtually unchanged for the Bodie LAU.

Of the forage habitat within the Bodie LAU, approximately 6% (277 acres) under Alternative B, and 4% (196 acres) under Alternative C would receive some form of treatment. These proposed treatments should not cause any substantial negative impact on the foraging potential for lynx with the Bodie LAU.

The remaining acreage scheduled for treatment within the Bodie LAU is currently considered unsuitable lynx habitat.

Trout Vegetation Management Project

Bodie Lynx Analysis Unit and Habitat Classification



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Both action alternatives utilize the best available science to manage for lynx, are well within the Forest Plan standards, and should not be detrimental to lynx use of the Bodie LAU. Unaffected denning habitat will still constitute 24-25% of the lynx habitat within the Bodie LAU, and 15 % of the total Bodie LAU. The low number of acres treated maintains more than 30% of the total LAU in suitable habitat and will not lead to more than 15% of the habitat being in a non-suitable condition within a 10-year period. Even if the project treatments were to be totally detrimental by changing affected denning and foraging habitat into non-suitable, only 16% (Alternative C) to 18% (Alternative B) of the suitable and non-suitable lynx habitat combined would continue to be classified as non-suitable, and the change would be adding only 3-5% to the non-suitable habitat-types.

Cumulative Effects

The boundary of the Bodie LAU encompasses an additional 6,991 acres (57%) that are not within the Trout project area. This area is primarily located within the northerly flowing drainages of Tonata Creek, which has a prevailing northerly aspect. Denning habitat accounts for 509 acres and foraging 3,366 acres.

The previously approved Berton Ecosystem Management Projects are currently in progress in the area, and are scheduled to affect approximately 110 acres of currently suitable and non-suitable habitat within the Bodie LAU. Similar to the proposed Trout project, the Berton project is intended to reduce understory and insect and disease-infected trees and ladder fuels, reduce fuel-loads and risk of stand-replacing wildfires, and restore sustainable biological communities. Less than two acres of denning and approximately 110 acres of foraging habitat are targeted for prescription treatment or action of any sort.

Adding the affected acres from Trout Alternatives C and B, respectively, to the acres being currently affected in the Berton project, would result in a total of 29 to 81 acres (2-4%) of the denning and 304 to 385 acres (7-8%) of the foraging habitat receiving action and treatment. Under either alternative, the affected amount of currently non-suitable habitat would remain unchanged at 101 acres (11%).

The cumulative totals within the entire Bodie LAU being affected would still remain below that suggested by the best science available for managing lynx. Unaffected denning habitat would still constitute 24-25 % of the suitable and non-suitable habitat within the LAU; only 5-7% of the suitable habitat would have the potential for becoming non-suitable; and, non-suitable habitat would have been increased by only 4-6 %.

The overall conclusion is that the no action alternative will have no effect to Canada lynx, and both action alternatives may affect but are not likely to adversely affect Canada lynx or their habitat.

Peregrine Falcon

Existing Conditions

No active peregrine falcon nest sites are currently found on the Colville National Forest, and neither suitable nesting habitat nor good foraging areas are available either within or near the Trout project area.

Effects

No direct or indirect effects to peregrine falcon are anticipated to result from any of the alternatives. None of the activities proposed under the alternatives will likely alter ecological conditions in any meaningful manner to encourage or discourage potential use of the area by peregrine falcons.

Any effect would tend to apply to transitory migrating birds, and in this regard, any opening of the habitat through removing the forested cover would be considered beneficial. Alternative B would be considered most beneficial since it would thin nearly twice the acreage as would Alternative C. The No Action alternative would be considered the least beneficial.

California Wolverine

Existing Conditions

Wolverines have only infrequently been reported and/or observed on the Colville National Forest. The Trout project area contains limited amounts of suitable habitat for wolverine, but no confirmed sightings have been documented for the area. The area contains some unroaded habitat suitable of providing seclusion with limited human activity, as well as areas with low to moderate open road densities; however, cliffs and talus slopes are seldom found. A few swampy areas and small ponds are occasionally found in the Trout area; and are mostly concentrated in Bowe/Hougland Meadows and the upper reaches of West Fork Trout Creek and headwater drainage of Bacon Creek.

Effects

No evidence currently exists to suggest or indicate wolverines are currently found within or adjacent to the Trout project area; therefore direct or indirect effects to the species are not anticipated to result from or expected to be associated with any of the alternatives. Furthermore, no important reason exists to believe the activities proposed under either action alternative will alter the potential use of the area by wolverines. None of the action alternatives are designed with the intention of encouraging or discouraging permanent human use and occupation of the area; and, any implementation will be of a temporary nature.

Cumulative Effects

The major impediment to the expansion of wolverine populations is conflict and mortal contact resulting from the increasing human presences and permanent land and industrial developments, including home residences, in otherwise free and open wolverine and large carnivore range. However, none of the alternative actions being proposed for the Trout project are designed with the intention of creating or encouraging permanent human presence or inhabitations. Any human activities, including those resulting from or

associated with implementing the Trout project, would be of a relatively brief and transitory nature. As a result, the there would be no cumulative effects to wolverines.

Pacific Western Big-eared Bat

Existing Conditions

No deep caves, or mine shafts, are known to be in the Trout project area. A large abandoned dilapidated barn is located on one end of Bowe/Hougland Meadows; but neither the barn nor adjacent area is being considered for any management action. The Trout area does contain snags, shallow caves and mine excavations, and rocky slopes for potential summer roosting and foraging, and is therefore considered potential summer habitat. Although, a bat survey conducted in 1988 was unable to confirm the presence of any Pacific western big-eared bats on the Republic Ranger District, the bats were recently discovered in an abandoned mine adit on the western slope of the Kettle Crest (J. Langdon 2002).

Effects

None of the necessary habitat components are known to occur in the Trout project area, therefore direct effects to this species are not anticipated to result from any of the action alternatives. The potential indirect effects within the foraging habitat will be in the form of removing the understory "clutter" and lessening interferences for foraging activity. Neither of the action alternative would lessen potential use of the area by foraging big-eared bats.

Pacific Fisher

Existing Conditions

The Trout project area would appear to contain potential suitable habitat for Pacific fisher. However, fishers have not been recently or currently found within or adjacent to the Trout project area, nor do the historical records reveal evidence for fishers being present in the area. The prevailing habitat is thought to be marginal for fishers, with few to any uniformly broad and attractive landscapes.

Effects

The activities proposed under either of the action alternatives are not expected to alter potential use of the area by fisher. In a limited context, aside from the objective to suppress the threat of wildfire, the intentions of both action alternatives are to promote the restoration of an older, more mature forest condition. Alternative B could be considered more preferable for fishers than Alternative C because it would more than double the number of acres being thinned to release and promote the aging and growth of standing trees. However, any advantage would not likely be soon realized.

Cumulative Effects

Within the broader context of the overall landscape, the loss and fragmentation of old-growth forested habitats through harvest, urbanization and competing forms of land use and developments continues. Between the years 1999 and 2004, between 10 and 15 % of the adjoining watersheds to the Trout project area were harvested for timber. However, adding to the fragmentation and removal of old-growth forested associations is not within

the objectives for the current Trout proposal; therefore, any resulting cumulative effects should be either positive or neutral.

Great Gray Owl

Existing Conditions

Great gray owls have not been identified within the Trout project area; however no over-riding reason exists to believe the birds could not be present. Efforts to substantiate the presence and nesting of great gray owls in the area associated with Bowe/Hougland Meadow in the West Fork Trout Creek drainage were not successful.

Approximately 5,000 acres of the Trout project area is considered potential habitat for great gray owls. Over 10% of this habitat is in the form of open meadows, including Bowe/Hougland Meadow, and the remaining 90 % within a two mile radius from the open meadows and primary range is in the form Structural Stage 6 forest.

Effects

Alternative A (No Action)

The No Action alternative would be expected to result in great gray owl habitat conditions continuing to gradually decline as the remaining single-storied and open forest stand conditions undergo succession in the absence of restoration activities. Natural meadows and other openings will gradually become reforested and decline in availability.

Alternatives B and C

Neither of the alternatives will affect known great gray owl nest sites; and both action alternatives will tend to promote favorable great gray owl habitat conditions by improving foraging conditions. Both action alternatives promote single-storied open stand conditions and restore open areas thus improving growth and vigor of herbaceous and shrubby vegetation. Alternative B has the potential for having a slight advantage over Alternative C as a result of opening-up and thinning a few more acres.

A small risk persists in the prescribed fires resulting in the loss of snags and/or large trees that provide potential nesting sites. However, adherence to Forest Plan standards and guidelines during timber harvest design should insure that the desired large tree and snag components are maintained.

Cumulative Effects

Due to the Trout project not contributing to the further loss of great gray owl habitat, the detrimental cumulative effects within the broader scale of analysis are considered either neutral or nil. The loss of mature and old-growth forest off the Trout project area continues, however much of the land is less than 3,000 feet in elevation and therefore less attractive for great gray owls.

Fisheries

Information provided in this Environmental Assessment about fisheries is excerpted from Fisheries Report for the Trout Creek Vegetation Management Project by Karen Honeycutt, January 13, 2005. The full text of this report is incorporated by reference.

The fisheries report describes the current and desired conditions with regards to the Inland Native Fish Strategy, and fisheries potentially affected by the Trout project. It also describes and compares the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

Three issues were identified with regards to Fisheries. They were:

- The Proposed Action has the potential to adversely affect fisheries in Curlew Lake and the project area.
- The Proposed Action has the potential to affect Red Band trout (a sensitive species) in Trout Creek.
- The proposed Action has the potential to adversely affect INFISH RMOs (Inland Native Fish Strategy Riparian Management Objectives).

Existing Conditions

Fisheries in Curlew Lake and the Project Area

The main fishery in Curlew Lake is a State-run stocking program of fingerling rainbow trout. Naturally reproducing populations of eastern brook trout, largemouth bass, and northern pikeminnow occur in the lake. Tiger muskies have been stocked to reduce the pikeminnow population. Tiger muskellunge are a sterile cross between northern pike and muskellunge that are used as a predatory biological control and trophy-fish option.

In 1997 the Washington Department of Ecology collected data on Curlew Lake for their Lake Monitoring Program. They noted that overall water quality was fair, but increased shoreline development caused actual or potential problems. (DOE, 1997).

Redband trout and eastern brook trout are the only fish species found in the Trout project area. Redband trout are the only species present in Trout Creek and West Fork Trout Creek. Redband trout have not hybridized with coastal rainbow trout, which were stocked from 1936-1955. Eastern brook trout have established a reproducing population in the North Fork of Trout Creek, which was found to contain both eastern brook trout and redband trout.

Bull trout were not found in fish population surveys in 1991, 1996, 1997, and 2002. While individual bull trout have been found in the Kettle River, there has not been a population documented in the any of the Kettle River drainages to the Canadian border. The Kettle River is not listed as critical habitat in the Draft Recovery Plan.

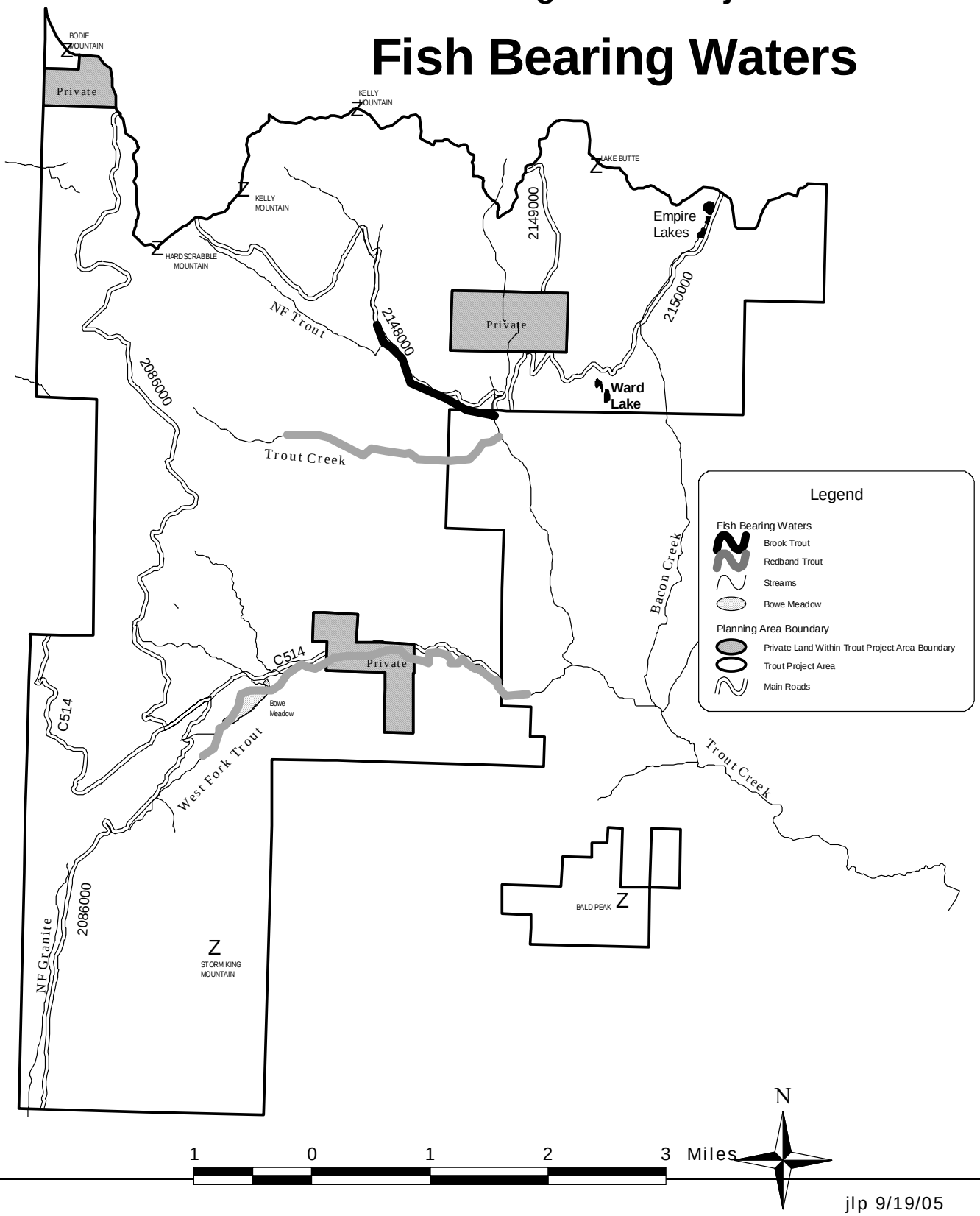
No westslope cutthroat trout have been found within the Trout project area.

Empire Lakes and Ward Lake contain populations of brook trout.

The planning area has a current condition of 63.4 miles of open road and 17.9 miles of closed road in the RHCA (Riparian Habitat Conservation Area). These roads have culverts not meeting the 100-year flood design, which may blow out in high flood events. This could cause channel degradation similar to a debris torrent in which the channel debris is swept downstream.

Trout Vegetation Management Project

Fish Bearing Waters



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Red Band Trout (sensitive species)

In 1995, the rainbow trout population in West Fork Trout Creek was genetically tested to determine hybridization. The tests results showed no hybridization and the population was pure redband trout. The population is strong. In 1992 and 1999, population surveys on the West Fork Trout Creek found only redband trout. The reach above Hougland/Bowe Meadows is an important spawning and rearing area for redband trout. The 1999 population survey noted that most of the young of the year were in this section (SE corner of SW ¼ of section 32).

North Fork Trout Creek had a population survey in 1992. Both Eastern brook trout and redband trout were found in this stream.

Trout Creek was surveyed in 2002.

INFISH Riparian Management Objectives[64]

For stream habitat, the INFISH Riparian Management Objectives were used to describe the condition of the individual reaches. All fish-bearing habitat has been surveyed. Surveys found that only a few reaches have been directly affected by cattle bank trampling and grazing. Basically most of the impacts have been caused by cattle getting into the riparian areas by road access, or cattle being in open pasture areas around the creek.

Roads have a major impact on in-stream sediment. The North Fork of Trout, the West Fork of Trout, and numerous unnamed tributaries have high sediment loadings in which road wash is a factor.

The highest risk areas for detriment to fisheries are the streams segments on North Fork Trout Creek and West Fork Trout Creek below the confluences of the small, unnamed tributaries. These tributaries are sources of sediment.

Regarding Ward and Empire Lakes, there is some road wash into Empire Lakes, but the lakes are in generally good condition.

Effects

Alternative A (No Action)

Fisheries in Curlew Lake and the Project Area.

The function of the riparian habitat (providing instream large wood, shade, detritus, bank stability and acting as a sediment filter) is expected to remain stable along most of the streams. Improvement of riparian function is expected as vegetation matures in past riparian harvest units and provides shade and wood recruitment over time.

[64] **INFISH Riparian Management Objectives** may be found in Attachment A of Decision Notice and Finding of No Significant Impact for the Inland Native Fish Strategy (Salwassar, et al., 1995).

Not implementing the road reconstruction would continue to impact streams especially from erosion originating from the roads. Sediment would continue to enter the streams in the analysis area at current levels.

The overall recruitment sources for large instream wood are expected to slightly improve as riparian vegetation matures throughout the project area. Over time, the new instream woody debris is expected to increase the number of pools, available spawning, hiding, resting and feeding habitat for trout. It would also increase the amount of detritus and habitat available to macroinvertebrates and slightly decrease water temperatures due to increased shading. However, numbers of large instream wood are expected to remain low in the fish bearing segments next to roads and in the meadows.

The habitat in West Fork Trout Creek would continue to be dominated by a redband trout population.

Taking no action increases the risk of high severity fire. In the event of a high severity fire, sedimentation from streambank instability would cause fish habitat to decline as spawning gravels become embedded with fine sediments that decrease the intergravel dissolved oxygen. Stream temperatures would also increase due to increased sediment loads and the removal of vegetative shade. The fisheries population in Trout Creek and Curlew Lake would decline due to degradation of habitat after the fire. As the streams recover the fisheries population would rebound.

Red Band trout (a sensitive species)

The redband population is at risk of due to degradation of habitat if a high severity fire occurred. However as the streams recover the fisheries population would rebound. Two of the watersheds do not have brook trout. Brook trout can outcompete a redband population in degraded conditions. North Fork of Trout Creek would be at risk of losing the redband trout population from competition from brook trout.

INFISH Riparian Management Objectives

If the proposed actions are not implemented, INFISH Riparian Management Objectives will not change. However if a high severity fire occurs, INFISH Riparian Management Objectives will be adversely affected.

Effects Common to All Action Alternatives

Fisheries in Curlew Lake and the Project Area

In general, the effect to Curlew Lake and Trout Creek are expected to be minimal.

Harvest Activities

Timber harvest units are all located outside of riparian areas. There would be no effect to fisheries from harvest activities within individual unit boundaries, except that the risk of high severity fire is reduced.

Road Construction, Reconstruction, and Maintenance

Current road construction standards, including Best Management Practices, should minimize the amount of sedimentation from new road construction.

Road reconstruction and use for haul can cause short-term (1-2 years) sedimentation. Reconstruction of the roads should result in a moderate beneficial effect over the longer term (5 years or more), as sediment production from road templates decreases due to new armoring, drainage structure placement, and revegetation.

Implementation of the action alternatives includes reducing erosion from roads through construction of drainage structures such as drain dips and outslope drains on roads used for commercial haul. These drainage structures assist in the reduction of long-term sedimentation by causing water to be moved off of road surface. Rocking of drain dips and road surfaces in Riparian Habitat Conservation Areas and their contributing areas, rocking of roadbed for sediment control and subgrade strength is also included. Very little sediment is expected to make it to Curlew Lake and impacts from the timber sale are not expected.

Haul

Road wash and dust from the road is a major factor in degradation of habitat in Trout Creek. This project would reduce the effect of these roads through rocking and other road reconstruction activities. Haul on these roads increases the amount of loose dirt that can be transported to the stream channel. With the exception of haul on the county roads, all of the activities will occur over five miles upstream of Curlew Lake. The Forest Service portions of these roads are well-armored and have riparian vegetation between the road and the stream channel. This vegetation traps and filters most of the dust from the road system. However some road wash is entering the stream system and will continue. Rocking of road segments within the Riparian Habitat Conservation Area will reduce the road wash entering the stream system.

Curlew Lake and Trout Creek below the forest boundary may receive some sediment from dust and runoff from haul. The county roads will not receive treatment. This will add sediment to Trout Creek and subsequently Curlew Lake. It is expected that this will be small and similar to the existing condition. Trout populations and INFISH RMOs will still be affected by sediment. It is not expected that the affect to the populations or INFISH RMOs will be noticeable.

Prescribed Fire

On the Colville National Forest, use of prescribed fire for natural fuels reduction and wildlife habitat improvement in the past has not created ground disturbance nor caused increased erosion except in small, localized areas of concentrated fuels. Continued use of fire for this purpose is not anticipated to increase sediment delivery to streams in the Trout project area. Any surface erosion from these areas will be buffered by vegetation prior to reaching the streams.

Both action alternatives reduce the risk of high severity fire. By reducing the risk, there is a beneficial effect to fisheries.

Rock Pits

Use of one rock pit is expected. It is outside of the RHCA, so there should be no effect to the stream system.

Red Band Trout (Sensitive Species)
There will be no effect to the redband population. A redband trout population will remain viable in the system and will not be negatively affected.

INFISH Riparian Management Objectives

Large Woody Debris[65]
There are no activities proposed that would reduce the amount of large woody debris available to aquatic habitats.

Bankfull Width to Depth[66]
Bankfull width to depth ratios would improve overall. Road improvements from reconstruction would reduce long-term sedimentation to stream channels. This would reduce channel widening that occurs from increased bedload and loss of habitat complexity. Some short-term sedimentation would occur, but would be too small to impact bankfull width to depth ratios.

Temperature
All units are outside of the riparian habitat conservation areas. The existing shade level would be maintained and therefore maintain the temperatures.

Pools Per Mile
The main effect to pools per mile is sedimentation of the pools and loss of habitat diversity. Long-term sedimentation would be reduced through road reconstruction. Some short-term sedimentation would occur during reconstruction and construction, but would be too small to impact the number of pools per mile. There would be no loss of habitat diversity, since activities would follow INFISH standards and guidelines.

Cumulative Effects
The cumulative effects area includes lower Trout Creek and Curlew Lake. Past, present, and foreseeable future activities considered in the cumulative effects analysis included: timber harvest on National Forest and lands of other ownership, wildfires, prescribed fires, fuel reduction activities, noxious weed management, erosion control projects, livestock grazing, recreation, and mining. The proposed Trout project would not add significant cumulative effects for fisheries and INFISH Riparian Management Objectives.

The overall conclusion is that the action alternatives may affect threatened (bull trout) and sensitive fish species (westslope cutthroat trout and redband trout) habitats but are not likely to lead in a trend towards federal listing or loss of viability.

Soils
Information provided in this Environmental Assessment about soils is excerpted from Soil Report for the Trout Project Environmental Assessment by Nancy Glines, February 22, 2005. The full text of this report is incorporated by reference. The soil report

[65] **Large Woody Debris** is defined as pieces of wood larger than 12 inches in diameter and 35 feet long.

[66] The term **Bankfull Width to Depth** is the mean (average) wetted width divided by mean (average) depth.

describes the current and desired conditions with regards to soils in the Trout project area. It also describes and compares the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

Affected Environment/Existing Conditions

General Description of Soils on the Landscape

Landtype G is the **scoured glaciated mountain slopes**. These are typically smooth convex ridges scoured during continental glaciation. The slopes were scoured, leaving bedrock close to the surface. This landtype is found along the top and extending down the south sides of many of the main ridges in the planning area. The soils are often shallow, and many occur in complex with rocklands. This landtype makes up about 40% of the planning area.

- Rockland and shallow soils make up about 37% of the landtype. Pepoon, Vallan, and Tenas are the most common soils, which are shallow to bedrock.
- Moderately deep residual soils[67] make up about 15% of this landtype. Bamber, Oxerine, and Leonardo are the most common soils in this group.
- Deep residual soils make up about 20% of this landtype. Growden, Inkler, and Togo are the most common.
- Soils formed on glacial deposits make up about 27% of this landtype. About half (12%) are in a complex with rocklands. These are often found along drainages, where the glacial material was deposited. The primary glacial soils in this landtype are Nevine, Merkel, Manley and Edds.

The primary activity proposed on this landtype is prescribed underburning. Pepoon, Vallan and Tenas are rated as highly sensitive to prescribed fire, because they are shallow to bedrock[68].

Landtype I is found on **glaciated mountain slopes that have generally not been scoured**. This landtype occurs on broad convex ridges mantled with glacial till. In this planning area, landtype I is generally found on the secondary ridges, and is more common on the north sides of ridges. Soils in this landtype are typically deeper. Some soils are formed on both glacial till and residuum. This landtype covers about 40% of the planning area.

- Deep glacial soils make up about 77% of this landtype. The most common soils in this group are Manley, Nevine, Edds and Merkel.
- Deep residual soils make up about 14% of this landtype. Growden, Inkler, and Togo are the most common.
- Moderately deep and shallow residual soils make up 5% of the landtype. Bamber (moderately deep soil formed in volcanic ash over residuum) is the most common.
- Rockland complexes make up about 20% of the landtype.

[67] Soils form on residuum and colluvium – soils formed more or less on weathered bedrock.
[68] Shallow soils are typically highly sensitive to prescribed fire because any erosion can adversely affect their productivity. However, these soils generally support brush and grasses, and are not highly productive initially.

Timber harvest, prescribed underburning, and road construction are proposed within this landtype. Many of these soils (Manley, Togo, Nevine, Growden and Bamber) are easily compacted due to the presence of volcanic ash in the surface horizons.

Landtype L is found on **deep glacial deposits such as moraines, undulating till plains, and outwash terraces**. The slopes are generally gentle and the topography is often undulating. Common soils in this landtype are soils formed on deep glacial materials especially outwash.

- Soils on glacial outwash make up about 49% of the landtype. Torboy, and Wapal are the most common; Goddard and Resner are less common. These soils are typically very flat except at terrace escarpments. On escarpments or other steep slopes (i.e., roadcuts) these soils ravel easily.
- Soils formed on deep deposits of glacial till make up about 36% of this landtype. Nevine, Manley, Merkel, and Neuske are the most common soils formed on glacial till. These tills generally grade up toward the adjacent landtype I, making a continuum of glacial till to the ridgetops.
- Soils on glacial lacustrine materials make up about 4% of this landtype. These soils are characterized by more clay than other soils in this planning area.
- Residual soils make up less than 3% of this landtype. Rockland complexes are rare.
- This landtype has sizable inclusions of wetlands and seasonally wet soils such as Shaskit and Tonata.

The primary activity proposed on this landtype is timber harvest. Some soils (Nevine, Manley, Nueske) are easily compacted due to the volcanic ash present. Torboy and Wapal have loose gravelly sand or gravelly coarse sand as their underlying glacial material. Tall roadcuts in this material are typically difficult to stabilize and difficult to adequately revegetate.

Volcanic Ash

The presence of volcanic ash strongly influences many of the management interpretations for these soils. Volcanic ash occurs in all landtypes, and most soils in the analysis area have some component of volcanic ash. This ash has a high water holding capacity and high nutrient holding capacity. In general, soils with deep ash layers are more productive and more resilient than other soils.

Soils with a Distinct Surface Layer of Volcanic Ash (Ash Cap)

Soils with a **distinct surface layer of volcanic ash** (ash cap) include: Bamber, Cobey, Edds, Goddard, Growden, Manley, Nevine, Oxerine, Pepoon, Tenas, Togo, Tonata, and Toroda. In this area, the ash layer generally ranges from 7 inches to about 20 inches. Bamber, Edds, Leonardo, Nevine and Tonata have thick ash caps – more than 30 inches thick.

Compaction: Most ash-cap soils are highly susceptible to compaction at all moisture levels. Typically soils with a distinct ash cap have a surface horizon with very low bulk density and low soil strength. Bamber, Edds, Manley, Nevine, Oxerine, Tenas, and Togo occur in complex with rockland. In the rockland complexes, these soils often have more coarse fragments mixed with the volcanic ash, reducing their sensitivity to compaction. Pepoon is lithic and typically contains more than 35% gravel and stones in the surface horizon, also reducing its sensitivity to compaction.

Erosion: Even though these soils don't have a lot of gravel or other coarse material on the surface, the surface soils are not highly erodible because the ash forms stable soil aggregates.

Soils where Volcanic Ash is Mixed with the Underlying Materials

The surface horizon of the following soils is **volcanic ash mixed** with the underlying materials: Inkler, Leonardo, Merkel, Torboy, Vallan, Wapal. Most have about 5-20% volcanic glass in the surface horizons. Inkler has more than 30% volcanic glass in the surface horizons. Leonardo has more than 60% pyroclastic material in the upper 16 inches. Typically these soils have higher bulk density, greater soil strength, and are less susceptible to compaction.

Compaction: Moderate sensitivity to compaction.

Erosion: Generally these soils do not form the stable aggregates seen in the ashier soils, and the erosion potential is slightly higher. Inkler and Leonardo have more ash, which makes them less erodible. Merkel and Vallan often have a lot of coarse fragments on the soil surface, making them less erodible.

Soils with no Volcanic Ash

Shaskit has **no volcanic ash**. Shaskit is formed from recent alluvial deposits.

Potassium Levels

Based on the bedrock geology, most of the soils in this area are expected to have medium to high levels of potassium. Most of the bedrock geology is medium and the soils also include quite a bit of volcanic ash, which is fairly high in potassium.

The Intermountain Forest Tree Nutrition Cooperative, based out of the University of Idaho, noticed that severe tree root rot areas were associated with rocks-types that had low levels of potassium[69] (Garrison and Moore, 1998). If low potassium were to be found anywhere in the project area, it would be expected on the ridge just south of Trout Creek in T38N, R32E, Section 20.

Because of the high cost of obtaining vegetation samples for potassium testing[70], it is recommended that any large pockets of severe root rot be treated as though they were low potassium sites. Most potassium in a tree is found in the branches and foliage. The most common mitigation for low-potassium soils is (1) leave branches and foliage on the site to reduce potassium removal and (2) before burning, to leave the slash on the ground for

[69] The IFTNC noted that, on some sites, nitrogen fertilization seemed to increase the overall level of root disease. Eventually, this observation lead to the conclusion that, for some trees, insufficient potassium was expressed as higher levels of root diseases.

[70] In this area, where the soils are commonly formed on three strata of material (volcanic ash, glacial material and bedrock), soil testing is not an accurate measure of potassium availability. The Intermountain Forest Tree Nutrition Cooperative (IFTNC) recommends testing foliage from the top third of the dominant and co-dominant trees in the fall after dormancy has set in (October through December). Typically foliage is gathered by climbing the tree. IFTNC recommends 5 samples per acre. It costs about $18/sample to process the material, and about $50/sample to obtain the material through climbing. The total cost is about $340 per acre.

one winter to leach the potassium from the slash into the soil further reducing the amount of potassium removed from the site.

Sensitive Soils

The following sensitive soils were identified relative to the projects proposed.

Soils that are easily eroded: Edds, Growden, Leonardo, Manley, Nevine, Oxerine, Tenas, Togo, Torboy, Vallan, and Wapal when they occur on 45-65% slopes. These soils are found on steep slopes in all landtypes.

Soils that have are wet or seasonally wet and are not suitable for operations by heavy equipment for all or part of the year: Shaskit-Tonata complex is generally found adjacent to streams.

Soils that are sensitive to the compaction by heavy equipment: Bamber, Edds, Growden, Leonardo, Manley, Neuske, Oxerine, Tenas, and Togo. All of the soils have a significant component of volcanic ash and few stones. These soils occur in all landtypes, but are most common in Landtypes I and L.

Landslide hazard: Landslide activity and hazards have been observed on the Nevine and Manley soil series, where they occur on steep slopes and are surrounded by numerous springs. An area such as this occurs south of the West Fork Trout Creek T37N, R32E, Section 5. No activities are planned in this area.

Evidence of past landslide activity has been observed on escarpments and inner gorge features formed by the downcutting of streams through relatively unconsolidated glacial materials. These areas are often mapped as Wapal, Torboy or Goddard soil series. These potentially unstable slopes occur on most of the larger creeks in the planning area – including North Fork Trout Creek, Trout Creek, West Fork Trout Creek, and Granite Creek. No road construction or timber harvest is proposed on these escarpments.

The following table summarizes the sensitive soils present in the planning area. Proposed activities include TH (timber harvest), UB (underburning), TP (precommercial thinning and piling), and road construction.

Table 13. Sensitive Soils

Soil Series	Activities Proposed on this Soil	Management Sensitivities: Slope class	Erosion	Comp-action	Fire	Wet	Cut-slopes
Shallow, rocky soils generally found in landtype G							
Pepoon	TH- small inclusions in units 10, 13, 18, 37. UB–units J, R. TP – small inclusions in units K and ZA.	<50%	M	M	H	No	
Tenas	TH- small inclusions in units 6, 32, 33, 36. UB–units D, M, N. TP- unit L. Road segment 14.	<50%	M	H	H	No	L
		35-65%	H		H		
Vallan	TH- small inclusions in units 9, 21. UB–units A, E, M, N, X.	<50%	M	M	H	No	
		35-65%	H		H		
Moderately deep soils formed on residuum and colluvium, generally found in landtypes G and I							
Bamber	TH- units 1, 5, 6, 9, 15, 24, 32, 36, 43. UB– units P, Q; minor inclusion in units N, R.	<50%	L	H	L	No	
		35-65%	M		M		
Oxerine	TH- units 10, 12. UB- minor inclusion in unit G.	<50%	M	H	M	No	
		35-65%	H		M		
Leonardo	TH – unit 20; minor inclusion units 18, 19, 23. UB- unit O.	<50%	M	H	M	No	
		35-65%	H		M		
Deep soils formed on residuum and colluvium, generally found in landtype I							
Growden	TH- units 3, 17, 20, 22. UB- units F, G, T, U.	<50%	M	H	L	No	
		35-65%	H		M		
Inkler	TH- units 6, 7. UB- minor inclusion unit D.	<50%	L	M	L	No	
		35-65%	M		M		
Togo	TH- units 17, 18, 19, 22, 22, 37, 38, 44. UB- unit U.	<50%	M	H	L	No	
		35-65%	H		M		
Toroda	UB- minor inclusion unit D.	<15%	M		M	No	
Deep soils formed on glacial materials, generally found in landtypes I and L							
Cobey	UB- minor inclusion in units J, V.	<50%	M		L	No	
Edds	TH- units 4, 10, 11. UB- unit G.	<50%	M	H	L	No	
		35-65%	H		M		
Manley	TH- units 2, 5, 13, 14, 16, 18, 28, 38, 45, 46, 47. UB- units F, U. TP- unit ZE. Road segments 14, 25.	<50%	M	H	L	No	
		35-65%	H		M		
Merkel	TH- units 10, 23, 26, 40, 41. UB- units O, W. TP- units K, ZC, ZE.	<50%	L	M	L	No	
		35-65%	M		M		
Neuske	TH- units 8, 10. TP- units K, ZA. Road segment 12.	<50%	M	H	L	No	L
Nevine	TH- units 1, 2, 3, 4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 23, 25, 31, 33, 34, 37, 39, 40, 41, 42, 48, 49. UB- units P, S, T, V. TP- units K, ZA, ZB, ZE. Road segments 3, 5, 12, 24, 32, 35.	<50%	M	H	L	No	L
		35-65%	H		M		
Deep soils formed on glacial outwash deposits, found in landtype L							
Goddard	TH- unit 8, small part of an escarpment is included in the unit.	35-65%	H	H	M	No	
Torboy	TH- units 19, 25, 26, 27, 28, 29, 30, 37. Escarpments in units 30, 37. TP- units ZC, ZD. Road segments 29, 36, 37, 38.	15-25%	M	M	M	No	H
		35-65%	H		H		
Wapal	TH- units 19, 21, 24, 26, 28, 30, 31, 33, 37. Escarpment in unit 37. TP- unit ZD. Road segment 24.	<15%	M	M	M	No	H
		35-65%	H		H		
Wetland soils found in all landtypes, but most common in landtype L							
Shaskit-Tonata	UB- minor inclusion in units J, P, R, V. *The only slope class is A – flat lands.*		L		L	Y	NA

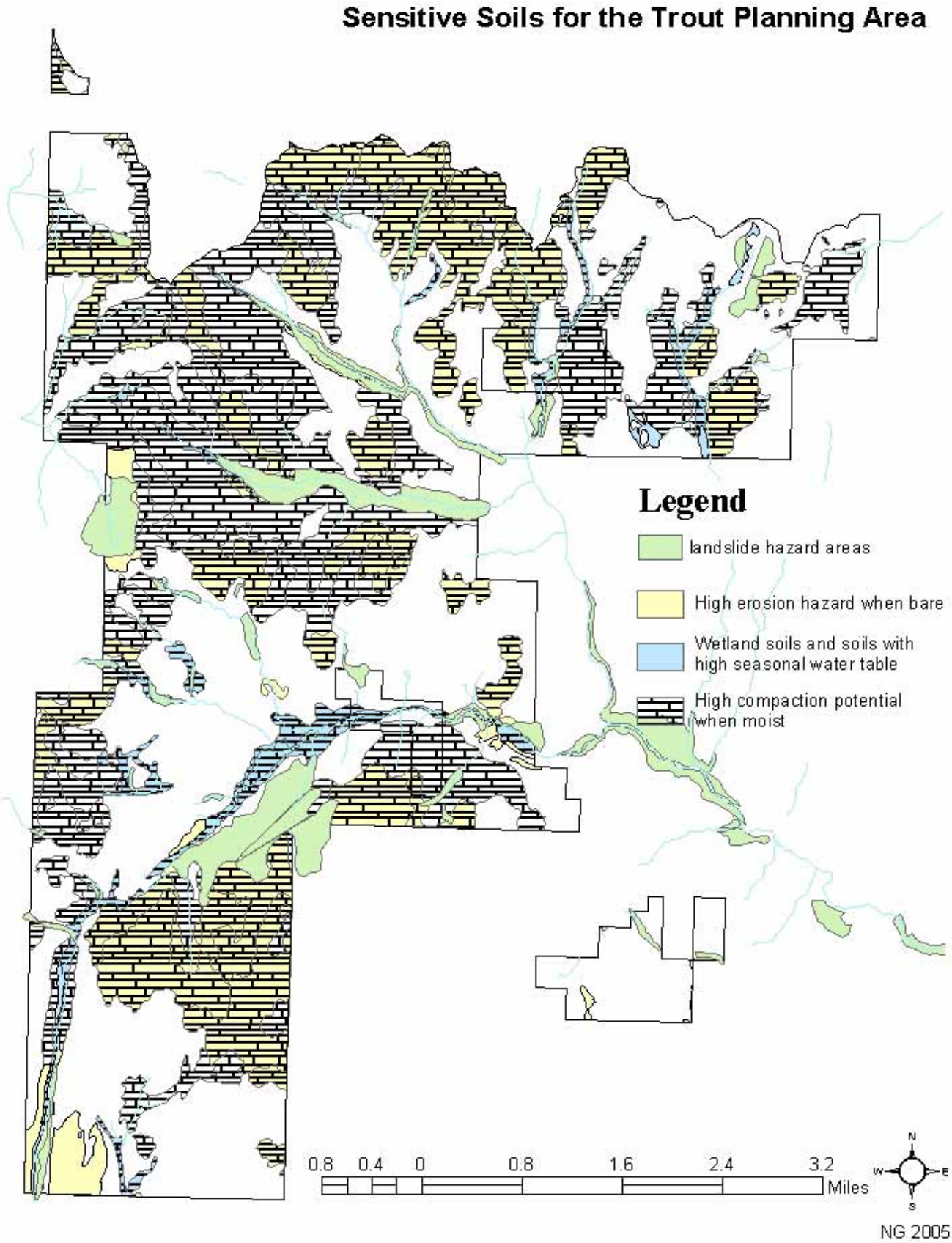

Sensitive Soils for the Trout Planning Area
Legend
landslide hazard areas
High erosion hazard when bare
Wetland soils and soils with high seasonal water table
High compaction potential when moist
0.8 0.4 0 0.8 1.6 2.4 3.2
Miles
N
W
E
S
NG 2005

Figure 3

Effects

Alternative A (No Action)

By deferring treatment at this time, Alternative A poses no short-term impact to soil resources. Soil conditions and processes would remain essentially as they are. There is probably more forest floor material than occurred under historic conditions. This material would continue to build-up until it eventually burns.

The effects on soils resulting from interrupting natural fire cycles have not been well studied, though the effects of fire have. According to Smith and Fischer (1997) fire suppression has allowed fuels to accumulate on the forest floor – the duff is thicker and the amount of down wood is probably greater. On sites with a short fire-return interval (such as the Douglas-fir/ninebark and Douglas-fir/ninebark/twinflower plant associations which dominate the planning area) the current duff depth may be outside the range of conditions experienced under a naturally occurring disturbance regime. In colder, wetter sites with a longer fire return interval (such as the subalpine fir series, which are present in the planning area) the amount of duff is probably within that experienced under a naturally occurring disturbance regime. However, these stands probably did not have the homogeneity that we see today – areas of thick duff and heavy accumulations of down wood would have been interspersed with areas that had been burned or underburned. Harvey (1999) suggests that fire suppression has changed the location of nutrient pools moving nutrients from the soil and high canopy to the forest floor and low canopy trees. This shift in nutrient pool and organic matter load could make sites, especially sites with a short fire return interval, more vulnerable to nutrient losses from fire. These changes have probably affected soil microbiology, soil chemistry and nutrient cycling.

The location, size and intensity of future wildfires are difficult to estimate, though some generalizations can be made. Generally uncontrolled wildfires occur during the driest time of the year, yielding a more intense fire that would occur under prescribed fire conditions. The adverse effects of an intense fire – loss of forest floor material, increased erosion, changes in soil biota – would be more widespread in an uncontrolled wildfire than under a prescribed fire.

The primary impact of an intense fire on soil productivity is the removal of duff and forest floor material, opening the soil to erosion.

If the organic matter of the mineral soil is reduced (as happens with a high-intensity, long-duration fire) the cation exchange capacity of the soil is also reduced and the ability of the soil to retain nutrients leached from ash decreases (Harvey et al. 1994). The soils in this planning area have volcanic ash in the soil surface, which has a high cation exchange capacity. While removal of organic matter will reduce overall cation exchange capacity, these soils will retain more capacity than most forest soils.

High intensity fires may volatilize some chemicals that are plant nutrients – specifically nitrogen and sulfur. Nitrogen is replaced through the fixation of gaseous nitrogen by bacteria, by fixation by nitrogen fixing plants, and through air pollution. It may take 10-

20 years for nitrogen to be replaced (Boerner, 1982). Sulfur would be replaced is a few years from atmospheric deposition (Tiedmann and Anderson, 1980).

Typically cation plant nutrients (e.g., potassium, calcium, etc.) do not volatilize at temperatures found in fires, they remain on the site in the ash (Downer and Harter, 1978). These cation nutrients may be lost through leaching. These nutrients would eventually be replaced from the decomposition of rocks.

Several researchers have suggested that fires, especially moderate and high intensity fires, can have a profound effect on soil arthopods, soil microbiology and nutrient cycling. Hungerford and others (1991), in a review of literature, report that burning kills many kinds of bacteria, fungi and arthropods but the extent of this effect is dependent on the amount of heat generated by the fire and the moisture content of the soil. Also, the effect may be short-lived.

Alternatives B and C

Both action alternatives impact the soil resources in the same ways. The number of acres impacted varies between the alternatives.

Table 14. Key Indicators for the Effects on Soil Productivity

	Alternative	
	B	**C**
Key Indicator for changes in site productivity due to road and landing construction		
Acres of landings to be constructed	9.5	4.5
Acres of new road to be constructed	4	0
Key Indicators for the effects of logging		
Total acres to be yarded with a ground-based system.	3,046	1,638
Key Indicators for the effects from burning		
Total acres to be treated with fire	6,263	7,234

Both alternatives identify a minimum skid trail spacing, as required by the Forest Plan. Each activity area was examined, and all activity areas proposed in both Alternatives B and C would meet the Forest Plan Standards for detrimental soil conditions.

Roads and Landings

Both alternatives would develop new landings. Only alternative B proposes new road construction[71]. Ketcheson, Megahan and King (1999) noted that: "Numerous studies have shown that most sediment resulting from timber harvest activities is caused by erosion on forest roads associated with the harvest rather than by erosion on the areas disturbed by tree cutting and skidding." Erosion from roads and landings may move into the fluvial system, impacting water quality and stream functions.

[71] Both alternatives B and C propose some 'construction of existing roads' (CE). It is called construction because it adds road to the system of 'classified roads'; but does not actually create a new road prism on the ground. This is not considered a change in detrimental soil conditions.

Sediment from roads and landings generally enters the fluvial system when roads and landings are located near streams. The distance sediment will travel across the forest floor depends largely on the slope between the source (road, landing) and the stream.

The construction of roads and landings is considered an irreversible effect on soil productivity.

Compaction

Compaction is an increase in the bulk density of a soil. Compaction occurs when ground-based equipment crosses the ground, vibrating and compressing the soil. Compaction adversely affects soil productivity and ecosystem processes by a variety of mechanisms including increasing the resistance to root penetration and elongation, changes in air and water movement through the soil, and subsequent changes in soil processes (e.g., soil microbiology, and nutrient cycling).

The impacts from skidding and falling equipment may not meet the criteria for a detrimental impact.

With tractor skidding, the main skid trails will experience detrimental compaction regardless of soil characteristics – unless ameliorating conditions exist such as snow or frozen ground. Design criteria are included which specify the minimum skid trail spacing. With 130 foot skid trail spacing, this project would detrimentally compact about 10% of the activity area.

Whether a Cut-To-Length system will create detrimental compaction is not significantly related to soil characteristics[72] – it is more related to the amount of slash buffering the trail. Cut-To-Length systems, with proper slash buffering, do not create detrimental conditions on the entire skid trail. Mitigation is included to prevent the use of a Cut-To-Length system unless the unit has sufficient slash or snow. With sufficient slash or snow, a Cut-To-Length activity area would experience about 9% detrimental compaction.

Most of the soils in the analysis area, and most of the soils proposed for ground-based harvest treatments have a high potential for compaction when moist. That is because most of the soils have the distinct volcanic ash horizon – which has a low bulk density, low strength and few coarse rock fragments. Mitigation measures require all heavy equipment to remain on designated skid trails. Therefore, additional compaction off of designated skid trails would not occur in these units.

Erosion and Sedimentation

Surface erosion is the detachment and transport of individual soil particles by wind, water, or gravity. Surface erosion can occur as the loss of soil in a fairly uniform layer (sheet erosion, dry ravel), or as concentrated erosion (rills and gullies). Severe erosion removes nutrient-rich topsoil, thereby reducing soil productivity. Monitoring on the Colville National Forest has seldom found erosion in areas large enough or severe enough to meet the criteria for detrimental surface erosion (Nancy Glines, personal observation).

[72] All of the soils proposed for ground-based logging has volcanic ash at the surface and contain little rock, therefore they are similar with regard to compaction by a Cut-To-Length system.

Tractors that cross the same ground many times eventually remove the duff and forest floor material baring the soil to erosion. The soil on these heavily used skid trails is generally also compacted and the soil structure is destroyed. Because the erosion on heavily used tractor skid trails occurs on already degraded sites, this erosion does not add to the amount of ground with reduced soil productivity.

Erosion from tractor skid trails may contribute to sediment to nearby streams. The WEPP (Water Erosion Prediction Process) model indicates that the probability of a climatic event that generates sediment is about the same with a tractor logging system as with a Cut-To-Length system, but the amount of sediment generated by such an event would be greater. The following table displays the WEPP model results.

Table 15. Water Erosion Model Results – Probability of sediment in the years immediately after harvest, and expected sediment for 6-yr, 15-yr and 30-yr recurrent storm event, with various levels of soil cover

Unit ##	Profile	Trail w/ 100% cover				Trail w/ 70% cover				Trail w/ 10% cover				No Action			
		Prob of Sed.	Storm			Probe of Sed	Storm			Prob of Sed	Storm			Prob of Sed	Storm		
			6 yr	15 yr	30 yr		6 yr	15 yr	30 yr		6 yr	15 yr	30 yr		6 yr	15 yr	30 yr
8	1	23%	0.03	0.43	2.56	23%	0.03	0.43	2.77	23%	0.03	0.43	2.99	7%	0	0	0.04
8	2	23%	0.01	0.22	3.34	23%	0.01	0.22	8.03	23%	0.01	0.22	10.33	not analyzed			
8	3	7%	0	0.01	0.47	7%	0	0.02	0.65	7%	0	0.02	0.83	6%	0	0	0.01
10	1	7%	0	0.16	2.99	7%	0	0.12	3.08	7%	0	0.19	3.05	6%	0	0	0.53
11	1	7%	0	0.04	3.04	7%	0	0.08	7.03	10%	0	0.13	9.98	not analyzed			
11	2	7%	0	0.06	7.18	10%	0	0.16	11.15	10%	0	0.27	17.96	6%	0	0	0.01
12	1	7%	0	0.04	1.36	7%	0	0.06	3.03	7%	0	0.07	3.88	7%	0	0	0.01
13	1	7%	0	0	0.48	7%	0	0.01	0.62	7%	0	0.01	0.75	6%	0	0	0.01
19	1	7%	0	0	2.97	7%	0	0.01	2.36	7%	0	0.01	2.34	6%	0	0	0.26
24	1	7%	0	0.25	5.35	7%	0	0.46	10.03	7%	0	0.64	11.3	4%	0	0	0.55
29	1	7%	0	0	2.13	7%	0	0	2.4	7%	0	0	2.4	6%	0	0	0.21

Erosion rates and the chance that sediment will enter a stream from harvest activities are highest in the first year following treatment. The table displays the probability of a climatic event of sufficient magnitude to generate sediment, in the first year following the disturbance. For most units and most slopes, the probability of sediment generating event is about 6-7% regardless of treatment. However, the amount of sediment that would reach the stream varies by treatment.

This table also shows that soil cover on the skid trail is important in reducing erosion. Shears and mechanical felling machines generally don't cross the same piece of ground repeatedly and therefore leaving the duff and forest floor intact. Cut-To-Length trails typically have 70-100% soil cover, because of the slash mat. Tractor logging typically results in 0-10% soil cover on the trails. As displayed in the WEPP tables, erosion and sediment is much less for Cut-To-Length systems.

Prescribed burning also bares the soil, subjecting it to erosion. The surface soils in this analysis area are typically silt-loam textures – a texture that is susceptible to raindrop impacts, surface sealing and increased runoff. In general, low and medium intensity fires burn only part of the duff and litter – leaving adequate soil cover over the majority of the site. The fires prescribed in both alternatives B and C are expected to burn the duff and litter in small, discontinuous areas throughout the prescribed burn areas. Because of their

small size (<100 square feet) these areas are not expected to degrade long-term site productivity. In general, low intensity prescribed fire does not cause excessive erosion and sediment, because soil cover is retained in a discontinuous pattern across the landscape. As displayed in the WEPP results table, sediment may occur where low intensity fire occurs along intermittent streams, such as occurs in Unit 8 slopes 1 and 2. Because of the combination of steep slopes and burning into the stream zone, the probability of sediment delivery is much higher and the amount of sediment potentially delivered to this stream much higher than the no action.

Soil Biology and Nutrient Cycling

Timber removal can result in both soil warming and an increase in soil moisture due to reduced evapotranspiration – the extent of the change is dependent on the amount and size of the timber removed. The soils warm in response to increased solar radiation, the more overstory trees removed the greater the effect (Hermann, 1978; Smith, 1986). Removing trees also reduces evapotranspiration because the total biomass of living plants is reduced. This effect typically disappears quickly as other plants reoccupy the site (Stone et al., 1978). Loss of canopy combined with increased soil moisture can create conditions favorable to decomposition of organic matter and increased biologic activity (Grier and others, 1989).

Alternatives B and C propose to remove about ¼ to ⅓ of the basal area of the treated stands, generally leaving the overstory. It is unlikely the other proposed treatments would reduce crown cover enough to influence temperature or water regimes (Hermann, 1978).

Timber removal can change soil microbiology through changes in stand density, soil temperature, moisture regime, species composition, and composition of the forest floor. The soil flora and fauna naturally changes as the vegetation changes – the flora and fauna that are present in a young stand is different than a middle-aged stand, and that is different from an old stand (Plitz and Molina, 1996). Changes in types of fungi have been documented in stands that have been thinned, but these stands have had about the same total biomass of fruiting bodies (Waters et al., 1994). Reductions in ectomycorrhizal fungi diversity is likely where vegetation is intensively used, composition simplified, or surface organic matter is removed or consumed (Amaranthus and Louma, 1995). Neither alternative proposes to simplify composition. Logging and tree removal alone does not remove the organic material on the forest floor. All alternatives retain the larger trees, which when they die and fall down provide the refugia needed especially on drier sites.

The prescribed fire proposed under Alternatives B and C would be light intensity with small areas of medium intensity, retaining unburned islands. This kind of burn would not have a long-term adverse impact on soil biota.

Nutrient loss from the removal of the boles of trees is typically small and can be replaced through the course of a rotation (Spurr and Barnes, 1980; Grier et al., 1989). The fire intensity proposed in Alternatives B and C would not be high enough to volatilize a significant amount of plant nutrients. Typically cation plant nutrients (e.g., potassium, calcium, etc.) do not volatilize at the temperatures expected in these alternatives. They

remain in the ash, where they may be lost through erosion or leaching (Downer and Harter, 1978). Because of the amount of organic matter to be left on the site, significant leaching is not expected to occur under Alternatives B and C.

Commercial or Small Pole Thinning using Ground-Based Yarding, followed by Underburning

These effects apply to Alternative B units 2, 3, 4, 5, 18, 19, 22, 23, 25, 29, 34, 36, 39, 44, and parts of units 8, 10, 12, 30, 32, 40; and to Alternative C units 18, 19, 29, 39, and parts of units 8, 10, 12, 30, 32, 40. The primary impact from these treatments is compaction, which is limited to designated skid trails.

Commercial or Small Pole Thinning using Ground-Based Yarding, followed by Mechanical Piling and Burning the Piles

These effects apply to Alternative B units 6, 11, 13, 14, 24, 26, 31, 37, 41, 42, 46, 47, and to parts of units 8, 10, 12, 18, 30, 38, and 40; and apply to Alternative C units 6, 11, 26, 37, 41, 46, and part of units 8, 10, 12, 18, 30, 38, 40. The primary impact is compaction on designated skid trails. Mechanical piling poses a slightly elevated risk of compaction off of designated skid trails. The potential for erosion and changes in soil biology apply as well.

Commercial Thinning using Ground-Based Yarding, with the Tops of the Trees Taken to the Landing and Burned (LTA)

These effects apply to Alternative B unit15 and parts of units 2 and 38; and apply to Alternative C unit 15 and part of unit 38. The primary impact from these activities is compaction on designated skid trails.

Commercial Thinning using Ground-Based Yarding, followed by Development of a Shaded Fuel-Break

These effects apply to portions of Alternative B units 8, 10, 26, 28, and 43; and portions of Alternative C units 10, 26, and 28. The primary impact from these activities is compaction on designated skid trails and some compaction off of skid trails from the development of the fuelbreak.

Commercial Thinning using Cable Yarding, followed by Underburning.

These effects apply to Alternative B units 17, 20, 43, and portions of unit 32; and Alternative C units 17, and part of unit 32. The primary impact is erosion in a few cableways, and a slight increase in erosion from the subsequent underburning.

Commercial Thinning using Cable Yarding, with the Tops of the Trees Taken to the Landing and Burned (LTA).

These effects apply to Alternative B unit 1. The primary impact is erosion in a few cableways.

Shaded Fuel-Break as the Only Treatment.

These effects apply to portions of Alternative B fuel treatment units ZA, ZB, ZC, ZD, and ZE; and Alternative C portions of units ZA and ZB, and units ZC, and ZD. No adverse impacts from these treatments are expected.

The Effects of Underburning as the Only Treatment

These effects apply to Alternative B fuel treatment units A, B, E, F, G, I, J, M, N, O, P, S, T, U, V, W, X; and Alternative C fuel treatment units A, B, C, D, E, F, G, I, J, K, M, N, O, P, Q, R, S, T, U, V, W, X. The primary impact would be from erosion.

Effects of Precommercial Thinning

Precommercial thinning using handheld equipment has no discernable soil impacts.

Cumulative Effects

Past Activities

Timber Harvesting

Much of the land in the Trout project area capable of growing commercial timber has been logged in the past. About 4,000 acres in the analysis area has been logged using stand-replacement prescriptions (clearcutting, seedtree, shelterwood). None of these areas are proposed for treatment at this time.

Most of the proposed timber harvest units include areas of past partial removal logging. Most of the past logging occurred in the 1960's and 1970's using tractors. Based on the age of stumps observed, it is likely some logging occurred prior to 1950. Even though these areas had been logged in the past, the duff appears to be consistent with unlogged areas with the same vegetation, moisture and temperature regimes. Down wood and finer forest floor materials appeared to be similar to logged areas. The compaction from past logging sometimes lasts for many years, and can result in a cumulative effect when past activities are combined with the proposed activities. Examination of these areas for this project found that compaction of logging skid trails and landings is the primary impact from this past treatment that lingers today. Compaction was variable – some stands with evidence of past logging had little compaction detectable with a probe. It appears that frost-action and/or biologic activity decompacted some lightly and moderately compacted skid trails in 30-40 years.

Fires

Portions of the analysis area were burned between 1900 and 1930. In most of the stands the duff is generally thick (1-3 inches deep) and consistent with the vegetation, moisture and temperature regime on the site; down woody material is abundant; soil tilth is good. The vegetation appears to have recovered from the past fires, and the soils appear to have recovered as well.

Recreation

The planning area supports a wide range of recreation activities including recreational driving, snowmobiling, berry picking, and camping at dispersed campsites. The activities most likely to cause soil impacts are camping and picnicking at dispersed campsites. Off-road vehicles were observed in the project area, but all were on existing roads.

Since most campsites are located on roads, they don't significantly increase the amount of detrimental soil conditions in the planning area.

Livestock Grazing

The project area includes all or part of three livestock grazing allotments. Most of the livestock grazing occurs in open and lightly forested stands, which generally occur on southern aspects. Livestock and wildlife trails[73] were observed in many proposed treatment areas. Typically the trails were about 12 inches wide. Often, they followed fences. Cattle trails were generally compacted. Since the number of trails is very small, perhaps 1 per acre, the total acreage detrimentally disturbed by livestock is very small. Cumulative soil effects happen when multiple events, such as past logging, grazing or recreation, occur in the exact same area. The following past or on-going activities were used to analyze cumulative effects: past logging, recreation, and grazing. There are no other reasonably foreseeable activities proposed for the units proposed for treatment under this project.

Proposed Actions

All proposed timber sale treatment areas were visited, and existing detrimental soil conditions estimated. Transects were used to help establish the existing detrimental soil conditions.

Less than 5% of the following proposed units currently have detrimental soil conditions: A, B, E, F, G, I, J, M, N, O, P, S, T, U, V, W, X, ZC, ZD, ZE, 7, 13, 14, 17, 18, 21, 22, 28, 39, 47, 48. About 5-10% of the following units currently have detrimental soil conditions: ZA, ZB, 1, 2, 3, 4, 5, 6, 8, 10, 11, 12, 15, 19, 20, 23, 24, 25, 26, 29, 30, 32, 34, 36, 37, 41, 44, 45, 46, 49. Overwhelmingly, the detrimental conditions encountered in these units was compaction and displacement of roads and landings, and residual compaction on old skid trails – all the result of past timber management activities. In all cases, the roads and landings would be re-used with this proposal. Most of the skid trails would also be suitable for use with this project. The cumulative effect of this project, when combined with past projects, would continue to meet the Forest Plan standard with regard to detrimental soil conditions.

The following units have higher levels of existing detrimental soil conditions, and will be described individually—

- Unit 6 under Alternative C only (3 acres, precommercial thin, underburn). In this alternative Unit 6 is only 3 acres in large part consisting of a road and landing. The existing detrimental conditions for this very small area are 29%. The trees harvested could be endlined to the roads so no additional acres would be compacted by heavy equipment. Areas that are currently above the standard may be treated if the treatment does not result in an increase of detrimental soil conditions[74] (FSM 2520.2 R6 Supplement 2500-98-1). The road is a classified road that has a long-term use for vegetation management. The landing is not excessive in size, and is appropriate for managing the larger stand. The reason this unit has such a high detrimental soil condition is due to the small size. Ripping the road or landing is not recommended. Because endlining the material to the existing roads and landings would not result in

[73] It is difficult to distinguish livestock trails from wildlife trails. It is assumed that the trail is used by both.
[74] In areas where more than 20 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration must, at a minimum, not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality.

an increase in the cumulative detrimental soil conditions, this unit would meet the Forest Plan standard, as supplemented by the Forest Service Manual.

- Unit 31 (Alternative B only) (49 acres, commercial thin, ground-based, mechanical pile) has existing detrimental conditions of 15%. The primary detrimental soil condition is compaction on visually apparent skid trails. The unit does not have enough small branches to allow a Cut-to-Length system in the summer. The landings along the bottom are suitable for reuse. Mitigation is included to require winter logging for this unit. At the elevation (4500 ft) adequate snow should be assured in most years. Mechanical piling would occur in the winter as well, and would be strictly limited to the existing skid trails. With winter logging and winter piling, the amount of detrimental soil conditions should remain at the current level, which meets the Forest Plan standard with regard to detrimental soil conditions.
- Unit 33 (44 acres, precommercial thin) has detrimental soil conditions of 10-15%. The primary detrimental soil conditions are compaction on a large number of skid trails. Recreation is contributing to the continued compaction of the landing and roads. Precommercial thinning with hand-held equipment would not increase the amount of compaction. Since the unit is currently below the standard, and the proposal would not increase the amount of detrimental disturbance, this unit would meet the Forest Plan standards with regard to detrimental soil conditions.
- Unit 38 (7 acres, commercial thin, ground-based, leave tops attached) has detrimental conditions of 17%. The primary detrimental soil condition is compaction and disturbance on a series of old roads that parallel the main road, and a large landing on the main road. The landings and roads would be used to skid any material harvested. Mitigation is included to require winter logging for this unit. At the elevation (4,000 ft) adequate snow should occur in most years. With winter logging, the amount of detrimental soil conditions should remain at the current level, which meets the Forest Plan standard.
- Unit 39 under Alternative C only (8 acres, commercial thin, ground-based). This unit is much smaller than in Alternative B. At its widest point it extends about 300 feet from the road. This portion of the unit is very rocky. Because of the road, detrimental soil conditions make up about 10% of the unit. 300 feet is really too long to pull line, so this unit will require some additional skid trails. It is estimated that it would take an additional 4-5 skid trails about 200 feet long. Cumulative detrimental soil conditions would be about 15% -- this unit would continue to meet the Forest Plan standard.
- Unit 40 (111 acres, commercial thin, ground-based, mechanical pile and underburn) has detrimental soil conditions of 12%. The unit is bisected by a long road (about 1.5 miles) that zig-zags through the unit. Along this road are some landings, and the adjacent lands have about 10% detrimental conditions in skid trails. The road, landings, and skid trails are in acceptable condition and can be reused by this project. By reusing the existing facilities, this project would add little to the existing detrimental soil conditions. This unit would continue to meet the Forest Plan standards for detrimental soil conditions.
- Shaded Fuelbreaks YA and YB (10 acres and 21 acres) are located on private land adjacent to National Forest system lands. Unit YA is located on ranchland adjacent to the Forest. The area had some timber removal, and is currently grazed. YB is located adjacent to County Road 514 and includes about 1,100 feet of county road, and about 1,500 feet of a water ditch and adjacent private road. Timber has been

removed in the past, and some skid trails are evident. Construction of a shaded fuelbreak would increase compaction slightly especially if heavy equipment is used to manipulate the fuels. Forest Plan standards do not apply to these areas.

While recreation occurs in the vicinity of proposed treatment areas, no evidence was observed that these forest visitors use the adjacent stands. No user-created off-road-vehicle trails were observed. Mitigation is included to prevent off-road-vehcile use of skid trails – though use of old skid trails was not observed in the analysis area. Therefore, recreation use is not expected to create a cumulative impact on the soil resources.

Cumulative effects from livestock grazing include detrimental compaction from animals congregating, and erosion from livestock trails. Individual livestock trails were noted in many proposed treatment areas, but the trails make up an extremely small percentage of the landscape and of the proposed activity areas. No activities were proposed in areas where livestock congregate in greater numbers. Livestock grazing is not expected to increase the portion of these units experiencing detrimental soil conditions.

The proposed action will reduce the density of trees in stands, making forage more available to livestock. Livestock would disperse more widely through the allotment. Dispersed livestock grazing in harvest units would not produce additional detrimental soil conditions (Broersma and others, 2000).

The cumulative effects of the increased spread on noxious weeds on soil productivity can only be described in general terms because of the large number of unknown variables. As described in the Noxious Weed report, weeds are likely to spread regardless of the alternative selected. It is likely that areas dominated by knapweed, have higher erosion rates than similar areas dominated by grasses or covered by duff. It is not clear how noxious weeds compare to native forbs that naturally invade burned and disturbed sites. Alternatives B and C provide for a mechanism, through the timber sale contract, to seed disturbed areas. This seeding would reduce erosion and prevent the establishment of noxious weeds.

Noxious Weeds

Information provided in this Environmental Assessment about noxious weeds is excerpted from Trout Vegetation Management Project Noxious Weed Report by Jim Nash, March 30, 2005. The full text of this report is incorporated by reference. The noxious weeds report describes the current and desired conditions with regards to noxious weeds in the Trout project area. It also describes and compares the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

Existing Conditions

Long-term, traditional use of quality forest and rangelands is being adversely impacted due to the encroachment of unpalatable, undesirable and competitive plant species.

Noxious weeds present in the Trout project area include diffuse knapweed, spotted knapweed, bull thistle, common houndstongue, oxeye daisy, goat weed (St. John's-wort), Canada thistle, absenth wormwood, common tansy, Dalmatian toadflax, hoary alyssum, orange hawkweed, yellow hawkweed, musk thistle, sulfur cinquefoil and common bugloss.

The following table displays noxious weed species, extent, and County Weed Classification[75] within the Trout project area.

Table 16. Noxious Weeds Present in Trout Project Area

Species	Acres	Ferry County Classification
Common Bugloss	6	B designate
Orange Hawkweed	191	B designate
Yellow Hawkweed	3	B designate
Diffuse/Spotted Knapweed	126	B designate
Hoary Alyssum	Present, extent unknown	B non-designate
Musk Thistle	5	B non-designate
Oxeye Daisy	Present, extent unknown	B non-designate
Sulfur Cinquefoil	Present, extent unknown	B non-designate
Houndstongue	115	B non-designate
Dalmatian Toadflax	Present, extent unknown	B non-designate
St. John's-wort (goatweed)	Present, extent unknown	C
Canada Thistle	Present, extent unknown	C
Absinth Wormwood	Present, extent unknown	C
Common Tansy	Present, extent unknown	C

As indicated in the table above, several weeds are present but their extent is not quantified. Most of these do not occupy large areas and often are just a few plants, or plants within an area too small to digitize or traverse with global positioning systems.

Diffuse knapweed is a noxious weed species that is a high priority for treatment along travel corridors. Spotted knapweed, hoary alyssum, common bugloss, and orange and yellow hawkweeds are classified as new invaders and are targeted by the County for eradication. However, these species are expected to continue spreading over the next decade.

The existing dense forest canopy on undisturbed timbered sites provides a natural deterrent to noxious weed invasion. The noxious weeds identified above are not generally shade tolerant, although common houndstongue, spotted knapweed and orange hawkweed can be found in shade.

[75] Noxious weeds are classified by the State into Classes A, B, and C. **Class A** weeds are non-native species with a limited distribution in Washington. Preventing new infestations and eradicating existing infestations is the highest priority. Eradication is required by law. **Class B** weeds are non-native species presently limited to portions of the state. Species are designated (i.e., **Class B-Designate**) for control in regions where they are not yet wide-spread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal. **Class C** weeds are non-native weeds found in Washington. Many of these species are widespread in the state. Long-term programs of suppression and control are a County option, depending on local threats and the feasibility of control in local areas.

Many of the roads within the analysis area were included for treatment under the 1998 Noxious Weed Treatment EA. Spraying of some of these weeds has been occurring since 1992. Mechanical treatments have been successful in small populations, with weeds that won't sprout after pulling. Biological agents have been successful in goatweed and musk thistle (e.g., below McGowan Spring on Tonata grazing allotment). While the biological agents reduce populations, weeds will not be eradicated with biological agents alone.

Effects

In the action alternatives, creating more open stands would provide a more favorable environment for the establishment of noxious weeds such as knapweed, hawkweeds, hoary alyssum, houndstongue, and goatweed. Though most weeds normally do not compete well with native vegetation in shaded environments, it is anticipated that the thinning treatments will not leave enough shade in most areas to deter these weeds' establishment. Therefore, it is anticipated that the disturbed areas would be at moderate risk for infestation, if seed sources for the above weeds were readily available. Timely implementation of mitigation measures is anticipated, which will reduce this risk to acceptable levels.

Disturbed areas will create a seedbed readily susceptible to noxious weed invasion. Mitigation measures are included that would require seeding of disturbed sites as soon as possible after the activity is complete.

For natural hazard-fuels[76] burning activities, the expectation is that exposure of mineral soil will be widely scattered, the areas of bare soil would be small in size, and that re-colonization by native plants will occur rapidly.

In the action alternatives, there would be funds collected for noxious weed treatment along haul routes. There would also be contract provisions for cleaning equipment. Timber sale provisions for cleaning equipment and collecting deposits for noxious weed treatment have been highly effective in reducing and treating noxious weeds.

For the effects analysis on the action alternatives it is estimated that the maximum area of disturbance to mineral soil will be as follows:[77]

Table 17. Estimated Soil Disturbance for Various Activities

Tractor Harvest	5% of activity area
Skyline Harvest	2% of activity area
Road Construction & Reconstruction	24 feet wide for length of road
Road Obliteration/Decommissioning/Abandonment	24 feet wide for length of road
Road Maintenance	15 feet wide for length of road
Prescribed burning	3% of activity area
Grazing	3% of activity area
Mining (open areas, gravel pits, borrow sites etc.)	100% of activity area

[76] The term **natural hazard-fuels** refers to fuels that accumulate naturally, as opposed to fuels that accumulate as a result of logging or other activity (called **activity fuels**).
[77] Source: *Method for Evaluating Soil Disturbance for Various Timber Harvest Alternatives*, by Duane Dipert, Soil Scientist, Colville National Forest, 1990.

The amount of road that is actually disturbed is dependent on conditions on the ground and could vary from 5% to 15%. An average value of 10% of the road length was determined to be appropriate based on field review of past projects. Soil disturbance as a result of grazing activities is based upon soil effects analysis for range projects. Considering water developments, trails, salting areas, and corrals, disturbance ranged between 1% and 3%.

Alternative A (No Action)

Orange and yellow hawkweeds have occupied sites since 1992 and currently occur on 194 acres. This represents an average increase of approximately 15 acres per year. Given the current abilities and funding to treat these weeds, the future extent of these weeds would be as much as 344 acres or 2% of the planning area in the next 10 years. This is based upon likely unknown sites and existing sites that get missed during follow-up treatments and the ability of the weed to spread both by rhizomes and wind-borne seed dispersal.

Diffuse knapweed infestations have occurred in the planning area since the 1980's. Since weed treatment began in 1992, population levels have remained somewhat stable. Knapweeds would not be expected to increase beyond current levels of 126 acres or less than 1% of the planning area.

Hoary alyssum is established and is expected to rapidly increase because it has not been treated in the planning area. Based upon visual observation around the Curlew area, spread is very rapid due to the quantity of seed production.

Houndstongue populations have increased in the planning area at a rate of 11.5 acres per year since 1995. Houndstongue would increase due to uncontrollable seed dispersal by a number of agents including humans, wildlife, and livestock. It would be expected to double in area in the next 10 years to 230 acres or 1% of the planning area.

There would be little additional increase in the extent of Dalmatian toadflax, musk thistle, and goatweed, because these have ongoing biological agents; and common bugloss, oxeye daisy, sulfur cinquefoil, Canada thistle, wormwood, or common tansy because existing populations are manageable.

Alternative B and C

Road building causes exposed soils where noxious weeds can colonize quickly and displace native species. Harvesting activities may create landings and skid trails where soil is exposed and becomes open to noxious weeds invasion. Burning may create exposed soil where noxious weeds may spread or invade. Equipment used in road building, road maintenance, or timber harvesting may bring in noxious weeds or seeds from other areas.

Road construction and the ground disturbance associated with timber harvest will increase the acres with favorable conditions for noxious weed establishment and could potentially cause an increase in the rate of spread. However, project mitigation measures are expected to reduce this rate and extent of spread. Where there is an existing

understory, and especially where it receives little disruption, vigorous regrowth of forest vegetation will also deter noxious weed invasion. This is especially true of sites with greater than 25 percent pinegrass or with a dense, shrubby understory.

Soil Disturbance

There would be an estimated 470 acres of disturbed soil available for invasion by noxious weeds or an additional 2.4% of the planning area under Alternative B, or 366 acres disturbed (1.9%) under Alternative C.

Table 18. Alternative B Estimated Maximum Soil Disturbance

	Amount of Activity		Acres of Disturbed Soil	
Disturbance Activity	**Alternative B**	**Alternative C**	**Alternative B**	**Alternative C**
Tractor Harvest (acres)	3,046	1,638	152	82
Skyline Harvest (acres)	131	51	3	1
Road Construction & Reconstruction (miles)[3]	24.6	9.8	73	28
Natural Fuels, controlled burning (acres)	6,263	7,234	188	217
Prescribed burning (slash and mechanical piles) (acres)	1,082	1,279	54	38

Change in Weed Extent

It is estimated that there would be 0.2 acres under Alternative B, and no acres under Alternative C, of orange and yellow hawkweeds disturbed by road construction/re-construction. Harvesting and burning would result in 2.7 acres (Alternative B), or 1.6 acres (Alternative C) of soil disturbance in areas with hawkweeds. In addition to the increase in weed extent in that is estimated to occur without any of the proposed actions (Alternative A), these weeds would likely increase their extent. The increase in extent would be dependent upon the timing of the disturbance. The extent of the hawkweeds would increase somewhat if hawkweeds were not in bloom, or the extent would increase substantially if hawkweeds were in bloom.

It is similarly estimated that there would be 13.2 acres (Alternative B) or 0.9 acres (Alternative C) of diffuse knapweed disturbed by road construction/re-construction, and 61.3 acres (Alternative B), or 28.4 acres (Alternative C) by harvesting and burning. In addition to the increase in weed extent in that is estimated to occur without any of the proposed actions (Alternative A), the increase in extent would be dependent upon the timing of the disturbance. The extent of the knapweeds would increase 27% per year if knapweeds were in bloom and spread around by equipment and equipment disturbing seeds already stored in the soil. During the life of the project (3 years), this would represent an increase of 153 acres (Alternative B), or 60 acres (Alternative C). This would result in approximately 1.5% (Alternative B) or 1.0% (Alternative C) of the planning area having knapweeds (including pre-existing populations).

[3] New road construction = .9 miles. Light and medium reconstruction actual disturbed length = 16.9 miles. Reconstruction of 6.72 miles of unclassified roads for a total of 24.6 miles of road construction and reconstruction equal to 73 acres.

There would be 0.7 acres of houndstongue disturbed by burning under either action alternative. In addition to the increase in weed extent in that is estimated to occur without any of the proposed actions the extent of houndstongue would increase because the fire would not be expected to kill the plants or the seeds and disturbed area would provide excellent seedbed.

There would be 3.3 acres (Alternative B) or 0.2 acres (Alternative C) of common bugloss disturbed by harvesting. The increase in extent would be dependent upon the timing of the disturbance. The extent of the bugloss would increase much the same as spotted knapweed or 27% per year if they were in bloom and spread around by equipment and equipment disturbing seeds already stored in the soil. During the life of the project (3 years), this would represent 7 acres (Alternative B), or 0.4 acres (Alternative C). Under Alternative B this would be less than 0.04% of the planning area (including other populations).

The effects to hoary alyssum, Dalmatian toadflax, oxeye daisy, musk thistle, sulfur cinquefoil, goatweed, Canada thistle, wormwood, or common tansy would be the same as Alternative A.

Cumulative Effects

The boundary of the cumulative effects area is defined as the primary road systems bounded by the watershed boundaries that include the planning area. The road systems were chosen because they are the primary vectors of noxious weed spread.

One of the greatest contributors to the spread of noxious weeds, if there are nearby seed sources, is the number of roads open to vehicular access. The highest risk of spread is associated with roads that are accessible to all types of vehicles (cars, trucks, all-terrain vehicles, mountain bikes, motorcycles, etc.). Next highest risk is roads that are closed to vehicles greater than 40 inches in width but are open to all other vehicles. At the lower end of the spectrum (but still at risk) are trails that normally are closed to motorized use by regulation. Many of these trails are still used by all-terrain vehicles and motorcycles but are at lower risk due to the reduced level of traffic associated on them.

The following table displays noxious weed species, abundance, and class, as known by the Forest Service, within the cumulative effects boundary.

Table 19. Noxious Weeds Present in Cumulative Effects Area

Species	Acres	Ferry County Class
Common Bugloss	6	B designate
Orange Hawkweed	298	B designate
Yellow Hawkweed	64	B designate
Diffuse/Spotted Knapweed	333	B designate
Hoary Alyssum	Present/unknown	B non-designate
Musk Thistle	50	B non-designate
Oxeye Daisy	Present/unknown	B non-designate
Sulfur Cinquefoil	Present/unknown	B non-designate
Houndstongue	366	B non-designate
Dalmatian Toadflax	775	B non-designate
St. Johnswort (goatweed)	Present/unknown	C
Canada Thistle	Present/unknown	C
Absinth Wormwood	Present/unknown	C
Common Tansy	Present/unknown	C

The following table displays the activities that have contributed to soil disturbance prior to project, or will contribute to soil disturbance during project life (anticipated to begin in 2006, projects completed by 2012), and after the project. For Washington Department of Natural Resources and Private activities within the life of the project, all activities from 2001 were included and assumed to have a five-year completion timeframe.

Table 20. Activities that Contribute to Soil Disturbance in Cumulative Effects Area

Activity	Past	During Project Life	Future
Harvest (acres)	Forest Service-19,166 DNR/Private-21,738	Berton-1,440 State/Private-4,987	
Road Maintenance (miles)	Forest Service and County-284	284 State/Private-51.2	284
Road Construction (miles)	All ownerships-680	State/Private-5.5*	
Road Reconstruction (miles)	Berton -15		
Road Obliteration/decommission/abandonment (miles)	Blacksmith-1 Berton-9.8	State/Private-3.0	
Burning (acres)	Berton and Berton Helicopter-501	Berton-4,637	
Grazing (acres)	Tonata, Empire, Clackamas, Sheridan, Trout Creek, Other Gov't, Private-121,243	121,243	121,243
Mining (acres)	Borrow Pits-18 Silver Bell, Kelly, Knobhill, unnamed-94	18 94	18 94

**Includes construction and reconstruction on State and Private lands.*

Table 21. Past, Present, and Foreseeable Estimated Maximum Soil Disturbance

Disturbance Activity	Acres of disturbed soil
Harvest (6,427acres)	321
Road Maintenance (335 miles)	609
Road Construction/Reconstruction (5.5 miles)	16
Road Obliteration/decommission/abandonment (3 miles)	9
Burning (4,637acres)	139
Grazing (121,243acres)	2,425
Mining (112 acres)	112

Air

Information provided in this Environmental Assessment about air quality is excerpted from Trout Vegetation Management Project Fuels Report by Reed Heckly, May 11, 2005. The full text of this report is incorporated by reference. The fuels report describes the current and desired conditions with regards to air quality in relation to prescribed burning for the purposes of reducing forest fuels and wildfire potential. It also describes and compares the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

When dispersed properly, smoke does not threaten human health. However, high concentrations found on the fire line can expose firefighters to the toxic compounds found in smoke. Smoke from controlled burning occurs infrequently during a few weeks in a year. The actual exposure time during which a person is substantially exposed to harmful smoke concentrations is very low.

Managing smoke from controlled burning involves timing and cooperating with the weather to minimize the impacts of smoke. The Republic Ranger District's burning program takes place when fuels and weather conditions meet predetermined prescription parameters. The burning of either logging slash or natural fuels is done primarily in the dry periods of the spring and fall. In any year, the burning program may involve ignitions on an average of 12 to 20 days in a year. Burn days are chosen when winds will move the smoke out of the project area and dissipate it. Ignition typically ceases by late afternoon so the burn will consume most of the fuels before downslope wind patterns develop in the evening. Any residual smoke from burning that lingers overnight generally shows in a "mid-elevation" inversion layer within the valleys. Inversions generally break up mid-morning and the smoke dissipates upward. Smoke settling into the valley bottoms is rarely seen.

Effects

Alternative A (No Action)

No smoke will be added if the project is not implemented.

Lack of fuel reduction activities will continue to indirectly contribute to increased vegetation growth with proportionate additional fire intensity and resultant smoke when fires occur.

The emission rate from a wildfire produces averages almost twice the amount of particulates as underburned slash and four times the amount of particulates as piled slash (Ottmar 2001 p100). Clearly, fuel reduction activities in prescribed conditions offer much less opportunity for smoke emissions than that produced by wildfires.

Effects common to the Action Alternatives

Direct effects will be seen as smoke from controlled underburning in both natural fuels units and commercial thinning units. Smoke is generated most copiously during the first few hours of a controlled burn, tapering off as the fuels consume. Smoke from residual burning may settle into the valleys during the night. Based on past experience, the smell of wood smoke from controlled burning may be detectable by the average citizen only occasionally in localized valley bottoms the morning after a burn.

The city of Spokane is the nearest non-attainment area, and smoke from prescribed burning on the Trout project would not affect the Spokane area.

The nearest Class I airshed is the Paysayten Wilderness in the Okanogan National Forest, approximately 60 air miles west of the Trout project area. Prevailing winds move smoke away from the Pasayten.

Effects unique to each alternative, and their differences

Alternative C burns fewer acres (7,506) than Alternative B (8,399) because many harvest units are dropped. The potential exists that Alternative C will emit more smoke by virtue that most of the mechanical piling has been dropped in favor of underburning. Mechanical piling is relatively clean burning since more fuel is consumed during the most efficient, flaming phase of the combustion process, which in turn produces the least amount of smoke.

Cumulative Effects of the Action Alternatives

Smoke produced from combustion has potential to combine with smoke from other burn areas on the District or combine with smoke from burning being done on adjacent Forest Service Districts, other agency lands, and/or private lands. Smoke can also mix with residual smoke from the previous day's burning adding to the total production of smoke. Regardless, the action alternatives are unlikely to pose adverse cumulative effects from smoke. In general, smoke emissions from controlled burns are occasional short-term events that disappear in the large-scale motions of daily wind and rain. State and national air quality regulations work to limit the rate of emissions so the production of particulates does not exceed the natural cleansing processes of the atmosphere. The everyday activities that produce vehicle exhaust, dust, home-stove smoke and other emissions are taken into account before smoke from forestry and agricultural burning is permitted. Therefore, controlled burning smoke, when compared to other human activities, is a transient product unlikely to produce lasting effects on a localized area.

Heritage

Information provided in this Environmental Assessment about heritage resources is excerpted from Trout Timber NEPA Specialist Report by Alecia D. Beat, August 2, 2004. The full text of this report is incorporated by reference. The heritage report describes the current and desired conditions with regards to heritage resources in the

Trout project area. It also describes and compares the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

Existing Conditions

There are twenty-seven identified historic properties within the Trout planning area. Of these, ten properties are located within or near identified planning units, and have the potential to be affected.

Past management practices have not identified any of these properties as evaluated for their eligibility to the National Register of Historic Places. Historic properties that are unevaluated are managed as if eligible, and mitigations for these properties will follow management prescriptions as specified.

Effects

Alternative A (No Action)

Heritage sites would continue to gradually deteriorate over time, subject primarily to natural forces.

Alternatives B and C

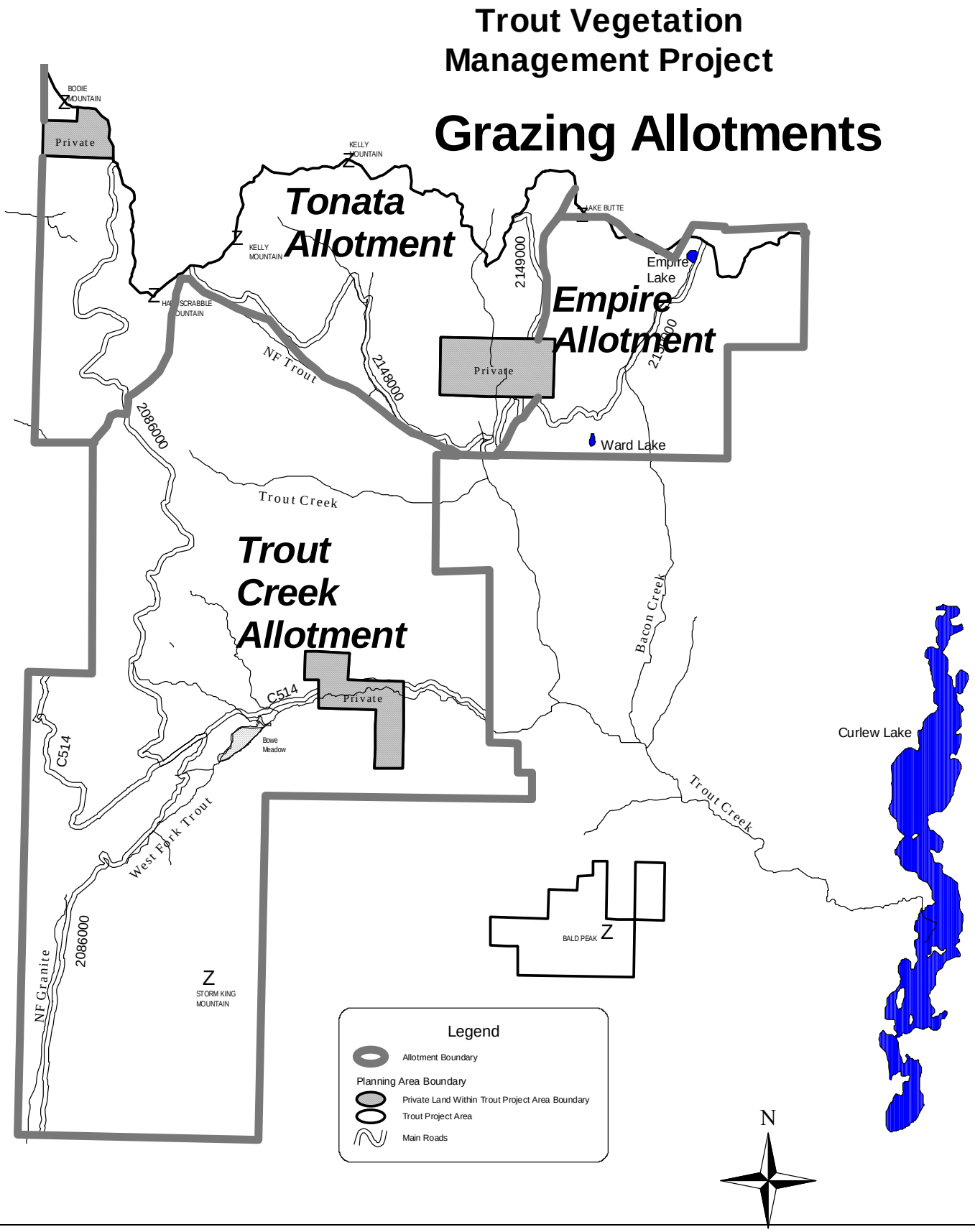
Ten heritage sites under Alternative B, and eight sites under Alternative C, have the potential to be affected. All are Management Class 2 sites.

Project activities have the potential to damage or destroy these sites directly by heavy machinery, falling trees, road building, fuels treatments, etc., or indirectly as a result of discovery and increased access to each site.

Having a buffer left around each one of the sites will protect the Management Class 2 sites. The size of the buffer will vary based on site-specific circumstances dealing with yarding methods and site vulnerability. With the buffering, each site will be protected. This will reduce the timber volume that could be removed in each unit by a small amount, and may influence how the logs are yarded adjacent to each site.

Range

Information provided in this Environmental Assessment about rangeland grazing is excerpted from Trout Vegetation Management Project Range Effects Report by Jim Nash, January 10, 2005. The full text of this report is incorporated by reference. The range report describes the current and desired conditions with regards to rangeland and domestic livestock grazing in the Trout project area. It also describes and compares the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.


Trout Vegetation
Management Project
Grazing Allotments
Tonata
Allotment
Empire
Allotment
Trout
Creek
Allotment
BODIE MOUNTAIN
Private
KELLY MOUNTAIN
KELLY MOUNTAIN
HAMMERSCRABBLE MOUNTAIN
LAKE BUTTE
Empire Lake
2149000
2148000
NF Trout
Private
Ward Lake
2086000
Trout Creek
Bacon Creek
C514
Private
Bowe Meadow
C514
West Fork Trout
Trout Creek
Curlew Lake
BALD PEAK
2086000
NF Granite
STORM KING MOUNTAIN
Legend
Allotment Boundary
Planning Area Boundary
Private Land Within Trout Project Area Boundary
Trout Project Area
Main Roads
N
1 0 1 2 3 Miles

jlp 9/20/05

Existing Condition

Areas suitable for grazing are composed of various densities of Douglas-fir with pine grass understory on the northern facing slopes and open ponderosa pine with bluebunch wheatgrass and Idaho fescue understory on southern facing slopes. Many of the traditional open grasslands and park like stands are being lost due to the encroachment of trees.

In the 1970s and 1980s, transitory range created through even-aged timber management offset the loss of primary range due to conifer in-growth. Many of the harvested areas were seeded for wildlife and livestock forage. Since many of these harvested units included riparian and wet areas, cattle access and use resulted in areas where detrimental resource impacts, such as bank trampling, occurred.

Grazing, although at a reduced level in the present day, is a very prevalent use within the Trout project area. Records from 1916 to the present show that cattle, horses, sheep, and goats have been permitted on the Trout Creek allotment.

The Trout project area includes one entire allotment (Trout Creek) and parts of two other allotments, (Empire and Tonata allotments).

The entire Trout Creek Allotment is within the Trout project area and is permitted for 104 cow calf pairs on a 3 unit deferred unit rotation grazing system from June 1st to October 30 of each year. This allotment has just received 3 years of non-use and must be grazed in 2005 or a change in a permit will be likely.

Two units of the Tonata Allotment are within the Trout project area. The Tonata Allotment is permitted for 262 cow-calf pairs from June 1st to October 1 of each year. This allotment is grazed in a 3-unit deferred rotation grazing system.

The third allotment partially within of the Trout project area is a unit of the Empire Allotment. This allotment has been vacated for approximately 10 years. When restocked this allotment will be in a two unit deferred rotation which will be permitted for 40 cow/calf from June 1 to Oct 15 of each year.

At the present time there are approximately 21 exiting spring developments, and approximately 13 miles of interior fence maintained by the Permittees within the analysis area.

Effects

Alternative A (No Action)

Over the short-term, implementation of the No Action alternative will result in little or no change in the range resource as it exists today. The opportunity to improve the range resource (construction of improvements) through Sale Area Improvement funds would not be realized. The most evident effect of this alternative to the range resource would be

the loss of the opportunity to improve and expand the upland grazing areas available and accessible to livestock.

Over the long-term, failure to re-introduce fire into the ecosystem will perpetuate the conifer encroachment into the open grassy areas. In the absence of wildfire these upland areas will gradually become more and more inaccessible and unavailable to livestock, which could result in increased grazing pressure on lowland riparian areas. This alternative has the highest potential to negatively affect (by limiting options for dispersal) the management of livestock on the Trout Creek, Empire and Tonata Allotments.

Alternatives B and C

For the effects analysis on the action alternatives it is assumed that only the tractor-harvested units will be readily used by cattle and that the skyline cable units will be used only lightly, if at all.

Over the long-term, the conversion of stands into the more-open stand conditions may help to reduce the complexity of the permittees' management. In addition, management of the cattle may be easier since the more open stand conditions may make the cattle more visible to the permittees when they need to gather or move them from one location to another. Conversely, the proposed management activities will open up new areas for the cattle to graze, and until the permittees become familiar with the new use patterns, can make it difficult for them to determine how to best achieve proper distribution. Movement of cattle from one grazing area to another is anticipated to become less difficult since it will not only be easier to see where the cattle are but will also be easier to herd them from one site to another.

A total of approximately 3,466 acres under Alternative B, and 3,874 under Alternative C, are expected to result in improved forage conditions and easier access to the forage for livestock grazing.

The biggest effect of the controlled burning of natural fuels will be between different allotments, since there has never been a need to put fence into these areas because the allotments were first defined based on natural barriers. These controlled burns are sometimes between units within an allotment, or between different allotments, or between National Forest system lands and private lands. For the most part, it is not positively known whether barriers to cattle movement will be eliminated through proposed management activities, especially the burning. Burn units G, I, J, M, N, O, R, U, W under both action alternatives, with the addition of Unit Q under Alternative C, are located where natural barriers are relied upon to keep cattle within grazing units. Harvest units that could affect barriers under Alternative B are: Units 8, 10, 23, 25, 26, 28, 40, 43, 49, ZB, ZB/10, ZC, ZC/26, ZD, ZD/28; and under Alternative C: Units 10, 26, 40, ZB, ZB/10, ZC, ZC/26, and ZD/28.

There is a slightly larger chance that a natural barrier will be breached under Alternative C since there are more burning acres involved.

There is some potential to burn man-made range improvements under either action alternative.

There is no harvesting within riparian areas so it is anticipated that there will not be any additional cattle access to those sensitive areas. However, there could be an increase in cattle use of harvested areas in response to the quality of forage, which may, in turn, result in cattle trying to gain access to nearby riparian areas. While the objective is to not burn in the riparian areas there is still a risk that some of the slash and debris, which currently serve as barriers, could be burned. Monitoring, and where needed, the prescribed mitigations, will address these concerns.

Based on local experience involving many years of prescribed burning, implementing any of the action alternatives is not expected to require grazing deferral or adjustment of grazing rotation systems. Burning is expected to occur in fall (very near the end of the grazing season) or spring (April), and burning is expected to be light with minimal damage to roots, so established range grasses are expected to have recovered sufficiently from burning by the time the cattle are returned to the range (June 1).

Alternative C improves some roads that the permittee can use for management of the allotment, but not as much as Alternative B. Under the action alternatives, all new roads and re-opened roads will be closed soon after harvest activities or after a short firewood-gathering period. Road closures that prevent standard vehicles while allowing permittees access by 4-wheeler are not expected to have much effect on implementation of the grazing system that is currently in progress.

Alternative B would sell more timber than Alternative C; therefore, there may be more money available through Knutsen-Vandenberg Sale Area Improvement funds for use in preventing and treating noxious weeds or for range improvements projects.

Overall, Alternative C is rated the best for livestock management, followed by Alternative B, and then Alternative A (No Action).

Cumulative Effects

In order to discuss cumulative effects it is important to understand the relationship between grazing, the local economy, and the cultural importance of Federal land grazing in Ferry County. Cattle ranchers in Ferry County rely heavily on permitted grazing on federal lands (Ferry County, 1998). Ferry County government regards grazing permits on federal lands to be an absolute necessity for economic viability (Ferry County, 1997). The Ferry County Natural Resource Policy Plan listed three common reasons for county economic hardships resulting from federal and state programs. The second of these reasons is “the loss of industries, jobs, and tax revenues that are dependent on multiple use of public lands” (Ferry County, 1997). In Ferry County, both the number of farms, and the number of farms with public grazing permits has been declining. The number of farms in Ferry County declined from 241 in 1982 to 193 in 1992, and the number of farms with public grazing permits declined from 42 in 1987 to 37 in 1992 (McGinnis, et al, 1997). BST Associates also reported a 10% job loss in farm employment since 1980 (BST Associates, 1994).

The cumulative effects of past timber harvest and roading activity, increased recreational use and development within the analysis area, constraints on grazing (and other activities)

brought on by regulation and management direction (i.e. Management of Competing and Unwanted Vegetation FEIS, Colville Forest Plan, Inland Native Fish Strategy, and the like) and the encroachment of human habitation into the forested environment have all complicated the management of grazing within the Trout Project Area.

Increased recreational use (especially during the hunting season) in the area has complicated management for the permittees. Permittees have difficulty gathering their cattle during or after the hunting season due to gates being left open and the cattle are scattered throughout the allotments (some even gain access to other grazing allotments).

In addition, between approximately 1975 and 1995 there was a dramatic increase in the amount of roads and timber harvest units that provide access to riparian areas. Many of these activities also prescribed the use of palatable forage species when seeding for erosion control. This created an environment that attracted cattle into riparian areas and provided desirable forage that kept them in these areas rather than moving on to natural upland range areas. Management direction contained within the Inland Native Fish Strategy now limits the amount of harvest and roading that can occur within riparian habitat conservation areas. All of these factors have added considerable complexity to the permittees' management of their allotments.

The No Action alternative does nothing to reverse the condition of declining transitory range that is being lost as past timber harvest areas and natural meadows become occupied by trees. Declining transitory forage gradually leads to decreasing numbers of cattle, decreasing season of use, or to increasing pressure on primary range and/or lowland riparian areas. This declining forage availability will likely lead to increasingly complicated management, which could lead to or contribute to reducing grazing on public lands in the project area. This reduced grazing could lead to increased difficulty in the permittees continuing in the livestock business, and could contribute to a decline in the ranching lifestyle and its contribution to the local economy.

The action alternatives (Alternatives B and C), on the other hand, both should improve transitory range and make permit management less complicated. As a result, the action alternatives, in a small way, are expected to help the permittees stay in the livestock grazing business, which in turn should help maintain the grazing industry locally, and should help maintain the ranching lifestyle and the local economy.

Irreversible and Irretrievable Impacts

There are no irreversible or irretrievable effects, since there is no loss of grazing or forage production under either of the action alternatives. Areas that are burned may cause breached barriers, which can be replaced by barricades or fencing, so there will not be any irreversible effects.

Recreation

Information provided in this Environmental Assessment about recreation is excerpted from Trout Vegetation Management Project Recreation Effects Report by James L. Parker, June 17, 2005. The full text of this report is incorporated by reference. The recreation report describes the current conditions and Forest Plan direction with regards to recreational activities in the Trout project area. It also describes and compares the

environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

Existing Conditions

Dispersed sites, trails

Dispersed camping sites in the Trout project area tend to be located where people find vehicular access, adequate space, and level ground. Proximity to water and a degree of isolation from traffic are also desirable, though not always necessary for some users. Some sites are used during hunting season every year, while many other sites are used only occasionally.

There are no developed recreation sites in the project area but there are well-established dispersed sites at Empire and Ward Lakes, as well as other sites scattered throughout the project area.

The area is locally popular for general recreation activities in the summer (fishing, sightseeing, horseback riding, berry picking, camping, picnicking, off-road vehicle riding) and is popular in the fall for hunting and fire wood gathering.

There is one non-system trail (Maple Mountain trail) in the southwest portion of the project in the Clackamas Inventoried Roadless Area. There are no plans to develop any recreation sites or trails in the project area. In the foreseeable future, use is expected to remain what it is now.

Hunting/Fishing

The Trout project area as a whole is used for hunting deer, grouse, bear, and fishing at Empire and Ward Lakes. The area is close to Republic so it receives moderate day-use. People from outside the local Republic area use the Trout project area (mostly hunters), but the primary hunting and fishing use is by local residents.

Firewood, Wood Products Gathering

Firewood is gathered from the project area. Other wood products (e.g., fence posts, fence rails, Christmas trees) are occasionally gathered from the area.

Off-Road Vehicle Use

Off-road vehicle use in the Trout project area has historically been light but widespread. Use is believed to be increasing, especially during hunting season. Historically, all open roads were used, including unclassified roads.

Currently, all areas except designated routes (listed below) are closed to off-road vehicle use. As of October 2005, designated roads open to off-road-vehicles in the Trout project area are:

- 2086000
- 2086900, from 2086000 to the junction with 2086950
- 2086950, from 2086000 to the junction with 2148115
- 2086780, to closure barrier in the NW ¼ Section 17, T37N, R32E

- 2086700, from 2086000 to the junction with 2086740
- 2086740
- 2086100
- 2148102
- 2148110, to closure barrier in the NE1/4 Section 21, T38N, R32E

Empire Lake Snowmobile Area

During the winter months (December 1-March 31) roads in the project area make up the Empire Lake Snowmobile Area (County Road 514, Forest Roads 2086000, 2086480, 2148000, 2149000, 2150000). These routes are "groomed" under the State of Washington snowmobile trail-grooming program, creating a relatively smooth, compacted snow surface on which the snowmobiles run. Proposed timber sale activities that may operate and haul timber in the winter have the potential to affect snowmobile use.

Secluded, Undeveloped Recreational Settings

Areas where people can find relatively secluded recreational settings occur in the following areas:

- Storm King Mountain,
- Kelly Mountain,
- Maple Mountain (Clackamus Inventoried Roadless Area)
- Lake Butte
- National Forest system lands between Empire Lake and Mount Elizabeth
- Area between Storm King Mountain and County Road 514 (excluding private inholding in Sections 28, 33, and 34) in West Fork Trout Creek drainage.
- Area between West Fork Trout Creek and North Fork Trout Creek (north of County Road 514, east of Forest Roads 2086-900, 2086-950 and 2148-110; and south of Forest Road 2148-101).
- Bald Peak

With the exception of the Maple Mountain area (which is part of the Clakamas Inventoried Roadless Area), none of the above areas are 5,000 acres in size, so none would likely qualify for consideration for inclusion in the Wilderness Preservation System.

Visitor Demographic, Visitor Distribution, and Visitor Satisfaction

There is no recreational use data for the Trout project area, so estimates are based on observations from Republic Ranger District employees.

Visitors to the Trout project area are primarily from the local area. A small percentage of visitors are from outside the local area, and non-local use is primarily during hunting seasons.

It is estimated that recreational use in the project area is fairly similar to that presented in Figure III-9 in the Colville Land and Resource Management Plan Final Environmental Impact Statement (1988), except that there are no "developed" recreational sites in the Trout project area. If developed recreation data are excluded, the Forest Plan "decade two" projection for the Colville National Forest as a whole shows a very high percentage

(over 90%) of recreational users are expected to be recreating in roaded-natural, roaded-modified, or semi-primitive motorized Recreational Opportunity Spectrum settings. The recreational pattern for the Trout project area appears to be similar, but likely has less semi-primitive non-motorized recreation use because there are no maintained Forest Service trails in the project area.

Visitors who recreate in the roaded portions of the project area appear to be satisfied with their recreational experience because it meets their expectations; most come to the Trout area expecting roaded access, and a mixture of "managed" and "natural" forest. Firewood is reasonably available, huckleberries are abundant in certain areas in most years, roads are available for driving, areas are accessible for hunting (either near roads or away from roads), and the lakes are vehicle-accessible for fishing.

Effects

Alternative A (No Action)

Failure to implement the project actions would result in continued and potentially increased insect and disease activity in the forest, which would perpetuate firewood gathering. Insect and disease activity is always present, but some pathogens are cyclic, with high and low periods. Following high levels of pathogen activity, firewood-gathering opportunities would increase.

Failure to implement the project actions would perpetuate and gradually increase the risk of stand-replacing wildfires. In the event of a wildfire, many of the present recreational opportunities (e.g., camping, berry picking) would be deminished until vegetation recovers (15+ years); other recreational opportunities would be little affected (e.g., snowmobiling, off-road vehicle riding, hunting); and still other recreational opportunities would be enhanced (e.g., firewood gathering, mushroom picking).

Alternatives B and C

Displacement of Recreational Users

Areas with active timber sale operations or active prescribed burning operations would be temporarily closed to maintain public safety. Alternative B would tend to temporarily close more areas with active timber sale operations because more logging would occur, but Alternative C would temporarily close more areas due to increased acreage affected by prescribed burning.

Recreationists who desire a natural appearing setting (campers, berry pickers, and those who are seeking secluded, undeveloped recreational settings) will likely find recently logged or recently burned areas to be aesthetically unpleasant and will avoid affected areas until vegetation recovers.

Active timber sale operations or active prescribed burning operations may displace some recreational users. Most likely they would be displaced to other nearby portions of the National Forest. Such displacement would be temporary, usually lasting from a few days to a few weeks in duration for active operations, or a few years (1-5) where vegetation is trampled or burned. It is not expected that recreational users would be displaced from the

project area or the National Forest, only displaced from the immediate logging or burning activity area to another nearby area.

Dispersed Camping

Logging and burning activities are expected to adversely affect some dispersed camping sites by burning trampling, or otherwise damaging the surrounding vegetation. In most cases, it is expected that the damage would be light to moderate, and will recover in 3-10 years. The dispersed camping sites at Ward Lake and Empire Lakes would not be affected, nor would fishing at these lakes be affected.

Mitigation is included that would vary stand density near dispersed sites to maintain natural appearance. It is expected that this would be implemented in relation to most frequently-used dispersed camping sites, but only be partially effective since "natural appearance" is a highly subjective term and not a measurable objective.

It is also expected that logging will create new dispersed camping sites, as log landings would create spots that are suitable for dispersed camping.

Hunting, Wood Gathering, Berry Picking

It is expected that big game hunting, wood gathering, and berry picking would all be improved under both action alternatives. Substantial acreages of the forest would be thinned and/or underburned, resulting in increased visibility for hunting; increased logging slash and dead trees (for a few years) available as firewood, and increased sunlight that should stimulate huckleberry production[78].

Maple Mountain Trail

The Maple Mountain Trail would not be affected by any of the proposed actions.

Off-Road Vehicles

Alternative B would construct 0.95 miles of new road, and would open up 1.09 miles of roads (2086000-10.98LA in Unit 1, and 2086955-0.30 in Unit 18) that are currently closed by small trees and brush. These roads are not currently available to off-road vehicles, and they would be closed following the project, however, they would have potential to be used by 4-wheelers and motorbike riders who circumvent closures following the project. In total, the addition of approximately two miles of new or re-opened road access would have very little effect on off-road vehicle access or other recreational values in this well-roaded project area.

Alternative C would not construct any new road, and would open up 0.41 miles of road that is currently closed by small trees and brush (2086955-0.30 in Unit 18). As in Alternative B, this segment of road would be closed following the project, but there would still be potential for this road to be used by off-road vehicles following the project.

[78]The expectation of increased huckleberry production is based on report for Scatter Ecosystem Management Projects by Mary Rourke, May 4, 2001, which is hereby incorporated by reference. It is expected that conclusions reached for the Scatter project would also be applicable to the Trout project area as the two areas are located only about 15 miles apart. Rourke's report examined several research studies and found results to be largely inconclusive; nonetheless, she concluded that thinning the overstory is expected to improve huckleberry production over the next several years in acres treated.

All other roads that would be reconstructed under either action alternative are either currently open, or are closed by earth barriers or other methods such that the roads are presently accessible to off-road vehicles. Roads that are currently closed would be re-closed following this project, but they would likely still be accessible to off-road vehicles. Whether this access is legal or not will likely be determined by the current off-road vehicle planning process. Even if it is determined that travel on closed roads is illegal, enforcement is uncertain; therefore, it is possible that all roads would be used, at least occasionally, by off road vehicles.

Snowmobiles

Logging and timber hauling would occur during the winter months, which would necessitate the timber sale operator plowing portions of snowmobile routes for access to and from logging sites. This would affect the snowmobilers and the State grooming contractor. Because Alternative B has approximately four times as much timber harvest as does Alternative C, it would be expected that Alternative B would have considerably more days when there would be an impact on snowmobile users.

Mitigation measures would specify that only one such route be plowed at one time. Log hauling would be prohibited on weekends, and parking areas would be plowed out at the new temporary trailhead for snowmobilers to park, load, and unload. Therefore, on weekdays, portions of the routes into the area would not be available to snowmobilers. On weekends, all routes would be available, though one of the trailheads might be relocated.

Secluded, Undeveloped Recreational Settings

There are no areas within the Trout Project Area that are so remote that noise from logging or vehicles cannot be heard when such noise is present. Therefore, there should not be an expectation of quietness, such as might be expected in a large wilderness area, in any portion of the Trout project area. However, there are areas where one can get sufficiently far from roads that a person can, on a day when noise from logging and other vehicle traffic is absent, get a feeling of seclusion from the “developed” world. Because Alternative B has approximately four times as much timber harvest as does Alternative C, it would be expected that Alternative B would have considerably more days when there would be noise generated by logging operations.

Because of the absence of trails or other backcountry attractions (i.e., backcountry lakes, high mountains, spectacular views), the Trout project area gets little use by those desiring a secluded, undeveloped recreational experience. Therefore, disturbance to such a recreational setting would affect a very small number of people. The effect to people desiring seclusion and undeveloped recreational settings would be negligible except during project implementation when noise from these and other logging or burning units would occur.

Logging

Logging is considered by the Forest Service as an “improvement” that is considered by some to be an adverse effect on an otherwise undeveloped recreational setting. [FSH (Forest Service Handbook) 1909.12, 71.11, WO (Washington Office) Interim Directive 1909.12-2005-8]. Logging leaves behind stumps and skid trails that persist 50 years or

more before they become "not evident." (Kettle Range Conservation Group and Inland Empire Public Lands Council v. United States Forest Service, 1997). Therefore, for the purposes of this analysis, areas with evidence of past logging are not considered to be part of an undeveloped recreational setting, and further logging proposed on previously logged ground would not be considered to have adverse impacts on the undeveloped character of the affected ground.

Logging creates noise from vehicle traffic and heavy equipment that can be heard for miles across an otherwise quite forest setting.

Prescribed Burning

Prescribed underburns would be conducted across most of the undeveloped areas within the Trout project; however, underburning does not constitute not "improvement" so does not to have any adverse impact on the condition of the undeveloped recreational setting. (FSH 1909.12, 71.11, WO Interim Directive 1909.12-2005-8). It is expected that prescribed fires would be contained using handline, wetline, blackline, existing roads and trails, or natural barriers. (Heckly, 2005). Bulldozer-constructed firelines are not expected.

Underburning would likely be helicopter-assisted, which has the potential to disturb persons desiring quiet and solitude; however, the public would be excluded from the immediate area during burning operations for safety reasons. Therefore, the only disturbance to solitude would be to persons outside the immediate project area. Duration of such disturbance would be no more than a few days for each burning unit.

Storm King Mountain

Under both Alternatives B and C, portions of Units 40, S, T, U, and W would have activities in the undeveloped area surrounding Storm King Mountain. In addition, Alternative B would have a portion of Unit 39 in the undeveloped area surrounding Storm King Mountain. No road construction is proposed in the Storm King Mountain area under either action alternative.

In Units 39 and 40, all logging would be within 1/4 mile of existing roads, though under Alternative C, Unit 39 would only log the immediate roadside area. The total affected acreage within the undeveloped area is less than 35 acres, which is less than two percent of the undeveloped area.

Cumulatively, one could argue that these logging units erode the size of the undeveloped area; however, due to the rocky ground that covers much of the Storm King Mountain area, it is unlikely that very much more of the Storm King Mountain area would be subject to logging in the future.

Kelly Mountain

The Kelly Mountain area contains several units that are adjacent to existing roads that would be logged under Alternative B (Units 2, 3, and 4), but these areas were previously logged in the 1970s. Further logging of these units would not affect the undeveloped character of the Kelly Mountain area. There is no logging proposed in the undeveloped area surrounding Kelly Mountain under Alternative C.

Maple Mountain (Clackamus Inventoried Roadless Area)

There are no logging activities proposed under either action alternative in the Clackamus Inventoried Roadless Area. A portion of prescribed burning Unit R is within the Inventoried Roadless Area in an area that was previously logged, but, as described above, underburning is not considered to be an "improvement" that would affect the undeveloped character of the area.

Lake Butte

There is no logging proposed under either action alternative in the undeveloped area surrounding Lake Butte. Burning Unit J (both action alternatives) is within the undeveloped area surrounding Lake Butte.

National Forest System Lands east of Empire Lake

No logging is proposed in areas that have not been previously logged under either action alternative within the area east of Empire Lake. Burning Units N and M (both action alternatives) are within the undeveloped area east of Empire Lake

Area between Storm King Mountain and County Road 514 (excluding private inholding in Sections 28, 33, and 34) in West Fork Trout Creek drainage

Under both Alternative B and C, Unit ZD/28 would have logging in the undeveloped area between Storm King Mountain and County Road 514 in West Fork Trout Creek drainage. In addition, Alternative B would log Unit 28 in this area. Also, Alternative B would construct 0.67 miles of new temporary road in this area. Under Alternative C, Unit 28 would extend approximately 600 feet away from the National Forest boundary line, while under Alternative B the logging unit would extend approximately 2500 feet from the property line. Alternative B would reduce the undeveloped area by 162 acres (estimated to be approximately 15-20% of the area), while Alternative C would reduce the undeveloped area by 64 acres (estimated to be approximately 5-10% of the area).

Cumulatively, these logging units would erode the size of the undeveloped area; however, the undeveloped area is small to begin with (estimated to be less than 1200 acres in size). There are no other activities in the foreseeable future that would add "development" to this area.

Area north of County Road 514, east of Forest Roads 2086-900, 2086-950 and 2148-110; and south of Forest Road 2148-101 (between West Fork Trout Creek and North Fork Trout Creek, referred to as "eastern arm of Horseshoe Mountain" by Kettle Range Conservation Group)

Under either action alternative, there would be no logging in areas that have not been previously logged in the undeveloped area north of County Road 514, east of Forest Roads 2086-900, 2086-950 and 2148-110; and south of Forest Road 2148-101. Prescribed burning Unit O (both action alternatives) is in the undeveloped area.

Bald Peak

There would be no logging in the Bald Peak area under either action alternative. Prescribed burning Unit X (both action alternatives) is in the undeveloped portion of the Bald Peak area.

Health and Safety of the Recreating Public

Under Alternative B, up to 2,900 log- truck trips could occur over one to four logging seasons. If one were to assume that the entire project was logged over a single 180-day season, there would be approximately 16 loads of logs hauled per day under Alternative B, and 4 loads of logs hauled per day under Alternative C. There would also be other traffic associated with the timber harvesting operation of 3-10 vehicles (mostly pickup trucks) per day while the timber sale is active.

Forest Roads 2086-000, 2148-000, 2149-000, 2150-000 and County Roads are designed to handle mixed recreational and logging traffic. Maintenance Level 2 roads also are designed to handle mixed traffic, with widened corners and turnouts. All haul routes would be signed to notify the public of timber hauling activities, and hauling would be prohibited on weekend and holiday periods between Memorial Day and Labor Day and during the winter snowmobiling season.

Logging traffic that would be generated by this project would not be unusual, and logging is a common occurrence in Ferry County. County-wide, there are few logging/recreation accidents. While the potential for accidents would increase with this increased logging traffic, with mitigation the potential for accidents is still considered to be low.

Effect of Project-Caused Changes in Livestock Grazing on Recreation

Project-caused changes to livestock grazing include access to additional forage created by opening up timber stands and underburning; and possible destruction of natural barriers that keep cattle within their pastures or from causing unacceptable damage to riparian areas. Because both action alternatives treat nearly the same total area (Alternative B—8,490 acres; Alternative C—7,555 acres), there would be no appreciable difference between the two action alternatives with regards to livestock grazing access.

Access to additional forage is expected to disperse cattle over a larger area, thus reducing the impact of cattle congregating along roads and dispersed camping sites.

There may be impacts resulting from cattle accessing areas that were formerly blocked until such time as breached barriers are discovered and corrected. Mitigation would be included to restore breached barriers so as to keep cattle in their pastures or to prevent unacceptable resource impacts. Once mitigation is in place, there should be no impacts to recreational users beyond what is occurring at present.

Dust

Timber hauling and other project-related traffic will generate considerable amounts of dust during dry periods. Most of this dust settles on or within a few hundred feet of the roadway, so the primary impact will be to vehicles following other vehicles, or to people recreating on or near the roadways. This may include people picking huckleberries, gathering firewood, or camping in dispersed campsites. During periods of heavy timber

hauling, it is expected that people recreating in the area will be displaced to another nearby area where dust is not being generated.

Dust could be mitigated by abatement treatments, but the number of people affected is too small to justify the expense. As such, this is considered to be an unavoidable impact.

Alternative B, because it would haul nearly four times as much timber as Alternative C, has the potential to generate considerably more dust.

Visitor Demographics, Distribution, and Satisfaction

Because most people who recreate in the Trout project area participate in road-based activities, and because the area has been heavily logged in the past, it is expected that thinning/logging will not deter current users from the area. They may avoid active logging and recently burned areas for a short period of time, but once activity concludes and vegetation begins to recover, the people who traditionally used the area will return and continue to use the area as they have in the past.

Changes in the Types of Recreational Activities (e.g., Motorized versus Non-Motorized)

It is not expected that the types of recreational activities would change as a result of the Trout project. There would be no change in non-motorized recreation as a result of the Trout project (there would be no opportunities created, and adverse effects to solitude and sense of isolation would be short-lived and of little consequence). Motorized recreation may increase over time, but such increase would be the result of increasing popularity of off-road vehicles, not a result of the Trout project.

Visitor Spending in Local Communities

Because effects to recreation would primarily be, during project activities, displacement to other nearby areas, it is not expected that there would be any effect on recreation-related spending in local communities.

Cumulative Effects

Activities that will affect recreation are primarily logging, log hauling, and prescribed burning. The effects on recreation (as described above) are temporary closures, noise, degradation of dispersed camping sites, snowmobile route closures, residual smoke, increased traffic, dust, temporary displacement, and decreased public safety on roads. The duration of the effects is the immediate time during project activities, and up to a few years while vegetation recovers from the effects of logging and prescribed burning.

Most of the direct effects from project activities would occur within the project area boundary. Exceptions would be smoke that may that may extend a few miles beyond the project area boundary, and effects of log hauling that would extend down the County Road system to the point where double-lane paved or gravel roads are encountered.

Indirectly, recreationists who are displaced by logging or prescribed burning from the Trout project area (or displaced by smoke, noise, or traffic generated by the Trout project) would be expected to be displaced to other National Forest system lands of the Republic Ranger District or the eastern portion of the Tonasket Ranger District. Nearby

areas that would likely receive increased recreational use as recreationists are displaced from the Trout area include the Swan Lake area to the south, the Ninemile and O'Brien drainages to the southeast, the Tonata Creek drainage to the north, and the Gardner Creek area to the southwest. It is not expected that very many displaced recreationists will move to lands of other ownership (State, BLM, or Private).

Several other logging and prescribed burning projects are scheduled to occur within the effects-areas described in the preceding paragraph. These include (but are not limited to) logging and prescribed burning on the Scatter Ecosystem Management projects in the Swan Lake area and the Berton Ecosystem Management Projects in the Tonata Creek drainage; logging on State lands within the Trout Creek drainage, and logging projects on private lands in the Trout project area vicinity.

It is expected that log haul from the Scatter, Berton, and 6/9/2005-advertised timber sale on State lands in T38N, R32E, Sections 25, 26, and 36 would be concluded before log haul for the Trout project begins, thought it is possible that there could be overlap if these projects are delayed. There has been considerable logging on private and State lands in the vicinity of the Trout project area in recent years, and private and State logging is expected to continue. These logging projects will continue to generate logging-related traffic, but much of this activity will use other access routes. Other logging operations are not expected to substantially add to logging traffic on Forest Service or gravel county roads used by the Trout project.

Residual smoke from these nearby projects may combine with Trout project residual smoke; however, compliance with Washington State Smoke Management requirements will disperse the vast majority of smoke into the upper atmosphere.

Recreationists who are displaced by logging, prescribed burning, or log hauling activities from any of these projects (Trout, Scatter, Berton, State, or Private projects) will be able to find other nearby areas to recreate. Logging throughout northern Ferry County and the northeastern Okanogan County has been a common occurrence for decades; people are inconvenienced when their favorite berry picking or hunting area is affected, but there are always other places to go. As a consequence, recreational use shifts location but continues on; there is little cumulative effect.

Effects Regarding Applicable Forest Plan Standards

The effects of the Trout project, under either action alternative, are consistent with all Forest Plan Standards and Guidelines and Management Area direction in the Land and Resource Management Plan, Colville National Forest (1988). See discussion in the Trout Vegetation Management Project Recreation Effects Report, in the Analysis File.

Sensitive Plants

Information provided in this Environmental Assessment about sensitive plants is excerpted from Trout Vegetation Management Analysis Project Analysis of Effects to Sensitive Plant Species by Kathy Ahlenslager, October 25, 2004. The full text of this report is incorporated by reference. The sensitive plants report describes the existing conditions with regards to sensitive plants potentially found in the Trout project area. It also describes and compares the environmental effects associated with the various

alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

Existing Condition

No federally listed threatened or endangered plants, or plants proposed for federal listing, are known to occur in the analysis area. Forty-five plant species listed on the Regional Forester's Sensitive Species List are documented or suspected for the Colville National Forest. Two of these in four populations were known from the Trout project area: blue-eyed grass (*Sisyrinchium septentrionale*) and kidney-leaved violet (*Viola renifolia*). In addition, potential habitat exists in the analysis area for another 25 suspected sensitive plant species (USDA 2004a, WNHP 2004, WNHP and USDI 2004). Within two miles of the project area, three sensitive plants are known from four populations: *Botrychium pedunculosum, Geum rivale* and *Platanthera obtusata* (two populations).

The 1999 collecting foray of the Herbarium staff at the University of Washington resulted in a sighting of skullcap (*Scutellaria angustifolia* ssp. *micrantha*) in the project area. It was the first sighting of the plant in Washington. Although this plant is not on the Region 6 Sensitive Species List (USDA 1999) or the Endangered, Threatened and Sensitive Vascular Plant List for Washington (WNHP 1997), it is under consideration for inclusion on these lists.

Effects

Alternative A (No Action)

For this alternative the Likelihood of Adverse Effects is considered to be "Low" (1) and the Consequence of Adverse Effects is "Low" (1).

Alternatives B and C

No sensitive plants are known to occur in any of the proposed timber harvest or fuel treatment units that were surveyed. Since all action alternatives will result in a net improvement to future single storied old-growth habitat conditions through restoration activities (timber harvest and prescribed burning), no long-term adverse affects of the timber harvest or fuel treatments on sensitive plant species are expected.

Skullcap (Olmstead 1990) was found in an open ponderosa pine forest within a prescribed burn unit. Although low- to moderate-severity fire may burn the aerial portions of plants, it should survive by sprouting from the rhizomes. Fire should not be harmful if it occurs while the plants are dormant (pers. comm Olmstead 2002).

Blue-eyed grass grows in dry meadows, pastures or streambanks in northeastern Washington (Henderson 1976). None of the alternatives propose any ground disturbing activities at the location of the blue-eyed grass in the project area. This rhizomatous plant is adapted to fire. Meadows where it is occurs have a low intensity and high frequency fire regime. The proposed prescribed burning would mimic these conditions and should not adversely affect potential habitat of this species. It is not documented from any of the prescribed burn units.

Although the wetland habitat of kidney-leaved violet is not proposed for any management activities, one of the two known sites in the project area is adjacent to a harvest unit. Sensitive plant habitat in wetlands is not likely to change appreciably through management activities for any of the action alternatives. No timber harvest would occur within 50 feet of wetlands up to one acre in size, within 150 feet of wetlands larger than one acre, or in Riparian Habitat Conservation Areas along stream courses.

By implementing the mitigations measures for Alternatives B and C, it is anticipated that the sensitive plant populations located within the Trout project area will maintain at least present population levels and viability. The Likelihood of Adverse Effects is decreased to "Low" (1). The Consequence of Adverse Effects is "Moderate" (5) because of possible effects to the plants or habitat. The resulting Risk Assessment value is 5--proceed with the Project as planned. All alternatives may have an impact on individuals, but are not likely to cause a trend to federal listing or loss of viability.

Visual Quality

Information provided in this Environmental Assessment about visual quality is excerpted from Visual Effects Analysis, Trout Vegetation Management Project by James L. Parker, July 27, 2005. The full text of this report is incorporated by reference. The visual quality report describes the current and desired conditions with regards to visual quality in the Trout project area. It also describes and compares the environmental effects associated with the various alternatives (Alternative A—No Action, Alternative B—Proposed Action, and Alternative C). Measures intended to mitigate adverse effects are also included.

Existing Conditions

The Trout Project Area is typical of the Okanogan Highlands character type[79]. Stands on north facing slopes tend to be dense with continuous canopy while south facing slopes tend to be more open with breaks in the canopy. The overall appearance of the project area is a mixture of natural-appearing and logged forestlands, including undisturbed areas that are considered a scenic feature of the landscape.

The dominant human processes that affect the visual quality of the landscape are road building, natural resource based industries (agriculture, timber harvesting, and mining) and prevention of fires. Fire suppression for approximately 100 years has altered the vegetative structure of the landscape by modifying species diversity and stocking levels.

The designated Retention and Partial Retention VQO (Visual Quality Objective)[80] areas generally meet the Natural Appearing designation and all other areas meet the Altered classification. This ranking does not include private lands.

[79] A **character type** is a large physiographic area of land that has common characteristics of landforms, rock formations, water forms, and vegetative patterns.

[80] **VQOs (Visual Quality Objectives)** are categories of acceptable landscape alteration measured in degrees of deviation from the natural-appearing landscape. In **Retention** VQO, human activities are not evident to the casual Forest visitor. In **Partial Retention** VQO, human activity may be evident, but must remain subordinate to the characteristic landscape. In **Modification** VQO, human activity may dominate the characteristic landscape, but must, at the same time, follow naturally established for, line, color, and texture. It should appear as a natural occurrence

The primary travelways and use areas of visual concern are as follows:

- **Washington State Highway 21** and **County Road 270** (West Curlew Lake Road) corridors are Concern Level 1 travelways. The National Forest lands in the Trout project area are seen at a background[81] distance from these highways.

- **County Road 201** (Trout Creek Road) between County Road 517 and County Road 270, **County Road 517** (North Fork Trout Creek Road) between County Road 270 and Forest Road 2149000, **Forest Road 2149000** between County Road 517 and Forest Road 2150000, **Forest Road 2150000** between Forest Road 2149000 and Empire Lake), **Ward Lake**, and **Empire Lakes,** carry a Visual Concern rating of a Level Two or Secondary Travelway. National Forest System Lands of primary concern are those acres seen at either a foreground[82] or a middleground[83] distance.

- **County Road 514** (West Fork Trout Creek Road), **Forest Road 2148000**, **Forest Road 2086000**, and other sites are considered to be visually sensitive, but to a lower concern level. These include a number of dispersed sites, winter snowmobile trails and road corridors that provide access to recreation opportunities.

The following statements describe the visual situations relating to the specific Management Areas within the Trout project area.

- **Management Area 1** (Old Growth Dependent Species Habitat emphasis) is 530 acres and represents 3 % of the project area. Management Area 1's standard is "a range of visual quality objectives that are consistent with management objectives for the area." Very little of Management Area 1 can be seen from any Concern Level 1 or 2 areas.

- **Management Area 3A** (Recreation emphasis) is 452 acres and represents 2 % of the project area. In the Management Area 3A within the Trout Project Area, the Visual Quality Objective is Partial Retention (based on the Colville National Forest Visual Quality Objective GIS layer). Management Area 3A areas in the Trout Project area are seen primarily from Concern Level 2 areas: Forest Roads 2149000 and 2150000, Ward Lake, and Empire Lakes.

- **Management Area 3B** (Recreation/Wildlife emphasis) is 47 acres and represents 0.2% of the project area. Visual quality objective is Partial Retention. The Management Area 3B surrounding Ward Lake can be seen only from the immediate vicinity of Ward Lake (Concern Level 2).

- **Management Area 5** (Scenic/Timber Emphasis) is 3,298 acres and represents 17% of the project area. In the Management Area 5 within the Trout Project Area, the

when viewed in foreground or middleground. Under **Maximum Modification** VQO human activity may dominate the characteristic landscape, bus should appear as a natural occurrence when viewed as background.

[81] **Background** viewing distance is from 3-5 miles to infinity.
[82] **Foreground** viewing distance extends from the observer to a distance of ¼ to ½ mile.
[83] **Middleground** is the space between foreground and background, located from ¼ to ½ mile to 3-5 miles from the viewer.

visual quality objective is Partial Retention (based on the Colville National Forest Visual Quality Objective GIS layer). Portions of this Management Area can be seen from a background viewing distance from a number of viewpoints. A small portion of the area can be seen from a middleground viewing distance from County Road 270 (West Curlew Lake Road).

- **Management Area 6** (Scenic/Winter Range emphasis) is 171 acres and represents 1% of the project area. Portions of Management Area 6 can be seen from a background viewing distance from Concern Level 1 areas.

- **Management Area 7** (Wood/Forage emphasis) is 14,024 acres and represent s 73% of the project area with a visual quality objective of Modification. Most of this Management Area cannot be seen from Concern Level 1 areas, and cannot be seen in the immediate foreground or foreground from Concern Level 2 areas.

- **Management Area 8** (Winter Range Emphasis) is 711 acres and represents 4 % of the project area with a visual quality objective of Modification. Most of this Management Area cannot be seen from Concern Level 1 areas, and cannot be seen in the immediate foreground or foreground from Concern Level 2 areas.

Effects

Alternative A (No Action)

In general, no immediate change would occur in the quality of the scenic resources. While no proposed activities would occur in the No Action alternative, and consequently no immediate change in landscape appearance, in the long-term, due to the high risk of stand-replacing wildfire, this appearance may not be sustainable.

Alternatives B and C

Road Construction Activities

Neither alternative would include major road reconstruction. Only Alternative B would construct new roads. All of the proposed road construction segments would be in Management Area 7 (Modification Visual Quality Objective), and none are in areas visible from Concern Level 1 roads. Only one new road construction segment (road in Unit 28) would be potentially visible from Level 2 roads (middleground, from Forest Road 2150 and County Road 517). None of the Alternative B proposed road construction segments would be across slopes over 45 percent. Therefore, all road construction activities would meet Forest Plan standards for visual quality.

Timber Cutting Activities:

For the purposes of this analysis, the term “timber cutting” includes all Commercial Thinning, Small Pole Thinning, Precommercial Thinning, Non-Commercial Thinning, and Shaded Fuel Break treatments. At all viewing zones except the immediate foreground[84], it is expected that these treatments would be seen as nothing more than a textural change in the forest canopy.

[84] **Immediate foreground** refers to the detailed landscape found within the first few hundred feet of the observer, generally from the observer to 300 feet away.

At immediate foreground viewing distances, all timber cutting treatments have potential to be seen: Distances between trees would be increased; logging slash and damaged understory vegetation would be visible for a few years; and soil in skid trails and landings would be visible for a few years.

Skyline logging has the potential to introduce vertical lines through treated stands; however, only a very small portion of one unit (Unit 17, background from State Route 21) would be potentially visible from any Concern Level 1 or 2 travelway or use area. Because of the small area affected and the long viewing distance involved, this treatment would be nearly impossible to detect.

At immediate foreground viewing distances, all timber cutting treatments have potential to be seen: Distances between trees would be increased; logging slash and damaged understory vegetation would be visible for a few years; and soil in skid trails and landings would be visible for a few years. At the foreground viewing distance, the visual effects of timber thinning treatments are expected to meet the partial retention visual quality objective.

Alternative B would have more timber cutting potentially visible (3506 total acres with timber cutting under Alternative B, and 1910 total acres cut under Alternative C). Additionally, Alternative C would remove fewer trees from most of the cut areas because of its lighter harvesting prescriptions. As a result, Alternative B would have more visual impact resulting from timber cutting than would Alternative C.

Timber Cutting Visible from Concern Level 1 Areas

Because of the viewing distances (background and middleground) and the type of treatments (thinning), all timber cutting treatments visible from Concern Level 1 roads would meet at least Partial Retention visual quality objectives, and would therefore meet Forest Plan standards for visual quality.

Timber Cutting Visible from Concern Level 2 Areas

Because of the viewing distances (middleground) and the type of treatments (thinning), and, in the case of the units seen in the foreground, application of mitigation measures, all timber cutting treatments seen from County Road 517, Forest Roads 2149000, 2150000, and Ward Lake would meet at least Partial Retention visual quality objectives, and would therefore meet Forest Plan standards for visual quality.

Other Visually Sensitive Areas (County Road 514, Forest Roads 2086000 and 2148000)

Because the timber treatment units would be logged under a thinning prescription with mitigation measures applied, it is expected that these units will meet partial retention visual quality objective.

Prescribed Burning Activities

The majority of the areas proposed for treatment in this project would have some form of prescribed burning.

Hand pile, mechanical pile, and landing pile burning have the potential to scorch nearby trees or tree limbs, and will leave a blackened area on the ground where the pile burned. What will be seen are scattered orange foliage on conifer trees, and spots of blackened ground. It is expected that the visual effect will only last for a few seasons, until scorched needles fall and vegetation becomes re-established in burned spots.

Broadcast burning or underburning have the potential to blacken tree trunks, low branches, and the ground, and turn low-hanging tree foliage orange. The effect can be visually dramatic immediately following the burn, but the effect becomes less as scorched foliage drops and understory vegetation re-grows, usually within a few seasons after the burn. The visually effects of underburning or broadcast burning are usually minimal to the casual observer in five years or less.

At the foreground viewing distance, the visual effects of prescribed burning are as described above, and are expected to meet the partial retention visual quality objective. As the viewing distance increases, the visual effects become less evident. At the middleground viewing distance, one is likely to see only occasional black or orange tree crowns widely scattered through the green forest canopy; the result of trees that torched or became excessively heated/scorched during the burn. At the background viewing distance, little if any visual effect should be discernable.

Alternative B would treat more total acreage with prescribed fire (8404 acres under Alternative B, 7511 under Alternative C); however, Alternative C would underburn or broadcast burn more area (7234 acres under Alternative C, 6263 acres under Alternative B). Because underburning and broadcast burning have more potential for visual impacts than does pile burning, Alternative C has more potential for visual impacts resulting from burning.

Prescribed Burning Visible from Concern Level 1 Areas

Because of the viewing distances (background and middleground) all prescribed burning treatments visible from Concern Level 1 roads would meet at least Partial Retention visual quality objectives, and would therefore meet Forest Plan standards for visual quality.

Prescribed Burning Visible from Concern Level 2 Areas

Where prescribed burning is conducted beyond the immediate foreground viewing distance, treatments would not be evident, or if evident, would remain subordinate to the characteristic landscape. Where prescribed burning would be conducted within the immediate foreground viewing zone, application of mitigation measures would ensure that burning treatments seen from County Road 517, Forest Roads 2149000, 2150000, Ward Lake and Empire Lakes would meet at least Partial Retention visual quality objectives, and would therefore meet Forest Plan standards for visual quality.

Other Visually Sensitive Areas (County Road 514, Forest Roads 2086000 and 2148000)

Prescribed burning would take place under both action alternatives that would be visible from County Road 514, Forest Roads 2086000 and 2148000.

Where prescribed burning would be conducted within the immediate foreground viewing zone, application of mitigation measures would ensure that treatments seen from County Road 514 and Forest Roads 2086, 2148 would meet at least Partial Retention visual quality objectives, and would therefore meet Forest Plan standards for visual quality.

Cumulative Effects

The cumulative effects for areas of concern (views from the Concern Level 1 and 2 travelways and use areas identified as potentially affected by the Trout Project) are measured from State Route 21, County Roads 270, 201, 517, Forest Roads 2149 and 2150, Ward Lake, and Empire Lakes.

Within these viewsheds, past clearcut and seed tree timber harvest treatments, on National Forest and lands of other landowners, are visible in the background. The Trout project is not likely to add any cumulative impact to the background view because none of the treatments are likely to produce forest openings that would be discernable at the background viewing distance.

Past timber treatments, both on National Forest and lands of other ownerships, are visible at the middleground and foreground viewing distances. Much of this logging is readily apparent to observers, and some of it would not meet the Partial Retention visual quality objective. While much of the Trout project activities are expected to be visible from the travelways and use areas of concern, all the project activities are expected to meet Partial Retention visual quality objective. As a consequence, there would be little added visual effect. The overall characterization of “large stands of continuous tree cover or areas broken by natural or man-made openings” and an overall appearance described as “a mixture of natural-appearing and logged forestlands” would not change as a result of the Trout project.

OTHER REQUIRED ANALYSES

Effects on Consumers, Civil Rights, Minority Groups and Women (Includes Environmental Justice Analysis)

The action alternatives would contribute to consumers, but only in a limited capacity. All action alternatives would provide wood products to one or more area sawmills, thus contributing raw materials that would become available to consumers. Because the amount of such material is small when compared to the regional wood products market, making this material available to the market will not measurably affect the price or availability of finished wood products.

All contracts and employment offered by the Forest Service contain Equal Employment Opportunity requirements. Therefore, no adverse or discriminatory effects to Civil Rights, Minority Groups or Women are expected with regards to access to federal contracts or jobs.

Environmental Justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment (USDA. 1997). In examining the Trout Project, there are two potential "populations" that may be affected: Tribes of the Colville Reservation and low-income residents of Ferry County.

Tribes of the Colville Reservation

The Tribes of the Colville Reservation reserve hunting, fishing, and gathering rights on the North Half of the Reservation, which includes the Trout project area.

The Colville Tribes were included in project scoping and thus were informed and invited to consult on the project and the proposed actions. There was no response received from the Tribal Council or any tribal members.

The Trout project would not affect access to the area because no new road closures are proposed. Hunting may be improved as mule deer habitat would be improved and sight distances increased in treated stands. Traditionally gathered plants may be improved with the opening of closed forest canopies and reintroduction of fire. Fishing will not be affected.

Low Income Residents of Ferry County

Ferry County has some of the highest unemployment and poverty rates in the State of Washington (BST Associates, 1994, and Cook & Jordan, 1995). In 1989, the poverty rate was 23.7%, which was the highest in the state (Cook & Jordan, 1995). Per capita income in Ferry County has historically been well below the state average (McGinnis, et al, 1997).

Changes in the availability of firewood would likely affect low-income residents more than others because alternate sources of heat are more costly. The Trout project would temporarily open several roads for timber harvest, and leave these roads open for firewood gathering for a short firewood-gathering period. Firewood (snags and downed wood that has been behind road closures, and logging slash created by the project) would be more available for a few years as a result of the Trout project.

Effects on Farmland, Rangeland and Forestland

The Trout project area (National Forest System lands) contains no farmland. Effects to rangeland and forestland are discussed in the resource reports and the environmental assessment elsewhere. There are no "prime" rangelands or forestlands in the affected portion of the analysis area, as defined in Forest Service Handbook 1909.15, section 65.21.

Effects on Wetlands and Floodplains

Effects on wetlands and floodplains are discussed in the Hydrology and Fisheries Report in the Analysis File, and are summarized in the Effects section of this Environmental Assessment.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The proposal is intended to restore and maintain sustainability and long-term productivity. Short-term and long-term effects are discussed for the various subjects in the Effects section of this Environmental Assessment.

Adverse Effects that Cannot be Avoided

Under both action alternatives, complete prevention of noxious weeds invading disturbed soils is not possible. Mitigation measures are prescribed that would be expected to substantially prevent weed invasion onto new sites, and to reduce weed spread from existing noxious weed infestations. Given the control measures proposed in the *Environmental Assessment for Integrated Noxious Weeds Treatment, Colville National Forest* (1998) to reduce existing weeds, and prevention measures included in the *Colville National Forest Weed Prevention Guidelines* (1999), the overall impact of implementing this project is expected to be beneficial in terms of extent and intensity of noxious weed infestation. Additional discussion of effects on noxious weeds is included in the Noxious Weed Report in the Analysis File.

Soil compaction and erosion as a result of logging is unavoidable. Sediment from soil-disturbing activities reaching streams is unavoidable. Many of these unavoidable effects are substantially mitigated by Best Management Practices included in the Environmental Assessment. Further discussion is included in the Soil and Watershed Reports in the Analysis File.

Smoke from burning forest fuels is unavoidable. By burning within prescription parameters documented in project Burn Plans, potential adverse effects will be substantially reduced. Adverse air quality effects from prescribed burning will be substantially less than would result from the same forest fuels burning under wildfire conditions. For more discussion about smoke and air quality effects, see the Fuels Report in the Analysis File.

Changing forest stands from multi-stratum with large trees to single-stratum with large trees will adversely affect old growth-dependent wildlife species that prefer multi-stratum old-growth stand conditions. These changes will, however, benefit species that prefer single-stratum large tree stand conditions. It should be noted that in all cases, the change from multi- to single-stratum stand conditions is proposed in biophysical environments where multi-stratum large tree stands are within or above the level to needed support dependent wildlife, but the amount of single-stratum large tree stands is below the historic range of variability and may not be sufficient to support dependent wildlife. For more discussion, see the Terrestrial Wildlife Species Report in the Analysis File.

Snags and downed logs will be unavoidably lost as a result of timber harvest and prescribed burning. However, sufficient numbers will be left, and replacement cavity nester trees created so that Forest Plan standards (including Screening Direction) will be met, and additional snags and downed logs will be created by prescribed burning and subsequent secondary tree mortality. Regardless, adequate snags and down logs will be

retained to meet Forest Plan standards and thus maintain viability of dependent wildlife species. For more discussion, see the Terrestrial Wildlife Species Report in the Analysis File.

Conflicts with Objectives of Other Land Management Plans, Policies, and Controls

The Ferry County Comprehensive Plan, and the Ferry County Natural Resource Policy Plan were examined for potential conflict with the Trout project. Examination of these local-government planning documents was conducted in response to concerns that the Trout project was not consistent with local county plans. In the project-specific case, no conflict was found. It is noted, however, that if compliance with the County Plans is measured by timber volume produced, Alternative B meets the County Plans' objectives to a substantially greater degree than does Alternative C.

In a broader sense the argument presented by the FCNRB (Ferry County Natural Resources Board) was that "ecosystem" management projects are not consistent with either local county plans or the Colville National Forest LRMP (Land and Resource Management Plan). The FCNRB defined "ecosystem" management projects as any project that is implemented under the "Eastside Screening" Forest Plan Amendment, and that any such project is not supplying "renewable, sustainable economic, or cultural stability to the communities located in close proximity of the Colville National Forest as well as contributing to the economy of the nation." The FCNRB points out that the Colville National Forest LMRP indicated that the average annual timber sale volume from the Colville National Forest would approach 123.4 million board feet of programmed timber harvest, and this level of production is not being met.

However, the "Eastside Screening" Forest Plan Amendment did in fact amend the Colville National Forest LMRP; therefore, it cannot be argued that compliance with the Eastside Screening Forest Plan Amendment is not consistent with the Colville National Forest LMRP. Further, shortfalls in meeting Forest Plan timber outputs and County Plans' expectations cannot be assessed at the individual project level because the various causes of the shortfall are in part the result of the amended Forest Plan direction.

Public Health & Safety

There are a substantial number of health and safety hazards to Forest Service employees and private contractors involved with carrying out of any of the action alternative. There are no hazards identified that are unusual or unique to the Trout project. The health and safety hazards to Forest Service employees and contractors are addressed by the USDA Forest Service Health and Safety Code (Forest Service Handbook 6709.11), and by Occupational Health and Safety Administration (OSHA) requirements. Analysis of these health and safety hazards will not be repeated here.

For the general public, there are a number of potential health and safety hazards.

Smoke

Smoke in large amounts is not expected to affect the general public because burning would only be done when smoke will be readily dispersed into the upper atmosphere. Also, the public is not expected to enter areas where burning is actively in progress because signs warn against public entry. Smoke in lesser amounts, as may occur when smoke settles into valley bottoms during evening hours following prescribed burns, can reduce visibility. It is not expected that visibility would be reduced to the extent that driving safety would be impaired. Valley-bottom smoke can also adversely affect the breathing of a small number of susceptible individuals. The Forest Service routinely announces to the public in advance when burning is to take place, so that susceptible individuals can take the necessary precautions to avoid adverse health effects. For more discussion about smoke and air quality effects, see the Fuels Report in the Analysis File.

Dust

During dry periods when unpaved roads are used in conjunction with any activity associated with the project (especially log hauling), dust will occur. In most cases, dust is not considered a serious health and safety hazard. However, in severe instances (which are occasionally associated with log hauling), visibility can be severely reduced, and breathing, especially in certain individuals, can be adversely affected.

Increased Traffic

Implementation of any of the action alternatives will increase traffic on roads within, and leading to, the project area. By a small amount, this added traffic increases the chance of vehicle accidents. For more discussion, see the Recreation Effects Report.

Logging Hazards

The general public is routinely advised (with warning signs) to stay out of active logging areas. Where logging occurs along main open roads, the Timber Sale Contract contains provisions to protect the public while passing through the logging area. As a result, the risk to the general public from logging (other than traffic hazards discussed above) is very small. Such hazards include falling trees, debris on roadways, rolling rocks or other material, and encounters with moving logging equipment.

Prescribed Burning Hazards

The general public is routinely advised (with warning signs) to stay out of active prescription burn areas. During aerial ignitions, no one is allowed inside the ignition area. As a result, the risk to the general public from prescribed burning operations is very small. In addition to smoke (discussed above), the health and safety hazards to members of the public who enter active burn areas include being burned, being hit by falling trees or rolling material, stepping into stump or root holes, or being hit (and/or burned) with flammable materials used to ignite prescribed fires.

Weed Treatments

Health and safety effects from treating noxious weeds are found in the *Environmental Assessment for Integrated Noxious Weed Treatment, Colville National Forest* (1998).

While there are health and safety hazards associated with the Trout projects (listed above), there are also public health and safety benefits.

Improved Road Safety

Public safety on Forest roads would be improved following timber sales. Roads that are reconstructed for timber sales that are to be open to public use following the timber sale include measures to enhance public safety (i.e. wider curves, more frequent turnouts). In addition, road maintenance is accomplished on all roads used for timber sales, resulting in improved visibility and smoother running surfaces.

Reduced Wildfire Risk

Implementing any of the hazard-fuel management actions will result in reduced risk of large wildfires that can threaten public health and safety.

Unique Characteristics of the Geographic Area

The Trout project area contains no unique characteristics or features. There are no park lands, prime farmlands, wild and scenic rivers, ecologically critical areas, Congressionally designated areas (such as wilderness, wilderness study areas, or National Recreation Areas), Research Natural Areas, or municipal watersheds. There is one inventoried roadless area, but there would be no effects to its roadless character. The area does contain steep slopes and highly erosive soils, threatened or endangered species or their habitat, floodplains and wetlands, and cultural sites; however, the effects to these resources have been examined in the Environmental Assessment, and there is nothing noted about these features that would suggest that they are unique, or that associated effects would be significant.

The Degree to which the Effects are Highly Uncertain or Involve Unique or Unknown Risks

There were no highly uncertain, unique, or unknown risks identified in any of the effects analyses conducted for the Trout project.

The Degree to which the Action may Establish a Precedent for Future Actions with Significant Effects

None of the proposed actions set precedents. The Republic Ranger District has been conducting timber sales and prescribed burns for years; many of which are similar in scope and nature to those proposed in the Trout project. Recent examples of timber harvest thinning and prescribed underburning similar to the Trout project include Eagle Rock Ecosystem Restoration, Berton Ecosystem Management Projects, and Lone-Deer Ecosystem Management Projects, which have been in various stages of implementation since 1996.

Chapter 4--Consultation And Coordination

The Forest Service consulted the following individuals, Federal, state and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

INTERDISCIPLINARY TEAM MEMBERS (COLVILLE NATIONAL FOREST EMPLOYEES)

James L. Parker, Project Leader
Mary Rourke, Silviculturist
Reed Heckly, Fuels Specialist
Nancy Glines, Soil Scientist
Stuart Luttich, Wildlife Biologist
Bert Wasson, Hydrologist
Karen Honeycutt, Fisheries Biologist
Ginger Gilmore, Transportation Planner

INTERDISCIPLINARY TEAM SUPPORT (COLVILLE NATIONAL FOREST EMPLOYEES)

Keith Wakefield, Recreation Specialist
Jim Nash, Range and Noxious Weeds Specialist
Alecia Beat, Archaeologist
Kathy Ahlenslager, Botanist
Larry Besemann, Timber Sale Preparation and Economic Appraisal
Jann Bodie, Landscape Architect
Kelvin Davis, Timber, Range, and Economics

FEDERAL, STATE, AND LOCAL AGENCIES

The following agencies were sent letters inviting comment and/or participation in the Trout project:

- United States Department of the Interior, Fish and Wildlife Service
- United States Department of the Interior, Bureau of Land Management, Spokane District
- United States Department of Agriculture, Forest Service, Okanogan-Wenatchee National Forest, Tonasket Ranger District
- United States Environmental Protection Agency, Seattle Office
- United States Air Force, Survival School
- Washington Department of Fish and Wildlife
- Washington Department of Ecology
- Washington Department of Natural Resources
- Washington State University Cooperative Extension
- Pend Oreille County Board of Commissioners
- Stevens County Board of Commissioners
- Stevens County Lands Advisory Committee

- Ferry County Assessor
- Ferry County Board of Commissioners
- Ferry County Fire Protection District
- Ferry/Okanogan Fire Protection District #4
- Ferry/Okanogan Fire Protection District #13
- Kettle River Advisory Board
- Ferry Conservation District

The USDI Fish and Wildlife Service replied on June 8, 2002 with a letter expressing concerns about endangered species, water quality, and fish and wildlife.

The USDI Bureau of Land Management was asked about activities on their lands in the vicinity of the Trout project area. A reply letter was received on November 6, 2002.

The Kettle River Advisory Board, represented by member Ed Watt, attended a meeting on 1/30/02 and submitted a comment letter on 2/6/02.

Ferry County Board of Commissioners was intently involved in the Trout project. Commissioners Mike Blankenship, Ron Bacon, Brad Miller, or Commissioner's Ferry County Natural Resource Board chairman Sharon Shumate met with the Republic Ranger District to discuss the Trout project on nine occasions (1/30/02, 8/22/02, 9/4/02, 9/19/02, 2/23/04, 2/28/05, 7/13/05, 8/19/05, and 8/25/05), and sent four letters (1/30/02, 5/28/02, 3/4/04, and 3/8/04). In addition, Republic District Rangers Carol Boyd, Jim McGilvery (acting District Ranger), and Joe Alexander provided the Ferry County Commissioners with project updates at the Commissioner's public meetings.

TRIBES

Letters inviting consultation were sent to the Confederated Tribes of the Colville Reservation, the Spokane Tribe of Indians, and the Kalispel Indian Tribe. The Spokane Tribe replied with a letter expressing concern about Inadvertent Discovery of cultural materials. No reply was received from the Confederated Tribes of the Colville Reservation, or from the Kalispel Indian Tribe.

OTHERS

Letters inviting comments and participation were sent for project development meetings (1/11/02) and project scoping (4/30/02) to the Project Mailing list, which included property owners in the project vicinity, and persons, groups, or organizations who expressed an interest in the Trout project, were known to be interested in similar projects, or who requested to be on the District mailing list for timber or fuel reduction projects.

The project development meetings were intended to gather public input to help guide development of the proposed action. The following people attended the project development public meetings:

- Sharon Shumate, Ferry County Natural Resource Board
- Josh Anderson, Vaagen Brothers Lumber Company
- Ed Watt, Kettle River Advisory Board

- David Heflick, Kettle Range Conservation Group
- Ray B. Watkins
- Dolly Watkins
- John Magoteaux
- George Andreas
- Janet Andreas
- Sara P. Brown
- Vick Davenport
- Bert Jolley
- Earl R. Coryell
- Mickey Woolley

Persons (other than agencies or Tribes, listed above) who submitted scoping comment letters were:

- Jim Pruitt
- John H. Magoteaux
- Ed Watt, Member of Kettle River Advisory Board
- Stuart Buck
- Daryl Rave, Rave Logging Company
- Joseph Barreca
- Sue and Tim Coleman
- David Heflick, Kettle Range Conservation Group/Conservation Northwest
- Mike Peterson, The Lands Council
- Nancy McCambridge

Persons who expressed an interest in a field trip at one of the project development meetings were invited to participate in a project field trip on August 9, 2002. Tim Coleman, Susan Coleman, and Hal Rowe of Kettle Range Conservation Group, and Sharon Shumate of Ferry County Natural Resource Board attended the August 24, 2002 field trip.

In July 2005, the NEW Coalition (Northeast Washington Forestry Coalition) was invited to review the Trout project to explore the possibility of resolving issues or concern held by various parties interested in the project. Members representing the NEW Coalition at either the July 13, 2005 meeting, or the August 3, 2005 field trip to the project area, were:

- Lloyd McGee, Vaagen Brothers Lumber Co. (NEW Coalition executive director)
- Tim Coleman, Kettle Range Conservation Group/Conservation Northwest
- David Heflick, Kettle Range Conservation Group/Conservation Northwest
- Russ Vaagen, Vaagen Brothers Lumber Co.
- Brian Reggear, Boise Washington Region
- Jill Palmer, Boise Washington Region
- Tanya Ellersick, The Lands Council
- Kathleen Altman, Case Creek Timber Company
- Stuart Luce, Case Creek Timber Company

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