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Coeur d'Alene River Ranger District
Shoshone County, Idaho

Placer Resource Area Environmental Assessment

Specialist's Reports

Specialist's Report on Fire/Fuels in the Placer Resource Area

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SPECIALIST'S REPORT ON FIRE/FUELS IN THE PLACER RESOURCE AREA

1. Regulatory Framework for Fire/Fuels

The IPNF Forest Plan objective is to implement efficient fire protection and use programs based on management objectives, site-specific conditions, and expected fire occurrence and behavior (PF Doc. FF-30). Management area standards and goals provide direction for appropriate response. Fire management plans are to be guided by the following standards (among others):

- *Human life and property will be protected.*
- *The appropriate suppression response for designated old-growth stands in all management areas except in wilderness will result in prevention of old growth loss.*
- *Activity fuels will be treated to reduce their potential rate of spread and fire intensity so the planned initial attack organization can meet initial attack objectives.*

The Forest Plan identified four management area designations for National Forest System lands in the Placer Resource Area (EA, page EA-1). The common fire management direction for these management areas is to confine, contain and control all fires. Also, in some areas, appropriate initial attack strategies (confine, contain and control) are to be used to achieve the best benefit based on commercial timber values and where appropriate, big-game winter range values. Prescribed fire is to be used as needed to meet silvicultural objectives and the objectives of the management area.

Forest Service Manual (FSM) 5105 defines fuel as combustible wildland vegetative materials, living or dead (PF Doc. FF-29). The objective of fuel management as stated by FSM 5150.2 is to identify, develop, and maintain fuel profiles that contribute to the most cost-efficient fire protection and use program in support of land and resource management direction in the forest plan. Methods used for controlling flammability and reducing the resistance to control of a fire may include mechanical, chemical, biological, or manual means, including the use of prescribed fire and wildland fire use (FSM 5150).

Federal fire suppression policy from the early 1900's until the late 1970's has been that of total suppression. Only recently has fire policy been modified to recognize the importance of fire in balancing vegetation cycles within the temperate forest. The *Federal Wildland Fire Management Policy and Program Review* was chartered by the Secretaries of the Interior and Agriculture to examine the need for modification of and addition to Federal fire policy. The review recommended a set of consistent policies for all Federal wildland fire management agencies. In adopting the policy, the Federal Agencies recognized the role of wildland fire as an essential ecological process and natural change agent that will be incorporated into the planning process (USDI and USDA 2001a, PF Doc. FF-22). The severe wildfire seasons in recent years throughout the country have made it clear that fire cannot be excluded from fire-dependent ecosystems. On the other hand, because of developed areas and commercial forests, fire cannot be fully restored to its historic character without severe consequences to humans, except perhaps in a few of the largest wilderness areas (Brown et al. 1994, in Hardy and Arno 1996, PF Doc. FF-20).

After the record-breaking wildfire season of 2000, the President requested a national strategy for preventing the loss of life, natural resources, private property, and livelihoods in the wildland/urban interface. Working with Congress, the Secretaries of Agriculture and Interior jointly developed the National Fire Plan ***(www.fireplan.gov)*** to respond to severe wildland fires, reduce their impacts on communities, and assure sufficient firefighting capabilities for the future. The National Fire Plan (NFP) is a long-term commitment based on cooperation and communication among federal agencies, states, local governments, tribes and

interested publics. The federal wildland fire management agencies worked closely with these partners to prepare a 10-Year Comprehensive Strategy (the Strategy), which was completed in August 2001 (PF Doc. FF-24). The four goals of the 10-Year Comprehensive Strategy are to improve fire prevention and suppression, reduce hazardous fuels, restore fire-adapted ecosystems, and promote community assistance. In response to the 10-Year Comprehensive Strategy goal of promoting community assistance, Shoshone County initiated a contract to develop a Fire Mitigation Plan to aid in the protection of the communities within the county (PF Doc. FF-47). The plan identifies a goal to reduce the rate of fire spread and acres of land burned by forest fires through the implementation of targeted fuel mitigation treatments where the landscape has the potential to sustain fires that threaten communities in the rural urban interface. The Shoshone County Fire Mitigation Plan has the following objectives:

- *Identify high risk areas for fire ignition*
- *Locate landscape features with a high risk for rapid fire spread*
- *Search out significant concentrations of home sites and other buildings*
- *Determine areas where initial efforts should be concentrated*
- *Develop risk reduction activities*

The plan identifies Placer Creek as a priority treatment area for Shoshone County, describing the south-facing areas of Placer Creek as being at moderate to high risk for possible wildfire ignition and spread because of the forest fuels, southerly aspect, potential for lightning strikes, and potential for ignition from human causes. In addition, communities along the eastern side of the I-90 corridor lie in the direction a fire would likely spread in this valley (PF Doc FF-47, page 79).

The Proposed Action is designed to help accomplish the goals of the Strategy, primarily by reducing hazardous fuels. One of the guiding principles of the Strategy is to set priorities that emphasize the protection of communities and other high-priority watersheds at risk. The long-term emphasis is to maintain and restore fire prone ecosystems at a landscape scale. The Placer Resource Area is within the wildland-urban interface as defined by the Shoshone County Fire Mitigation Working Group (PF Doc. FF-39 and FF-46); the resource area is in close proximity to communities, and is used as a municipal watershed. These factors make the Placer Resource area a high priority for hazardous fuel treatment.

The National Fire Plan, the 10-Year Comprehensive Strategy, and the Implementation Plan for the Strategy (PF Doc. FF-25) can be accessed on the internet at ***www.fireplan.gov***.

2. Methodology for the Fire/Fuels Analysis

Several sources of information were used to assess the existing conditions in the Placer Resource Area. The fire history of the Coeur d'Alene River Ranger District, including the Placer Resource Area, has been recorded and mapped by the Forest Service since its inception. Fires were initially mapped with colored pencil on a district map, but are now digitized and placed in a GIS (geographic information system) coverage. A map of the recorded fire history for the Placer Resource Area was used to make assumptions as to when effective fire suppression began (PF Doc. FF-37). Additionally, a fire history study of the Idaho Panhandle National Forests was conducted by Zack and Morgan (1994; PF Doc. FF-23). The information gathered by this study and the subsequent conclusions drawn from it are relevant to the Placer watershed and were used to help characterize the existing condition of the area.

Records of fire ignitions are compiled by the Forest Service (1960 to 2000) and Idaho Department of Lands (1981 to 2000), and kept in a national database. These records include the year, size, location, and cause of each fire reported. Records for fire ignitions in the Placer Resource Area were used in this analysis (PF Doc. FF-36).

Fire Regime Condition Class (FRCC) was analyzed using the Fire Regime Condition Class software and direction outlined in the Interagency Fire Regime Condition Class Guidebook (PF Doc. FF-52). FRCC was assessed at only the *landscape* scale within the Placer Resource Area; *stand*-level assessments of the FRCC

were not done. Of primary concern to fuels management is the long-term fuel loading increase and subsequent changes in fire intensity and severity that may occur. The Forest Vegetation Simulator (FVS), which is widely used by forest managers throughout the United States and Canada to predict the effects of various vegetation management actions on future forest conditions, was used for this additional analysis. The Fire and Fuels Extension to FVS (FFE-FVS) integrates FVS with elements from existing models of fire behavior and fire severity. Model output displays fuels, stand structure, snags, and potential fire behavior over time and provides a basis for comparing proposed fuel treatments (Reinhardt and Crookston 2003, page 12; PF Doc. FF-14). FFE-FVS was used in this analysis to describe the existing conditions of the forest stands in the Placer Resource Area, as well as to compare the effects of proposed treatments within each alternative.

Information about existing vegetation was obtained from an existing database (Field Sampled Vegetation or FSVeg) that was developed from stand exam information, historical records and aerial photo interpretation. This information was used in the Fire and Fuels Extension (FFE) to the Forest Vegetation Simulator (FVS), which was developed to assess the risk, behavior, and impact of fire in forest ecosystems. (Beukema et al. 1999; page 1; PF Doc. FF-7). The Fire and Fuels Extension was created in order to link the changes in forest vegetation due to growth, natural or fire-based mortality, and management, with changes in fire behavior, using existing models and information wherever possible (Beukema et al. 1999, page 1; PF Doc. FF-7).

Figure FF-1. Active crown fire behavior.

FFE-FVS was used to assess the risk of fire to a stand with indicators such as potential flame length, the type of fire (e.g. surface fire or crown fire), and the critical wind speeds required to initiate and sustain a crown fire. This model is not intended to predict the probability of fire or the spread of fire between stands (Reinhardt and Crookston 2003, page 12; PF Doc. FF-14). It is used solely to assess the potential fire behavior and fire effects possible considering current and future stand conditions. In addition to FFE-FVS, BehavePlus was used with custom fuel models to describe fire behavior changes in non-forest stands (brush fields).

Fire Behavior Indicators:
- ✓ Flame Length
- ✓ Torching Index
- ✓ Crowning Index
- ✓ Rate of Spread

Four primary indicators of fire hazard were used to evaluate the changes in fire behavior in forested stands. First, the potential **flame length** (which is related to fuel loading and fuel arrangement) was used to determine the surface fire behavior potential, as well as the trend over time. Suppression tactics are directly related to flame lengths. For example, flame lengths less than four feet can be effectively attacked using hand crews constructing direct fire line, while flame lengths greater than four feet will likely have to be attacked using dozers, engines, and retardant aircraft (NWCG 1993, page B-59; PF Doc. FF-11).

The second indicator of fire hazard used in this analysis was the **torching index**. The torching index is the 20 foot wind speed at which crown fire is expected to initiate, and it was used to describe a stand's potential for passive crown fire behavior, which is also called torching or candling. Torching occurs when individual or small groups of trees torch out, but solid flame is not consistently maintained in the canopy. Passive crowning encompasses a wide range of fire behavior, from the occasional tree torching out to a nearly active crown fire. Embers lofted during passive crowning can start new fires downwind, which make containment more difficult and increase the overall rate of fire growth. The torching index reflects both the surface fuel loading and

amount of ladder fuels within a stand. A lower torching index means that the stand can exhibit passive crown fire at lower wind speeds; a lower torching index means a higher fire hazard.

The third indicator of fire hazard used to compare alternatives was the **crowning index**. The crowning index is the wind speed, 20 feet above the canopy, at which active crowning is possible (Scott and Reinhardt 2001, page 17; PF Doc. FF-10). The crowning index reflects the density of canopy fuels. Active crown fire, also called a running or continuous crown fire, is one in which the entire surface/canopy fuel complex becomes involved, but the crowning phase remains dependent on heat from the surface fuels for continued spread. Active crown fires are characterized by a solid wall of flame extending from the fuel bed surface through the top of the canopy (Scott and Reinhardt 2001, page 4; PF Doc. FF-10). Because active crown fires consume the crowns of trees, they result in complete mortality of the overstory. Sites that can initiate or sustain a crown fire at lower wind speeds are more prone to crown fire. Critical open wind speeds for crown fire initiation and active spread are stand-specific indicators of crown fire hazard. Although critical wind speeds were used as indices, the site conditions (surface and canopy fuels, slope steepness), not the weather, are being rated (Scott and Reinhardt 2001, page 16; PF Doc. FF-10).

The crowning index describes the point at which active crowning is possible, not necessarily the point at which a crown fire can be initiated. Conventional wisdom is that a surface fire must first go through a passive crown fire phase before becoming active as burning conditions worsen. A passive crown fire phase is a phase in which individual or small groups of trees torch out, but solid flame is not consistently maintained in the canopy. This wisdom also suggests that any stand not capable of initiating a crown fire would not support an active crown fire under the same conditions (Scott and Reinhardt 2001, page 21; PF Doc. FF-10). However, it is possible to have an active crown fire in a stand that would not easily initiate an active crown fire, depending on the type of originating fire (Scott and Reinhardt 2001, page 22; PF Doc. FF-10). For example, although there may not be enough ladder fuels in a particular stand to initiate a crown fire until the winds reach 75 miles per hour, if a crown fire enters that same stand from another area, it could sustain the crown fire at a much lower wind speed, perhaps 20 miles per hour. For this reason, stands that are considered safe from crown fire initiation cannot necessarily be relied upon to cause crown fire cessation (Scott and Reinhardt 2001, page 26; PF Doc. FF-10). The spatial variability of fuel conditions in the Placer Resource Area (and beyond) could lead to crown fires initiating elsewhere and entering the stands targeted with this project.

Figure FF-2. Passive crown fire behavior.

In brush fields, flame length and **rate of spread** were used as indicators of fire behavior potential. Because of the lack of crown fuels in the non-forested stands, torching index and crowning index are not meaningful indicators of fire behavior potential. Flame length reflects surface fuel loading and fuel arrangement, and the rate of spread shows how fast a fire is moving. A higher rate of spread means the fire will be more difficult to control.

All of the indices used (flame length, crowning index, torching index and rate of spread) need to be considered in conjunction with one another. For example, just because the crowning index is increasing over time (meaning crown fire *hazard* is decreasing), it does not necessarily indicate a positive trend for potential fire suppression activities. Surface fuels and the associated flame lengths may be increasing at the same time, dictating different suppression tactics.

Features Related to Fuels Management

The proposed action alternative includes specific design features that would be followed during project implementation to protect resources in the Placer Resource Area.

> ***Slashing***
>
> ***is the use of chainsaws to treat noncommercial undesirable tree species in order to prepare a site for burning and reforestation with desired species.***

- *Surface or understory fuels in harvest units would be treated through the use of prescribed burning, grapple piling, or slash busting. Because post-harvest fuel conditions cannot be completely predicted, assessments would be made by a fire/fuels specialist and a silviculturist after completion of harvest activities. A determination would then be made as to whether the burn could be implemented safely and effectively without further fuels treatment, or if some modification of the fuels using other methods is required to meet the objectives of the silvicultural prescription. These methods could include slash piling, leave tree protection, or slashing.*
- *Post harvest activities would include prescribed burning (and related slashing, as needed) to reduce fuels, fuel continuity, and fuel ladders, and introduce fire as an intermediate disturbance process.*
- *Burning would take place only when soil moistures are above 25 percent.*
- *Based on past experience, approximately 10 to 15 percent mortality of overstory trees would be anticipated as a result of prescribed burning. Salvage of this mortality would not occur without further analysis as appropriate under NEPA.*

Features Designed to Protect Air Quality

The Idaho Panhandle National Forests is a party to the North Idaho Smoke Management Memorandum of Agreement (PF Doc. FF-42), which established procedures regulating the amount of smoke produced from prescribed fire. The North Idaho group currently uses the services and procedures of the Montana State Airshed Group. The procedures used by the Montana Group are considered to be the "best available control technology" (BACT) by the Montana Air Quality Bureau for major open burning in Montana. A Missoula-based monitoring unit is responsible for coordinating prescribed burning in North Idaho during the months of April through November. This unit monitors meteorological data, air quality data, and planned prescribed burning and decides daily on whether or not restrictions on burning are necessary the following day.

Each year, a list of all prescribed burning planned for the burning season on the Coeur d'Alene River Ranger District is forwarded to the monitoring unit through the Coeur d'Alene Interagency Dispatch Center before March 1. Daily, by 8:30 a.m., the Coeur d'Alene River Ranger District informs the Dispatch Center of all burning planned for the next day and they forward this information to the monitoring unit. By 3:00 p.m. the same day the monitoring unit informs the Forest whether any restrictions are to be in effect the following day, and the Dispatch Center informs the District. These procedures limit smoke accumulations to legal, acceptable limits. The District strictly complies with these procedures, and has had no air quality violations.

Historically, prescribed burning on the Coeur d'Alene River Ranger District occurs in the spring and fall seasons over a total time span of 45 to 60 days during each season. All burning complies with federal, state and local regulations. Management practices include, but are not limited to, burning under spring-like conditions (high moisture content in fuels, soil and duff) to reduce emissions, provide for retention of large woody debris, and to protect the soil. Prescribed burning during spring or fall would generate less smoke than a much hotter stand replacing summertime wildfire (PF Doc. FF-42).

3. Existing Conditions

A. Fire Regime Condition Class

An analysis of the Fire Regime Condition Class (FRCC) was completed for the Placer Resource Area (PF Doc. FF-50 and FF-51). FRCC is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001, PF Doc. FF-53). FRCC includes three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and disease mortality, grazing and drought). The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside of the natural range of variability.

Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural (historical) fire regime. Uncharacteristic conditions are considered to be those that did not occur within the natural (historical) fire regime, such as invasive species (e.g. weeds, insects, and diseases), "high-graded" forest composition and structure (e.g. large trees removed when they would have lived in a frequent surface fire regime).

Fire Regime Definitions:

- **I** 0-35 year frequency and low (surface) fire most common to mixed severity (less than 75% of the dominant overstory vegetation replaced.
- **II** 0-35 year frequency and high (stand replacement) severity (greater that 75% of the dominant overstory vegetation replaced.
- **III** 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced)
- **IV** 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced)
- **V** 200+ year frequency and high (stand replacement) severity

Table FF-1. Approximate habitat type, Fire Regime, and Fire Regime Condition Class distributions in the Placer Resource Area.

Habitat	Fire Regime	FRCC	Acres	% Composition
Dry	I	3	1,993	20
Moist	III	2	4,982	50
Subalpine	III	2	2,989	30

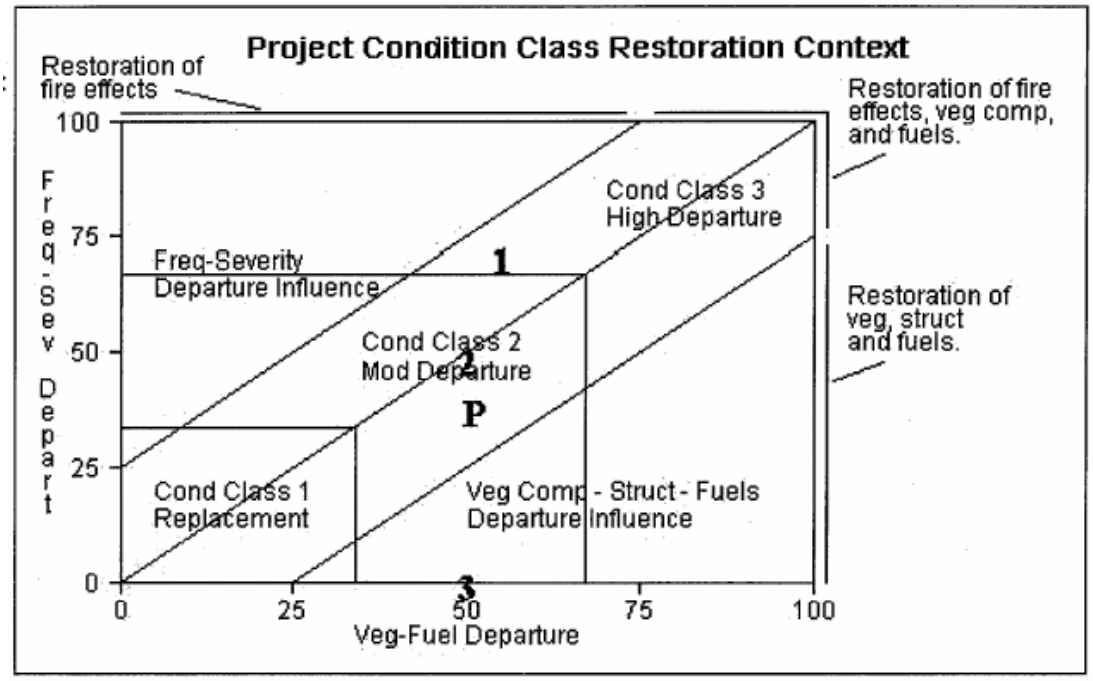
Fire regimes in the Placer Resource Area were determined using VRU's (Vegetation Response Units). The VRU's were grouped into three broad habitat type groups: dry, moist, and subalpine. Dry habitats are primarily south aspects where ponderosa pine or Douglas-fir is the climax species, although in the Placer Resource area, many of these sites are dominated by shrubs. Dry habitats fall into Fire Regime I. Moist habitats are generally more northerly aspects or draws, and host a variety of species such as western larch, white pine, grand fir, Douglas-fir, and western red cedar. The most dominant climax species on moist sites in the Placer Resource Area is western hemlock. Subalpine habitats generally occur above an elevation of 3,800 feet in the Placer Resource Area, and have species such as subalpine fir and mountain hemlock. Both the moist and subalpine habitats fall into Fire Regime III.

The **Fire Regime Condition Class** Analysis for the Placer Resource area showed that the landscape as a whole is in Condition Class 2, and is in need of restoration of fire effects, vegetation composition/structure and fuel characteristics. The dry habitat types are most altered, and as a group fall into Condition Class 3. Moist and subalpine habitats fall into Condition Class 2. Both the departure from natural fire frequency and severity and the departure from natural vegetation composition/structure, and fuel characteristics influenced the dry and moist habitat types. However, subalpine habitats were not influenced by a departure from natural fire frequency and severity, but were influenced by a departure from natural vegetation composition, structure and fuel characteristics. Fire exclusion, white pine blister rust, and timber harvest not mimicking the natural fire regime were primary factors in pushing the Condition Class rating towards Condition Classes 2 and 3. The following graph shows the result of the analysis. Maps of Fire Regimes and Condition Classes are in the project file (PF Doc. FF-48 and FF-49).

Table FF-2. Description and Potential Risks of Each Fire Regime Condition Class.

Fire Regime Condition Class	Description	Potential Risks
Condition Class 1	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) is low.
Condition Class 2	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate.. Risk of loss of key ecosystem components is moderate.
Condition Class 3	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components is high.

Figure FF-3. Fire Regime Condition Class Analysis Summary for the Placer Resource Area. *Dry habitats are represented by the number 1, moist by the number 2, and subalpine by the number 3. The resource area is represented with a 'P'. The graph shows dry habitats in Condition Class 3, and moist and subalpine in Condition Class 2.*



B. Broad Scale Fire History

Fire is the major disturbance factor that produces vegetation changes in our ecosystems. Changing or removing the role of fire results in substantial changes in the ecosystem. Fire has burned in nearly every ecosystem and nearly every square meter of the coniferous forests and summer-dry mountainous forests of northern Idaho, western Montana, eastern Washington and adjacent portions of Canada. Fire was responsible for the widespread occurrence and even the existence of western larch, lodgepole pine, and western white pine. Fire maintained ponderosa pine on sites throughout its range at the lower elevations and killed ever-invading Douglas-fir and grand fir (Spurr and Barnes 1980, PF Doc. FF-19). Many ecosystems are regularly recycled by fire; life for many forest species literally begins and ends with fire. According to Zack and Morgan (1994; pages 19-22; PF Doc. FF-23) there are generally three types of fires that occur in forested ecosystems:

- ***Nonlethal fires*** *- fires that kill 10% or less of the dominant tree canopy. A much larger percentage of small understory trees, shrubs and forbs may be burned back to the ground line. These are commonly low severity surface and understory fires, often with short return intervals (a few decades).*

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

- ***Lethal fires*** *- fires that kill 90% or more of the dominant tree canopy. These are often called "stand-replacing" fires and they often burn with high severity. They are commonly crown fires. In general lethal fires have long return intervals (140-250+ years apart), but affect large areas when they do occur. Local examples of these types of fires would be the Sundance and Trapper Peak fires of 1967 that burned over 80,000 acres in a relatively short time period during late summer drought conditions.*

The Coeur d'Alene River drainage historically had a variable fire regime of long interval, large, lethal fires mixed with shorter return interval non-lethal and mixed severity fires. Fires were more frequent in watersheds on the periphery of the Coeur d'Alene Basin, adjacent to and downwind from the drier, pine dominated Rathdrum Prairie (FF-23, Zack and Morgan 1994, page 34). Prior to Euro-American settlement (1880), the mean fire return interval within the Interior North Fork of the Coeur d'Alene River was 62 years. The mean fire return interval on the Rathdrum Prairie face and the Hayden Lake watershed was 55 years (FF-23, Zack and Morgan 1994, page 27).

"Severity" refers to the degree to which a site may be altered or disrupted by a fire which is often determined by the degree of soil heating.

"Return interval" refers to how often a particular type of fire occurs.

"Fireline intensity" is the energy release rate per unit length of fire line and is a physical parameter that can be related to flame length.

The fire history analysis of the Coeur d'Alene Basin conducted by Zack and Morgan in 1994 (PF Doc. FF-23) drew the following conclusions:

- *In addition to cycling carbon and nutrients, the infrequent large lethal fires played a dominant role in resetting the successional sequence and structuring the vegetation matrix across the landscape. However, the nonlethal and mixed severity fires were also important. Most stands (within the Coeur d'Alene Basin) apparently experienced an average of one to three of these low severity burns between lethal fires. These lower severity fires would reduce ground fuels, reduce ladder fuels, thin stands, and favor larger individuals of fire resistant species (larch, Douglas-fir, and ponderosa pine), than if these mixed severity and nonlethal fires had not occurred.*

- *Lower severity fires structured how the landscape responded when a lethal severity fire did occur. The lower severity fires increased the proportion of the landscape with big trees and open canopies that would not sustain a crown fire. Reduction of ladder fuels would mean that even high intensity fire might not reach tree canopies in some cases. The larger trees that grew as a result of this thinning would be more likely to survive even intense fires. The net result would be that even lethal severity fires would be likely to leave more individual residual trees and patches of residual trees than if the lower severity fires had not occurred. The effects of lethal fire events would be less uniform as a result of the lower severity fires*

Zack and Morgan (1994, page 1; PF Doc. FF-23) found that since 1540 there was one major fire every 19 years, somewhere in the Coeur d'Alene River Basin. However, since the mid 1930's, fire control efforts have become effective, and the last major stand-replacing fire in the Coeur d'Alene River Basin occurred in 1931. The primary impact of fire control has been to eliminate underburns and mixed severity fires which served as the thinning agents that favored larch and ponderosa pine.

C. Placer Resource Area Fire History

The dominant fire event in the recent past in north Idaho as well as in Placer Creek is the 1910 fire. The 1910 fire burned practically all of Placer Creek in devastating fashion, leaving only a few small islands of surviving trees and scattered individual trees. The West Fork of Placer Creek is the site of Ranger Edward Pulaski's famous run to an abandoned mine where he saved the lives of nearly 40 men by holding them in the mine at gunpoint while the firestorm passed. The 1910 fire burned over 2.5 million acres of northern Idaho and western Montana in 36 hours when a windstorm fanned the flames of many already existing fires that were burning during that drought year.

The fire that burned Placer Creek originated near the St. Joe River; very strong southwesterly winds blew the fire over 40 miles, to near Thompson Falls, Montana. The town of Wallace, which sits at the mouth of Placer Creek, was evacuated, and by the time the fire passed, one-third of the town had burned. The only other fire that was large enough to be mapped in the Placer Resource Area occurred in 1928. This fire burned primarily in the St. Joe drainage, but a small part of the 19,000-acre fire burned into Placer Creek. About 450 acres at the headwaters of Placer Creek burned as part of this fire, which re-burned area that had burned in the 1910 fire.

Figure FF-4*. The mine portal where Pulaski led his crew during the devestating fire of 1910.*

The 1928 fire was very similar to the 1910 fire in that it was wind-driven and spread in a northeasterly direction. For a map of the fire history of the Placer Resource Area, refer to the project file (PF Doc. FF-37). The 1928 fire was the last large fire that occurred in the Placer Resource Area. Since then, fire suppression has been effective, and only small fires have been recorded. Forest Service and Idaho Department of Lands records show that 19 fires have been detected and suppressed in Placer Creek. The majority of these fires were kept very small, accounting for a total of just 67 acres burned. Ten of the 19 fires were caused by lightning and the other nine were either human-caused or of unknown origin (PF Doc. FF-36).

D. Wildfire Hazard-Risk Assessment

A Wildfire Hazard-Risk Assessment for the Coeur d'Alene River Ranger District (PF Doc. FF-18, Jerome, 2001) assessed the relative wildfire hazard for broad areas across the district and compared relative risk ratings for several different resource values-at-risk. The Placer Resource Area falls into two different zones (as assigned by the assessment), so risk scores vary depending on the part of the project area. The assessment was not meant to be applied at the project-level scale, but at a broader district-level scale to compare relative risks for general areas of the district. Therefore, it was not used as a major reference in this site-specific assessment of the Placer Resource Area.

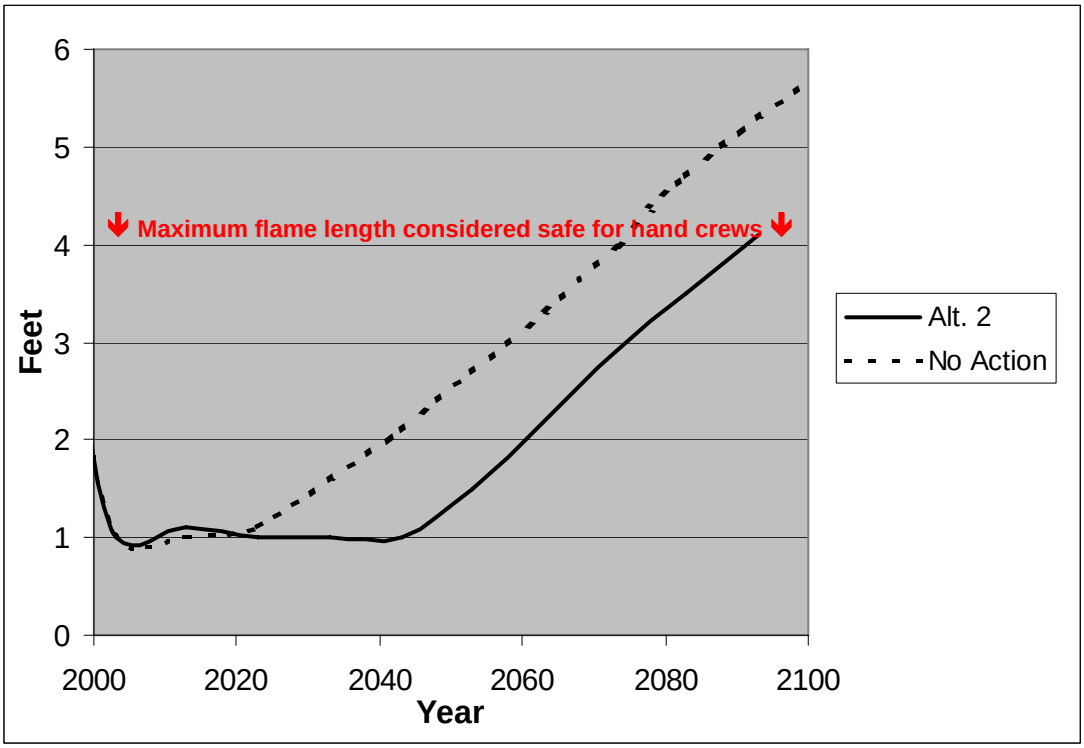
4. Environmental Consequences

The following graphs briefly compare the No-Action and Proposed Action Alternatives in terms of the four fire behavior indicators (flame length, torching index, crowning index, and rate of spread). A more detailed discussion of the effects of each alternative follows the comparison.

A. Flame Lengths

Only flame lengths of 4 feet or less can be safely attacked directly using hand crews. Once flame lengths surpass this mark, other suppression tactics must be employed. These could include using dozers and air tankers, as well as indirect attack. Indirect attack means that suppression forces would retreat to a safe and defensible place where they believe the fire can be stopped, and attempt to hold the fire at that location. Use of this tactic often results in more acreage burned (NWCG 1993, page B-59; PF Doc. FF-11). In addition, as surface fuels and flame lengths increase across the landscape, the likelihood is greater that the fire will climb into the canopy and become a crown fire. Crown fires have the largest immediate and long-term ecological effects and the greatest potential to threaten human settlements near wildland areas (Graham et al. 2004, page 20; PF Doc. FF-6).

Figure FF-5. Flame length over time. *Under the No-Action Alternative, flame lengths in this stand would surpass the four-foot mark 20 years earlier than under the Proposed Action Alternative. Under the Proposed Action, flame lengths would increase slightly as slash is created from harvest operations, then subside after slash is treated. Activities under the Proposed Action would reduce surface fuels and the associated flame lengths. Although flame lengths vary widely among the stands in the project area, they all exhibit the same trend shown in this graph, of increasing flame lengths over time as surface fuels build. This effect persists through the modeling period.*



B. Torching and Crowning Indices

Effects of a thinning treatment on crown fire behavior under specific weather conditions are shown in the following figures. These figures describe one representative stand, and effects vary somewhat between stands depending on site conditions and other factors (refer to PF Doc. FF-44 for all modeling results). **When the torching index increases, it means that ladder fuels are decreasing and it is harder for a fire to climb into the crowns of the trees.** The crowning index reflects the density of the tree canopy, and its ability to sustain an active crown fire.

The effects of a thinning treatment on the crowning index are shown in Figure FF-6. The thinning treatment would greatly increases the crowning index compared to the No-Action Alternative, i.e. crown fire hazard decreases because canopy fuels and the overall density of the canopy have decreased. This is a long-term effect, and although every stand modeled does not show such an obvious change, the stands do show the same trend of an immediate decrease in canopy fuels that lasts for many years, in most cases.

Figure FF-6. Torching Index with a thinning treatment. *Under the No-Action Alternative, this stand would exhibit passive crown fire behavior even with no wind, a stuation that lasts for the entire modeling period. Under the Proposed Action, thinning treatments would reduce ladder fuels, so the torching index would increase sharply until approximately 2060, when ladder fuels would build and the torching index would decline.*

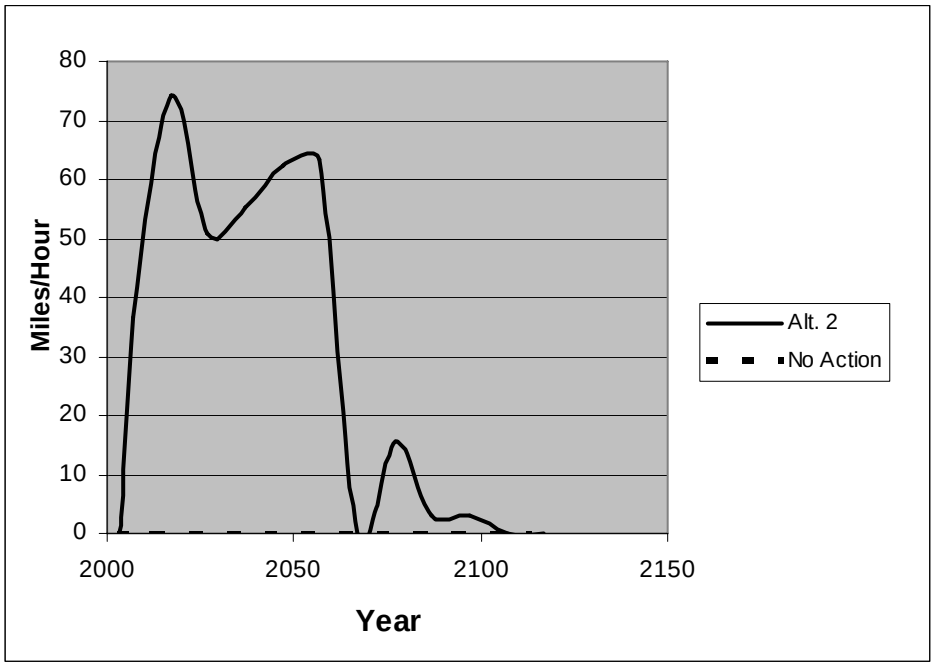


Figure FF-7. Crowning Index in a stand with a thinning treatment. *Under the No-Action Alternative, this stand would sustain an active crown fire with approximately 25 mph windspeeds. Under the Proposed Action, thinning would substantially reduce crown fuels and consequently reduce the crown fire potential of the stand. The crowning index would remain notably higher through the modeling period under the Proposed Action, whichh means that it would take stronger winds to sustain an active crown fire.*

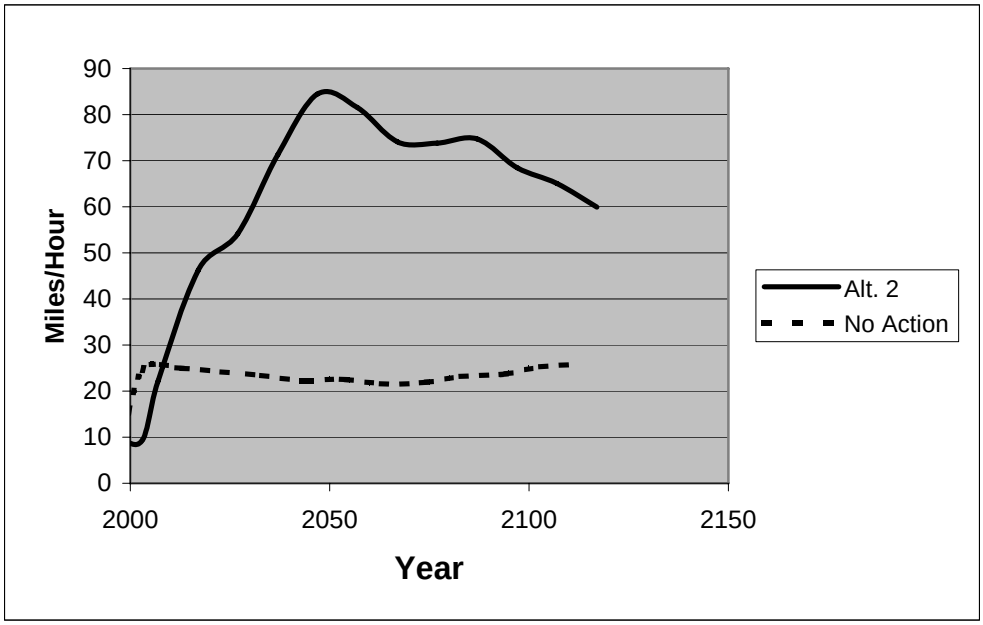


Figure FF-8. Crowning Index in a stand with a regeneration treatment. *The regeneration treatment under the Proposed Action Alternative would drastically increase the crowning index in comparison to the No-Action Alternative. This means that crown fuels would be reduced and the potential for an active crown fire would lowered for most of the modeling period. In approximately 80 years, however, crown fuels increase and and surpass what would exist with no action.*

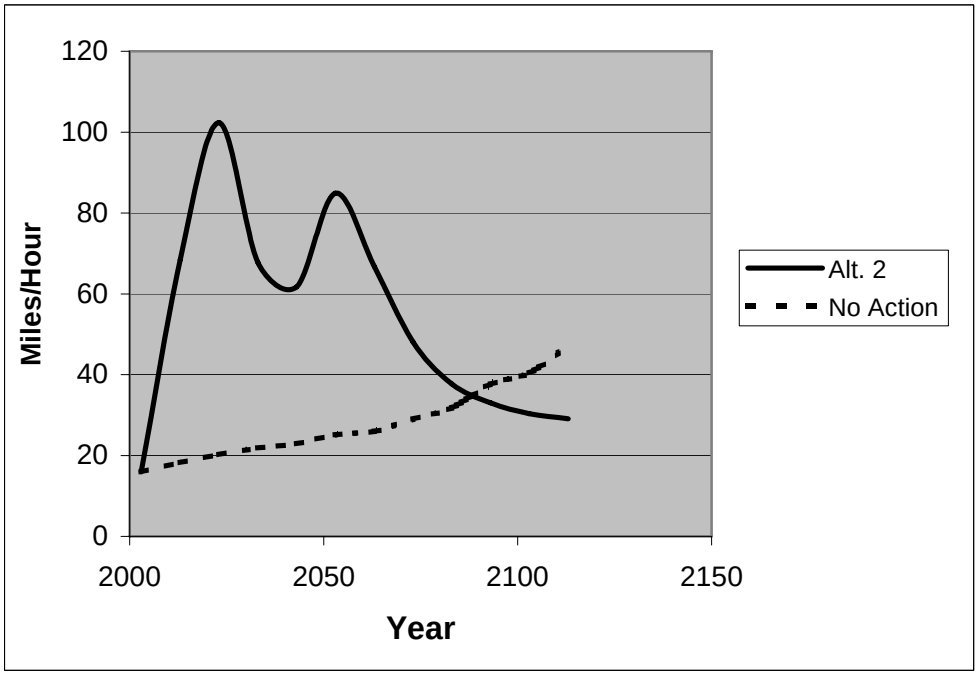
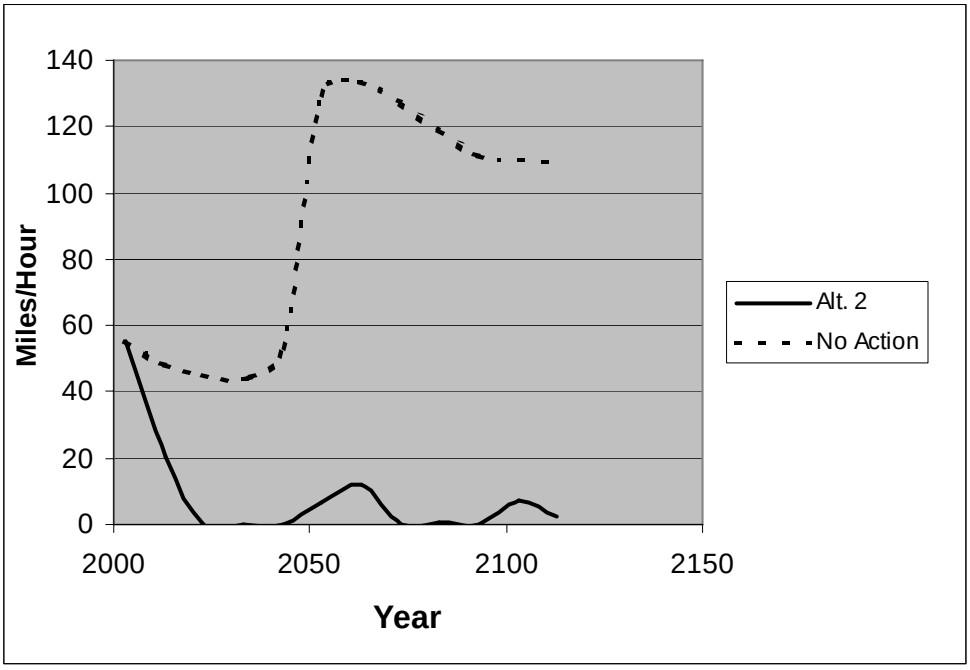


Figure FF-9. Torching Index in a stand with a regeneration treatment. *The regeneration treatment under the Proposed Action Alternative would substantially decrease the torching index in comparison to the No-Action Alternative. The decrease is due to the increase in ladder fuels caused by the influx of small trees with branches close to the ground. This means that a fire could climb up the small trees with little or no wind throughout most of the modeling period. Early in the modeling period, this type of fire behavior is not a cause for concern, however, but as the canopy grows taller and more dense, fire hazard increases.*



C. Effects Under the No-Action Alternative

Direct and Indirect Effects of the No-Action Alternative

Direct effects (those which are caused by the action and occur at the same time and place) to fire and fuel conditions would be minimal if not absent under the No-Action Alternative, because no activities are proposed under the No-Action Alternative.

The primary effects of the No-Action Alternative would be indirect and cumulative as a result of the ongoing and reasonably foreseeable activities (EA, Appendix B). The current full fire suppression policy would continue; no unplanned ignitions would be allowed to burn as wildland fire use fires. Surface fuels would continue to accumulate. The successional changes in stand structure that affect fire behavior would also continue on their current trend. Figure FF-5 displays the effects of the process of surface fuel accumulation over time, if no action is taken. Flame lengths would increase over time as the fuel load builds. Flame lengths would surpass four feet 20 years earlier under the No-Action Alternative than under the Proposed Action (only flame lengths of four feet or less can be safely attached directly using hand crews).

Cumulative Effects of the No-Action Alternative

As discussed earlier, fire suppression is the primary factor in determining cumulative effect of this project. The No-Action Alternative represents the continuation of current management, which means the effects of 75 years of fire suppression would continue on their current trend. The No-Action Alternative would allow the continuation of surface fuel accumulation, as well as the changes in fire behavior associated with a change in forest structure and species. Successful fire suppression without prescribed fire causes an increase in amount and continuity of the living and the dead material that fuels fires (Saveland 1998, page 4; PF Doc. FF-3). The

continued loss of fire-resistant species would continue to lead to forests that are less resilient to fire, meaning that they could experience more pronounced fire effects and an increased amount of mortality associated with a wildfire.

Under the No-Action Alternative, fire behavior would maintain its trend away from historic conditions, creating an increasing challenge to fire suppression forces. Fires would continue to be more intense, and therefore more dangerous to firefighters. Forests where insect and disease problems are increasing would also contain more snags, which are particularly dangerous for firefighters. Larger, more intense fires that threaten nearby homes and communities could have various unwanted effects (evacuations, threatened and burned structures, adverse health effects from smoke, negative economic impacts).

Fire exclusion has many effects that are documented in the publication *Cascading Effects of Fire Exclusion in Rocky Mountain Forests*" (PF Doc. FF-32). Those effects are summarized here. Fire exclusion causes forest composition to change from early seral, shade-intolerant tree species to late seral, shade-tolerant species, while stand structure changes from single-layer canopies to multiple-layer canopies. An important stand characteristic that changes with advancing succession in the absence of fire is the increase in the amount of dead and live biomass or fuels. Fuels loadings generally increase in the absence of fire because of a myriad of ecological factors. First, long fire return intervals mean live fuels have longer times to grow and dead fuels have longer periods to accumulate on the ground. Next, crown fuels increase because late seral, shade-tolerant species tend to have more biomass in the forest canopy due to their high leaf areas, and biomass tends to be well distributed over the height of the trees. Stand leaf area generally increases over successional time because shade-tolerant species generally have longer needle retention times, higher leaf area/sapwood ratios, and more leaf mass in the crown. Higher leaf area usually requires additional conducting tissue for support, which means the tree may need to produce more branch and twig wood along greater portions of its stem. Because late seral species are shade tolerant, there are many smaller seedlings and saplings present in the understory to take advantage of any gaps in the canopy. So, the greater crown biomass distributed along greater parts of the stem, coupled with high seedling and sapling densities, can create the ladder fuels that allow flames from surface fires to climb into the forest canopy and result in crown fires.

Surface fuel loadings increase as fire is eliminated because the greater crown biomass ultimately results in increased leaf and woody material accumulating on the forest floor because the recycling process of fire is absent. Dense crowns also reduce solar radiation attenuated to the forest floor, which may lower soil temperatures resulting in decreased decomposition rates and still higher branch and litter accumulations. Duff and litter depths generally increase proportionate to the crown closure and leaf area because of the additional needle fall and reduced decomposition.

Soil properties change as fires are reduced and succession advances in an ecosystem. Organic matter generally increases with decreased fire frequency, and this improves pore space, water-holding capacity, and aggregation. However, when soils with thick organic horizons are burned, some of the volatilized organic matter moves downward and condenses to form a water repellent layer that impedes infiltration and can cause massive erosion.

Landscapes tend to become more homogeneous as fire is removed because succession eventually advances all stands to similar communities dominated by shade-tolerant species. Even though late seral species may differ across a landscape depending on site, the multi-layer structures of these late seral stands are nearly identical across most biophysical settings. Landscape structure (spatial distribution of patches) also changes with fire exclusion as landscapes generally become less fragmented, have lower patch density, and evolve decreased patch diversity, which often results in more contagion, corridors, and large patches. Larger patches and high homogeneity tend to foster more continuous crown and surface fuels, which can then burn in large fires that create still larger patches and so on in this downward "fire-exclusion" spiral.

Fire exclusion will heighten fire hazards to forest homes as people continue to develop and settle lands along the urban-wildland interface. The loss of homes and human life can escalate as the surrounding forest advances in succession because of the buildup of canopy and surface fuels. Moreover, multi-layered canopies

and dense crowns will increase the chance of crown fires that are difficult to control. This could increase the harm to people who own the property and the firefighters who try to protect it. Brackebusch states that during any period of fire exclusion, the hazard usually continues to build and the probability of a disastrous fire increases correspondingly (PF Doc. FF-8).

Under the No-Action Alternative, the lack of activities would allow the landscape further deteriorate into Condition Classes 2 and 3. The approach would not re-introduce the effects of fire; restore vegetation composition/structure; or trend fuels to resemble the landscape's natural (historical) range.

D. Effects Under the Proposed Action Alternative

Under the Proposed Action, all harvest treatments would be followed by fuel reduction treatments. Underburning would be the primary treatment, although other mechanical methods (such as grapple piling and slash busting) are also proposed. Activities that reduce surface fuels (low vegetation, woody fuel, shrub layer) decrease the chances that a surface fire would be able to ignite ladder fuels and canopy fuels (Graham et al. 2004, page 23; PF Doc. FF-6).

"Slash busting" is a treatment similar to chipping, where slash is broken into small pieces and left on the ground. This reduces fuel bed depth and retards combustion rates.

Treatment units range in size, which is an important aspect of landscape and fuel variability. Discontinuities in surface, ladder and crown fuels interrupt fire spread, but relatively small patches may not have substantially affect relatively large fires. Treatments of individual stands under a given prescription would probably be irrelevant to fire behavior and effects at the landscape scale, because wildfires are often larger than individual treatment units (Finney and Cohen 2003, page 356; PF Doc. FF-31). Treatments under the Proposed Action would be consistent with and would further the goals of the 10-Year Comprehensive Strategy Implementation Plan (www.fireplan.gov) to reduce hazardous fuels and restore fire-adapted ecosystems.

Prescribed burning is an important aspect of the Proposed Action, and can have a range of effects depending on the fuel and weather conditions at the time of the fire. Prescribed fire can effectively alter potential fire behavior by influencing multiple fuel bed characteristics (Graham et al. 2004, page 24; PF Doc. FF-6), including:

- *Reducing the loading of fine fuels, duff, large woody fuels, rotten material, shrubs and other live surface fuels, which together with compactness and continuity change the fuel energy stored on the site and potential spread rate and intensity.*
- *Reducing horizontal fuel continuity (shrub, low vegetation, woody fuel strata), which disrupts growth of surface fires, limits buildup of intensity, and reduces spot fire ignition probability.*
- *Increasing compactness of surface fuel components, which retards combustion rates.*

Prescribed burning is completed using a prescription and burn plan in order to control and predict the effects of the fire. Common effects of prescribed burning include surface fuel reduction, understory and overstory mortality, duff consumption, soil heating, and mineral soil exposure. Although prescribed burning creates smoke that contains particulate matter, the proposed activities would substantially reduce the PM2.5 (particulate matter less than 2.5 microns in size) emissions of potential wildfires (PF Doc. FF-42).

The degree of each effect of a prescribed fire can be controlled by careful ignition in the appropriate weather conditions. Weather conditions, however, cannot be predicted completely accurately, so there is some risk of escape with every prescribed fire that is ignited. The proximity of the Placer Resource Area to private land and communities increases the values-at-risk, and dictates very careful implementation of any prescribed burning. Prescribed burning has been carried out in the Placer Resource Area and in the Coeur d'Alene River Ranger District in the past, and, based on that history, it is reasonable to expect that prescribed burning under the Proposed Action would be implemented safely and effectively, with little effect to private property. The boundaries of the proposed treatment areas were established with consideration of the prescribed burning to occur after the harvest, and will likely allow efficient ignition and suppression of prescribed fires. Whenever

possible, changes in aspect and shaded draws would be used as boundaries; these areas often have higher fuel moistures (especially in the spring), and in many cases burn with very little intensity, if at all. Fire line would be used to contain prescribed burns when necessary (this determination would be based on site-specific characteristics and weather conditions at the time of the burn). Even with careful forethought and planning, prescribed burning can be uncertain, and small burned areas outside of the designated treatment areas should be expected. These "slop-overs" are commonly relatively small and quickly contained, and cause insignificant effects.

Direct and Indirect Effects of Commercial Thinning Under the Proposed Action Alternative

The Proposed Action would include commercial thinning. Any removal of canopy would reduce the moderating effect of canopy on wind speed, so surface winds would increase. Scott and Reinhardt (2001, pages 31-32; PF Doc. FF-10) have addressed this subject. They state,

Surface winds are those beneath the canopy that affect surface fuels.

> *"The increased fuel-level wind speed coupled with increased insolation also leads to lower dead fuel moisture in treated stands during summer. These two factors tend to exacerbate surface fire behavior. However, properly executed treatments also tend to reduce the crown fire potential. Crown fire mitigation treatments often represent a tradeoff – the decrease in crown fire potential comes at the expense of increased surface fire spread rate and intensity. The greatly increased spread rate and intensity of crown fires makes this tradeoff reasonable."*

The relationship between the forest canopy, surface fuel moisture, soil moisture and fire behavior and effects is complex and has many aspects which must be considered when determining effects. In addition to those site factors that remain constant, current weather, season of the year, presence of drought and the characteristics of the fire in question are all very important but highly variable factors that influence fire behavior and effects.

Under the Proposed Action, commercial thinning treatments and associated prescribed burning (or other surface fuel treatments) would result in a reduction of surface fuels (Figure FF-5). Harvest units would result in a short-term increase in surface fuels until the slash is treated. Thinning treatments under the Proposed Action would tend to increase the torching index. Some increases are short-term in nature, but others, as shown in Figure FF-6, would substantially raise the torching index for a long period of time.

The timber harvesting included under the Proposed Action would immediately cause an increase in surface fuel loading, as well as an immediate decrease in canopy fuels (see Figures FF-5 through FF-9). The unmerchantable branches and other fuels that are left after harvest can substantially increase the fuel load, and consequently the potential flame lengths on any given site. This fuel load would then pose a slash fire hazard for a short period of time (one to three years), until the fuel on the site was treated with an underburn or other slash treatment method such as grapple piling or slash busting. These slash treatment methods either reduce the amount of surface fuels on site by burning, or they modify the fuel bed so that potential fire behavior is reduced.

A small amount of lopping and scattering would occur under Proposed Action in commercial thinning units. Where that occurs, surface fuels would only decrease through decomposition, which could take 5-10 years. The lop and scatter treatment would occur immediately adjacent to a grapple piling treatment, which would serve as a fuel break until the other fuels decompose.

Depending on the amount of fuel on the site and the potential effects of a prescribed burn to the remaining overstory, several methods may be used to control the effects of a prescribed burn. Slashing of the understory, protection of leave trees by pulling slash away from their boles, and piling and burning of slash are possible methods that could be used to decrease the slash load on a site and prepare the site for safe and efficient underburning.

Any type of human activity increases the possibility of ignition and wildfire. Common ignition sources include equipment and vehicle operation, smoking, and arson. A timber purchaser would be required to have fire suppression equipment on site and to take necessary fire precautions to prevent a wildfire from occurring. In the event of extreme fire conditions, harvest activities would be regulated or suspended until conditions improved. A timber sale administrator closely monitors the fire prevention requirements of the timber contract throughout the timber harvest operations.

Direct and Indirect Effects of Regeneration Harvests Under the Proposed Action Alternative

The Proposed Action includes regeneration harvesting. Both thinning and regeneration harvests are followed by surface fuel reduction activities such as underburning or grapple piling, so they both result in a reduction in surface fuels once activities are completed. Another similarity between thinning and regeneration harvests is the reduction in crown fuels. The reduction in the density of crown fuels caused by a regeneration harvest is reflected in Figure FF-8. Under the Proposed Action, the crowning index would increase substantially over what would occur under the No-Action Alternative. This effect would last nearly 80 years, when the building up of canopy fuels would increase the likelihood of crown fire at lower wind speeds.

Although regeneration harvests and the accompanying fuel treatments have the similar effects as thinning treatments on surface and crown fuels, their effect on ladder fuels is different. Regeneration harvests remove most of the canopy and initiate the establishment and growth of small trees, which generally have their branches lower to the ground than larger trees. This causes an increase in ladder fuels, and thus a decrease in the torching index. This increase in ladder fuels is of less concern immediately, primarily because the canopy has been removed and there is nowhere for the fire to climb. As the tree regeneration grows, however, the tree canopy gets taller and its density increases, resulting in the potential for not only torching of small trees, but also for a fire to climb into the canopy and remain there as an active crown fire.

So, regeneration treatments have positive effects on fire behavior until crown fuels build back up; at that time, ladder fuels are likely still present and the potential for active crown fire is substantial. Projections of stand growth and associated fire behavior show that this may not happen for up to 80 years. These regeneration harvests may need future treatments such as pre-commercial thinning and piling of slash to mitigate the potential future fire hazard.

A major direct effect of regeneration harvest is the almost complete reduction in crown fuels in the treated stands. This reduction results in a disruption in the continuity of crown fuels. Because regeneration harvests remove almost all crown fuels, they act as a barrier to crown fire spread. Any crown fire that encounters a regeneration harvest will be forced to the ground because of the lack of crown fuels. This effect is not permanent, however; as the regenerated stand grows, it once again builds crown fuels.

Direct and Indirect Effects of Rehabilitation

Rehabilitation treatments would reflect similar fire behavior to regeneration units. The primary difference between regeneration treatments and rehabilitation treatments is that rehabilitation treatments are meant to re-establish locally derived seral species where off-site species currently exist. Any differences in fire behavior characteristics between rehabilitation treatments and regeneration treatments are minimal and cannot be modeled meaningfully.

Direct and Indirect Effects of Brush Field Burning

The Proposed Action would include prescribed burning of brush fields. Fire behavior in the brush fields was modeled using custom fuel models (PF Doc. FF-35). Custom fuel models were based on fuel transects completed in the Placer Resource Area in the summer of 2003 (PF Doc. FF-43), as well as on data reported in Smith and Fischer's 1997 publication, *Fire Ecology of the Forest Habitat Types of Northern Idaho* (PF Doc. FF-4, page 41). Fuel transects completed in a previously burned brush field showed increased levels of surface fuels. This increase in surface fuel loading is common in stands where the prescribed burn is the first fuel treatment occurring in the stand in decades – the fire kills many small trees which contribute to the woody fuel load (Graham et al. 2004, page 28; PF Doc. FF-6). In unburned brush fields, there is likely more total fuel, but standing stems are not accounted for in basic fuel transects. The following graphs show changes in fire behavior that can be expected with prescribed burning. Key changes brought about by prescribed burning in brush fields include the reduction of total fuel volume, the reduction of fuel bed depth, and the increase in the ratio of live to dead fuels.

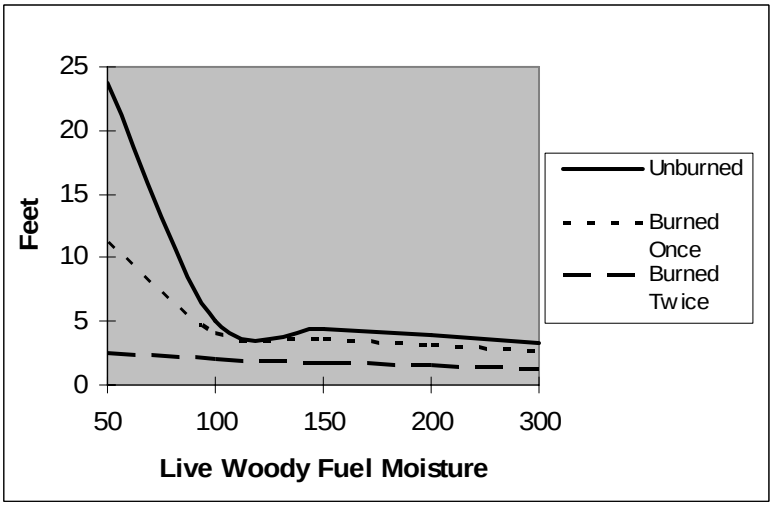


Figure FF-10. Flame lengths in a typical brush field with treatment. Flame lengths are lower in burned than unburned brush fields.

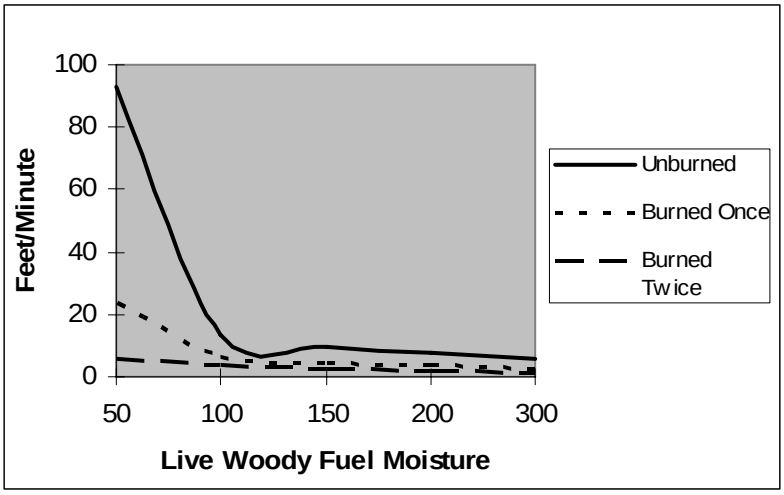


Figure FF-11. Rate of fire spread in a typical brush field with treatment. Burned brush fields exhibit lower rates of spread than unburned brush fields, especially when live woody fuel moistures are below 100 percent.

Note that in all conditions, fire behavior is very similar until live fuel moisture drops below about 100 percent. At this point, potential flame length and rate of spread differ widely depending on treatment. Burned brush fields exhibit lower flame lengths and rates of spread than unburned brush fields. Although the brush fields in the Resource Area may differ to some extent from the custom fuel models created to model their fire behavior, it is probable that actual fire behavior would fall within the range of values presented, and would also show the same trends as the treatments shown here. The major trend is that prescribed burning treatments will cause a substantial reduction in rate of spread and flame length, especially when live fuel moistures reach critical values.

Direct and Indirect Effects of Roadside Fuel Break

The fuel break running along Road 456 a width of 150 feet on either side may include a combination of various treatments including thinning, pruning, piling and burning, among others. The fuel break would be approximately 237 acres in size, but after site-specific inspection, some areas may not need fuel reduction work. The fuel break would reduce surface and ladder fuels, while reducing crown fuels where necessary

outside of riparian buffers. Fuel reduction work would reduce potential fire intensities near the road, which would allow safe travel in the event of a wildfire. Fuel reduction activities are particularly important where human ignitions are most likely, especially near travel corridors. These activities would result in decreased flame lengths and rates of spread of any fire that started near the road, allowing fire suppression crews more time to contain the fire before it got out of control. Reducing fuels and the associated flame lengths would also allow fire suppression crews to attack any developing fire with direct methods. The fuel break would also modify the behavior of any fire that spread from another location and came into contact with it. This may result in a reduction of potential fire size within the Placer Resource Area.

Direct and Indirect Effects of Helispots & Access

The Placer Resource Area is within the protection of the Idaho Department of Lands (IDL); they have suppression responsibility for wildfires in the area. In order to facilitate suppression of future wildfires, the IDL made comments on the proposed action and identified pre-planned helispots and important road access for fire suppression. These activities (which were integrated into the Proposed Action) would facilitate fire suppression, possibly resulting in quicker containment of wildfires and less acres burned by wildfires.

Direct and Indirect Effects of Other Activities

The Proposed Action also includes activities such as culvert replacements, bank stabilization, and temporary road construction. These activities do not have measurable direct or indirect effects, nor do they contribute to cumulative effects on the fire/fuels resource so they will not be discussed further.

Table FF-3. Summary table of activities and slash treatments.

	TREATMENT					
SLASH TREATMENT	Brush field Burning	Comm. Thin	Rehab	Regeneration	Roadside Fuel break	Acres
Pile/Burn					237	237
Eco-burn	1,183					1,183
Grapple Pile/Burn		35				35
Slash busting		85				85
Underburn		298	27	327		652
Lop & Scatter		5				5
TOTAL	**1,183**	**423**	**27**	**327**	**237**	**2,197**

E. Cumulative Effects under the Proposed Action Alternative

Cumulative effects are those that would result from the Proposed Action in addition to the incremental impacts of past, ongoing and reasonable foreseeable actions (described in the EA, Appendix B). Fire suppression is the primary action to be considered when evaluating cumulative impacts in the fire/fuels analysis. The Proposed Action would take steps to counteract the effects of fire exclusion as summarized previously in this section. The trend of fire behavior away from historical conditions would be interrupted, since early seral, less dense, single layer canopies would be promoted. Dead and live biomass (fuels) would be reduced in the form of surface and crown fuels, and, in many cases, ladder fuels would also be reduced for a period of time. Increasing the proportion of fire-resistant tree species such as western larch will increase the survivability of trees because they have thicker bark, taller crowns, and a higher canopy base height (Graham et al. 2004, page 36; PF Doc. FF-6).

It is almost impossible to separate indirect effects from cumulative effects when fire suppression is considered. Fire suppression has been effective in the Placer Resource Area for over 75 years, and although most of the area burned in stand-replacing fashion in 1910, the incremental effect of suppressing each small fire in the watershed would have over time promoted late seral species rather than early seral species, and

changed the structure of those moist forests, which in turn would change the way they responded to fires (Zack and Morgan 1994, page 32; PF Doc. FF-23).

Considering the Resource Area's close proximity to communities and its use as a domestic watershed, fire suppression will very likely continue in the future. The reduction in fuels under the Proposed Action would change potential fire behavior and intensity, and could also affect fire severity. Activities under the Proposed Action would promote early-seral, fire resistant species such as western larch, which are more likely to survive even intense fires, reducing future potential fire severities. Even if the larch were killed in a fire, it is possible that the seeds would survive to regenerate the stand with early-seral species. Without species such as western larch on-site, natural regeneration of that species after a wildfire would be much less likely.

Maintaining the brush fields and regenerating some stands in the resource area would create a mosaic of vegetation (Brackebusch, PF Doc. FF-8). This mosaic would create fuel interruptions that reduce the potential for conflagrations or serious fast spreading fires. Fuel mosaics can result in delayed fire spread or fire build-up, reducing the risk of escaped fires. Brackebusch recommends that these mosaics be tied to natural, fire resistant features of the terrain. Brush fields can be fire-resistant features of the terrain in most live fuel moisture conditions, especially when fuels have been reduced in volume and height by activities such as prescribed burning (Figures FF-9 and FF-10). However, in certain extreme weather conditions, fires may become uncontrollable despite any efforts at fuel management.

The spatial arrangement of vegetation influences the growth of large fires. Patches of vegetation that burn relatively slower or less severely than surrounding patches can reduce fire intensity, severity, or spread rate, or may force the fire to move around them by flanking (at a lower intensity), which locally delays the forward progress of a fire (Graham et al. 2004, page 29; PF Doc. FF-6). The spatial arrangement of treatments under the Proposed Action would likely disrupt the growth of a fire burning towards Wallace, and modify fire behavior so that suppression might be more effective. The treatments are strategically placed and overlapping, so that they would have the most substantial effect on a fire burning down the Placer Creek drainage towards Wallace (Finney 2001; PF Doc. FF-9).

Records show that 330 acres of prescribed burning has occurred on Forest Service lands in the past in the Resource Area (PF Doc. FF-41). This burning includes hand piling and burning, broadcast, wildlife and ecosystem burning. The Bureau of Land Management (BLM) has also completed prescribed burning of brush fields in the Placer Resource area, including approximately 147 acres in 1998, and 140 acres in 2004 (Cranky Gulch). These burns have the same direct effects as the brush field burning described for the Proposed Action, and would complement the treatments proposed with this project. The historic prescribed burning has helped to maintain more acres of the resource area in an early seral stage, providing discontinuity to the fuels within the area. In addition, these burns fit well into the spatial arrangement and design of fuel treatments to disrupt fire growth in the direction of Wallace.

It is neither possible nor desirable to "fireproof" fire-dependent ecosystems, but active land management can reduce potential effects of severe fire. Federal land management agencies can mimic natural disturbances, but it is essential for managers to consider that current conditions may be considerably different from those conditions that occurred historically. Reintroduction of native processes such as fire without modification of structural patterns, fuel loadings, and spatial distributions can produce unpredictable and undesirable effects (Quigley et al. 1996, pages 165 and 184; PF Doc. FF-21). Multiple treatments would be needed to regulate vegetation structure, composition, and associated biomass loadings. Long management horizons may be required to restore unhealthy ecosystems to more sustainable conditions. The most effective means to restore long-term forest health would be tree density and fuels management, plus regulation of species composition to improve the dominance and distribution of seral species (Harvey, et al. 1995; PF Doc. FF-17).

Activities under the Proposed Action would affect the Fire Regime Condition Class by restoring fire effects, vegetation composition/structure, and fuels to more resemble the landscape's natural (historical) range. Treated areas would move toward Condition Class 1, rather than toward Condition Class 2 or 3.

Additional discussion on the effects of past, ongoing and reasonably foreseeable activities is provided in the EA, Appendix B.

Cumulative Effects on Private Lands

Most often, timber harvests on private lands tend to be partial cuts that remove trees of the highest economic value, generally large fire resistant seral species. Natural regeneration is relied on to fill most created openings. This tends to favor shade tolerant Douglas-fir and grand fir over early seral species such as pine and larch. The historic fire adapted vegetation structure was lost early in the century. With increased values for private timber, and historic harvest practices on private lands, it is probably safe to say that inherent disturbance regimes and historic vegetation patterns will never be re-established on private lands within the analysis area. Because private lands are likely to convert to more shade tolerant species, the structure of stands on private land will probably not approximate what existed there historically. However, currently, there are fuel reduction efforts focused on private lands, primarily around structures within the Resource Area.

These efforts are part of the Shoshone County Wildland Urban Interface Fire Mitigation Program, a program designed to help homeowners reduce fuels on their property and increase the chances of their home surviving a wildfire. In 2003, approximately 5.5 acres of private land were treated within the Placer Resource Area under the Shoshone County Fire Mitigation Plan. In 2004, approximately 11 acres were treated within the project area under the Shoshone County Fire Mitigation Plan (PF Doc. FF-38). Work includes non-commercial fuel reduction activities such as thinning, pruning, piling and chipping primarily within the home ignition zone around Wallace. These activities are consistent with the goals of this project, and together they will help protect homes and other resources from damage by uncontrolled wildfire. The County expects to complete one more acre of similar structure protection work in 2005 in the Placer Resource Area. Other future County projects, such as treating residual slash above King Street in Wallace and working on the roadside fuel break along Road 456, will help reduce the risks posed to the community by an uncontrolled wildfire. Other reasonably foreseeable activities (such as herbicide spraying for noxious weed control) would not contribute to cumulative effects to the fire/fuels resource.

5. Consistency With Forest Policy and Legal Mandates for Fire/Fuels

The Forest Plan (PF Doc. CR-002, page II-38) identifies two standards regarding fire management.

Forest Plan Fire Management Standard #1

Fire protection and use standards are specified by management area. Cost effective fire protection programs will be developed to implement management direction based on on-site characteristics that effect fire occurrence, fire effects, fire management costs and fire caused changes in values.

Forest Plan Fire Management Standard #2

The Fire Management Action Plan will be guided by the following Forest-wide standards:

a. Management area standards.

b. Human life and property will be protected.

c. Fire will be used to achieve management goals according to direction in management areas. Implementation guides will be prepared for prescribed fire projects and programs identified in Table 10 (Forest Plan Appendix F) using unplanned ignitions.

d. Management area standards will be used in Escaped Fire Situation Analyses as a basis for establishing resource priorities and values.

e. The appropriate suppression response for designated old-growth stands in all management areas except in wilderness will result in preventing the loss of old growth. Fire policy in relation to old growth within wilderness will be provided in specific management direction developed for each wilderness area.

f. Activity fuels will be treated to reduce their potential rate of spread and fire intensity so the planned initial attack organization can meet initial attack objectives.

g. Forest Fuel Management Fund expenditure priorities are:

(1) Natural fuels that pose a threat to human life and property

(2) Unfunded activity fuel projects

(3) Areas where fuels/fire behavior is a threat to management area objectives

Following is a description of how each alternative meets these Forest Plan standards. Forest Plan standards 2d and 2e relate to wildfire suppression policy and requirements that are not affected by this project, and therefore compliance with these standards is not described. This project does not determine Forest Fuel Management expenditure priorities, so compliance with standard 2g is not addressed.

No-Action Alternative

The No-Action Alternative would not use prescribed fire to help meet the goals of the management areas within the resource area. The alternative would not help develop cost-effective fire programs because it would allow far more intense potential fire behavior to exist in stands that, with treatment, would primarily exhibit low intensity, easily controlled fire behavior. Under the No-Action Alternative, severe fire effects, large wildfire management costs, and fire caused changes in values could reasonably be expected; these results could likely be prevented or lessened with action to treat forest fuels.

The No-Action Alternative would not take any preventative steps to protect human life and property within the resource area from an uncontrolled wildfire. The continued succession of fuels and vegetation, mortality from insects and disease, and the exclusion of fire would create areas where the trend in fire behavior characteristics would in time be inconsistent with the goals, objectives and standards established in the Forest Plan. No activity fuels would be created under the No-Action Alternative, so there is no need to treat activity fuels, which is consistent with the Forest Plan.

Proposed Action Alternative

The Proposed Action would use prescribed fire to help meet the goals of the management areas within the resource area, consistent with the Forest Plan. The Proposed Action would help develop cost-effective fire programs by making substantial progress toward reducing potential intensities of wildfire in areas affected by past fire suppression. By inference, the more area treated to restore and maintain stands toward historical species composition, the better the alternative meets the Forest Plan goals. Of the two alternatives, the Proposed Action would best meet the goals, objectives and standards of the Forest Plan because it would reduce the severity of fire effects, the costs of potential wildfire, and fire caused changes in values. Treatments under the Proposed Action would begin to trend stands away from potential fire behavior that could threaten human life and property in the resource area. The activity fuels created would be treated in a manner that is consistent with the standards of the Forest Plan.

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Specialist's Report on Forest Vegetation in the Placer Resource Area

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SPECIALIST'S REPORT ON FOREST VEGETATION IN THE PLACER RESOURCE AREA

1. Regulatory Framework for Forest Vegetation

The regulatory framework for the management of vegetative resources on the Idaho Panhandle National Forests includes the:

- *1987 Forest Plan for the Idaho Panhandle National Forests*
- *Multiple-Use Sustained Yield Act of 1960*
- *Endangered Species Act of 1971*
- *National Forest Management Act of 1976*
- *Forest and Rangeland Renewable Resources Planning Act of 1974*
- *Idaho Forest Practices Act*
- *Forest Service regulations and policy*

Consistency with specific Forest Plan standards and vegetative/silvicultural requirements of RPA and NFMA is provided in section 5 of this Forest Vegetation report.

2. Methodology Used in the Forest Vegetation Analysis

2.A. Scale of the Forest Vegetation Analysis Area

The analysis area for existing vegetative conditions and to assess effects to forest vegetation follows the Placer Resource Area boundary, except when discussing allocated old growth, for which the analysis follows the boundary of Old Growth Management Unit 119 (PF Doc. VEG-30). Where appropriate, information is provided at both the project area scale and the Coeur d'Alene River Basin scale to provide a landscape perspective.

2.B. Analysis of Forest Vegetation Conditions

Methodology for Analysis of Existing Forest Vegetation Conditions

The interaction of successional development (as represented by habitat types in VEG-R1 and VEG-R15) and disturbances such as fire, insects, diseases, and human influences are all deciding factors in the species composition, structure and landscape arrangement of an ecosystem. (PF Doc. VEG-5 and VEG-11) Clearly, on both National Forest and BLM lands, existing conditions reflect past disturbances and management activities.

Part of the analysis included a comparison to reference conditions developed in the Geographic Assessment for the Coeur d'Alene River Basin (Toward an Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin; PF VEG-12 and VEG-R12). The purpose of the Geographic Assessment was to develop a scientifically based understanding of the processes and interactions occurring in the Coeur d'Alene River Basin, so that activities can be developed to promote healthy and resilient ecosystems. In order to maintain healthy, sustainable ecosystems, it is important that species are well adapted to the environmental variability inherent in the ecosystem and to maintain forest structures necessary to support ecosystem diversity and productivity. The conditions in the Placer Resource Area are consistent with findings of the Geographic Assessment for the Coeur d'Alene River Basin (PF Doc. VEG-R12 pp. 28-31, 33, 36-40 and VEG-12), which include a substantial reduction in western white pine, ponderosa pine and western larch; a reduction in old forest structure; and an increase in smaller patches across the basin, with shrub/seedling/sapling stands demonstrating the most decrease in size.

These findings are consistent with the Columbia Basin Assessment (ICBEMP, 1997, pages 37 and 59-67; PF Doc. VEG-R10), the Northern Region Overview (PF Doc. VEG-R8 and R9), and the Collaborative

Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy (PF Doc. FF-24) and Implementation Plan (PF Doc. FF-25).

In terms of vegetation, the Geographic Assessment identified the risks associated with conversion to shade tolerant, drought and fire intolerant species from shade intolerant, drought and fire tolerant species. Since a single resource risk cannot be considered in isolation, the Geographic Assessment identified the risks to hydrologic, aquatic, wildlife and recreation along with the interrelationships of these risks. The Geographic Assessment proposed a strategy for risk management that strove to be both integrated and adaptive. This approach is consistent with ICBEMP, the National Fire Plan and 10-Year Comprehensive Strategy. The project interdisciplinary team considered these recommendations as they developed the proposed alternatives. The Geographic Assessment found that vegetative restoration and watershed restoration, with wildlife as an additional issue are a priority for restoration.

Another part of the analysis included a comparison to the desired condition for forest vegetation in the Placer Resource Area, which was developed during the Ecosystem Analysis at the Watershed Scale (PF Doc. VEG-8). It is based on multiple resource objectives using direction of the Forest Plan and tiering down from data and recommendations from the Geographic Assessment, UCRB and National Fire Plan/10 Year Strategy. This desired future condition was used for comparing the present condition of the Placer Resource Area with anticipated conditions under the No-Action and Proposed Action alternatives over time.

Design features related to vegetation management would be implemented. All vegetative treatments would have silvicultural prescriptions approved by a certified silviculturalist before treatment. Prescriptions would consider site-specific factors such as physical site, soils, climate, habitat type, current and future vegetative composition and conditions, as well as interdisciplinary objectives, NEPA decisions, other regulatory guidance, and Forest Plan goals, objectives and standards. All regeneration areas would be regenerated with site-adapted species/seed source. In areas treated with regeneration harvest, site preparation for regeneration, fuel treatment, and planting would occur within five years of harvest completion. Site preparation and/or fuel treatment may include a combination of slashing, pruning, prescribed burning, or grapple piling, depending on post-harvest conditions that meet both site preparation and hazard reduction objectives.

Methodology for Analysis of Effects to Forest Vegetation

Of primary concern in terms of forest vegetation in the Placer Resource Area is the need for a healthy and resilient forest ecosystem. A healthy and resilient forest ecosystem will supply the balance of species composition, structure, landscape arrangement, growth and health sufficient to meet the multiple resource objectives for this Resource Area including fire/fuels (in this urban interface and immediately adjacent areas), wildlife, recreation, aquatics, etc. The forest vegetation analysis addresses two of the three key issues identified in the Placer Resource Area: forest composition and forest structure.

The effectiveness of the alternatives in addressing **forest composition** is indicated through changes in:

- *Percent forest cover type (specifically from Douglas-fir, grand fir or western hemlock to the long-lived seral species - western larch, white pine, and ponderosa pine), either by basal area dominance in stands of trees greater than 5 inches diameter at breast height, or by trees per acre in stands up to 5 inches diameter at breast height*
- *Health of lodgepole pine stands, measured through a rating that tracks risk of the mountain pine beetle to lodgepole pine stands over time*

The effectiveness of the alternatives in addressing **forest structure** is indicated through changes in:

- *Percent of the area in each structural stage (shrub/seedling/sapling, small to medium timber, and mature/large timber)*
- *Landscape arrangement, measured through changes in patch sizes*

- *Stand growth, measured through the predicted tree growth over time at the stand and project area scales*

Allocated old growth is addressed as part of the forest structure analysis (as a subset of the mature/large timber stage). The definitions for old growth and the direction for allocation of old growth are from the 1987 Forest Plan (PF Doc. VEG-28), the Regional Task Force Report "Old Growth Forest Types of the Northern Region" (Green et al, 1992 with errata corrected 2/05 in PF Doc. VEG-29), and Forest Supervisor letters of direction for implementing old growth standards (PF Doc. VEG-28). The table below is a synopsis from Green et al. to display some of the minimum standards used as part of the definitions for old growth types in the OGMU 119 — clearly these are not the only considerations for old growth allocation (see full document Green et al, 1992 with errata corrected 2/05 in PF Doc. VEG-29).

Table VEG-1. Minimum Standards for Old Growth Types in the Placer Analysis Area *(see Green et al. 1992 with errata 2/05 at PF Doc. VEG-29)*

Forest Type	Habitat Group	Minimum # of trees per acre greater than threshold diameter (dbh)	Large tree threshold diameter (dbh)	Minimum age of large trees (years)	Minimum basal area (sqft/ac)
ponderosa pine, Douglas-fir,or western larch	warm-dry	8	21"	150	40
Douglas-fir, grand fir, western hemlock, western larch or white pine	moderately warm-moist	10	21"	150	80
subalpine fir and mountain hemlock	moderately warm-moist and cool-moist	10	17"	150	80
subalpine fir and mountain hemlock	cool-dry	10	17"	150	60

The old growth definition is considered valid when taking into account recent scientific information. In addition, the desired future condition for vegetation takes into account restoration of old growth, as part of the broader mature, large timber structural stage.

The review of OGMU 119 used Forest Plan definitions and standards and followed a 4-step methodology which included:

1) *a detailed review of allocated old growth in OGMU 119 in TSMRS prior to 5/18/05 (VEG-32);*

2) *a detailed review of all stands in OGMU 119 to search for stands not previously allocated that currently meet allocation definitions and could be allocated (VEG-33); and*

3) *the wildlife biologist and silviculturist reviewed landscape arrangement and consistency with Forest Plan Old Growth Standards, before final allocation in OGMU was made (see VEG-34). As part of the final allocation decision, August 2004 digital aerial photos were used to determine if changes (natural or man caused) had occurred that may change allocation since the last field exam. Landscape arrangement info is found at VEG-35.*

4) *As part of the effects analysis, a review of proposed treatment units for potential old growth definition criteria also was accomplished (see document and VEG-37).*

There is no allocated old growth within the Placer Resource Area, and there are no activities in allocated old growth under the Placer proposal.

However, the Placer Resource Area is located within Old Growth Management Unit 119, which does include allocated old growth (PF Doc. VEG-30). Therefore, allocated old growth is addressed as a part of the forest structure analysis (as a subset of the mature/large timber stage). A more detailed explanation of the methodology used for the analysis of allocated old growth is found in the Project Files (PF Doc. VEG-27, VEG-28, VEG-30 and VEG-R20).

Validation of the data items used for old growth allocation is provided in PF Doc. VEG-4. Field reviews and recent exams are important aspects of this validation.

2.C. Models, Information Sources and Other Tools Used in the Forest Vegetation Analysis

The **Forest Vegetation Simulator (FVS) model** and the suite of tools that support it were developed from the Prognosis model. FVS was originally developed in 1973 and has been used extensively across the U.S for vegetative analysis since 1983. The FVS analysis for the Placer Resource Area used the forest pest and fire/fuel extensions to predict forest stand dynamics through time given variable management regimes (PF Doc. VEG-6 and VEG-47). FVS provided a variety of information for the Placer analysis including species composition, size of trees, growth, canopy cover, fire/fuels parameters and mountain pine beetle risk rating. While this hazard rating does not predict insect infestations, either in terms of area or timing, it does report the level of conditions favorable to insect infestation. This risk rating was used for all lodgepole pine stands for current and future level of conditions favorable for beetle infestation. Documentation of these FVS items is found in PF Doc. VEG-6, VEG-47, VEG-R2, VEG-R3, VEG-R4, VEG-R5 and VEG-R6. Keywords, output, detailed tables of information and pertinent portions of FVS references used in this analysis are found in the project file (PF Doc. VEG-6, VEG-R2, VEG-R3, VEG-R4, VEG-R5 and VEG-R6).

Fragstats is a forest vegetation model used to describe and compare landscape pattern, arrangement and patch size (PF Doc. VEG-R7). Output and detailed information and Fragstats references used in this analysis are found in the project file (PF Doc. VEG-7).

The **timber stand management resource system (TSMRS) database** contains management information for National Forest System lands, including some past harvest in the Placer Resource Area from as early as 1910 to present. The Timber Stand Data Record System or TSMRS is a regional standardized approach that combines an automated database, index map (compartment map) and stand folder. At the initiation of TSMRS in the mid 1970s, its purpose was 1) to provide information for silvicultural prescriptions, 2) to plan and schedule treatments, 3) to make required reports, 4) to keep an historical record of all treatments and 5) to provide information to update and revise the timber resource plan and harvest schedule. TSMRS has evolved over time, and portions have been replaced by new databases. Most recently, the FACTS database replaced the TSMRS activities table.

The Placer Resource Area information from before about 1976 was drawn from historic references, including maps, photos and newspapers. Acre figures in the database represent harvest activity acres, not stand acres. Some stands may have had multiple harvests during the last 100 years. Similar information for BLM managed lands was not available for this analysis. Clearly, however, on both FS and BLM lands, existing conditions reflect past disturbances and management activities, including harvest. A map version of stands with harvest, non-harvest and fire activities in the data base is found in the Project File (PF Doc. VEG-2). A detailed description of individual data items and their validation methodology for the Placer vegetation analysis is found in PF Doc. VEG-4. Silvicultural diagnosis information associated with the Placer Resource Area is found in PF Doc. VEG-3 and VEG-44. Information regarding existing vegetative conditions on BLM and private lands within the resource area is based on information provided by BLM personnel, landowners, aerial photo interpretation, and observations made by project team specialists.

The usefulness of the any data tracking system is directly proportional to the reliability and completeness of the data entered. The database portion of TSMRS is actually a summary database i.e. it summarizes information at the stand scale from a variety of sources including stand exam field data (found in R1Edit, which has recently been replaced by the national database FSVeg), photo interpretation, contract accomplishments, historical records/maps and field observations. The Timber Management Control Handbook (FSH 2409.21e) describes how each field in TSMRS is determined, as well as providing standardized definitions and protocols for each data field and code. (FSH 2049.21e is available at the following webpage: *www.fs.fed.us/ipnf/eco/yourforest/gis/veg/tsmrshb.pdf)*. Obviously, the reliability of any individual field from TSRMS is dependent on how that data field information is acquired i.e. the forest

type field is automatically crossed from the most current stand exam field data, as it is available, and forest type is based on the plurality of tree numbers or basal area depending on size of the trees. However, without exam data, forest type may be based on field reconnaissance and/or photo interpretation.

A validation of two categories of vegetative information used for the Placer Resource Area was completed (PF Doc. VEG-4). The first of these categories is the TSMRS data fields. The validation includes a review of the following TSMRS data fields: forest type, habitat type, size class, year of origin, past disturbances, elevation, aspect, slope, and special use code (used to label allocated old growth). All of these are stand level parameters. PF Doc. VEG-4 reviews the data collection protocols for these data parameters as well as a current validation from a comparative sample of these items using combinations of recent stand exams, field reviews and aerial photo reviews. Another category of vegetative information used for the EA includes: stand trees per acre, stand basal area and tree age. These items are either taken directly from the field data database FSVeg (which updated R1Edit) or are generated from standard summarizations of field data. These are also stand-based parameters for which statistical information can be available if using standard summarizations or reports. PF Doc.VEG-4 reviews the data collection protocols for these and discloses a current validation of samples of this information using combinations of recent stand exams, field reviews and aerial photo reviews.

ArcView/ArcMap spatial computer software was used extensively to analyze existing conditions and compare alternatives. Copies of the base maps used (along with all the data associated with these maps) are found in PF Doc. VEG-43. From these maps and data all potential combinations of map and data are available using ArcView/ArcMap.

3. Overview of Vegetative Conditions in the Placer Resource Area

3.A. Setting

Vegetation is a fundamental part of terrestrial ecosystems. More than 80 years of fire research have shown that physical setting, weather and fuels combine to determine wildfire intensity and severity. Of these three factors, fuel (vegetation) is the only factor that can be changed through management (PF Doc. VEG-R13, page iv). Vegetation is a basic element of wildlife habitat and is a critical factor regulating hydrologic regimes. The vegetative structures that exist in the ecosystem are a function of climate, the physical site, the seed and/or plant species available in an area, the disturbance history and the successional processes between disturbances. Most landscapes are a mosaic reflecting the interaction between disturbance history and succession. This interaction is a keystone process shaping the landscape vegetation mosaic (Zack and Morgan, 1994, page 5; PF Doc. VEG-R14). This vegetative overview will summarize soils, climate and patterns of successional development and disturbance in terms of general trends found in habitat type groups.

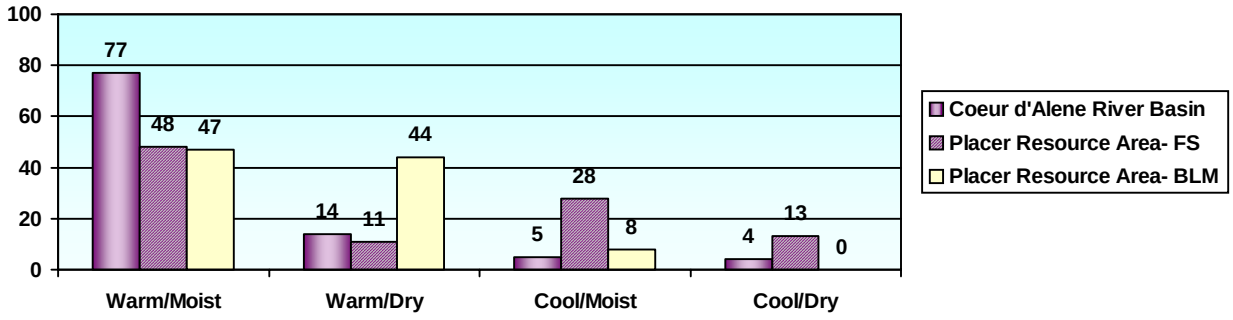
The vegetation in northern Idaho is a result of the productive ash cap soils and the prevailing climatic pattern. The loess, ash cap soils range from 6 to 16 inches deep across the Coeur d'Alene River Basin. These soils are highly productive due both the availability of elements and ability to hold moisture. Of note is the current scientific hypothesis related to tree disease susceptibly and the availability of particular elements from specific meta-sedimentary parent materials/rock types, such as potassium. The Placer Resource Area is dominated by parent material from the Middle and Lower Wallace formation with some areas of the St. Regis formation. The scientific work associated with rock type and element availability for growth of plants is continuing. At this point all resource activities maintain soil productivity by abiding with the Forest Plan and Soil Nutrition Guidelines from the Soil Nutrition Cooperative (PF Doc. SR-06 and PF Doc. VEG-41).

The climatic pattern is characterized by westerly winds that carry maritime air masses from the northern Pacific across the northern Rocky Mountains during winter and spring. Precipitation occurs mainly between November and February, with only 12 percent of the annual precipitation occurring between July and September (Geographic Assessment, page 12; PF Doc. VEG-R12). The inland maritime airflow provides northern Idaho with abundant moisture (25-60 inches per year) and moderate temperatures. Located close to the Idaho/Montana divide as well as being part of the St. Joe River and Coeur d'Alene River Divide, the

Placer Resource Area receives an average of approximately 42-58 inches of moisture annually (PF Doc. VEG-39).

The interaction of successional development (as represented by habitat types - see PF Doc. VEG-5, VEG-11, VEG-R1, and VEG-R15) and disturbances such as fire, insects, diseases and human influences are key in determining species composition, structure and landscape arrangement of the ecosystem.

Figure VEG-1. Percent Habitat Type Groups on National Forest System lands in the Coeur d'Alene River Basin and the Placer Resource Area (PF Docs. VEG-10 and VEG-11).



3.B. Ecosystem Disturbances

Ecologist Aldo Leopold once referred to ecosystem health as the capacity of the land for self-renewal. Resiliency is the ability of the ecosystem to respond to disturbances. In other words, resiliency is a measure of repetition or redundancy of ecosystem processes and therefore an indicator of ecosystem fragility (Borman and Likens, 1979 in: Toman and Ashton, 1996, page 370; PF Doc. VEG-R33). Resiliency is one of the characteristics that enable the system to persist in many different states or successional stages. For this analysis, disturbance agents are fire, insects, disease, and timber harvest.

Fire in the Coeur d'Alene River Basin and the Placer Resource Area

Although fire is often discussed in context to habitat type groups (Figure VEG-1) an additional broader picture of fire as a disturbance agent and its spatial and temporal characteristics at various basin and watershed scales is needed. Prior to European settlement in the Coeur d'Alene River Basin, fire was the most important disturbance occurring across the landscape. Zack and Morgan (1994; PF Doc. VEG-R14) describe fire history within the Coeur d'Alene River basin (1.5 million acres in size, of which three quarters of a million is managed by the Forest Service). Their report indicates that fires covering greater than five percent of this forest occurred on an average of once every 20 years. Overall, Zack and Morgan (PF Doc. R-14) found there was great variation in fire frequencies, patterns, and

Figure VEG-2. West Fork of Placer Creek following the 1910 fire.

the variation in fire severity on the landscape scale. The variation in fire severity was due to different fuel types, burning conditions and terrain that allowed some large individual trees, patches of trees, and snags to survive even through the most severe fires. These remnants were the seed source for the regeneration following the fires. Large patch size (tens of thousands of acres) of stand replacement fires was a frequent pattern throughout the basin over long periods of time, often burning entire watersheds or groups of watersheds in a single event. While this pattern was dominant, other non-stand replacement fires, as well as various insects and diseases, and the variable patterns of species and seed source set by stand replacement fire, would tend to create complexity to the more or less homogenous patterns of stand replacement fires.

The fires of 1889 spread throughout portions of the Silver Valley, however impact to the Placer Resource Area is unknown. The majority of the Placer Creek watershed did burn in the large stand replacement and mixed severity wildfire of 1910, with some portions (about 300 acres) of the Placer drainage also burning in 1928 and 10 acres burned in 1979. In 1910, the entire Placer Creek watershed burned with only single individual trees and a few scattered small patches of live trees remaining. Evidence of earlier fires or fire history was almost completely removed in the 1910 event. Essentially, the 1910 fire created one large patch of new regeneration encompassing more than the entire Placer watershed, which is over 10,000 acres. As a result, areas with a viable seed source regenerated to those species (lodgepole pine, white pine, Douglas-fir, etc), while other areas without a viable seed source were slow to regenerate or in terms of succession have spent a longer time in the shrub phase. There is historic information related to concerns for the lack of natural regeneration after the 1910 fire and after multiple burns in the Coeur d'Alene River Basin overall (PF Doc. VEG-13). Planting took place on some areas within the Placer watershed into the 1920's in response to concerns for lack of natural regeneration. Some areas of these plantings are found today and some areas were later understood to be offsite plant material. The specialist's report on Fire/Fuels provides a detailed discussion of fire history in the Placer Resource Area.

Diseases in the Coeur d'Alene River Basin and the Placer Resource Area

Disease trends in 2003 and since 1988 are reported for the IPNF in the 2003 Forest Plan Monitoring Report (page 13-14; PF Doc. VEG-R36). Disease status in the Placer Resource Area is based on annual aerial detection flights for insects and disease identification (PF Doc. VEG-40), stand exams and silviculturists field recon and photo interpretation (PF Doc. VEG-44).

In the absence of fire, forest insects and diseases drive forest succession by affecting tree species, size, and stand density. Insects and diseases outside of the historic disturbance range are considered signs that the functions of these disturbance agents are not resilient over the long term.

Approximately 46% of the Coeur d'Alene River Basin has a moderate to high probability of insect and disease agents affecting the timber vegetation (Geographic Assessment, page 29; PF Doc. VEG-R12).

Both insects and diseases continue to be a dynamic component of most forested acres within the Placer Resource Area. Examination of many dead and dying trees within the Resource Area and vicinity by district personnel as well as Forest Protection Staff entomologists and pathologists revealed the presence of a number of important diseases and bark beetles.

Root diseases are the primary disease group found in the Placer Resource Area. This group of diseases include: Armillaria, Annosus and Schweinitzii. In general, these diseases cause the roots to weaken to the point of eventual starvation of the tree of water and nutrients. Generally, crown thinning, windthrow, breakage, beetle attacks and mortality follow infection. Douglas-fir is the most susceptible species to these diseases in this area followed by grand fir and sub-alpine fir. Other species are also susceptible; however levels of resistance vary over their lives. Root disease and insects often act together in this ecosystem, with root disease weakening a tree that is then killed by insects or other cause.

In terms of successional development, root diseases were a significant factor in reducing competition from Douglas-fir and grand fir to maintain western white pine, western larch, and on some sites, ponderosa pine. Douglas-fir tended to regenerate readily along with white pine, western larch and others in the early stages of stand development, but Douglas-fir dropped out as a significant component due to high rates of mortality caused by root disease (Byler and Zimmer-Gorve, 1990, page 103; PF Doc. VEG-R17). At this stage of stand development, western white pine, ponderosa pine and larch have a higher

level of resistance to root disease the Douglas-fir and were able to capitalize on the increased availability of growing space. Fire exclusion and the loss of white pine, ponderosa pine and larch through white pine blister rust and harvest have reduced the opportunity for these long lived early seral species to become established in root disease areas. Root disease is currently the most prominent landscape-altering process in the Coeur d'Alene River Basin (Geographic Assessment, p. 30; PF Doc. VEG-R12). Functions of pathogens and insects in forests can be divided into two parts: 1) the action, such as killing trees, decaying heartwood or reducing growth; and 2) the outcome, such as changing species composition of a stand or causing a change from a mature, closed canopy structure to a pole-size, low-density structure (page 2-246 and 2-244; PF Doc. VEG-R34). Currently, in terms of forest succession, when Douglas-fir dies in moist stands, the result is an effective 50 to 150-year acceleration of succession to grand fir and/or hemlock climax. On dry sites, stands tend to cycle with continual Douglas-fir regeneration and low overstory canopy densities, because other seed sources often are not available. The rate of successional change is very important when discussing resiliency of ecosystems. The condition of heavy root disease and ladder fuels promotes and increases the risk of stand-replacement fire (Northern Region Overview Detailed Report, p. 22; PF Doc. VEG-R8), which also has relevance to rate of successional change and ecosystem resiliency. There is no known historical comparative for the levels of Douglas-fir/grand fir and root diseases currently found in the Coeur d'Alene River Basin.

White pine blister rust is a non-native disease that was introduced into this area in the early 1900's. Blister rust is a fungal disease that forms cankers on branches or stems of trees that eventually kill or weaken the tree. In the decades following introduction, white pine was infected over the entire Coeur d'Alene River Basin; trees were either killed and/or harvest was accelerated to recover their economic value. White pine historically dominated approximately 45 percent of the Coeur d'Alene basin, it currently is about 4 percent. Loss of mature white pine and the continuing mortality of younger trees due to blister rust have led to the increase in Douglas-fir, grand fir and hemlock now seen across the basin. Efforts were made to control blister rust through eradication of the alternative hosts, currant and gooseberry. Although these methods had been somewhat successful in the eastern United States, topography and landscape scale in the west prevented success and the program was dropped in 1968 (Neuenschwander et al, 1999, pp. 5, 8, 10, and 12; PF Doc. VEG-R18). Emphasis has shifted to development of genetically rust-resistant trees that can be planted throughout the natural range of white pine. There have been successes, both regionally and on the district, in genetically improving tree resistance, planting those trees and then using cultural treatments like pruning to improve survival (Schwandt, Marsden and MacDonald, 1994; PF Doc. VEG-R19). These programs are continuing.

White pine blister rust is present in the Placer watershed. Some historic information represents the Placer drainage as an area of high white pine stocking previous to the 1910 fire, however the 1910 fire obliterated direct evidence of such. Planting of white pine took place following the 1910 fire however only remnants of these are currently present. Current blister rust mortality can be seen in scattered locations of the Placer Creek drainage. These remnant trees may become a long-lived seral component over the very long term in the Resource Area depending on continued disease resistance.

A variety of **dwarf mistletoes** are present (and considered a management issue) locally on western larch and Douglas-fir, but are generally not considered a landscape-level problem in the Coeur d'Alene River Basin. Their presence is likely due to the number of mistletoe-infected trees that survived mixed severity fires. These mistletoe-infected trees then infected natural regeneration that resulted from the opening of growing space by fires. Mistletoe causes growth loss and sometimes mortality. Since mortality from this small parasitic plant is slow in large trees the primary concern is avoiding infection in young larch, which can be killed much more rapidly. Removal of heavily infected overstory trees can help avoid infection of the understory. Larch dwarf mistletoe, while only minimally present in the Placer Resource Area, is not considered a management issue either in immature/mature stands of western larch or in areas potentially planned for western larch regeneration.

Insects in the Coeur d'Alene River Basin and the Placer Resource Area

Insect trends in 2003 and since 1988 are reported for the IPNF in the 2003 Forest Plan Monitoring Report (page 13-14, PF Doc. VEG-R36). Insect status is based on annual aerial insect and disease detection flights (PF Doc. VEG-40), stand exams, field reconnaissance by silviculturists, and photo interpretation (PF Doc. VEG-44). Bark beetles common to the Coeur d'Alene River Basin include mountain pine beetle, western pine beetle, Douglas-fir beetle, and fir engravers. While the effects of disease most often creates change over a longer period of time, insect mortality is often dramatic. These insects have always been present in this ecosystem and are can be dramatic in their effect when appropriate hosts and weather conditions were suitable. The greatest biological factor affecting bark beetle populations is the availability of food, which is determined by the conditions of their host species within the forest. Short-term increases in fuel loading (due to bark beetle mortality) may have led to increased moderate intensity fires and created small to large openings for the reintroduction of seral species. In some cases, insect infestations may have contributed to large stand-replacing fires (Geographic Assessment, p. 30; PF Doc. VEG-R12).

Historically, mountain pine beetle played a major role in mature white pine (Geographic Assessment, p. 29; PF Doc. VEG-R12) and lodgepole pine. Outbreaks were recorded in the early 1900's that killed up to 50% of the mature white pine in some stands and spread over thousands of acres of the Coeur d'Alene River Basin (Geographic Assessment, p. 30; PF Doc. VEG-R12). Mountain pine beetle is the most aggressive bark beetle of lodgepole pine. During the course of an outbreak, it may kill 90 percent or more of trees over 6 inches in diameter in a stand. Currently, in the Placer Resource Area, mountain pine beetles appear to be scattered and impacting individual trees but not large groups of trees. There are numerous stands in the Placer drainage that are a very good match for a mountain pine beetle attack and high mortality. Bark beetle conditions can change dramatically if weather events such as drought, wind and or ice breakage create weakened trees and a fuel bed conducive to beetle population build-up. Portions of North Idaho have been subject to droughty conditions over the last 5 years. In addition, areas around the Placer drainage have moderate to extreme populations and mortality due to mountain pine beetle, resulting in high beetle pressure on the Placer drainage. In the nearby Superior and Plains/Thompson Falls Ranger Districts mountain pine beetle populations are more expansive and aggressive than have ever been recorded for the area (PF Doc. VEG-42).

Western pine beetles were common on drier portions of the upland forest in the Coeur d'Alene Basin, killing individual trees or small groups of ponderosa pine. This insect has similar behavior in the remnant ponderosa pine of the resource area. This ponderosa pine was not natural regeneration but planted (some of which could be considered offsite) following the 1910 fire.

Douglas-fir beetle and fir engravers have always been present throughout the Coeur d'Alene sub-basin. The substantial increase in dominance of Douglas-fir and grand fir across the CDA basin increased the effects these bark beetles have overall. Fir engraver beetles typically kill mature grand fir during periods of drought. Drought conditions and fir engraver damage are presently common in the CDA basin. Douglas-fir beetle outbreaks can occur following disturbances such as windfall, snow breakage or fire. This damage did not take place in as high amounts in the Placer Resource Area as it did in other locations of the Coeur d'Alene River Basin following the 1996 ice storm. The Douglas-fir beetle epidemic following the ice storm of 1996-97 has subsided in the CDA basin, however some Douglas-fir mortality is still occurring in the basin as well as in the Placer Resource Area due to root diseases and surviving Douglas-fir beetles. The Douglas-fir beetle tends to kill the large diameter (>14" size) Douglas-fir that are 80 years of age or greater. The presence of root disease in many of the Douglas-fir forest types has resulted in higher endemic levels of the Douglas-fir beetle and the propensity for rapid beetle population buildups during favorable conditions (Lockman and Gibson, 1998; PF Doc. VEG-R28). It is important to note that the majority of the Resource Area forest trees fall within this highly susceptible species, age and diameter range.

Timber Harvest in the Placer Resource Area

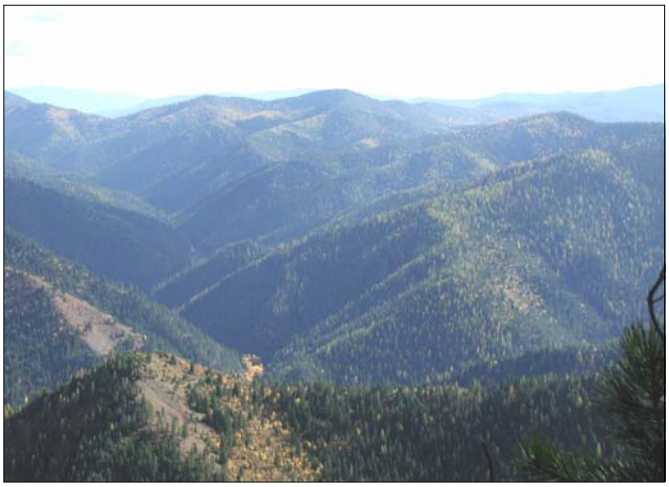


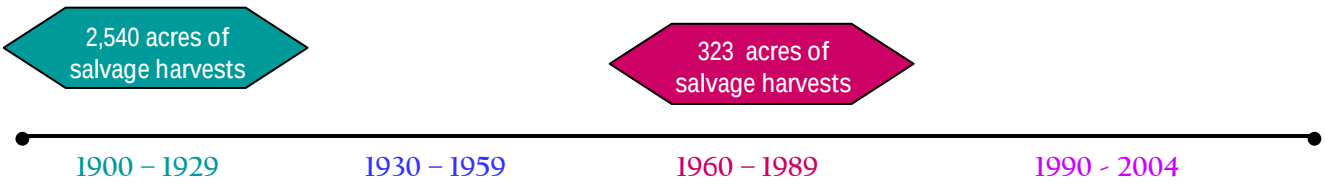
Figure VEG-3. Photo from Pulaski Peak, fall 2003. Harvest following the 1910 fire was substantial yet is not visually evident today.

Substantial timber salvage likely occurred in the resource area following the 1910 fire (due to the area's proximity to the town of Wallace). TSMRS indicates approximately 2,540 acres of salvage occurred in the 10-15 years following 1910 (this information was based on historic maps and reports). This salvage harvest took place in areas reachable with technology of the time, which would include riparian areas and areas adjacent streams. Because we do not know exact locations or the types of trees harvested with this harvest activity, it is not clear if this salvage changed successional pathways. However since the 1910 fire killed most or all of the timber in the harvest areas, harvest likely had little effect on vegetative development. In the late 1970's, 323 acres of salvage (overstory removal) has occurred on NFS and BLM lands in the resource area; all in stands previously salvaged following the 1910 fire. This activity removed trees that survived the 1910 fire and were thought to be shading and inhibiting growth of regeneration. This structure, if it were to survive until the next disturbance, would have been a possible seed source following that future disturbance.

Approximately 259 acres (see PF Doc. AQ-87) have been harvested on private lands over the last 20 years within the Resource Area, however as stands mature and fuel treatments become necessary in the urban interface and immediately adjacent areas, additional harvest would take place.

The timeline below displays the activities in the area since about 1900 (PF Doc. VEG-14). While some of these areas have had multiple harvest entries, it is not possible to track in the current database if the same acres were harvested (or had other non-harvest activities) on the re-entries because stands are often larger than recorded activity acres. For additional information regarding the past activities and their environmental effects, please refer to the EA (Appendix B).

Figure VEG-4. *Occurrence of past timber harvest activities in the Placer Resource Area from about 1900 to 2004.*



4. Existing Conditions and Effects to Forest Vegetation

4.A. Forest Composition

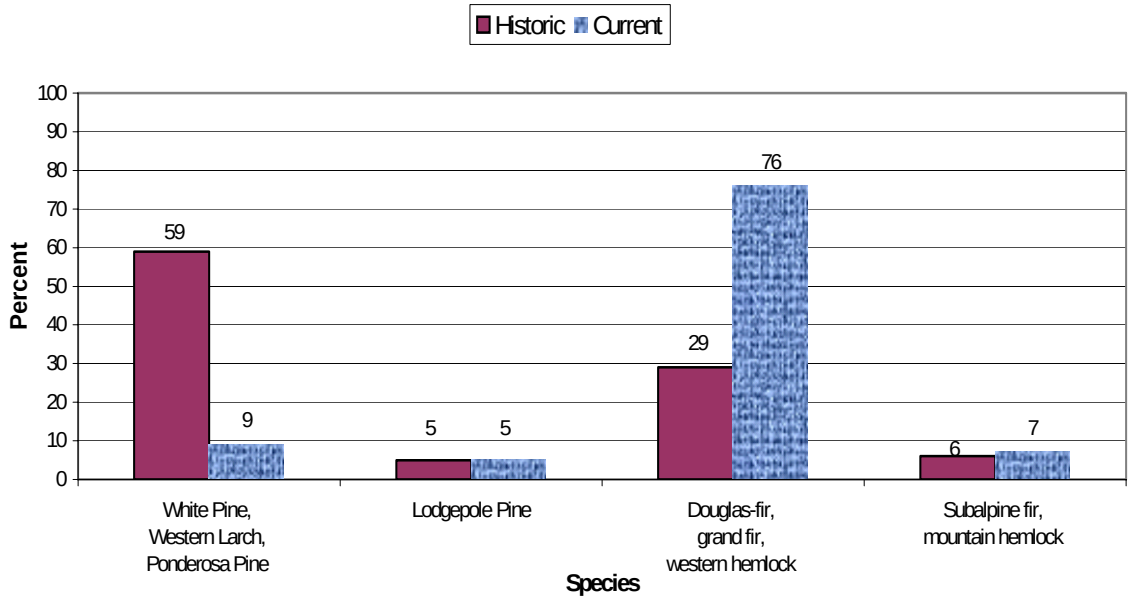
Existing Forest Composition in the Coeur d'Alene River Basin and Placer Resource Area

The findings of the Geographic Assessment indicate that there has been a tremendous change in species composition within the **Coeur d'Alene River Basin** over the last 100 years (pages 36-37, PF Doc. VEG-12). This change is also consistent with the Upper Columbia River Basin (PF Doc. VEG-R10) and Northern Region Overview (PF Doc. VEG-R8 and R9). While the Forest Plan does not mandate management at the levels of historic species compositions and structures, these are helpful reference points to understand what

trends may be needed over the long term to create increased resiliency in the ecosystem. It should be recognized that it may not be desired or feasible to return to actual historic conditions.

Forest Cover Types: Forest cover types describe the dominant species in the stand. Long-lived seral species (western white pine, western larch and ponderosa pine) have declined within the sub-basin as a result of changes in the role of fire, white pine blister rust, and harvesting that tended to remove these species while leaving species such as grand fir, hemlock and Douglas-fir. Harvest of white pine was accelerated on the IPNF in the mid 1970's and early 1980's. At the entire Coeur d'Alene River Basin scale (all ownerships) the white pine cover type has substantially declined in the past 100 years (Geographic Assessment, p. 36-37; PF Doc. VEG-R12), while grand fir and western hemlock cover types substantially increased (Geographic Assessment, pp. 31 and 36-37; PF Doc. VEG-12). Larch forest types have also decreased, while the Douglas-fir type increased (Geographic Assessment, p. 37; PF Doc. VEG-12). Fire suppression has allowed the development of denser stands over larger areas and changes in the fuel amounts and arrangements that could lead to catastrophic fire.

Figure VEG-5. Current and Historic Forest Cover Types on National Forest System lands in the Coeur d'Alene River Basin (PF Doc. VEG-10).



Within the Placer Resource Area fire history and loss of the white pine (on moist sites) in this area over the last 100 years, the current forest cover types contain much more Douglas-fir than previous to the 1910 fire. On FS/BLM managed lands, currently Douglas-fir dominates the landscapes on both dry and moist habitats, with a lesser amount of grand fir. Lodgepole pine, subalpine fir and mountain hemlock occupies more area proportionally in Placer than within the Coeur d'Alene River Basin. White pine and western larch combined represent only 14 percent of the forest cover types and are located on moist sites. Subalpine fir and mountain hemlock are only present as cover types on Forest Service managed lands. This is due to the relative location of these lands, with the BLM lands in the lower portions of the watershed and the Forest Service in the mid and upper elevations.

Table VEG-2. Forest Cover Types in the Placer Resource Area.

Forest Cover Type	% of total federal lands in the Resource Area	Desired Future Condition	% of NFS lands in the Resource Area	% of BLM lands in the Resource Area
white pine, larch and ponderosa pine	14	35-45%	14	12
lodgepole pine	15	5-15%	18	3
Douglas-fir and grand fir	40	15-30%	36	53
subalpine fir and mountain hemlock	20	20-35%	26	0
other (including nonforest)	11	~~~	6	32

Private lands make up about 1,350 acres of the resource area. Most of these are concentrated in the northern portion of the Resource Area, in the downstream half of Placer Creek. The habitat types on private land are similar to those of the FS/BLM lands, with a mixture of moist grand fir and the drier Douglas-fir and grand fir series. Forest cover types are generally Douglas-fir and grand fir. Structural stages are a combination of shrub/seedling/sapling, and small/medium timber sizes.

Lodgepole pine: Lodgepole pine stands within Placer Resource Area have very little stocking of other species, are 80-100 years old, average at least 8 inches diameter at breast height, have not had major disturbances since 1910 and root disease has been observed in lodgepole stands in and adjacent to the resource area. These conditions indicate high hazard conditions (see Amman PF Doc. VEG-45; USFS R1 PF Doc. VEG-46; and Randall PF Doc. VEG-47). In addition, mountain pine beetle populations are at the extreme level in the Montana/Idaho divide area less than 10 miles from the resource area. Populations are more expansive and aggressive than have ever been recorded in that area. Without a major change in weather mountain pine beetle populations will likely continue to increase in susceptible lodgepole pine stands in currently infested areas until most lodgepole pine over about 6 inches diameter at breast height have been killed (PF Doc. VEG-47). Currently the mountain pine beetle hazard of lodgepole stands is high to very high in lodgepole pine stands of the Placer Resource Area. In other words all the tree/stand characteristics for high to very high mortality are present. Lodgepole pine occupies about 1,300 acres (15%) of the Resource Area; of this about 25% is within a roadless area. All the lodgepole pine within the Placer Resource Area originated after the 1910 fire and is 80-100 years old.

Direct and Indirect Effects to Forest Composition Under the No-Action Alternative

Forest cover types: At first glance, it would be expected that the No-Action Alternative would result in basically the same species compositions and structures as currently found in the Placer Resource Area. However, this is not the case in the natural ecosystem. In the absence of fire, change will take place on more or less predictable successional pathways. Given specific conditions at the time of a fire, or other disturbance, that disturbance also has a more or less predicable outcome. Under the No-Action Alternative, there would be no activities to restore forest vegetation toward increased resiliency. Forest cover types would trend overtime to greater representation of Douglas-fir and grand fir at lower elevations and greater representation of subalpine fir and mountain hemlock at higher elevations (PF Doc. VEG-6).

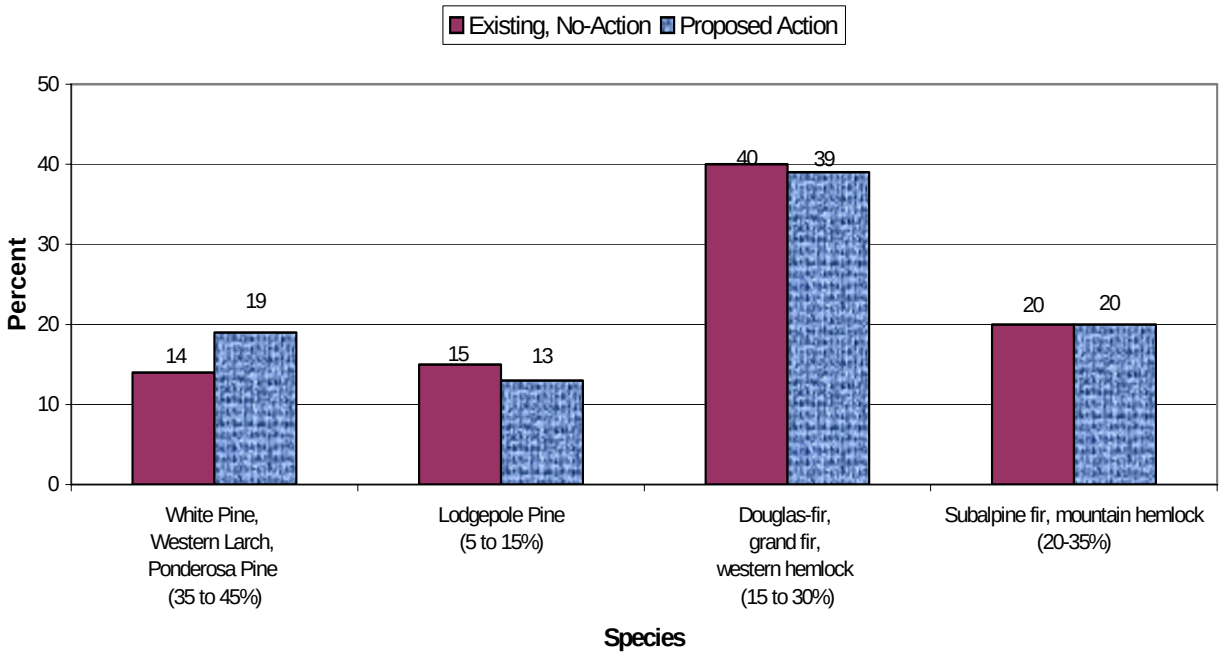
Lodgepole pine: Lodgepole pine has a relatively short life span and was likely to fade from stands as their age reached 90 to 120 years (Zack and Morgan, 1994: PF Doc. VEG-R14). All the lodgepole pine within the Resource Area originated after the 1910 fire and is 80-100 years old. FVS modeling (with the root disease extension and mountain pine beetle hazard ratings) for stands with no proposed treatment indicated that mountain pine beetle hazard rating of lodgepole pine stands would remain "high to very high" until after about 50 years, when it would drop drastically as the majority of susceptible trees (the majority of lodgepole over 6 inches) are killed and stands naturally regenerate to lodgepole pine and/or subalpine fir/mountain hemlock (PF Doc. VEG-6). High levels of mortality in lodgepole pine stands over the next 20 to 50 years would increase stand fuel loadings as well as the likelihood of high intensity and high severity wildfire in the

urban interface and areas immediately adjacent. Specific details for analysis of mountain pine beetle hazard model runs and other pertinent supporting information are provided in PF Doc. VEG-6, VEG-8, VEG-15 and VEG-23.

Direct and Indirect Effects to Forest Composition Under the Action Alternative

Forest cover types: Commercial thinning/daylighting activities would improve the stand species composition to long lived serals on approximately 330 acres. Regeneration and rehabilitation harvest would improve the species composition to long-lived serals on an additional 110 acres. Overall, long-lived early seral species composition would increase by 5 percent. While this change is advantageous for the Placer Resource Area, the number of acres of change in this project is such a small percentage of the Coeur d'Alene River Basin that no change would be reflected at the overall basin scale.

Figure VEG-6. Comparison of Forest Cover Types on FS/BLM managed lands in the Placer Resource Area (VEG-15 and 23). (The desired future condition is in parenthesis)



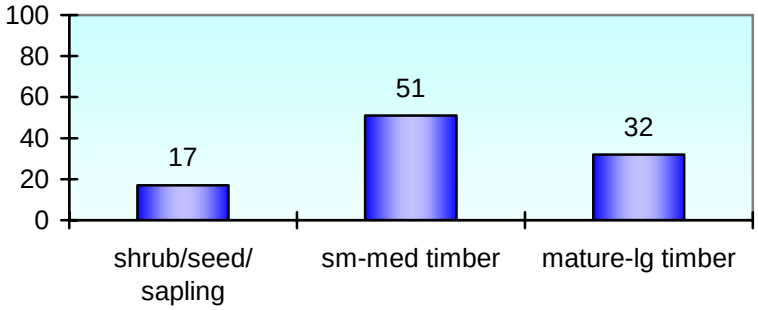
Lodgepole pine: Lodgepole pine occupies about 1,300 acres (15 percent) of the Resource Area; of this about (319 acres) 25 percent is within a roadless area. Where lodgepole pine is a desired species, as it is in some areas of this Resource Area (at the 5 to 15 percent level), loss due to mountain pine beetle cannot be totally avoided; only the hazard can be managed. In areas treated under the Proposed Action, mountain pine beetle hazard would drop from the current "high to very high" hazard condition to a "very low" hazard level and then, as stands again mature in the next 80-100 years, mountain pine beetle hazard would again increase to the "very high" hazard level. The Proposed Action would treat about 20 percent of the lodgepole pine in the Placer Resource Area, focusing only on the "high to very high" hazard rating stands. Specific details for analysis of mountain pine beetle hazard model runs and other pertinent supporting information are provided in PF Doc. VEG-6, VEG-8, VEG-15 and VEG-23.

4.B. Forest Structure

Existing Structure in the Coeur d'Alene River Basin and Placer Resource Area

Structural stages: In terms of forest structure, the greatest difference in the Coeur d'Alene River Basin from historic or reference conditions has been in the amount of small- to medium-sized timber and mature/large sized timber structure found on the landscape. Due to the fires early in the 1900's the small/medium sized timber structure component has increased and is now higher than the historic range.

Figure VEG-7. Percent current and historic ranges of structural stages in the Coeur d'Alene River Basin (PF Doc. VEG-10).



Historic Ranges	
Shrub/seedling/sapling	15-50%
Small-medium timber	18-50%
Mature-large timber	23-66%

Table VEG-3. Percent current structural stages in the Placer Resource Area (PF Doc. VEG-16).

Structural Stage	% of total federal lands in the Resource Area	Desired Future Condition	% of NFS lands in the Resource Area	% of BLM lands in the Resource Area
Shrub/seedling/sapling	14	10-30%	5	48
Small/medium timber	86	20-40%	95	52
Mature/large timber	0	40-55%	0	0

Shrub/seedling/sapling stage

Forest stands less than 35 years old, most often resulting from natural events (such as fire) or past regeneration harvests. Stands usually have average tree diameters less than 5 inches at breast height. Some stands may have a considerable number of overstory trees; others may have no large tree component. This stage may also include stands that are non-tree cover such as shrubs and sod.

Small to medium stage

Stands generally 36 to 100 years old. These stands may have resulted from fires or may represent natural or artificial regeneration following harvest. Most of these stands can be expected to be quite dense, with high stocking levels and closed canopies. Average tree diameters are greater than 5 inches at breast height.

Mature/large stage

Stands over 100 years old, generally resulting from fires prior to 1900 and presently quite varied in appearance. Stand conditions differ in species composition, structure, and canopy closure as a result of disturbances caused by insect mortality, root disease and other pathogens, fires, past harvest activity, or growth potential of the site including soil conditions. Stands unaffected by these will be dense and have fairly closed canopies for the site. Stands affected by these disturbances may have canopies ranging from open to dense. Average tree diameters are greater than 9 inches at breast height. *A subset of the mature, large timber structural stage is allocated old growth (PF Doc. VEG-27, 28, 29,30,31, 32, 33, 34 35, 36, 37 and 38).*

Figure VEG-8. Example of forest structure in the vicinity of Road 985 in the Placer Resource Area.

Large fires and insect and disease mortality have dramatically shaped the structural stages found within the Placer Resource Area today. Current structural stage percentages in the resource area are displayed in Table VEG-3 (PF Doc. VEG-16). The Placer Resource Area has a higher percentage of small/medium timber in comparison to the overall Coeur d'Alene River Basin and the desired condition. Current canopy cover, as modeled by FVS, is 56% overall.

Allocated old growth is a subset of the mature/large structural stage. A detailed review of the old growth in OGMU 119 took place with this analysis. Forest Plan old growth standards/definitions were used and validation (PF Doc. VEG-4) included recent field exams, field reviews and 2004 photo interpretation. This review found that one previously allocated stand no longer met old growth definitions; this stand was dropped from the old growth allocation (PF Doc. VEG-31, 32 and 34). In addition, four stands not previously allocated, met old growth definitions and are now allocated (VEG-31, 33 and 34. It was found that many stands are growing at a rate that meets the number of trees per acre over the defined habitat type group threshold, but they do not meet the minimum age criteria to be allocated as old growth. The majority of the entire OGMU burned in 1910. Clearly many stands in the OGMU will qualify as old growth over the next 50 years (although this depends on potential natural disturbances). Also, this detailed review verified that no harvest is proposed in allocated old growth (PF Doc. VEG-37). Additional information regarding Forest Plan Old Growth Standards is found at the end of the Vegetation section.

Table VEG-4. Old Growth Allocation in Placer Resource Area and OGMU 119 before/after allocated old growth review (PF Doc. VEG-32, VEG-34, VEG-35).

Stand #	Allocated acres before detailed review	Allocated acres after detailed review	Location of summary, tables, and data sheets	Block/ Patch for OGMU 119 final allocation (see PF Doc. VEG-35)	Date of most recent exam
11802003	18	18	VEG-32 and 34	A	2003
11802007	57	57	VEG-32 and 34	A	2003
11802020	0	30	VEG-34	B	1984*
11802021	0	35	VEG-34	B	2005
11901001	0	242	VEG-34	C	2003
11901003	26	26	VEG-32 and 34	D	2003
11901013	98	98	VEG-32 and 34	E	2003
11901024	129	129	VEG-32 and 34	E	2003
11901029	19	19	VEG-32 and 34	D	2003
11902021	0	83	VEG-34	F	1990*
11903015	136	0**	VEG-32		2002
483	**737**	**Acres allocated old growth before and after detailed review**			
3.37%	**5.14%**	**% of OGMU 119 (14,327 total acres in size)**			

** Additional validation of these stands included field review and/or 2004 aerial photo review (PF Doc. VEG-34).*

*** Not part of the final allocation for OGMU 119 because there were no old trees in the stand, and none over 21 inches in diameter at breast height.*

Landscape Arrangement: There have been changes over the last 100 years in the size and distribution of patches across the landscape of the Coeur d'Alene Basin (please refer to the Ecosystem Disturbances discussion above and PF Doc. VEG-1). The mean patch size has decreased since the early 1900's in the Coeur d'Alene Basin and patches have become more linear, with accompanying increases in edge and decreases in core/interior habitats (Geographic Assessment, p. 42; PF Doc. VEG-12).

In the Placer Resource Area, insect and disease related mortality and the extent and fire behavior of the 1910 fire created a more or less single shrub/seedling/sapling patch greater than the size of the resource area. Within the Coeur d'Alene Basin, stand-replacement fires, while infrequent and displaying very large patch sizes (originating after more severe fires), would often be modified by the low and mixed severity fires that occurred later in stand development. The Placer Resource Area has had only limited fire or harvest disturbances since 1910.

While fire behavior is influenced by a number of weather and landscape conditions, fire behavior is strongly influenced by stand structure as it relates to live and dead fuel loadings and their configurations, such as ladder fuels. An individual stand treated to a given prescription will probably be irrelevant to fire behavior and effects at the landscape scale because wildfires are often larger than individual treatment units (Finney from Salazar and Gonzalez-Caban; Dunn at PF Doc. VEG-R38, p. 29).

The spatial arrangement of vegetation influences both the growth of large fires and the variability of fire as it moves across the landscape. This is a creation of a vegetation mosaic, by design, which allows the manager to control or at least ameliorate hazards of all kinds (Brackebusch, PF Doc. VEG-R23). Research shows the importance of changing the spatial pattern to the efficiency and effectiveness of treatment units in changing fire behavior at the landscape scale. Strategic area treatments create landscape fuel patterns that collectively slow fire growth and modify behavior while minimizing the amount of treated area required (p. 30, PF Doc. VEG-R13).

This led to the development of a desired patch size and arrangement for this resource area based on the arrangement of moist and dry habitat types, likely fire-free intervals of 50-200 years or more with stand replacing fire intervals of about 200 years and a need to improve landscape fire resiliency within and immediately adjacent to the urban interface. The desired future condition for patch size is 100-1000 acres in size (a minimum of 300-700 acres) with correspondence to broad landscape patterns of aspect, topography, etc. and creation of connectivity between patches where possible (PF Doc. VEG-7). This desired condition is within the context fire behavior for the Coeur d'Alene Basin. The Fragstats model (PF Doc. VEG-R7) was used to determine landscape pattern for the Placer Resource Area.

Stand Growth: As a method to characterize the desired level of overall resilience and health, the growth of stands in the resource area is compared to the growth or productivity modeled in the Forest Plan. The Vegetation Management Practices section of the Forest Plan (Appendix A, PF Doc.VEG-26) estimates average timber production levels under intensive management based on general habitat type groups. This level can be compared at the stand level or the resource area with the current and projected growth figures from the FVS model. This Forest Plan modeled level for the Placer Resource Area is approximately 80 cubic feet per acre per year. Currently growth in the Placer Resource Area is 29 cubic feet per acre per year, which is 36 percent of Forest Plan modeled levels (PF Doc. VEG-6).

Direct and Indirect Effects to Forest Structure Under the No-Action Alternative

Structural stages: Depending on health, most areas currently in the small medium size could enter the mature/large size in the next 10-15 years. Historically, these areas were dominated by closed canopies of white pine and western larch on the moist habitat types, or the more open canopies of ponderosa pine mixed with western larch and some Douglas-fir on dry habitat types. Landscape conditions now tend to be dominated by varying canopy densities of Douglas-fir and grand fir. Canopy densities vary due to extent of insect and disease mortality and/or differences in past fire behavior on sites. The current modeled canopy cover of 56% overall would decline to 43% over the next 100 years (PF Doc VEG- 6). Many of these stands are unlikely to provide the same mature structures as stands containing large white pine, larch or ponderosa pine that were once a major component of the Coeur d'Alene River Basin and Placer Resource Area.

Although mature/large timber stands may contain large trees and provide some old structural components, openings caused by root diseases and other pathogens and insects may be common. Structures are more likely to be multi-storied and multi-aged over time. This mature/large timber mixed storied structural stage may be more susceptible to disturbances ranging from fire to insects/diseases and windfall. There would be no change in allocated old growth under the no action alternative.

Landscape Arrangement: The existing patch size of the small/medium structural stage (Table VEG-5 and PF Doc. VEG-7) is quite large as a result of the 1910 fire, with an average patch size of 1,045 acres. Without major disturbance, the existing patch sizes and landscape patterns in the future would remain similar to the existing condition. However, it is likely that disturbances that could alter the patch sizes will take place given the current stand conditions. Therefore, under the No-Action Alternative, some changes in structure within the patches/patterns can be expected, but the extent of change is not predictable. In addition, over time the potential for stand disturbance will increase as the current large patches are subject to insect, disease and fire disturbances.

Stand Growth: Volume growth was used in this analysis as one indicator of forest health, particularly productivity, and is expressed in cubic foot volume per acre per year. The Forest Plan modeled productivity level. Over the next one hundred years, overall growth at the resource area scale would not improve, but would fluctuate between the current level of 29 cubic feet per acre per year and approximately negative two cubic feet per acre per year ending up at 21 cubic feet per acre per year in 2110 (PF Doc. VEG-6). Currently growth is about 36% of the Forest Plan modeled level of approximately 80 cubic feet per acre per year under intensive management (Forest Plan, p. A-6 at PF Doc. VEG-26).

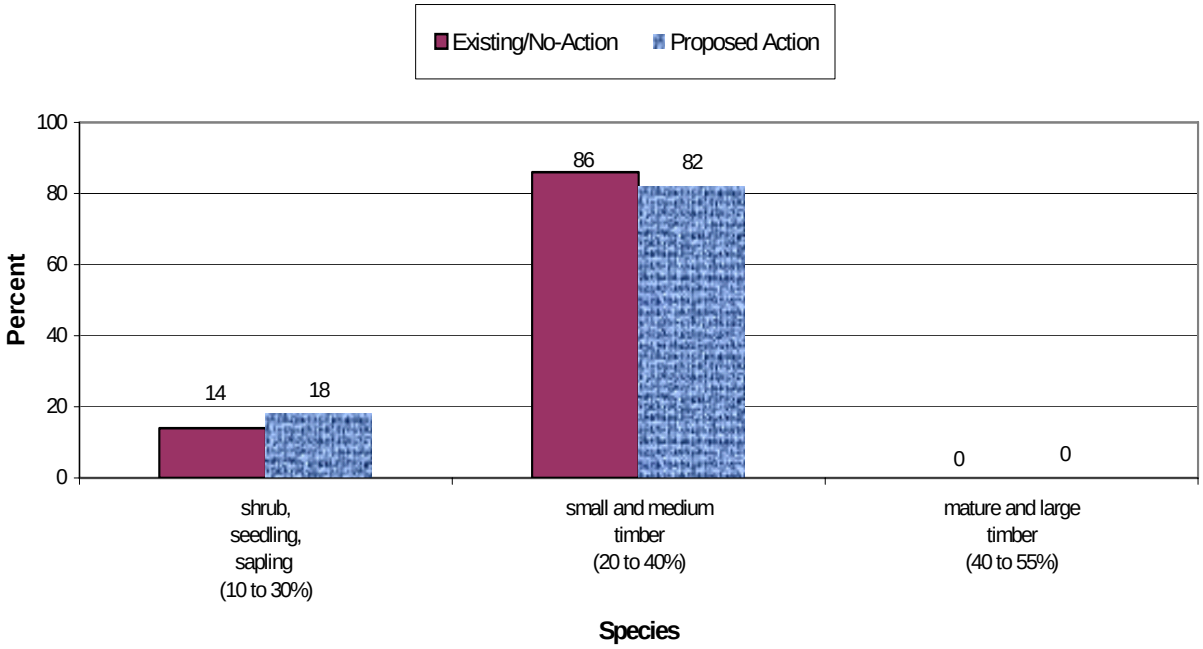
Direct and Indirect Effects to Forest Structure Under the Proposed Action

Structural stages: Proposed timber harvest would reduce the small/medium structural stage by 4 percent in the Placer Resource Area. Following harvest activities, about 82 percent of the Placer Resource Area would be in the small/medium structural stage. These areas would grow into the mature/large class over the next 10 to 20 years and, depending on overall health would develop the characteristics of late successional structures as they age. The seedling/sapling structural stage would be increased by 4 percent in the Placer Resource Area, bringing the total of this class up to 18 percent. The areas converted to the seedling/sapling stage are more likely to provide a long-term improvement in stand and landscape structure and increased resiliency to native change agents (such as insects, pathogens and fire) due to species conversion to long-lived serals. Because the entire watershed burned as a stand replacement fire in 1910, almost the entire watershed is in the same age class. This is also the case to some extent in the Coeur d'Alene River Basin overall. This lack of structural diversity was addressed in the Forest Plan (page II-1 to 2, PF Doc. VEG-26) with a goal to provide for future age distribution. An 8 to 10 percent change per decade would be needed over the next 30 years in the Placer watershed to meet the desired future condition (PF Doc. VEG-8). As currently unmanaged stands age and likely exhibit less resiliency to insects, disease and fire, the opportunities to achieve structural characteristics without starting over with regeneration would be increasingly limited. Allocated old growth would not be harvested under the Proposed Action. Because the number of acres of change in this project is such a small percentage of the Coeur d'Alene River Basin, the Proposed Action would not result in a change in structural stages at the overall basin scale.

In 100 years, areas treated with regeneration treatments would have about 60 percent canopy cover. The stands treated with daylight/commercial thinning would have about 40 percent canopy cover. In 100 years, areas without treatment would have about 43 percent (PF Doc. VEG-6). Future treatments over the next 20-40 years may include commercial thinning (in some cases this would be the second commercial thinning), a regeneration harvest or precommercial tending treatments such as precommercial thinning, release, improvement harvest and/or understory prescribed burning.

In the future, the Proposed Action would result in a good representation of resilient long-lived serals species (white pine and western larch) as well as stands with greater opportunity to manage insect hazard in lodgepole pine in the future. Refer to the silvicultural diagnosis for further documentation and literature citations associated with the rationale for this treatment (PF Doc. VEG-3).

Figure VEG-9. Comparison of changes in the percent forest structure on lands managed by the Forest Service and Bureau of Land Management in the Placer Resource Area (PF Doc. VEG-16 and 24). Desired range is provided in parenthesis.



Landscape Arrangement: In the Placer Resource Area, insect and disease related mortality and the extent and fire behavior of the 1910 fire created a more or less single shrub/seedling/sapling patch greater than the size of the resource area. Changes in patch size under the Proposed Action are displayed below.

Table VEG-5. Changes in Mean Patch Size (acres) in the Placer Resource Area.

Structural Stage	% of Placer Resource Area	Existing patch size (acres)	Patch size under No-Action (acres)	Patch size under Proposed Action (acres)
Seedling/Sapling/Nonforest	14	102	102	66
Small/Medium	86	1,045	1,045	793
Mature/Large	0	NA	NA	NA
Old Growth	0	NA	NA	NA

Desired future condition of patch sizes would be from hundreds to thousands of acres (with a minimum of 300 to 700 acres and connectivity where possible). The existing patch size of the small/medium structural stage is quite large as a result of the 1910 fire and the lack of structural stage disturbances since 1910. The limited amount of past regeneration harvest on National Forest System lands in the Placer Resource Area has not contributed to the fragmentation of structure stage patches. The seedling/sapling/nonforest stage is mostly made up of shrub-dominated stands that originated following the 1910 fire. Activities under the Proposed Action would decrease the mean patch size of both the seedling/sapling/nonforest stage and the small/medium stages. The average patch size of proposed regeneration treatments is 29 acres. These treatments have been designed to focus treatments on areas with high current mortality and risk and trend stands and landscapes toward more resilient patterns and compositions in the face of future drought, fire, or wind events within and immediately around the wildland urban interface.

There are currently no stands in the old growth structural stage within the Placer Creek watershed. The patch size of future old growth would develop over the next 50 years from stands currently in the small/medium stage. Following treatment, the small/medium stage would represent 82 percent of the Placer Resource Area. Depending on disturbance, these areas have the potential of becoming large patches of old (around 800 acres in size). Several potential locations (across a range of habitat types, species, wildlife habitat needs, etc.) of the small/medium stage were mapped as potential future old growth (PF Doc. VEG-34) by the silviculturist and wildlife biologist prior to alternative development (PF Doc. VEG-35). These areas represent 888 acres total with average block size of 59 acres and range in block size from approximately 20 to 160 acres. These areas, in addition to proposed treatment areas, allow a full range of options for successional development pathways in large patches to meet needs of future planning within the context of the desired landscape arrangement in this wildland urban interface area. Treatments focused on the tending and regeneration of lodgepole pine (where appropriate) and the long-lived seral species western larch and white pine to contribute to more resilient structures and more resilient overall patterns on the landscape.

The sizes of proposed new openings range from approximately 10 to 95 acres. The prescribed treatments strive to trend treatment patches toward the size and extent of fire disturbances before the 1900's on these landscapes. Models and observations of landscape-scale fire behavior and the impact of fuel treatments clearly suggest that a landscape approach is more likely to have a more substantial impact on fire spread, intensity, perimeters and suppression capability than an approach that treats individual stands in isolation. Treating small or isolated stands without assessing the broader landscape will most likely be ineffective in reducing wildfire extent and severity (page 29, PF Doc. VEG-R13). While fire severity increased with treatment age but decreased with unit size in the analyses of the Rodeo/Chedeski (pages 1 and 9; PF Doc. VEG-48) and the Hayman Fires (pages 9 to 18; PF Doc. VEG-50), no single management prescription will achieve multi-resource objectives across all stands within a landscape. Silvicultural systems using density and species management, along with the judicial use of prescribed fire, are key to managing western forests (page 23, PF Doc. VEG-R13). Treatment areas focus on areas with the highest insect and disease mortality and current risk (regeneration treatments) as well as areas to increase overall health and resiliency (both regeneration and thinning treatments) in a connected landscape block arrangement using the inherent arrangement of habitat type groups, aspect, and current structure (PF Doc. VEG-8) along with the desired arrangement to decrease fire risk in the wildland urban interface.

Thinning and shelterwood/seedtree type harvests are intended to simulate the extent and stand arrangement of fire disturbances that occurred historically in this area, and provides for the retention of individual trees and groups of trees that may have survived a fire. Harvest does not duplicate all aspects of fire disturbances because trees killed by fires prior to Euro-American settlement were not harvested. Generally with fire disturbances before the early 1900's the dead trees remained standing until decay progressed to a point where they fell over. Some snags may have stood for decades. Regeneration was dependent on surviving, scattered remnant trees (usually fire-resistant species), seeds that survived on dying trees, or seeds carried by wind and animals from adjacent seed sources.

The figures below are generated through the Stand Visualization System or SVS (McGaughey 2002; PF Doc. VEG-R30), which is a tool included with FVS (discussed earlier under Forest Vegetation Analysis Methodology) depicting stand conditions based on individual stand components, such as trees, shrubs and down material. The images produced by SVS modeling, while somewhat abstract, provide an easily understood representation of stand conditions, silvicultural treatments and forest management alternatives.

Figure VEG-10. SVS Model Depiction comparing a typical lodgepole pine stand in the Placer Resource Area under the NO-ACTION Alternative to one immediately after treatment under the PROPOSED Action Alternative.

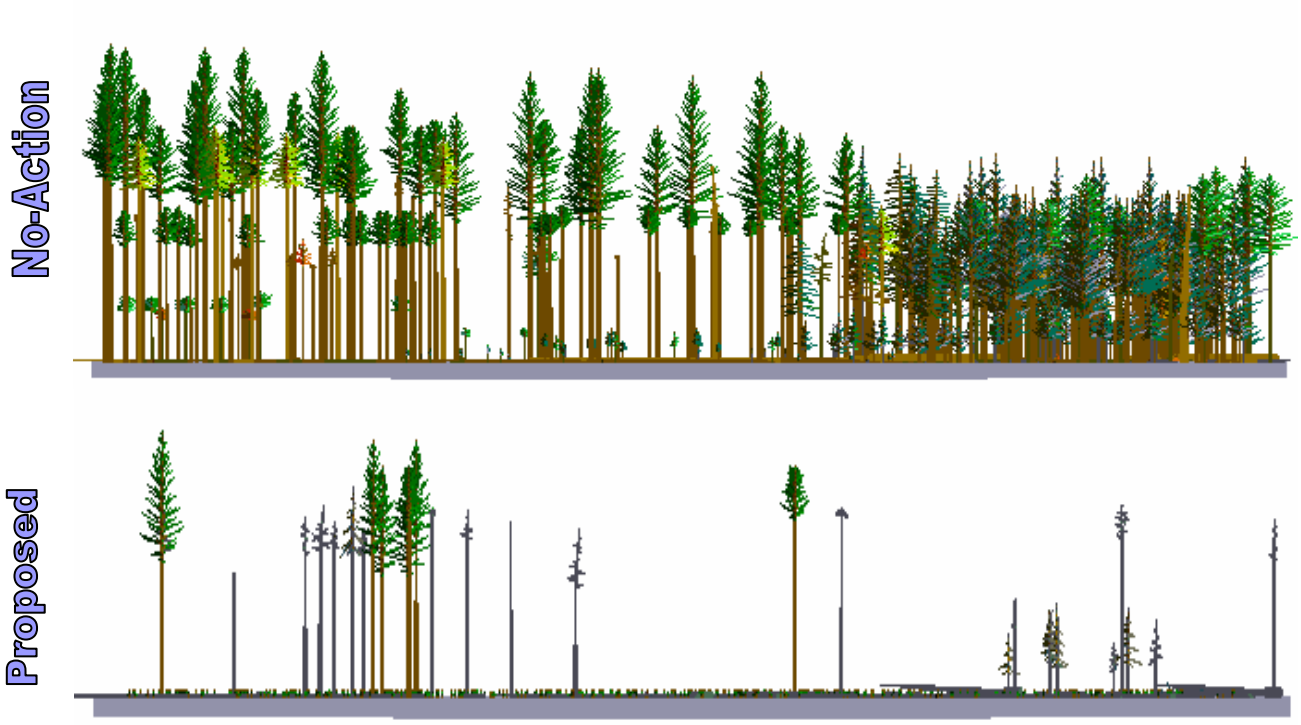


Figure VEG-11. SVS Model Depiction comparing a typical lodgepole pine stand in the Placer Resource Area fifty years from now under the NO-ACTION Alternative to one under the PROPOSED Action Alternative.

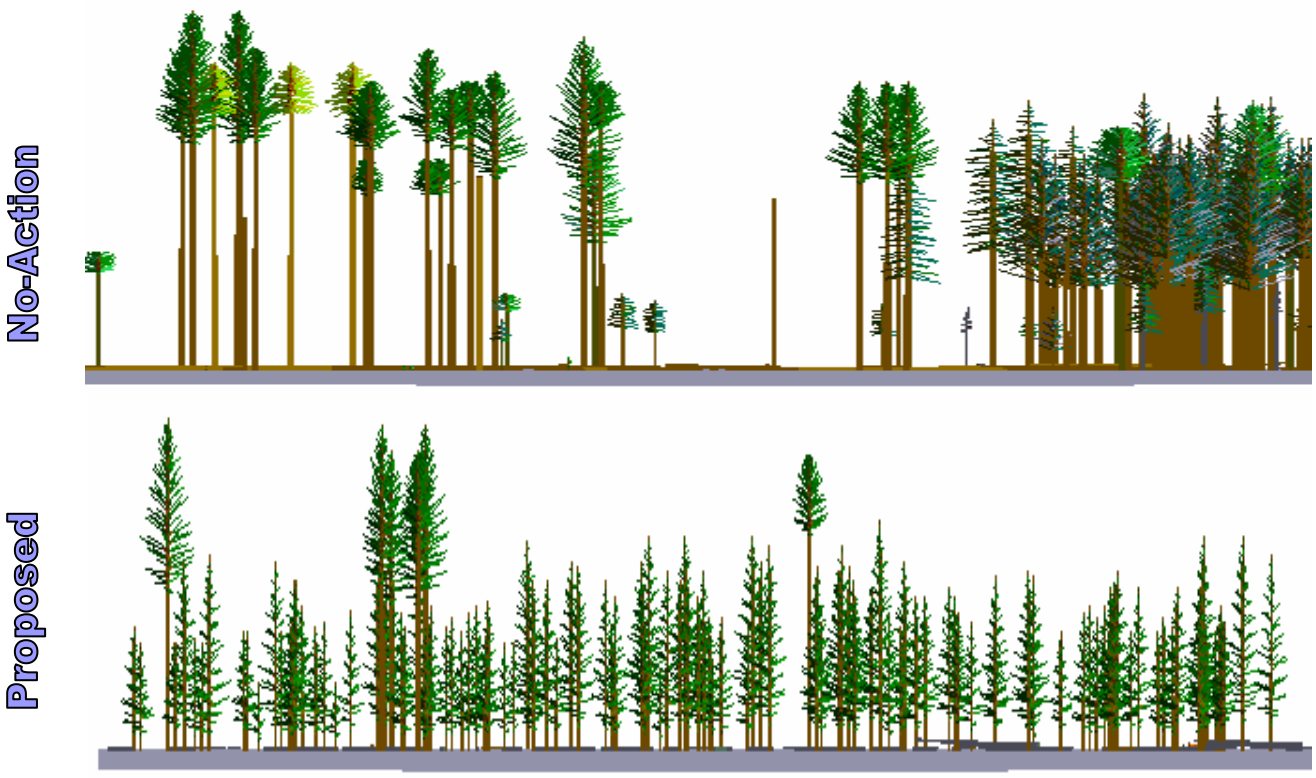


Figure VEG-12. SVS Model depiction comparing a typical western larch stand in the Placer Resource Area under the NO-ACTION Alternative to one immediately after the PROPOSED Action Alternative.

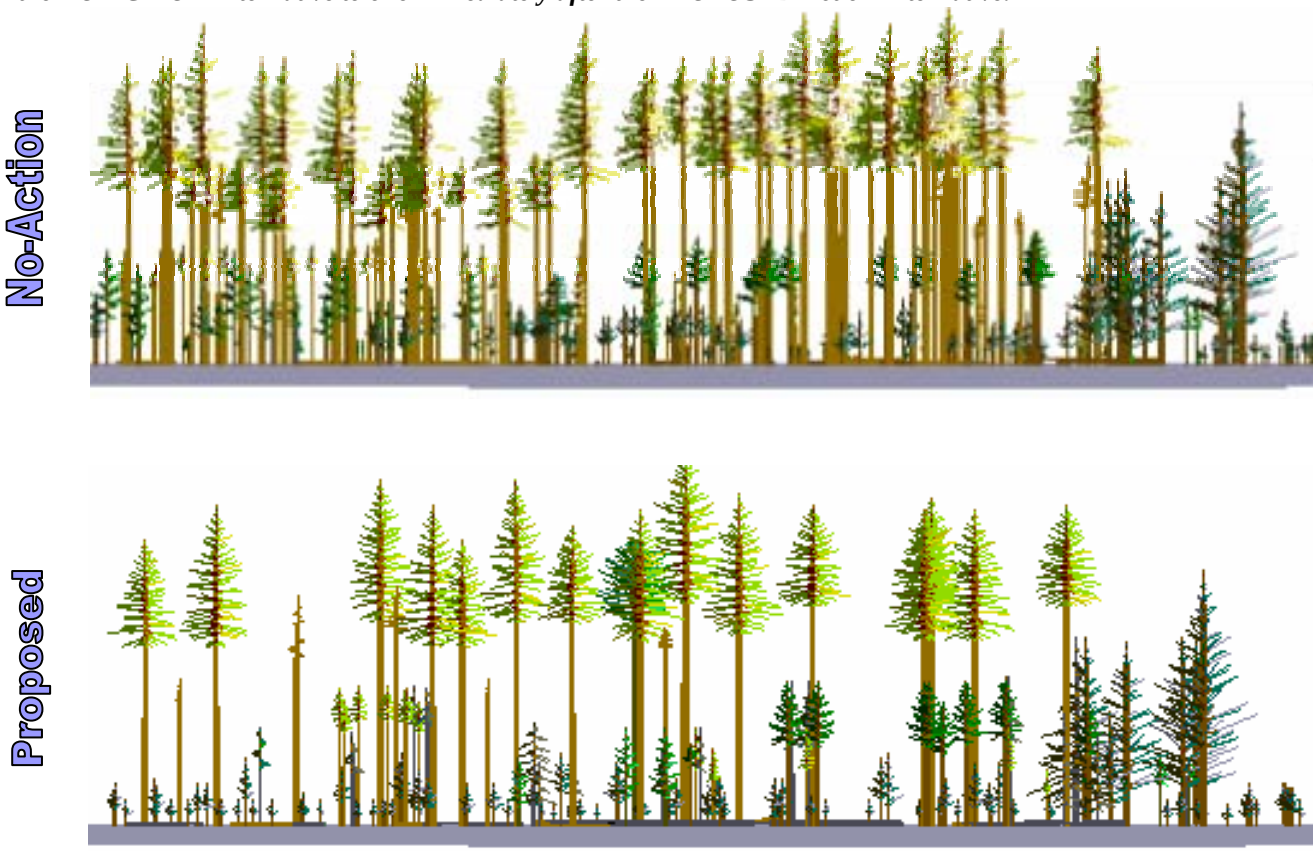
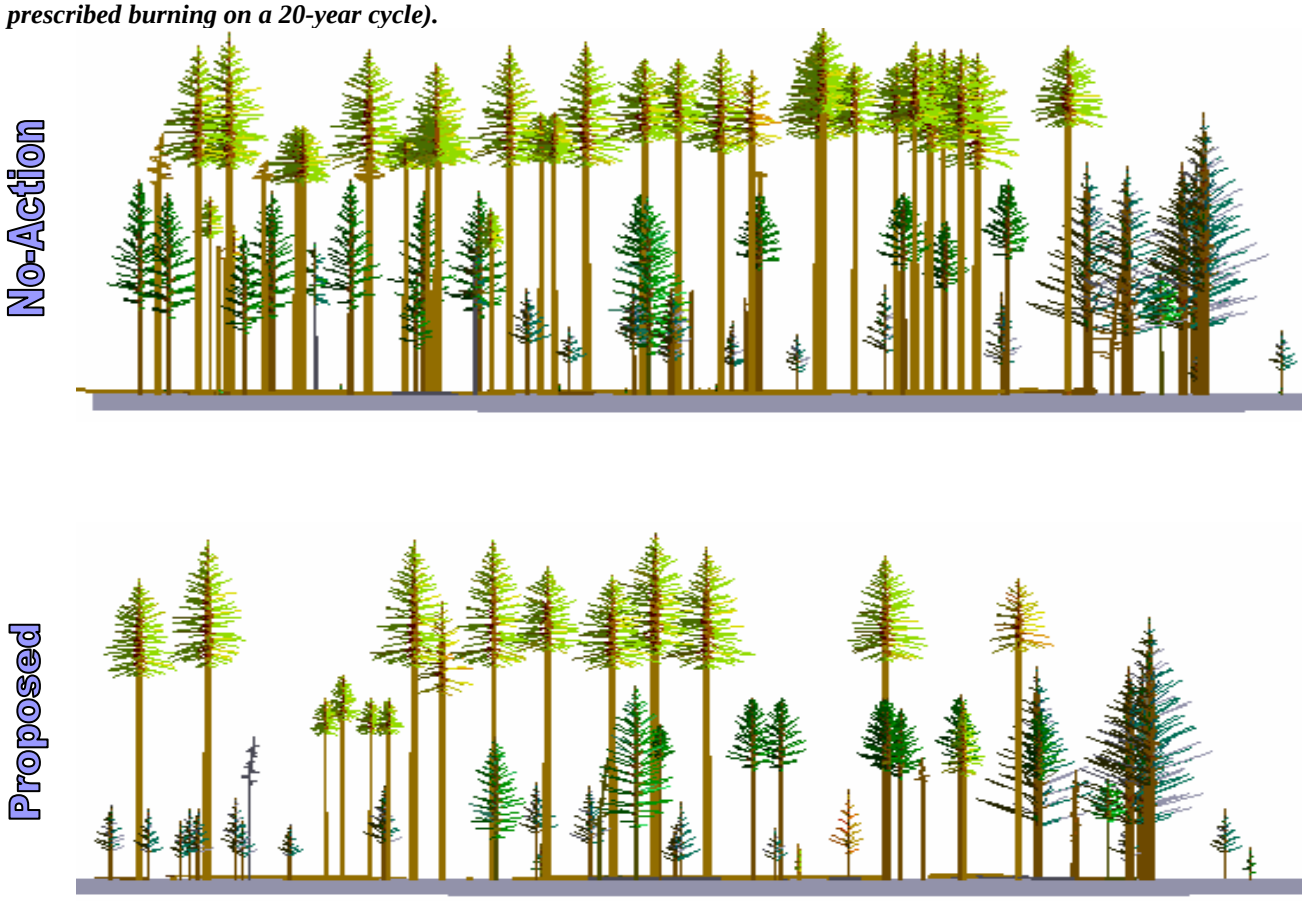


Figure VEG-13. SVS Model depiction comparing a typical western larch stand in the Placer Resource Area fifty years from now under the NO-ACTION Alternative to one under the PROPOSED Action Alternative (which includes prescribed burning on a 20-year cycle).



Forest Service policy FSM 2471.1 (PF Doc. VEG-25) direct land managers to normally limit the size of harvest openings created by even-aged silvicultural methods to 40 acres or less. With some exceptions, creation of larger openings is allowable with Regional Forester approval. Under the Proposed Action, four units could exceed the 40-acre opening size, as displayed in the table below.

The proposed openings are of the scale and pattern comparable to the desired condition developed to attain increased fire resiliency in the wildland urban interface and immediately adjacent lands within the context of inherent landscape patterns (aspect, slope, habitat type, etc.) and fire history of both the Coeur d'Alene basin and Placer Resource Area (PF Doc. VEG-8). These openings fit the definition of a shelterwood harvest; units would have up to 20 trees per acre in groups (1/2 to 5 acres in size) and single trees at irregular spacing. Following harvest and prescribed burning, units would have scattered areas of live and dead trees.

Treatments were designed to take advantage of the current landscape arrangement of resilient components (both on the stand and landscape scales) and treatments centered on areas with the highest concern in terms of insect and disease mortality and risk. The spatial patterns of fuel treatments in landscapes would most likely determine their (the areas of fuel treatments) effectiveness in modifying wildfire behavior (Hessburg and others, 2000, p. 29; PF Doc. VEG-R13). Fuel treatments are expected to change fire behavior but not necessarily stop fire (p. 11, PF Doc. VEG-R35). Treating small or isolated stands without assessing the broader landscape would most likely be ineffective in reducing wildfire extent and severity (p. 29; PF Doc. VEG-R13). Random fuel treatment arrangements are extremely inefficient in changing fire behavior requiring perhaps 50 to 60 percent of the area to be treated compared to 20 percent in a strategic fashion (Finney 2001, p. 30; PF Doc. VEG-R13).

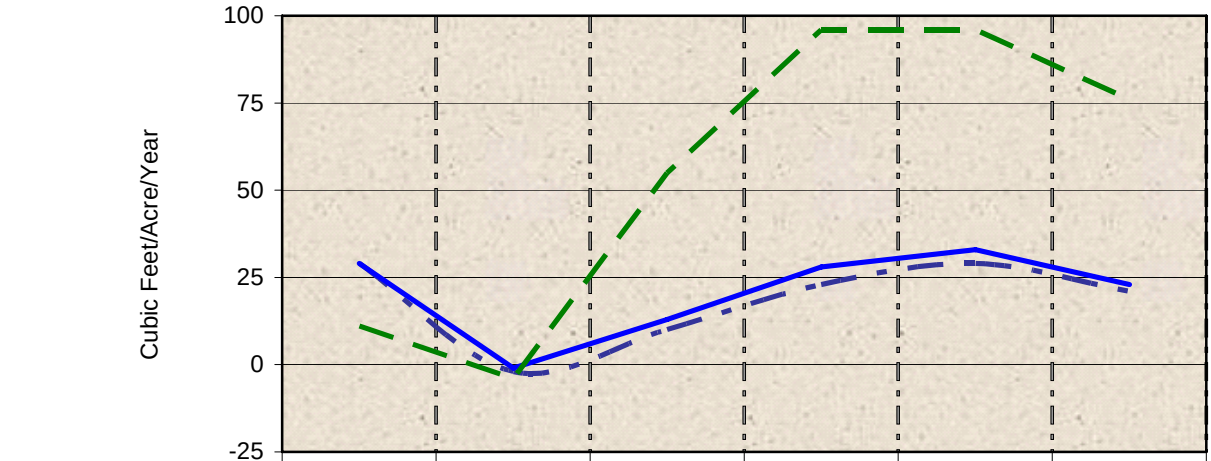
Units 1-1a, 2-2a and 8 are high-risk lodgepole pine stands; Unit 6 has a high Douglas-fir component with root disease mortality in an area where treatment could be a visual concern. The design and size of openings under the Proposed Action focused on fire, vegetative, wildlife and visual concerns within other resource management objectives and constraints. Fire resource concerns included landscape arrangement of fuels over the short and long term in the wildland urban interface and areas immediately adjacent (refer to the Specialist's Report on Fire/Fuels, PF Doc. SR-01). Vegetative objectives focused on areas with high insect and disease mortality and risk. The size and arrangements of Units 1, 2 and 8 incorporate wildlife habitat objectives of varying sized patches of forage mixed with cover/denning for a number of species including lynx (PF Doc. SR-07). As proposed, Unit 6 is visually more appealing in the terms of size, arrangement and landscape location.

Table VEG-5. Units with openings exceeding 40 acres under the Proposed Action (PF VEG-25).

Unit #	Acres	Total Opening (Acres)	Additional Information
1&1a	41	41	Shelterwood harvest unit in high risk lodgepole pine.
2&2a	94	94	Shelterwood harvest unit in high risk lodgepole pine.
6	40	40	Shelterwood harvest unit of Douglas-fir dominated stand (with root disease mortality) in visually sensitive area.
8	42	42	Shelterwood harvest unit in high risk lodgepole pine.

Stand Growth: Estimated growth in stands treated with regeneration harvests and for the entire resource area are displayed below. Under the No-Action Alternative, in 100 years there would be little if any change in growth from the current level (36 percent of Forest Plan). In contrast, growth within the regeneration units in 100 years would be approximately at modeled Forest Plan levels (PF Doc. VEG-6 and VEG-26).

Figure VEG-14. Growth on NFS/BLM lands (measured in cubic feet per acre per year) under the No Action Alternative (PF Doc. VEG-6 and VEG-37).



	2010	2030	2050	2070	2090	2110
Existing/Alt. 1	29	-2	10	23	29	21
Alt. 2 - All units	29	-1	13	28	33	23
Alt.2 - Regen Units	11	-4	55	96	96	76

Year

4.C. Cumulative Effects to Forest Vegetation

Cumulative effects are those that would result from the proposed action in addition to the incremental impacts of past, ongoing and reasonable foreseeable action. The spatial scale of planned activities is important to consider in effects discussion. Scales and hypothetical scale sizes to be considered include: plant (the plant and close proximity), site (less than few acres in size), stand (2-50 acres in size), landscape (50 to 100's or 1000's of acres), watershed (such as the Placer Creek watershed) and basin (such as the CDA basin). The vegetative effects analysis of the proposed action focused on the stand, landscape, watershed and basin scales. Cumulative effects analysis is also focused at these scales. Past disturbances and management activities combined with successional growth resulted in the existing conditions used for analysis of the proposed action. All activities associated with previous timber sales or other decisions have been completed on Forest Service and BLM lands within the Placer Resource Area (there are none currently ongoing).

Forest vegetation in the majority of the Resource Area will be dominated by the vegetative trends discussed under no action. In terms of important management activities, fire suppression of areas developing along ecological successional pathways is the primary action to be considered when evaluating cumulative effects to vegetation. A full discussion of the cumulative effects of fire suppression is provided in the Specialist's Report on Fire/Fuels (pages FF-20 to FF-22). Discussion of successional development trends is found at VEG-12 and VEG-16.

Planned activities such as trail reconstruction, weed treatment, and watershed and riparian restoration projects have no cumulative effect to vegetative composition, structure, arrangement and disturbance types at the stand and landscape or larger scales. At the plant and site scales, roads proposed for permanent closure or decommissioning would eventually provide forest cover, although they would be likely to go through a prolonged period of grass, forbs and/or shrub dominance. Watershed and riparian restoration can include scattered interplanting with cedar and other species will speed the recovery of desired trees species, increase diversity for wildlife species and trend the riparian area to increase resiliency. Planting is required because minimal desired seed source exists in the area. Use of native seed source will assure future resiliency and support success of this project. Planting of cedar is most successful in areas where some canopy is

maintained. In areas without current canopy cover, a 'nurse crop' of cottonwood may be helpful in establishment of cedar seedlings.

The planned fuel break projects on FR 456 and King Street, the future shrub field maintenance by both the Forest Service and BLM (such as those that occurred in the past), Shoshone County Fire Mitigation structural protection projects and the BLM South Hill project may have vegetative effects at the stand scale however the intent and design of these projects is to change fuels and fire effects at the stand, landscape and watershed scales. In other words, the mosaic of vegetation that results from these treatments would create interruptions that would reduce the potential for high intensity fire and/or conflagrations. These fuel management activities would extend or reinforce the positive trends of the proposed action which result in improved trends of fire effects, vegetative composition/structure and fuels. The effects to vegetative composition, structure, and arrangement depend on the type and scale of the disturbance or fire and the conditions and arrangements at the time of that disturbance.

Pre-commercial thinning, pruning, weeding, release and/or understory slashing reasonably would occur during the next 10-20 years within areas treated by proposed action. These activities will maintain the positive trends of the proposed action at the stand, landscape and watershed scales. Tending activities will be prioritized and analyzed in detail before implementation. The overall objective of these activities is to allow the long-lived early seral species white pine, western larch and ponderosa pine to better compete with the more shade tolerant species on sites so stands will better provide the desired forest structure and composition. These tending activities would improve the growth and vigor of desired (naturally regenerated and/or planted) trees, and/or prepare for other activities that will improve the fuel configuration of stands. Pruning of white pine reduces the potential of infection by white pine blister rust and also improves the tree's ability to survive infection by removing infected branches. Pruned trees have a better chance of reaching maturity and contributing to the desired forest structure and composition (Schwandt, 1994, VEG-R19). Thinning, pruning and understory slashing may also prepare trees and sites for underburning while stands are pre-commercial in size in the case of ponderosa pine and western larch. Administrative access will be necessary to accomplish long-term tending activities will be vital to attain desired stand conditions economically. Because these activities often do not generate funding, monies are often not available to establish or reestablish some level of access to complete these tending activities. Future decisions concerning administrative access must consider that 'walk in only' access increases the cost (both contract and agency) of stand tending activities by 20-50% above the same activities with road access. This is due to the extra time required to access sites in addition to associated increased health risks related to the increased length of time to attain emergency medical treatment for workers.

Future timber harvest on private lands within the resource area is reasonable, and becomes more likely as stands initiated following the 1910 fire mature. Private land harvests in and around the resource area commonly have the objectives of salvage and/or partial harvest to remove trees of economic value. Regeneration is usually natural and results from the seed source of trees remaining following harvest. This natural regeneration is dominated by Douglas-fir, grand fir, lodgepole pine and subalpine fir. These species do not contribute to the positive species composition trend of the proposed alternative and the landscape arrangements are determined by ownership patterns rather than a strategic fashion to change fire behavior.

5. Consistency with Forest Policy and Legal Mandates

Forest Plan direction provides that timber management activities will be the primary process used to minimize the hazards of insects and diseases and will be accomplished by maintaining stand vigor and diversity of plant communities and tree species (Forest Plan, page II-8, PF Doc. VEG-26). Direction regarding vegetation is also guided by the Forest Plan standards for old growth (Forest Plan, page II-29, PF Doc. VEG-28), timber (Forest Plan, pages II-31 to 32, PF Doc. VEG-26), forest protection (Forest Plan, pages II-38 to 39 PF Doc. VEG-26) and individual management areas (Forest Plan, pages III-1 to 87, PF Doc. VEG-26).

Forest Plan Standards for Old Growth

Old Growth Standard 10a: A definition for old growth is being developed by a Regional Task Force and will be used by the Forest when completed. As an interim guideline, stands classified as old growth should meet the definition given by Thomas (1979).

This standard applies to both the old growth management unit (OGMU 119) and the IPNF. Allocation of old growth within the Placer Resource Area is based on current and widely accepted science and follows current old growth definitions from the Forest Plan (PF Doc. VEG-28), the Regional Task Force Report including "Old Growth Forest Types of the Northern Region" (Green et al, 1992 (errata corrected 2/05); PF Doc. VEG-29) and Forest Supervisor letters of direction for implementing Forest Plan old growth standards (PF Doc. VEG-28). This standard would be fully met under either alternative.

Old Growth Standard 10b: Maintain at least 10 percent of the forested portion of the IPNF as old growth.

The IPNF old growth allocation of 10% (231,000 acres) was distributed among the districts as documented in the Forest Supervisor's May 7, 1991 letter regarding the "Forest Plan Explanation: Implementing Old Growth Standards" (PF Doc. VEG-28). The Coeur d'Alene River Ranger District was responsible for allocating 56,000 acres for old growth management (with 18,000 acres on the former Fernan Ranger District and 38,000 on the former Wallace Ranger District).

The 2004 Forest Plan Monitoring and Evaluation Report indicates that the Forests' total allocated old growth at the end of 2004 was 278,552 acres (12.1% of IPNF forested acres). The Coeur d'Alene River Ranger District had a total of 65,260 acres (2004 Forest Plan Monitoring and Evaluation Report, p. 71; PF Doc. CR-026).

The Monitoring Report discusses how a multi-scale approach is used on the IPNF to monitor old growth based on two separate, independent tools: 1) Forest Inventory and Analysis (FIA) data is used to calculate forest-wide and mid-scale old growth percentages; 2) An IPNF stand map displays all stands allocated for old growth management, with old growth data recorded in the TSMRS database. Based on the FIA data, the IPNF proportion of old growth is 12.85% (with 90% confidence intervals of 10.55% to 15.27%); based on total acres of mapped stands, 12.1% is allocated and maintained for old growth. Together, these two monitoring tools offer compelling evidence that the IPNF is meeting Forest Plan standards for the amount of old growth to be retained. Full discussion of this multi-scale approach (including statistics) is found in the 2004 IPNF Forest Plan Monitoring and Evaluation Report, pages 66 through 74 (PF Doc. CR-026).

Since neither of the No-Action or Proposed Action Alternatives propose activities in allocated old growth (there is no allocated old growth within the Placer Resource Area), both alternatives would be consistent with this Forest Plan standard.

Old Growth Standard 10c): Select and maintain at least five percent of the forested portion of those old growth units that have five percent or more of existing old growth.

and

Old Growth Standard 10d: Existing old growth stands may be harvested when there is more than 5% in an old growth unit, and the Forest total is more than 10%.

These standards apply to OGMU 119 scale only. The Placer Resource Area is within a portion of Old Growth Management Unit (OGMU) 119 (PF Doc. VEG-30). As displayed in Table VEG-4, OGMU 119 currently has five percent of the OGMU allocated as old growth (PF Doc. VEG-34). The five percent standard would be fully met under either alternative. Consistency with the 10 percent standard is addressed under standard 10b.

Old Growth Standard 10e: Old growth stands should reflect approximately the same habitat types series distribution as found on the IPNF.

A demonstration of compliance with this standard is found in the 2004 Forest Plan Monitoring and Evaluation Report (page 92, PF Doc. VEG-36), which concludes, "Old growth on the IPNF does reflect approximately the habitat type series distribution of the forest…old growth distribution is less than proportional to habitat type series distribution only in the Douglas-fir and grand fir series, which occupy the driest 21% of the land…The low proportion of old growth in these dry habitat type series is a function of the combined effects of the huge, severe 1910 burn and other big early 20th century fires, subsequent suppression of low severity fires, early 20th century timber cutting, root diseases and bark beetles have contributed to the low proportion of old growth in these two habitat type series," (2004 Forest Plan Monitoring and Evaluation Report, page 72; PF Doc. CR-026). Since neither of the No-Action or Proposed Action Alternatives propose activities in allocated old growth (there is no allocated old growth within the Placer Resource Area), both alternatives would be consistent with this Forest Plan standard.

Old Growth Standard 10f: One or more old growth stands per old growth unit should be 300 acres or larger. Preferences should be given to a contiguous stand; however the stand may be subdivided into stands of 100 acres or larger if the stands are within one mile. The remaining old growth management stands should be at least 25 acres in size. Preferred size is 80 plus acres.

This standard applies at the OGMU scale and for this analysis includes only OGMU 119. The Placer Resource Area is within old growth management unit (OGMU) 119. Supporting documentation for the following discussion is found in PF Doc. VEG-35. Allocated old growth in OGMU 119 involves six patches. Five patches are in the vicinity of Polaris Peak to Lost Lake. These patches range from 45 to 242 acres. Two of these five patches are over 100 acres and are within one-half mile of each other, resulting in a 469-acre effective patch. All of these five patches are within three-quarters of a mile of another allocated old growth patch. The other patch is in the Lake Elsie area and is approximately 83 acres in size. In summary, one effective patch is over 300 acres, all patches are greater than 25 acres each, and three of the six patches are over 80 acres in size. Therefore, old growth standard 10e would be fully met. In addition, the silviculturist and wildlife biologist identified approximately 800 acres of additional future old growth (PF Doc. VEG-35).

Old Growth Standard 10g: Roads should be planned to avoid old growth management stands to maintain unit size criteria.

This standard applies at the OGMU scale and for this analysis includes only OGMU 119. No new permanent road construction or temporary road construction occur in allocated old growth under either alternative. This standard would be met under either alternative.

Old Growth Standard 10h: A long-term objective should be to minimize or exclude domestic grazing within old growth stands.

This standard applies at the OGMU scale and for this analysis includes only OGMU 119. The proposed activities would not include any new domestic grazing allotments in the Placer Resource Area nor in allocated old growth. There are currently no grazing allotments in the area. It is unlikely that grazing would occur within mature or allocated old growth structures in the Placer Resource Area in the future since mature and old growth structures do not normally provide sufficient forage for these animals. This standard would be met under either alternative.

Old Growth Standard 10i: Goals for lands to be managed as old growth within those lands suitable for timber production are identified in the management area prescriptions.

A demonstration of compliance with this standard is found in the 2004 Forest Plan Monitoring and Evaluation Report (pages 91-92, PF Doc. CR-026) where a table displaying both the goals by management area and current allocation of old growth in these management areas on the IPNF. "Only the four …management areas have specific Forest Plan old growth goals...Current old growth allocations meet and far exceed these Forest Plan goals." Old growth standard 10i is met.

Forest Plan Standards for Timber

Timber Standard 1. Both even aged and uneven aged silvicultural systems will be employed on the IPNF and will meet resource and vegetation management objectives identified in the Forest Plan.

Treatments associated with the Proposed Action are fully described above (Direct and Indirect Effects to Forest Vegetation under the Proposed Action). Treatments would include shelterwood, commercial thinning, group seed tree with reserves, pruning, and prescribed burning. Shelterwood and group seed trees are considered even aged. Commercial thinning, pruning and prescribed burning are intermediate treatments for both even and uneven aged silvicultural systems. This standard is met under alternative 2. Utilization of these treatments methods complies with Forest Plan standards (page III-3, PF Doc. VEG-R13 and VEG-26) and Forest Plan Vegetation Management Silvicultural Practices (pages A-2 to 10; PF Doc. VEG-R13 and VEG-26). In addition, these actions are consistent with the Forest Plan which states that prescribed fire be used to meet silvicultural objectives (page III-4; PF Doc. VEG-R13 and VEG-26). Western larch and blister rust resistant white pine, and possibly small amounts of lodgepole pine would be planted. This complies with Forest Plan direction that reforestation will normally feature seral tree species utilizing a mixture of species. (Forest Plan, p. II-32, PF Doc. VEG-R13 and VEG-26). These actions would promote stand structures and compositions, which reduce susceptibility in the present and future to insects, diseases, and wildfire.

Uneven-aged management was considered as a treatment method in the Placer Resource Area. To be successful, uneven aged management (or individual tree selection/group selection) requires healthy stands with a high percentage of long-lived seral trees to manage. Most stands in the Placer resource area do not meet these criteria (see PF Doc. VEG-8, VEG-3, VEG-9 and VEG-15). In addition, the uneven aged stand structure involves development of stand structures that have substantial amounts of ladder fuels within the stand over the long term, which can be a concern when addressing a stand's potential fire behavior in this wildland urban interface.

Timber Standard 2. Timber stands that are substantially damaged by fire, wind throw, insect or disease attack, or other catastrophe may be harvested where this salvage is consistent with silvicultural and environmental standards. All management areas are open to this potential salvage activity except Management Areas 11 and 14.

Salvage of trees damaged by prescribed burning would only occur with appropriate NEPA analysis; however, such salvage is not planned to occur in the Placer Resource Area. This standard is met under either alternative.

Timber Standard 3. Recommended changes in timber resource land suitability from the approved Forest Plan will be based upon the criteria contained in 36 CFR 219.14(a) and the rationale displayed in environmental assessments. Changes from suitability classification will be done in accordance with the procedures outlined in Appendix M.

An analysis of suitability related to concerns for potential regeneration success for resource management was completed for the Placer Resource Area (PF Docs. VEG-17). This analysis found that 19 percent of the resource area's federally management (National Forest System and BLM) lands are not suitable for timber management because of potential regeneration concerns. These areas average approximately 45 acres in each patch. The arrangement of these areas while scattered across the resource area, make up 79 percent of the roadless area. Suitability and limitations due to regeneration concerns within harvest units will be further assessed on a site-by-site basis during unit layout. Regeneration harvest will not take place on sites with potential regeneration success concerns.

About 24 percent of the Placer Resource Area is within Forest Plan Management Area 9 (PF Doc. VEG-18), which consists of lands unsuited for timber production, lands capable of timber production but isolated or highly sensitive visual areas around Lake Pend Oreille and Hayden Lake. The Forest Plan broadly mapped these areas. Within this resource area many of the MA 9 lands are actually mosaics of productive and unproductive sites. Because the suitable and unsuitable areas within the MA 9 of this resource area form a mosaic, this analysis will not change the management area designation but rather will only propose

regeneration harvest in areas capable of regeneration success and timber production based on a site-by-site assessment as part of the unit layout process based on the Forest Plan, FSH 2409.13 (PF Doc. VEG-17) and 36 CFR 219.27 (PF Doc. VEG-17). No change in suitability classification is proposed under any alternative (PF Doc. VEG-17). This standard is met under either alternative.

Timber Standard 4. Reforestation will normally feature seral tree species, with a mixture of species usually present. Silvicultural practices will promote stand structure and species mix that reduce susceptibility to insect and disease damage.

All regeneration harvests would be regenerated with site-adapted seral species/seed source. All treatments would retain (to the extent possible) and promote resilient long-lived seral species and structures; therefore this standard is met under either alternative.

Timber Standard 5. Project design will provide for site preparation and slash hazard reduction practices that meet reforestation needs of the area.

Site preparation and/or fuel treatment may include a combination of prescribed underburning, and hand slashing and/or hand piling depending on post harvest conditions and silvicultural treatment needs; therefore this standard is met under either alternative.

Timber Standard 6. Timber harvest schedules and access will be coordinated with intermingled landowners where applicable.

Access to private property in the Placer Resource Area would be maintained under either alternative (PF Doc. TRAN-1); therefore this standard is met under either alternative.

Timber Standard 7. Openings created by even-aged silviculture will be shaped and blended to forms of the natural terrain to the extent practicable; in most situations they will be limited to 40 acres. Creation of larger openings must conform to current Regional guidelines regarding public notification, environmental analysis and approval.

and

Timber Standard 8. An area of National Forest land will no longer be considered an opening when vegetation meets management goals established for the management area in accordance with the Regional Guide. Lands in other ownership within or adjacent to National Forest land will be included in the analysis when planning openings.

The 2003 Forest Plan Monitoring Report item reviews the maximum size for harvest areas at the IPNF scale (PF Doc. VEG-25). For the Placer Resource Area proposal, the public was informed in August 2005 that regeneration openings in excess of 40 acres were proposed (PF Doc. PI-46). A letter of approval to exceed the 40-acre opening size, with appropriate interdisciplinary analysis and documentation, will be received from the Regional Forester prior to project decision. The proposed openings will create opening of the landscape of the scale and pattern that are similar to the historic disturbance regimes for this resource area. Proposed harvest openings greater than 40 acres are identified and discussed above (Proposed Treatment Opening Sizes portion of section B), in the EA (Direct and Indirect Effects to Forest Vegetation under the Proposed Action) and in the Project Files (PF Doc. VEG-25). This standard is met under either alternative.

Timber Standard 9. The silvicultural prescription for each stand will establish the level of management intensity compatible with the management area goals. Preferred species management as identified in the silvicultural prescription will consider both biological and economic criteria.

All vegetative treatments have silvicultural diagnosis (PF Doc. VEG-3) and prescriptions approved by a certified silviculturist prior to project implementation. These integrate site-specific factors (such as physical site, soils, climate, habitat type, fuels and current vegetative composition and conditions) as well as interdisciplinary objectives (including fuels management) and Forest Plan goals, objectives and standards. This standard would be met under either alternative.

Forest Plan Standards for Forest Protection

Forest Protection Standard 1. Use integrated pest management methods that provide protection of forest resources with the least hazard to humans, wildlife and the environment.

and

Forest Protection Standard 2. Use silvicultural methods and schedule practices that reduce the development and/or perpetuation of pest problems.

As described earlier in this section, loss of the long-lived seral components (western larch, white pine and ponderosa pine) in the ecosystem is a major reason for the lack of vegetative resiliency. Use of various regeneration and intermediate treatments to trend toward species compositions with increased resilience is a major objective of the Proposed Action. In combination with alternative design features (Chapter 2, Features Designed to Improve Vegetation Management or Chapter 2 Forest Vegetation section B. Direct and Indirect Effects to Forest Vegetation Under the Proposed action), these treatments would minimize adverse effects associated with pests. The Proposed Action would meet these two Forest Plan standards. The No-Action Alternative would not use integrated pest management methods or reduce the perpetuation of pest problems; therefore it would not meet Forest Protection Standards 1 and 2.

Forest Protection Standard 3. Vegetation management will favor the use of fire, hand treatment, natural control, or mechanical methods wherever feasible and cost effective. Direct control methods, such as chemical or mechanical, may be used when other methods are inadequate to achieve control.

Proposed vegetative treatments would utilize a combination of fire, hand treatment and natural and mechanical methods. Forest vegetative treatment using chemicals (excluding weed treatments) is not proposed under either alternative; therefore this standard is met under either alternative.

Consistency with Rangeland Renewable Resource Planning Act (RPA)/NFMA

Vegetation Manipulation (36 CFR 219.27(b).

1. **Assure that technology and knowledge exists to adequately restock lands within fire years after final harvest.** Technology and knowledge does exist to comply with this requirement, therefore this requirement is met (PF Doc. VEG-17). The IPNF Forest Plan Monitoring and Evaluation Report, 2003, page 10, (PF Doc. VEG-19) states, "over the last 11 years (1983-1993) of monitoring, our reforestation success rate has averaged 88 percent." An analysis of potential regeneration success concerns for resource management was completed for the Placer Resource Area (PF Doc. VEG-17). This analysis found 19 percent of federally managed lands in the Placer Resource Area are not suitable for resource management because of potential regeneration concerns. These areas average approximately 45 acres in each patch, scattered across the resource area, and making up 79 percent of the roadless area. Limitations due to regeneration concerns within harvest units would be further assessed on a site-by-site basis during unit layout. Regeneration harvest would not take place on sites with potential regeneration success concerns. Overall regeneration success on the Coeur d'Alene River Ranger District is 97 percent for the period 1976 to 1999, with 80 percent success within 5 years of regeneration harvest (PF Doc. VEG-19).

2. **Be chosen after considering potential effects on residual trees and adjacent stands.** The analysis considered the effects on residual trees and adjacent stands; therefore this requirement is met (PF Doc. VEG-3). Under the Proposed Action, harvest and site preparation treatments will consider the short and long term potential negative effects (including blow down, fire mortality, etc) of proposed activities on adjacent trees and stands with site by site prescription modifications, such as change in unit boundary, modification of prescribe burning prescriptions, etc.

Silvicultural Practices (36 CFR 219.27(c). No timber harvest, other than salvage sales or sales to protect other multiple-use values, shall occur on lands not suitable for timber production.

Guidelines for determining suitability are found in the Forest Plan, 36 CFR 219.27 and FSH 2409.13 (PF Doc. VEG-17). The 2003 Forest Plan Monitoring Report addresses changes to timberland suitability at the IPNF scale (page 11, PF Doc. VEG-17). The proposed harvest units are within the productive habitat types as described by the Forest Plan. An analysis of suitability for resource management was completed for the resource area (PF Doc. VEG-17). About 24 percent of the Placer Resource Areas are within Forest Plan Management Area 9 (PF Doc. VEG-18). Management Area 9 (MA 9) consists of lands unsuited for timber production, lands capable of timber production but isolated or highly sensitive visual areas around Lake Pend Oreille and Hayden Lake. The Forest Plan broadly mapped these areas. Within this resource area many of the MA 9 lands are actually mosaics of productive and unproductive sites. Because the suitable and unsuitable areas within the MA 9 of this resource area form a mosaic, this analysis will not change the management area designation but rather will only propose regeneration harvest in areas capable of regeneration success and timber production based on a site-by-site assessment as part of the unit layout process based on the Forest Plan and FSH 2409.13 (PF Doc. VEG-17).

The arrangement of the unsuitable areas is scattered across the resource area. Harvest unit layout will consider suitability limitations on a site-by-site basis. Timber harvest will not occur in unsuitable sites; therefore this requirement is met.

Even-aged Management (36 CFR 219.27(d) When timber is to be harvested using an even-aged management system, a determination that the system is appropriate to meet the objectives and requirements of the Forest Plan must be made. Where clearcutting is to be used, it must be determined to be the optimum harvest method.

Under the action alternative, there is the potential for both future use of both even- and uneven-aged silvicultural treatments with shelterwood with reserves, commercial thinning and group seed tree with reserves, pre-commercial thinning and pruning. While a shelterwood and group seed tree tends to develop an even-aged stand, the presence and/or some development of three or more age classes (uneven-aged) is possible and desirable as stand resiliency increases in the future on these sites. Commercial thinning, precommercial thinning and pruning are neither even nor uneven aged by definition but intermediate treatments for both systems. All treatments under the Proposed Action would be silviculturally appropriate and are within the timber and vegetation management practices outlined in the Forest Plan goals, objectives, management area direction and practices (Forest Plan, Appendix A; PF Doc. VEG-26). Silvicultural diagnosis and target stand descriptions have been completed (PF Doc. VEG-3 and VEG-9); no clearcutting is proposed. This requirement is met.

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Specialist's Report on Threatened, Endangered and Sensitive Plants in the Placer Resource Area

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January 2006

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TES Plants Appendix A – Rare Plant Species

SPECIALIST'S REPORT ON THREATENED, ENDANGERED AND SENSITIVE PLANTS

1. Regulatory Framework for TES Plants

A. Forest Service Lands

Federal legislation, regulations, policy and direction that require protection of species and population viability, evaluation and planning process consideration of threatened, endangered and other rare (Forest Service "sensitive") plants species include the Endangered Species Act (1973) as amended; the National Forest Management Act (1976); the National Environmental Policy Act (1969); Forest Service manual 2670.1-2673.4 (PF Doc. TES-1); Forest Plan, 1987 (PF Doc. TES-2, pp. II-1, 5, 6, and 27); and direction from the Regional Watershed, Wildlife, Fisheries and Rare Plants program and Washington Office.

B. Bureau of Land Management Lands

Management direction for Bureau of Land Management "Special Status Plant Species" is provided through the Endangered Species Act (1973), as amended, the Federal Land Policy Management Act (1976), The Emerald Empire Management Framework Plan (1981), BLM Manual 6840, and statewide guidance.

2. Methodology Used in TES Plants Assessment

A. Assessment of Existing Conditions

The term "rare plants" is used in this document to describe all plant species that are listed by the US Fish and Wildlife Service for the Idaho Panhandle National Forests (IPNF) and the Coeur d'Alene Field Office, Bureau of Land Management. Also included are species designated by the Forest Service as "Sensitive" or "Forest Species of Concern," and by the Bureau of Land Management as "Special Status Plant Species." Complete lists of rare plant species are included in TES Appendix A.

The geographic scope of the analysis for sensitive plants is the Placer Creek Resource Area boundary. A pre-field review was conducted of aerial photos, topographical maps, Idaho Department of Fish and Game Conservation Data Center (ICDC, 2003; PF Doc. TES-3) element occurrence records, Timber Stand Management Records System (TSMRS), U.S. Fish and Wildlife Service National Wetlands Inventory Maps (USDI, 1987; PF Doc. TES-4) and recent literature.

This assessment describes the extent of all rare plant guilds in the Resource Area. The potential for the occurrence of Forest Service Threatened, Sensitive, Forest Species of Concern (FSOC) and BLM Special Status Species plants was based on an assessment of potential habitat for rare plants. The Coeur d'Alene Threatened and Sensitive plant species list may be broken into eight general habitat guilds; moist forest, wet forest, dry forest, grassland, alpine/subalpine, alluvial/deciduous shrub, aquatic, and peatland (Mousseaux, 1998; PF Doc. TES-5). BLM rare species were grouped with the appropriate guild for the purpose of the analysis. TSMRS queries were used to identify high potential Sensitive plant habitat by habitat guild in the Resource Area (PF Doc. TES-6). Photo interpretation, USFWS Wetland Maps, and personal knowledge of similar habitats were used to refine data derived from TSMRS. Lists of stands that may be potential rare plant habitat are contained in the project file (PF Doc. TES-34).

Areas of high potential habitat (approximately 740 acres) of National Forest System lands in the Placer Resource Area were field surveyed for TES plants in 2003 and 2004 (PF Doc. TES-16). No new occurrences of rare plants were discovered during surveys.

Design features were included in the Proposed Action to protect Threatened, Endangered and Sensitive Plants. No harvest activity would occur which would adversely affect any known rare plant population. All populations potentially adversely affected would be buffered from harvest and other project-related activities by at least 100 feet. No commercial harvest activity would occur within riparian habitat. All newly identified Threatened and Sensitive plant occurrences would be evaluated. Specific protection measures would be implemented to minimize impacts to that population occurrence and its habitat. The timber sale

contract would include a provision allowing modification of the contract if protection measures prove inadequate, if new areas of plants are discovered, or if new species are added to the list of rare plants.

Prescribed fire ignition would not occur within riparian habitat, although fire would be allowed to burn into riparian areas. Higher fuel moistures in riparian habitats would likely limit the spread of any prescribed fire. To limit ground disturbance, fire line would not be constructed in riparian areas unless needed to keep a burn from getting out of control.

Some areas previously surveyed may be resurveyed, based on the date and intensity of the most recent sensitive plant survey and the risk to sensitive habitat from proposed activities. Should rare plants be located during additional surveys or implementation, one or more of the following protective measures would be implemented:

- *Drop the proposed unit from activity*
- *Modify the proposed unit or activity*
- *Implement minimum 100-foot slope distance buffers around sensitive plant occurrences as needed to minimize effects and maintain population viability*
- *Implement, if necessary, Timber Sale Contract provisions for "Protection of Endangered Species" and "Settlement for Environment Cancellation"*

These measures are considered by the District botanist to be highly effective. The requirement to survey, identify and protect populations from adverse effects and to buffer habitat for Threatened species from all activities would be implemented prior to award of contracts. The maintenance of any buffer protecting populations would be administered through the contract.

B. Assessment of Environmental Consequences

Analysis was conducted using results of past sensitive plant surveys, current distribution and condition of sensitive plant populations in habitats similar to those found in the proposed treatment sites, types of proposed treatments and the likely effects to existing populations and habitat from the proposed activity based on current knowledge and professional judgment. It included a broad-scale assessment of the distribution and suitability of rare plant habitat in relation to proposed activities and a detailed analysis of each proposed activity and any need for design features, such as field surveys. Discussion of effects will focus on the alpine/subalpine, and wet, moist, and dry forest guilds, as these are the habitats most likely to be affected by proposed activities. The Project Files include lists of stands where activities are proposed under each alternative, including potentially affected plant guilds and acreage (PF Doc. TES-34). The cumulative effects analysis area for TES plants is the Placer Creek Resource Area.

Effects to sensitive plant species or suitable habitat from proposed activities are generally described as very low, low, moderate or high, with the following definitions:

> ***very low*** *= no measurable effect on individuals, populations or habitat*
>
> ***low*** *= individuals, populations and/or habitat not likely affected*
>
> ***moderate*** *= individuals and/or habitat may be affected, but populations would not be affected, and habitat capability would not over the long term be reduced below a level which could support sensitive plant species*
>
> ***high*** *= populations may be affected and/or habitat capability may over the long term be reduced below a level which could support sensitive plant species*

Indicators used to measure effects on Sensitive plants and suitable habitat include: the type of activity, the amount of each proposed activity, the extent of ground disturbance resulting from activities, and the proximity of known sensitive plant occurrences and suitable habitat to proposed activities. The following table displays the risk of effects to rare plants from various types of disturbance and activities (not all of these types of activities are proposed in the Placer Resource Area). The level of risk to Sensitive plants from various types of disturbance was used in the evaluation of environmental consequences.

Table TES-1. Summary of risk to rare plants from proposed activities in highly suitable habitat, by plant guild.

Proposed Activity or Event	Rare Plant Guild potentially affected	Risk of Adverse Impacts to Sensitive Plant Occurrences
Loss of < 50% canopy due to insects or disease	Wet Forest/ Moist Forest / Dry Forest Guild	Low to Moderate
Loss of > 50% canopy due to insects or disease	Wet Forest/ Moist Forest / Dry Forest Guild	Moderate to High
Regeneration harvest/site prep.	Moist Forest / Dry Forest Guild	High
Commercial thinning and selective harvest using ground based equipment	Moist Forest / Dry Forest Guild	High
Helicopter and Roadside Selection harvest	Moist Forest/ Dry Forest	Low
Full Road Obliteration	Wet Forest/ Moist Forest / Dry Forest Guild	High
New road construction	Wet Forest / Moist Forest / Dry Forest/Peatland	High
Road reconstruction/ reconditioning	Wet Forest / Moist Forest / Dry Forest Guild	Low
Channel crossing/culvert removal	Wet Forest / Moist Forest	Low to Moderate
Road closure, ripping, seeding	All	Low
Instream fisheries/watershed restoration (structure placement with equipment)	Deciduous riparian/wet forest/peatland	High
Fuel reduction by underburning	Wet Forest/ Moist Forest / Dry Forest	Moderate to High
Fuels reduction - mechanical	Moist Forest / Dry Forest	Moderate to High
Fuel break construction	Wet Forest / Moist Forest / Dry Forest	Moderate to High
Noxious weed prevention and treatment	Dry Forest / Moist Forest	Low to Moderate
Stand replacing wildfire	Wet Forest / Moist Forest / Dry Forest	Moderate to High

****** Some Dry Forest sensitive plant species may be dependent on periodic low levels of disturbance from fire, such as that which occurred historically in some dry forest habitats. The timing of an underburn relative to soil moisture in suitable habitat and the flowering and fruiting of the plant species of concern also influences potential effects.*

For unsurveyed habitat that is highly suitable to support sensitive plants, presence is assumed. Protection of large occurrences and contiguous, unoccupied highly suitable habitat is an effective conservation strategy (Burgman, et al 2001, PF Doc. TES 36). Examples of conservation strategies that have been prepared for Forest Service Region 1 TES species include Lichthardt, 1995 (PF Doc. TES-37), Lichthardt 2003 (PF Doc. TES-8), and Lorain, 1991 (PF Doc. TES-38). As described under the Methodology Section (Design Features), populations would be protected, although some isolated individuals may be impacted by activities.

3. Existing Condition of TES Plants

A. Threatened and Endangered Plant Species

A Threatened species, as determined by the US Fish and Wildlife Service, is any species that is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range. Currently, the US Fish and Wildlife Service (USDI 2004, PF Doc. TES-11) list two species as Threatened for the Idaho Panhandle National Forests and the Coeur d'Alene Field Office, BLM; water howellia (*Howellia aquatilis)* and Spalding's catchfly (*Silene spaldingii*). There are no federally listed Endangered plants for the Idaho Panhandle National Forests or the Coeur d'Alene Field Office, Bureau of Land Management.

B. Candidate Plant Species

Candidate species are plants for which the US Fish and Wildlife Service has sufficient information on biological vulnerability and threats to support proposals to list them as Endangered or Threatened. Slender moonwort (*Botrychium lineare*) was listed as a Candidate species by the U.S. Fish and Wildlife Service on June 6, 2001 (USDI 2001; PF Doc. TES-12). Candidate species are not addressed in Biological Assessments. According to Forest Service Manual direction, the Forest Plan and NFMA, potential effects of

Forest Service projects on Candidate species will be considered in environmental planning. Slender moonwort is listed as Sensitive in Forest Service Region 1 in Idaho, and as a Type 1 species for the BLM.

C. Forest Service Rare Plant Species

The subbasins of northern Idaho contain a wide array and diversity of habitats and plant communities, many of which contain plant species that are known or thought to be rare. Of the estimated 1,200 to 1,500 plant species known or thought to occur here, about 10 percent are considered rare or uncommon. Sensitive species are determined by the Regional Forester as those species for which population viability is a concern, as indicated by a current or predicted downward trend in population numbers, or in habitat capability which would reduce the species' existing distribution.

Twenty-eight species of Sensitive plants are known or suspected to occur within the Coeur d'Alene subbasin. Forest Species of Concern (FSOC) are those that may not be at risk within their range or at the regional or state scale, but may be imperiled within a planning area, such as a National Forest (USDA 1997, PF Doc. TES-14, p. 5). FSOC are addressed in effects analyses to provide for population viability as directed in NFMA. Biological Evaluations are not required to address FSOC. A discussion of habitats for FSOC is included within the discussion of rare plant guilds.

Threatened and Sensitive plants and Forest species of concern can be assigned to one or more rare plant guilds. These guilds are artificial assemblages based on similar habitat requirements used for the purpose of analysis. For the Coeur d'Alene River Ranger District, the rare plant guilds are aquatic, deciduous riparian, peatland, wet forest, moist forest, dry forest, grassland, and subalpine. Rock seeps and springs are microsites that can support certain sensitive plants, however, these can occur across all guilds and are not identifiable at a coarse scale. Refer to the Project Files (PF Doc. TES-5) for specific plant guild descriptions. Rock seep habitats will be detected through field surveys. The following table lists Region 1 Sensitive and Threatened plant species by habitat guild that are known or suspected to occur in the Coeur d'Alene sub-basin.

D. Bureau of Land Management Rare Plant Species

The Bureau of Land Management has five categories of Special Status Plant Species. Eleven species have potential habitat in the Placer Resource Area. The complete list of BLM special status plants is included in TES Appendix A. The special status plant species categories are as follows:

Type 1. Threatened, Endangered, Proposed and Candidate Species

These species are listed by the USFWS as threatened or endangered, or they are proposed or candidates for listing under the Endangered Species Act.

Type 2. Globally Imperiled Species Within Their Range - High Endangerment

These are species that have a high likelihood of being listed in the foreseeable future due to their global rarity and significant endangerment factors.

Type 3. Globally Imperiled Species Within Their Range - Moderate Endangerment

These are species that are globally rare with moderate endangerment factors. Their global rarity and inherent risks associated with rarity make them imperiled species.

Type 4. Species of Concern

These are species that are generally rare in Idaho with small populations or localized distribution and currently have low threat levels. However, due to the small populations and habitat area, certain future land uses in close proximity could significantly jeopardize these species.

Type 5. Watch List

Watch list species are not considered BLM sensitive species and associated sensitive species policy guidance does not apply. Watch list species include species that may be added to the sensitive species list depending on new information concerning threats and species biology or statewide trends.

E. Extent and Type of Suitable Habitat in the Resource Area

Suitable habitat for five of the eight Rare Plant Guilds is present in the Resource Area. Two of the guilds (wet and moist) have been grouped together for the purpose of this analysis. The extent of the habitats is displayed in the table below. There is no suitable habitat present for the Aquatic, and Peatland Guilds. The Deciduous Riparian Guild has a trace amount of habitat represented, however, it does not fall within areas proposed for activities. The project files contain descriptions of Rare Plant Guilds and species with potential for effects from proposed activities in the Placer Resource Area (PF Doc. TES-5).

Table TES-2. Rare plant guilds in the Placer Resource Area.

Rare Plant Guild	Acres of potential habitat in resource area*	
	Forest Service	Bureau of Land Management
Wet and Moist Forest	2,344	722
Dry Forest	180	444
Subalpine	2,791	143
Deciduous Riparian	Trace	Trace
Peatland	0	0
Grassland	399	507
Aquatic	0	0

** Table acreage pertains only to federally managed (National Forest System and BLM) lands, and does not include lands under other ownership.*

F. Plant Surveys and Documented Occurrences

Design features to protect TES Plants (EA, Part 3) provide for botanical field surveys to be completed in all previously unsurveyed areas of highly suitable habitat where activities would take place. In addition, some previously surveyed areas may be resurveyed, as deemed necessary. Field surveys would be completed prior to project implementation. The need for field surveys is based on habitat suitability and the risk of effects to Sensitive plants and habitat due to project activities.

Table TES-1 illustrates the risk to Sensitive plants and Forest Species of Concern from various types of disturbance. Regional direction (Leonard 1992; PF Doc. TES-15) states that the need for and extent of field reconnaissance should be commensurate with the risk associated with the project, the species involved, and the level of knowledge already in hand. Approximately 740 acres of Forest Service lands in the Resource Area were field surveyed in 2003 and 2004 for TES plants. Copies of the surveys are contained in the project files (PF Doc. TES-16). No new occurrences of rare plants were discovered during surveys. There are three previously documented Sensitive plant occurrences in the Placer Resource Area on BLM lands. There are no known occurrences of Threatened and Endangered plants in the Resource Area.

G. Potential Effects to Rare Plant Species

Analysis indicates that the Alpine/Subalpine, Deciduous Riparian, Dry Forest, Grassland and Wet/ Moist Forest Guilds have the greatest potential to occur in the Placer Creek Resource Area, and may be affected by project-related activities. Suitable habitat for Aquatic and Peatland Guild species does not exist in the Resource Area. Species that are documented to exist in the Resource Area or that have a high likelihood of occurring there are discussed in detail below.

Deciduous Riparian

Short-spored jelly lichen *(Collema curtisporum*) is a small, black foliose lichen that has a gelatinous texture when wet. It is found in moist riparian forests, usually on the bark of older black cottonwood trees. In the Pacific Northwest, this lichen may also grow on conifers next to black cottonwood trees in floodplain forests, typically on heavily furrowed bark of mature tree trunks. Short-spored jelly lichen is listed as a FSOC on the IPNF, and as a Type 3 Sensitive species by the BLM. The nearest documented occurrence is in Beaver Creek, approximately ten miles north of the Resource Area. Deciduous Riparian habitat or short-spored jelly lichen would be not be affected by project-related activities.

Alpine/Subalpine Guild

A Forest Service Sensitive plant species in the Alpine/subalpine Guild is leafless bug-on-a-stick moss (*Buxbaumia aphylla*). There are also several FSOC plants that may occur in subalpine habitats. There is considerable alpine/subalpine habitat in the Resource Area.

Leafless bug-on-a-stick moss (*Buxbaumia aphylla*) is a circumboreal species that is documented from one location in Idaho on the Nez Perce national Forest. This occurrence is at an elevation of 5,500 feet on mineral soil. There is a chance that it may exist in the Resource Area.

Iceland-moss lichen (*Cetraria subalpina*) is a rare lichen that grows on menziesia and other ericaceous shrubs in cool, subalpine habitats. The nearest occurrence is in the Selkirk Mountains on the Sandpoint Ranger District. This species has been observed in previously burned areas in some large, localized occurrences.

Cascade reedgrass (*Calamagrostis tweedyi*) is a BLM Type 2 Sensitive species. This grass is a rhizomatous perennial found in the subalpine fir/beargrass habitat type. Within the overall range of this species, it occurs in habitats in early to late stages of ecological succession but seems to be found most often in mid-successional stands. This species appears to respond favorably to disturbance associated with clearcutting and burning.

Bourgov's astragalus *(Atragalus bourgovii)* and **California sedge *(Carex californica)*** are IPNF Forest Species of Concern that occur near the boundary of the Resource Area in subalpine bald habitats. There are no activities planned in these habitats with this project. Unauthorized, off-road-vehicle travel may be a threat to documented occurrences.

Seeps, Springs and Moist to Wet Microsites

Giant helleborine *(Epipactis gigantea)*, or chatterbox orchid is a relatively large, perennial member of the orchid family that grows in moist areas along streambanks, lake margins, seeps and springs. This species occurs in open vegetation or in partially shaded sites, but usually is not a component of the understory in tall, dense riparian communities. The closest occurrence to the Resource Area is in Bonner County, Idaho. Potential habitat exists in the Resource Area, mainly along Placer Creek, West Fork Placer Creek, and seeps or springs that may occur as microsites within moist to wet forest. Because these habitats would be buffered from project-related activities, this species was not analyzed further.

Dry Forest Plant Guild

Dry Forest habitat occupies the smallest portion of the Resource Area (Table 3-TES-3) of any guild present. Some dry portions of the Resource Area that burned in previous wildfires do not represent suitable rare plant habitat due to the structural stage or dense shrubfield conditions.

Clustered lady's slipper orchid (*Cypripedium fasciculatum*), is found in portions of eight western states: California, Oregon, Washington, Idaho, Montana, Wyoming. Colorado, and Utah. Distribution is patchy throughout its range and populations tend to be small. In Idaho there are 116 documented Element Occurrences extending from Kootenai County, south to the South Fork of the Clearwater River. In Idaho the habitat preference includes both moist western red cedar/hemlock forest and dry Douglas-fir/grand fir. On the Coeur d'Alene portion of the IPNF, the habitat preference is primarily dry forests.

There are 17 element occurrences of clustered lady's-slipper orchid documented on the IPNF, 7 of which occur on the Coeur d'Alene River Ranger District. Of these, one occurrence is a historical population that has not been relocated since 1934 (ICDC 2002, PF Doc. TES-3). Another occurrence in the Coeur d'Alene subbasin is found on private land on the eastern shore of Coeur d'Alene Lake. The majority of occurrences in the subbasin are located in mid to late seral, Dry Forests, with a Douglas-fir/ ninebark habitat type. A few are found in Moist Forest Guilds in Western redcedar/ ginger and queen's cup beadlily habitat types. This species is not known to occur in the Resource Area, however it may be present based on habitat suitability. The closest EO to the Placer Creek Resource Area is approximately twenty miles west in the Alder Creek drainage.

Clustered lady's-slipper is a rhizomatous, perennial orchid. As in other members of the orchid family, this species requires a symbiotic relationship with fungi in the soil for reproduction and development. It reproduces mainly by seed, but also may increase to a limited extent by rhizome. Because of its dependency on fungal associates, reproduction is typically low. Clustered lady's-slipper requires shade, either from overstory trees and/or shrubs, and a level of duff or litter. The amount of shade and duff necessary to sustain the species has not been established, and probably varies depending on habitat type, and other site factors.

Bank monkeyflower (*Mimulus clivicola*) is a Forest Species of Concern (FSOC) with approximately 50 documented occurrences on the IPNF and 23 in the Coeur d'Alene subbasin. It is also identified as a Type 5 Watch Species by the BLM. Bank monkeyflower is a regional endemic of the Pacific Northwest that is distributed from northern Idaho and adjacent Washington, southward to the southern end of the Snake River Canyon (Lorain, 1990, PF Doc. TES-18, p. 4). The species is a small, herbaceous annual that occurs within a narrow set of environmental conditions. Plants are found almost exclusively on southern aspects with slopes of 60 percent or greater and seasonally moist, exposed, mineral soils. Bank monkeyflower most often occurs in openings in ponderosa pine, Douglas-fir or, occasionally, grand fir forest dominated by a grass or shrub understory. The elevation range at which the species is found varies from 2,200 to 4,900 feet. The closest occurrence to the Project Area is approximately two miles north in Revenue Gulch.

Moist and Wet Forest Plant Guilds

Moist and Wet Forest Plant Guilds were grouped for this analysis. Moist Forest Guild plant habitat occurs mainly on northeast and northwest slopes, and in drainage bottoms. Of the Moist Forest Sensitive plants, deerfern (*Blechnum spicant*) and Constance's bittercress (*Cardamine constancei*) are the most likely species to be affected by proposed activities based on the presence of suitable habitat and proximity of documented occurrences. Sensitive moonworts (*Botrychium spp.*), may occur in moist to wet habitats in the Resource Area primarily in riparian zones and near seeps or springs if present. Henderson's sedge (*Carex hendersonii*), a FSOC, may be found in similar habitats. The Wet Forest Sensitive Plant Guild occupies a trace amount of acreage in the Resource Area, and is restricted to stream bottoms. These areas have been subjected to considerable alteration from road building, logging and mining in the past. Bogs, springs, and seeps are uncommon in the Resource Area. Wet Forest Guild habitats would be protected by riparian buffers from timber harvesting as described under Methodology (Design Features); therefore, the likelihood is low that project related activities would affect plants of this guild.

Deerfern (*Blechnum spicant*) is a long-lived, evergreen, perennial fern favoring moist forest and riparian areas in cedar/hemlock forest. The distribution of deerfern is interruptedly circumboreal. It is found chiefly in the Cascade Mountains but has disjunct populations in Idaho and British Columbia. There are 27 occurrences of deerfern documented from the IPNF. Seven are known to occur on the Coeur d'Alene River Ranger District. An occurrence of deerfern is located approximately five miles north of the Resource Area in Twomile Creek.

Constance's bittercress (*Cardamine constanei*) is an Idaho endemic species that is most likely to occur in partly shaded riparian areas and moist cedar/hemlock forest at lower elevations (below 4,000 feet. There are three documented occurrences of Constance's bittercress in the Resource Area that are present in BLM units proposed for prescribed burning. Placer II, Units 2, 3, and 4 were burned in 1998. Monitoring plots set up in 1997 to monitor effects of burning on Constance's bittercress, have not been revisited. Noxious weed populations in Unit 2 were monitored and may be a threat to the bittercress occurrence.

Figure TES-1. Constance's bittercress (Cardamine constancei).

Henderson's sedge (*Carex hendersonii*) is a perennial forb of low elevation (less than 3,500 feet), moist forest habitats. The principal range of this species is west of the Cascade Mountains from southwestern British Columbia to northwestern California. It has a disjunctive distribution in northern Idaho, extending from the Selway River, north to the Coeur d'Alene subbasin. It is most often found on the IPNF in western redcedar/hemlock and grand fir forests, often near streams or seeps, and on moist benches upslope from streams.

There are 38 documented occurrences of Henderson's sedge on the IPNF and 32 in the Coeur d'Alene subbasin (ICDC 2002, PF Doc. TES-3). The nearest occurrence to the Placer Resource Area is located approximately seven miles north in Beaver Creek.

Lichthardt and Moseley, 1994 (PF Doc. TES-19, pp. 10, 11, and 23) suggest that there may be genetic differences between plants on mesic versus moist sites, making this an important consideration for population protection. Henderson's sedge is sometimes found associated with elk trails; ungulates or rodents may be important vectors for seed dispersal, since seed heads are commonly nipped off just below the flag leaf (Lichthardt and Moseley 1994, PF Doc. TES-19, p. 23). Stable source populations are thought to supply seed to replace ephemeral populations and individuals in surrounding, less optimal habitat (Pulliam 1988, PF Doc. TES-20).

Moonworts (*Botrychium ascendens, B. crenulatum, B. lanceolatum, B. lineare, B. minganense, B. montanum, B. paradoxum, B. pedunculosum, B. pinnatum, and B. simplex*) are fern-like plants that are found in a variety of habitats ranging from damp meadows and boggy areas to moist coniferous western hemlock and cedar forest (Lorain 1990, PF Doc. TES-21, p. 7). On the IPNF they occur most often on shallow sloped sites in densely shaded moist to wet forest habitats. There are approximately 75 occurrences of moonworts on the IPNF, and 28 on the Coeur d'Alene River Ranger District. No moonwort occurrences are documented from the Placer Resource Area, but they may occur there based on potential habitat. A documented occurrence of Mingan moonwort (*Botrychium minganense*) is approximately ten miles northeast in the Vendetta Creek drainage.

Slender moonwort (*Botrychium lineare)*, a Candidate species for Federal listing, and IPNF Sensitive species, is one of the more distinctive moonworts. The habitat has been described as "deep grass and forbs of meadows, under trees in woods, and on shelves on limestone cliffs, mainly at higher elevations" (Wagner and Wagner 1994, PF Doc. TES-35). However, a specific habitat description for this species is problematic because of its formerly widespread distribution ranging from sea level in Quebec to nearly 3,000 meters, 9.840 feet in Boulder, Colorado (USDI 2000, PF Doc. TES-22, p. 2). Although slender moonwort was previously documented from Oregon, Colorado, Idaho, Montana and California, only two populations in two states (Montana and Colorado) are thought to exist currently. The Idaho population, documented from Upper Priest River on the Idaho Panhandle National Forests was last observed in 1925, and has not been

relocated. There is a chance that slender moonwort may occur in the Resource Area, though rare plant surveys to date have not located any occurrences of this species.

Idaho barren strawberry (*Waldsteinia idahoensis*), a member of the rose family, is a strongly rhizomatous, herbaceous perennial. This species most commonly occurs in open, cool, moist forest sites, from toe to mid-slopes in grand fir, western redcedar, and subalpine fir zones. Idaho barren strawberry infrequently grows in poorly drained sites. Populations of Idaho barren strawberry have been found in previously harvested areas. The closest population is in Lost Creek, approximately 15 air miles north of the Resource Area.

Grassland Plant Guild

The Threatened plant **Spalding's catchfly (*Silene spaldingii*)** may occur in the Resource Area if suitable grassland habitat is present. Potential grassland habitat occupies approximately 250 acres, primarily on south to southwest facing slopes. Potential Spalding's catchfly habitat was identified using satellite imagery as a coarse filter approach to defining grassland and forb communities (Mousseaux 2000, PF Doc. TES-23). Aerial photography was also used to define suitable habitat.

Spalding's catchfly (*Silene spaldingii*) is a perennial herb endemic to the Palouse region of southeast Washington and adjacent Oregon and Idaho and is disjunct in northwest Montana (Lesica 1999, PF Doc. TES-24, P. 1). This species is suspected to occur on the IPNF. Field surveys of potential habitat that were completed for recent projects such as the Douglas-fir Bark Beetle FEIS (USDA 1999, PF Doc. 25), Small Sales FEIS (USDA 2000, PF Doc. TES-26), Iron Honey FEIS (USDA 2001, PF Doc. TES-27), and Deerfoot Ridge (USDA 2003, PF Doc. TES-13) have failed to detect any occurrences of this species.

Suitable habitat for Spalding's catchfly consists of grasslands dominated by native perennial grasses such as Idaho fescue (*Festuca idahoensis*), prairie junegrass *(Koeleria macrantha),* and rough fescue (*Festuca scabrella*), with associated species such as bluebunch wheatgrass (*Pseudoroegneria spicata*) snowberry (*Symphoricarpos albus*), ninebark (*Physocarpus malvaceus*) and Nootka rose (*Rosa nutkana*). Depending on soil moisture characteristics, some sites have few to no shrubs or trees present, whereas other sites may have scattered individual ponderosa pine or Douglas-fir (USFWS 2000, PF Doc. TES-28, p. 2). Spalding's catchfly sites range from 1,750 to 5,100 feet. Soils are generally moderately deep to deep. The closest documented occurrences to the project area are in Spokane County, Washington. Field surveys conducted in 2003 did not locate any occurrences or suitable habitat for this species in the Resource Area. Potential habitat was found to be of low suitability, mainly because of the presence of thin soils, surface rock, or dense shrubfields. Some areas were found to be noxious weed infested, which lowers habitat suitability, though does not preclude the possibility of the species occurrence.

4. Environmental Consequences to TES Plants

The following table summarizes the acres of potential rare plant habitat affected in each alternative. A complete list of Rare Plant Guild stands and units, by alternative, is located in the Project File (PF Doc. TES-34).

Table TES-3. Summary acres of potential rare plant habitat affected by proposed activities on lands in the National Forest System (NFS) and under Bureau of Land Management (BLM)*.

Rare Plant Guild	No-Action Alternative		Proposed Action Alternative	
	NFS	BLM	NFS	BLM
Moist/Wet Forest	0	0	367	228
Dry Forest	0	0	104	142
Alpine/Subalpine	0	0	596	106
Deciduous Riparian	0	0	0	0
Peatland	0	0	0	0
Grassland	0	0	229	155
Aquatic	0	0	0	0
Total Guild Acres	**0**	**0**	**1,296**	**631**

**Acreage figures were derived from Timber Stand Management Records System data and Satellite Imagery (SILC).*

A. Effects Under the No-Action Alternative

Direct and Indirect Effects under the No-Action Alternative

The No-Action Alternative would have no direct effect on any Threatened, Sensitive, Forest Species of Concern (FSOC) or Special Status Plant Species (SSPS). While there would be no direct impacts to these species with this alternative, there would also be no improvement made to vegetative and watershed conditions, which could in the long term provide suitable sensitive plant habitat.

Under No Action, there would be no restoration activities implemented to restore dry site ecosystems and reduce the risk of high severity, stand-replacing fires. In the future with no action, wildfires in the Resource area would likely be more widespread and of higher intensity. While there would be no direct effects to Threatened, Sensitive, SSPS, and FSOC occurrences and habitat under the No-Action Alternative, there would be a complex variety of indirect effects. In the long term, the dry forest and moist forest habitat guilds would be the most affected. The current vegetative condition is such that stand structure, function and species composition are outside the natural range of variability for the Coeur d'Alene River Basin (refer to the Specialist's Report on Forest Vegetation; PF Doc. SR-02).

The No-Action Alternative would not implement any management activities to trend the watershed toward the desired condition. Identified risks associated with certain roads, and road channel crossings would not be treated and hydrologic conditions would not be improved (see also Aquatic Resources, Chapter 3). Suitable rare plant habitat in riparian areas would not be restored or improved with this alternative, but would remain vulnerable to random catastrophic events such as flooding and landslides.

Indirect effects to Threatened, Sensitive, FSOC, and SSPS plant habitat and populations under Alternative 1 are likely for certain guilds and species. In stands with declining canopy cover due to mortality from insects and diseases, the likely effects to certain sensitive plant guilds and species present could range from a beneficial response, due to factors like increased levels of light and available moisture, a neutral response, species persist but there is no evident change in population levels, to an intolerant response because of factors like loss of shade and decrease in relative humidity.

Indirectly, there would be an increased risk to sensitive plants and habitat due to the gradual increase in fuel loads through time with continuing fire suppression. The greater the fuel loading, the greater the risk of a high intensity burn and stand replacing fire, with possible loss of rare plants and habitat. The increase in ignition risk and a resulting fire would also have an array of likely effects for sensitive plant species, ranging from beneficial to intolerant, depending on factors like the intensity of the fire, the species ability to survive the event, and compete in early successional habitat. The ability to analyze these effects for all sensitive plant species is limited given our current level of knowledge. The following section provides general information on how herbaceous plants respond to fire.

There is little specific information for the Coeur d'Alene River Basin on rare plant occurrence in pre-settlement times. Available information on shifts in forest stand structure and composition and disturbance patterns suggests that many changes have also taken place in understory shrub and forb communities and grasslands. Photo-comparison and fire history studies suggest that fire exclusion has allowed a greater portion of inland forests on the landscape to develop as dense stands (USDA 2000, PF Doc. TES-29, p. 116). The spatial arrangement of these stands may allow insects and disease epidemics and stand replacement fires to become larger than in the past. At the same time seral grassland species (shrubs, aspen, and seral conifers) are being replaced by thickets of shade-tolerant conifers. Due to excessive fuel loadings and fire suppression in much of the forest, when fires occur, they are likely to burn more intensely.

Fire behavior, duration, fuel consumption pattern, and the amount of subsurface heating all influence injury and mortality of plants, and their subsequent recovery. Post-fire responses also depend on the characteristics of the plant species on site, their susceptibility to fire and, and the means by which they recover after fire (USDA 2000, PF Doc. TES-29, p. 9).

A low severity fire (moderately burned, moderate duration, moderate ground char) that only consumes some of the surface fuels may kill laterally growing rhizomes or roots near the surface, or stem buds that are not well protected. It has little effect on buried plant parts and can stimulate significant amounts of post-fire sprouting. In contrast, a high severity fire (heavily burned, long duration, deep ground char) removes the duff layer and most of the woody debris, particularly rotten material. It can eliminate species with regenerative structures in the duff layer, or at the duff-mineral soil interface, and may lethally heat some plant parts in the upper soil layers, particularly where concentrations of heavy fuels or thick duff layers are consumed (PF Doc. TES-29, p. 20).

Whether herbaceous plants recover after fire depends largely on whether their regenerative structures are exposed to lethal temperature. Similar to woody plants, their survival depends on depth below the surface, whether they are located in combustible material, and the subsurface moisture regime at the time of the fire (USDA 2000, PF Doc. TES-29, p. 21). In addition, plants regenerate by a variety of means including vegetatively by means of resprouting or spreading with rhizomes, or by seed. Some plants have seed accumulate in the soil for long periods of time in the form of a "seed bank", which only germinates after a disturbance such as fire.

Cumulative Effects under the No-Action Alternative

Cumulative effects to individual species and guilds under the No-Action Alternative are described below. Refer to the EA (Appendix B) for a list of past, ongoing and reasonably foreseeable activities considered in this analysis.

Wet Forest Guild

Cumulative impacts to wet forest habitat would be low. The amount of wet forest guild habitat is very low in the Resource Area. Wet Forest Guild Habitat would be less prone to a stand replacing wildfire than drier habitat guilds. While there are ongoing and foreseeable activities that may be affecting wet habitats on private lands, the Forest Service has no authority over these activities.

Moist Forest Guild

Cumulative impacts to highly suitable moist forest habitat related to loss of canopy cover are predicted to be low where stands have been sufficiently opened to promote establishment of early seral understory vegetation. The likeliest cumulative impacts would be to those species with a broader habitat range (moonworts, round-leaved rein orchid, phantom orchid and clustered lady's slipper) which seem to require dense shade and/or soil mycorrhizae and which may not compete successfully with early seral forbs. Cumulative impacts to moist forest habitat where canopy cover has not been significantly reduced would be low.

Cumulative impacts resulting from recent insect and disease activity in moist forest habitat could include high-intensity, duff-replacing wildfires from predicted high fuel loading in untreated areas. Such a fire, if it were to occur, would be detrimental to obligate mycorrhizal species such as the moonworts, phantom orchid, clustered lady's slipper, and round-leaved rein orchid. Populations of these species could be destroyed if such a fire were intense enough to remove a significant amount of duff and organic material. The prospect of recolonization of affected habitat by any of these species would depend on the extent and duration of habitat alteration and the availability of an adjacent seed source. Cumulative impacts to these species related to stand-replacing wildfire would be predicted to be low to moderate.

Dry Forest and Grassland Guilds

Cumulative effects to dry forest and grassland guild species and habitat with Alternative 1 are expected to be low. Dry forest habitats would be inherently more at risk of stand replacing wildfire with fire suppression, and in the absence of harvest or fuels reduction treatments. Since dry forest species are adapted to habitats, which, historically, experienced a greater fire frequency, some would likely survive a stand replacing fire in scattered microsites. Successful recolonization for species after such disturbance events would likely be more difficult than it was historically due to fragmentation and overall habitat reduction.

B. Effects of the Proposed Action Alternative

Direct and Indirect Effects under the Proposed Action Alternative

Activities under the Proposed Action would directly affect moist forest, dry forest, and alpine/subalpine guild habitat. Effects to plant guilds due to specific treatments are described below under effects of project-related activities. Species for which information is available on response to management activities are displayed in the following section.

Cumulative Effects under the Proposed Action Alternative

The cumulative effects of the Proposed Action on Alpine/Subalpine, Moist/Wet, and Dry Forest Plant Guilds and species are discussed below. Refer to the EA (Appendix B) for a list of past, ongoing and reasonably foreseeable activities considered in this analysis.

Effects to Threatened and Endangered Plants

There would be no effect to any Endangered plant with implementation of activities under the Proposed Action Alternative.

There would be no effect to the Threatened aquatic species water howellia (*Howellia aquatilis*) as a result of activities under the Proposed Action because no suitable habitat exists in the Resource Area.

There would be no effect to the Threatened species Spalding's catchfly (*Silene spaldingii*) under the Proposed Action. Potential habitat for Spalding's catchfly is present in 384 acres proposed for prescribed burning; there is no potential habitat in units proposed for timber harvesting. No highly suitable habitat or occurrences have been found in areas previously surveyed in the Resource Area, or on the IPNF. Low suitability habitat has been confirmed. The possibility of Spalding's catchfly occurrence is very low. The dry grasslands and grassy openings in Douglas-fir/ponderosa pine habitat that may have been inhabited by this species historically were maintained by frequent, low-intensity fires. Studies of Spalding's catchfly by Lesica (PF Doc. TES-32) suggest that fire may contribute to maintenance of grassland habitats through removal of excess litter and creation of sites for seedling recruitment. Increased recruitment and plant vigor were observed following spring and fall burns on experimental plots in Montana. While weed invasion is a potential threat to grassland habitats, features of the proposed action would reduce the risk of weed invasion and spread. For further information on effects to Threatened plants, refer to the Biological Assessment in the Project Files (PF Doc. TES-39).

Effects to Sensitive Plants, Special Status Plants, and Forest Species of Concern

There would be no impact to rare plants of the Peatland, and Deciduous Riparian Guilds from implementation of the Proposed Action. There would be direct, indirect and cumulative effects to rare plants of the Wet, Moist, and Dry Forest and Alpine/Subalpine Guilds with project implementation. Much of what is known about the effects of activities on rare plants is anecdotal. Plants with specific effects information available are discussed below.

Deerfern *(Blechnum spicant)* may be directly affected by opening of the forest canopy and soil disturbance. A potential threat to the Idaho deerfern populations is loss of habitat, possibly through timber management e.g. overstory removal, broadcast burning and subsequent introduction of competitive early successional plant species (Merkel and Hammet 2003, PF Doc. TES-7). The effects of fire on deerfern populations and suitable habitat applies to prescribed fire as well, with effects dependent on the severity of fire, the response of competing vegetation and whether sufficient rhizomes survive to recolonize a particular site.

This species has been observed to survive harvesting in wet forest habitats, although its reproductive success may be affected. Long-term impacts to deerfern could occur in the event of a high severity fire. Deerfern is apparently able to survive light surface fires, and may recolonize by sprouting from rhizomes or by spores from adjacent populations. Its response to severe wildfire has not been documented. Fire intervals in the cool, wet forest habitats the species prefers are estimated to be several hundred years, so that large-scale fires

are usually catastrophic. Cumulative impacts on deerfern from a potential future wildfire would be difficult to predict.

Clustered lady's-slipper *(Cypripedium fasciculatum)* occurs in moist to dry forest habitats in the Coeur d'Alene basin. Natural or management-related disturbances that could affect soil fungi and overstory shade have the potential to impact clustered lady's-slipper survival. Disturbances of primary concern include fire, various types of timber harvest, thinning, and ground disturbance associated with these activities (Lichthardt 2003, PF Doc. TES-8, pp. 22-25). Observers generally agree that the rhizome of Clustered lady's-slipper is shallow (1-5 inches below the mineral soil surface) but differ as to how much protection this affords (Lichthardt 2003, PF Doc. TES-8, pp. 22-25).

Dry forest types historically experienced frequent low-intensity fires, so this species may be adapted at some level to fire regimes naturally occurring in these forest types. While clustered lady's-slipper may be able to survive low-intensity fires, high intensity fires that would remove canopy cover and eliminate or reduce the duff level may lead to mortality and an inability to reproduce (Lichthardt 2003, PF Doc. TES-8; and Kagan 1990, PF Doc. TES-30). This species has a shallow rhizome that is 1-5 inches below the mineral soil and can be killed by the direct effects of an intense fire (Lichthardt 2003, PF Doc. TES-8). Harrod et al, 1995, (PF Doc. TES-31, pp. 313-314) monitored clustered lady's-slipper on plots burned by the Rat Creek fire on the Wenatchee National Forest. There was a decrease in the number of plants where the duff layer was removed by the fire. There was an accompanying decrease in the percent cover of plants and the number of fruits per stem on the burned plot. Results of the study indicated that this species is fire-intolerant and should not be managed with prescribed fire. Clustered lady's slipper habitat may be impacted by project activities. Features of the proposed action designed to protect rare plants (Chapter 2) would ensure population and species viability would be maintained.

Constance's bittercress *(Cardamine constancei)* reacts favorably to openings in the forest canopy as long as the ground is not severely scarified by equipment (Crawford 1980, PF Doc. TES-10). It does not tend to flower under shaded conditions, but may be able to maintain itself indefinitely by vegetative growth as long as competitive pressures are not too great (Lichthardt and Moseley 1994, PF Doc. TES-19). Populations along the St. Joe and Selway rivers which were affected by crown fire have been observed to multiply vegetatively in response to increased sunlight, but successful flowering and seed set was low due to hot, dry conditions later in the summer. Indications are that survival of this species after canopy removal may be dependent on the availability of moist microsites. Proposed harvest treatments in the Action Alternative provide for the retention of live trees, snags and snag replacements in all activity units. These features would aid in maintaining moist microsites, however, to what degree, would vary by type of harvest treatment.

The Constance's bittercress metapopulation that is present in BLM burn Units Placer II 2, 3, and 4 is not likely to be impacted by prescribed burning. Spring burning would use low intensity fire to reduce small fuels and stimulate wildlife browse production. While a few individuals may be affected, this activity is not likely to reduce population viability. Monitoring for noxious weed infestation would be done following burning and weed treatment would be implemented as necessary to protect the occurrences.

Bank monkey-flower *(Mimulus clivicola)*, a dry forest guild species, may occur in dry, open forest habitats in the project area. It favors steeply sloping (greater than 60%), southeast to southwest aspects with a thin soil layer. These habitats historically have had a higher frequency of non-stand replacing fires, than the moist and wet habitats. Low intensity fire is not likely to directly affect bank monkeyflower. Lorain, 1990 (PF Doc. TES-18, p. 4) concluded that this species is tolerant of certain management actions and moderate disturbance based on the fact that much of the habitat with areas of exposed mineral soil and recently discovered bank monkeyflower populations are growing on naturally or unnaturally disturbed soils. This annual plant's reliance on a soil seed bank for reproduction contributes to its ability to survive low intensity fire and other disturbances.

Henderson's sedge *(Carex hendersonii)* may be present in moist to wet to moist forest guild habitats. These habitats burned with stand replacing and mixed-severity fires on a longer fire return interval than in dry forest habitats. In the Resource Area, Henderson's sedge may occur in the lower elevations along streams and in seepy areas, extending into upland, moist forests. This species ability to survive a high severity fire would

depend on the amount and distribution of "refugia" where individuals could survive and recolonize suitable habitat.

Lichthardt and Moseley, 1994, (PF Doc. TES-19, p. 23) considered stable valley-bottom, or "source" populations, to be important as a seed source to replace ephemeral populations and individuals in less optimal surrounding habitats. Little information is available on the response of Henderson's sedge to burning. Some research has been done on this species response to fire under managed conditions. Five years of monitoring Henderson's sedge on the Clearwater National Forest (Lichthardt 1998, PF Doc. TES-9, pp. 10-11) indicate that on logged and burned plots, Henderson's sedge may be negatively affected by management activities during the first year, but can recover in numbers of plants and reproductive ability over a period of time.

Idaho barren strawberry *(Waldsteinia idahoensis)* may be present in the Resource Area in moist forest habitats. Crawford (PF Doc. TES-10) found that Idaho barren strawberry increased in abundance after canopy removal with timber harvesting. He also observed that fire seems to reduce competition and open sites for invasion by this species. This species has been seen existing (though not thriving) in recent regeneration harvest units on the Coeur d'Alene River Ranger District. Idaho barren strawberry would not be negatively impacted by activities under the Proposed Action, and may even increase with moderate canopy removal and low intensity burning.

Effects of Project-Related Activities

Timber Harvesting: Direct impacts of timber harvest can include elimination of individual plants through ground disturbance. Indirect impacts to sensitive plants can include changes in fuel loading, duff levels, moisture regime, and light levels. Effects to plant habitat can result in decreased suitability for colonization and spread of plant populations. The effects to sensitive plants would vary according to species and harvest prescription. Most timber harvest would take place in moist forest habitats, so most of the effects would be confined to moist forest guild species. Fewer acres of dry and wet, in comparison to alpine/subalpine and moist forest guild habitat, would be potentially impacted by harvest under the Proposed Action. Since Riparian Habitat Conservation Area guidelines would be followed for all action alternatives, most wet forest habitat would be excluded from harvest activities. Road construction activities could potentially impact wet forest habitat. Table TES-4 displays the acres of suitable sensitive plant habitat potentially affected by timber harvest.

The effects of timber harvesting on deerfern are not yet fully understood. Merkel and Hammet (PF Doc. TES-7) noted that deerfern populations in Washington State have withstood timber harvest and related treatment. Although populations studied in Idaho have been found to be genetically and phenologically similar to plants studied on the west coast, disjunct and peripheral populations may behave differently.

Commercial Thinning: Selective harvesting would take place under the Proposed Action. The effects of selective harvest would be similar to the effects of mortality induced by insect and disease agents, as under the No-Action Alternative. The main difference would be the change in fuel loadings in untreated stands and resulting increased risk to sensitive plants from future stand-replacing wildfires. There would be some direct effects from selective harvest in suitable habitats for sensitive plants of the alpine/subalpine, moist, dry, and wet guilds, especially those that are intolerant of changes in the moisture and light regime (i.e. mycotrophic species, moonworts and orchids). The other species are not likely to be adversely affected by selective harvest treatment. Commercial thinning of larch is proposed. Commercial thinning, as an intermediate harvest method, is similar to selective harvest in the amount of tree canopy cover removed, but it differs in that it would result in a more uniform spacing of trees than with selective harvest. The effects of commercial thinning on sensitive plants would generally be the same as selective harvest.

Regeneration Harvest: Regeneration harvest is proposed, which would remove approximately 80 percent of the overstory canopy. Live green trees as well as dead and dying trees would be cut in order to provide conditions suitable for reforestation with long-lived seral tree species. Fuels treatment would occur in most regeneration units, consisting of slashing, underburning, or machine piling and burning. Regeneration harvest would directly affect moist, dry, and only slightly wet guild sensitive plant habitat. The limited data and observations available indicate that most species in these Rare Plant Guilds are intolerant of major canopy removal. Bank monkey flower, while not likely to be affected by an increase in sunlight due to

canopy removal, could be impacted by excessive ground disturbance. Mycotrophic species such as moonworts and sensitive orchids are very vulnerable to regeneration harvest. The most detrimental sort of regeneration harvest treatment appears to be with ground based equipment, followed by a hot burn, which consumes a lot of the organic matter on the site, or with mechanical fuels treatment. The least detrimental would be that in which top attached yarding was used as the fuels treatment, though the potential for impacts due to alteration of the moisture regime would still be high.

Yarding System Methods: The yarding methods proposed for the action Alternative consist of helicopter, skyline, forwarder, and tractor yarding. Helicopter yarding would have an insignificant effect on sensitive plants and habitat because there would be little or no ground disturbance. Some damage to the live crowns of leave trees would be expected, but it would be minimal. The effects of skyline yarding would be intermediate between helicopter and tractor yarding. Skyline would necessitate construction of corridors for yarding purposes in which long narrow canopy openings would be created. Some ground disturbance would result from the yarding process. Tractor yarding would cause the most detrimental and long lasting impacts to the sensitive plant habitat, but it would be confined to designated skid trails. Here, compaction and soil displacement would be the primary negative effects because they operate on a slash mat and cause less ground disturbance. The effects of forwarder yarding would be similar, but somewhat less than those of tractor. In all alternatives, Forest Plan Standards and Guidelines would be met for woody debris retention on site and minimizing soil displacement and compaction.

New Road Construction, Road Reconstruction, and Reconditioning: New temporary road construction, road reconstruction and road reconditioning would occur under the Proposed Action. These activities vary in the potential for effects to plant guild habitats and species. New road construction is a high ground disturbance activity, constituting a high risk to sensitive species in these guilds. In contrast, road reconstruction and reconditioning are low risk activities in terms of direct or indirect effects to sensitive plants and habitat. For these activities, existing road prisms would be treated which are already disturbed and of very low habitat suitability. While there are a few sensitive plant occurrences on the IPNF on old roads or cutbanks they are, in general, individuals isolated from the main occurrence.

Fuels Treatment: Various methods of fuels reduction are proposed under the action alternative, all having the potential to directly and indirectly impact sensitive plants and habitat. Slashing and lop and scatter fuels treatments would have a negligible effect on sensitive plant species. Underburning for fuels reduction would be done within harvest unit boundaries only. Spring burning has the potential to impact rare plant individuals, particularly clustered lady's slipper, bank monkeyflower, and moonwort species. Specific design features (described under Methodology) would protect populations and highly suitable habitat that may be discovered during field surveys prior to project implementation. There would be a risk of increasing certain noxious weed species with burning, depending on the proximity to existing infestations and the cover type of the area treated (refer to the Specialist's Report on Noxious Weeds, PF Doc. SR-04). There would be no underburning within designated Riparian Habitat Conservation Areas, effectively buffering riparian wet forest habitats from this type of activity. Impacts to moist forest habitat would be very low. Regeneration units would generally have control lines constructed to contain prescribed fire (refer to the Specialist's Report on Fire/Fuels; PF Doc. SR-01). Fire line construction has the potential to impact sensitive plants and habitat through vegetation and ground disturbance. Use of the slash buster, wherein woody fuels would be chipped and left on site, would detrimentally impact sensitive plant habitat. The mulching effect of wood chips would inhibit understory regeneration for a period of time, until decomposition was completed. Design features (described under Methodology) would protect documented populations and new ones discovered prior to implementation.

Weed Treatment and Prevention: Noxious weed treatment and prevention would be performed according to guidelines outlined in the Coeur d'Alene River Ranger District Noxious Weed Final Environmental Impact Statement and Record of Decision (USDA Forest Service, 2000, PF Doc. TES-33). As described in this document, integrated weed control methods would be used, including herbicide spraying, manual, cultural (seeding/fertilizing) and biological. Weed treatment and prevention measures would reduce, but not eliminate the risk of weed spread in the project area. Effects to Threatened, Sensitive plants and Forest Species of

Concern (FSOC) would be very low because of mitigation measures to protect these species as outlined in the Noxious Weeds FEIS (PF Doc. NW-2).

Tree Planting: Tree planting would result in a minor amount of soil disturbance with hand tools. The risk of incidental effects to sensitive plants from this activity are predicted to be very low.

Cumulative Effects under the Proposed Action Alternative

There is little existing information regarding documented rare plant occurrence or habitats in the Placer Resource Area. Prior to 1988 the USFS did not conduct rare plant surveys, and occurrence reports to the Idaho Conservation Data Center were incidental (IPNF 2003; TES-17). Past activities on Federal lands prior to policies affording protection of rare plants, have affected populations and habitat of sensitive plant species. Current activities proposed on Federal lands are required by law and policy to address sensitive plant species. Populations, when found, are managed for. Activities on State and private lands are not required to protect these species; therefore, loss of populations and modification of habitat is likely occurring.

In the long term, project activities would trend watershed and vegetative conditions toward the desired future condition. While there would be direct and indirect effects to rare plant habitat, potentially suitable habitat for rare plants would gradually be improved. Considering these factors and the design features for TES plants outlined in the EA (Part 3), and the Cumulative effects of the proposed action on rare plant guild species and habitats, overall, would be low.

Ongoing and Reasonably Foreseeable Activities

Implementation of ongoing or reasonably foreseeable projects on National Forest System lands would contribute insignificant impacts to sensitive plants or suitable habitat.

Road channel crossing removal would have effects mainly to moist and wet forest habitat and is considered to be a low to moderate risk activity for sensitive plants, depending on the amount of ground disturbance. Road channel crossing upgrades that would be done during reconstruction are considered to be lower risk activities to sensitive plants. In-stream channel work would constitute a short-term risk to sensitive plant habitat, but would have long term benefits because channel stability and riparian community habitat would be improved. Moist and wet forest guild species would be protected according to the design features for TES plants (described under Methodology).

While individuals of some sensitive plants may occasionally be impacted, cumulative impacts to species and habitats are expected to be low. Ongoing and reasonably foreseeable projects in the cumulative effects analysis area are identified in the EA (Appendix B).

C. Determination of Effects for Rare Plant Species

Based on the above analysis, and with the provisions for surveys and protection of rare plant populations (Features Designed to Protect Rare Plants, EA, Part 3), the following table represents the determination of effects to plants for each alternative. A description of habitat guilds and list of rare plant species is included in the Project Files (PF Doc. TES-5).

Table TES-4. Summary of determination of effects on rare plant species, by guild, for each alternative.

Species Guild	Alt. 1	Alt. 2
Moist/Wet Forest	NI	MIIH
Dry Forest	NI	MIIH
Alpine/Subalpine	NI	MIIH
Deciduous Riparian	NI	NI
Peatland	NI	NI
Grassland	NE	NE
Aquatic	NE	NE

NI = No Impact
MIIH = May Impact Individuals or Habitat with no trend to federal listing or loss of species or population viability
WIIH = Will Impact Individuals or Habitat with a likely trend to federal listing and/or loss of population or species viability
BI = Beneficial Impact
NE = No Effect

5. Consistency with Forest Policy and Legal Mandates

All of the proposed activities with the requirements for surveys and implementation of design features would meet the intent of the Forest Plan. The No Action Alternative would also meet the intent of the Forest Plan.

A Forest Plan management goal is to "manage habitat to maintain populations of identified sensitive species of animals and plants" (Forest Plan, II-1, PF Doc. TES-2).

A Forest Plan standard for sensitive species is to "manage the habitat of species listed in the Regional Sensitive Species List to prevent further declines in populations which could lead to Federal listing under the Endangered Species Act" (Forest Plan, II-28, PF Doc. TES-2).

Analysis included distribution of habitat for rare plants, including Region 1 Forest Service Sensitive plants, Forest Species of Concern, and Threatened plants. The Idaho Conservation Data Center was consulted for information on rare plant occurrence in the State. Alternative design considered the documented occurrence of rare plant species in the Resource Area, and the potential effects of proposed activities. Rare plant surveys would be conducted prior to project implementation in all areas of suitable habitat where activities would occur (EA, Part 3). Documentation of field surveys for rare plants are included in the Project File (PF Doc. TES-16).

The Forest Plan also identifies the need to "Determine the status and distribution of Threatened, Endangered and Rare (sensitive) plants on the IPNF" (Forest Plan, II-18, PF Doc. TES-2).

Three species of Threatened plants are listed by the USFWS for the Coeur d'Alene River Ranger District (USDI 2003; PF Doc. TES-11). Although there is potentially suitable habitat, no Threatened species have been discovered on Forest Service lands. There are no Endangered plant species currently listed for the IPNF or Coeur d'Alene River Ranger District. All projects on the Coeur d'Alene River Ranger District are analyzed for effects to Threatened plant species. Potentially suitable habitat is surveyed prior to project implementation. Projects that may have effects to Threatened plants are consulted on with the U.S. Fish and Wildlife Service according to Section 7 Guidelines under the Endangered Species Act, 1999.

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TES APPENDIX A
RARE PLANT SPECIES

Table TES-A-1. Forest Service Threatened, Endangered and Sensitive Plants for the Coeur d'Alene River Ranger District, by Rare Plant Habitat Guild (October 2004)**

Status and Species	Common Name	Habitat Guild
Threatened		
Howellia aquatilis	water howellia	Aquatic
Silene spaldingii	Spalding's catchfly	Dry grassland/grassy openings in Dry Forest
Sensitive		
Asplenium trichomanes	maidenhair spleenwort	rock seeps in Moist/Wet Forest
Blechnum spicant *	deerfern	Moist/Wet Forest
Botrychium ascendens *	upswept moonwort	Wet Forest
Botrychium crenulatum *	dainty moonwort	Wet Forest
Botrychium lanceolatum *	triangle moonwort	Wet Forest/Moist Forest
Botrychium lineare	Slender moonwort	Moist Forest
Botrychium minganense *	Mingan moonwort	Wet Forest/Moist Forest
Botrychium montanum	western goblin	Wet Forest
Botrychium paradoxum	paradox moonwort	Wet Forest/Moist Forest
*Botrychium pendunculosum**	stalked moonwort	Wet Forest
Botrychium pinnatum *	northwestern moonwort	Wet Forest/Moist Forest
Botrychium simplex	least moonwort	Wet Forest/Moist Forest
Buxbaumia aphylla	leafless bug-on-a-stick moss	Subalpine
Buxbaumia viridis *	green bug-on-a-stick moss	Wet Forest
Cardamine constancei *	Constance's bittercress	Deciduous Riparian/Moist/Wet Forest
Carex chordorrhiza	string-root sedge	Peatland
Carex livida	livid sedge	Peatland
Cetraria subalpina	iceland-moss lichen	Subalpine
Cypripedium fasciculatum *	clustered lady's slipper	Moist/Wet/Dry Forest
Grimmia brittoniae	Britton's Grimmia	Rock cliffs in Moist Forest
Hookeria lucens	clear moss	Wet Forest
Hypericum majus *	large Canadian St. John's wort	Peatland
Mimulus alsinoides	chickweed monkeyflower	rock cliffs/seeps in Wet/Moist/Dry Forest
Rhynchospora alba	white beakrush	Peatlands
Scheuchzeria palustris *	pod grass	Peatlands
Schoenoplectus subterminalis	water clubrush	Peatlands
Thelypteris nevadensis	Sierra woodfern	Wet Forest Seeps
Waldsteinia idahoenesis *	Idaho barren strawberry	Moist and Wet Forest

**Species with documented occurrences in the Coeur d'Alene sub-basin, includes Forest Service and other ownership.*

*** Based on the Regional Forester's TES species list, October 2004.*

Bureau of Land Management Plant Special Status Species Protocol

Type 1. Threatened, Endangered, Proposed and Candidate Species

These species are listed by theFWS as threatened or endangered, or they are proposed or candidates for listing under the Endangered Species Act.

Type 2. Rangewide / Globally Imperiled Species - High Endangerment

These are species that have a high likelihood of being listed in the foreseeable future due to their global rarity and significant endangerment factors.

Species ranked by the CDC Network with global ratings of G1-G3 or T1-T3 with a threat priority of 1-9 using the FWS Listing Priority Criteria (Table 2).

Type 3. Rangewide / Globally Imperiled Species - Moderate Endangerment

These are species that are globally rare with moderate endangerment factors. Their global rarity and inherent risks associated with rarity make them imperiled species.

Idaho BLM sensitive species that (a) are ranked by the CDC Network with global ratings of G1-G3 or T1-T3 with (a) a threat priority of 10-12 using the FWS Listing Priority Criteria or (b) an INPS ranking of Priority 1-2 or Sensitive (INPS sensitive species with the majority of the population on BLM-administered lands).

Type 4. Species of Concern

These are species that are generally rare in Idaho with small populations or localized distribution and currently have low threat levels. However, due to the small populations and habitat area, certain future land uses in close proximity could significantly jeopardized these species.

INPS sensitive species that are not Type 3.

Type 5. Watch List

Watch list species are not considered BLM sensitive species and associated sensitive species policy guidance does not apply. Watch list species include species that may be added to the sensitive species list depending on new information concerning threats and species biology or statewide trends.

This includes (a) INPS Monitor and Review species and (b) INPS Sensitive species (Types 2, 3, or 4) that are only suspected to occur in a resource area.

Table TES-A-2. Threatened and endangered species listing priority criteria used by the US Fish and Wildlife Service.

Listing Priority	Taxonomic Status	Extinction Threats	
		Magnitude	Immediacy
1	Monotypic genus	HIGH	Imminent
2	Species		
3	Subspecies/Variety		
4	Monotypic genus		Non-imminent
5	Species		
6	Subspecies/Variety		
7	Monotypic genus	LOW	Imminent
8	Species		
9	Subspecies/Variety		
10	Monotypic genus		Non-imminent
11	Species		
12	Subspecies/Variety		

Specialist's Report on Noxious Weeds in the Placer Resource Area

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January 2006

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SPECIALIST'S REPORT ON NOXIOUS WEEDS IN THE PLACER RESOURCE AREA

1. Regulatory Framework for Noxious Weeds

Federal legislation, regulations, policy and direction that require development and coordination of programs for the control of noxious weeds, and evaluation of noxious weeds in the planning process include: The National Forest Management Act (1976); the National Environmental Policy Act (1969); Forest Service Manual (Chapter 2080, as amended, 1995 (FSM 2000; PF Doc. NW-22) ; Executive Order #13112 (February 1999); Idaho Panhandle National Forests, Forest Plan (1987); and the Idaho Panhandle National Forests Weed Pest Management EIS (1989).

Noxious weed management direction for the Bureau of Land Management is provided through the Federal Land Policy Management Act, 1976, (43 U.S.C. 1701-1712), BLM Manual 9015, Integrated Weed Management, The Emerald Empire Management Framework Plan (1981), and statewide guidance.

The Forest Service Handbook (FSH 3409; PF Doc. NW-4), on Forest Pest Management defines a strategy for managing pests, including noxious weeds, as "A decision-making and action process incorporating biological, economic, and environmental evaluation of pest-host systems to manage pest populations". (FSH 3409.11 6/86; PF Doc. NW-4) This strategy is termed Integrated Pest Management (IPM). The Forest Plan provides the following direction for implementing an Integrated Pest Management program: "Noxious weed control will be based on an integrated pest management approach, which includes but is not limited to the current practices of inventory, monitoring, some hand-pulling, and some biological control. Noxious weed control will be conducted in cooperation with counties, other agencies, and private landowners." The overall IPNF strategy is to contain weeds in currently infested areas and to prevent the spread of weeds to susceptible but generally un-infested areas. The noxious weeds management strategy for the Coeur d'Alene River Ranger District was outlined in the "Noxious Weeds Final Environmental Impact Statement" (IPNF, 2000; PF Doc. NW-2). It follows the general IPNF strategy. All weed treatments conducted on the Coeur d'Alene River Ranger District are conducted according to the guidelines contained in the EIS. Some additional key objectives of this strategy include:

- *Protect the natural condition and biodiversity of the Coeur d'Alene River Basin ecosystem by preventing or limiting the spread of aggressive, non-native plant species that displace native vegetation.*
- *Eliminate new invaders before they become established.*
- *Protect sensitive and unique habitats.*
- *Reduce weed sources at potential dispersion sites, such as recreation sites, trail heads, and dispersed campsites, and along main travel routes (roads and trails).*
- *Comply with Federal and State laws regulating management of noxious weeds.*

Noxious weeds are those plant species that have been officially designated as such by Federal, State, or County officials. In *Weeds of the West* (Whitson et al. 1992; PF Doc. NW-3), a weed is defined as "a plant that interferes with management objectives for a given area of land at a given point in time." The Federal Noxious Weed Act of 1974 defines a noxious weed as "a plant which is of foreign origin, is new to, or is not widely prevalent in the United States, and can directly or indirectly injure crops or other useful plants, livestock or the fish and wildlife resources of the United States or the public health" (P.L. 93-629; PF Doc. NW-4).

The Idaho Noxious Weed Law defines a "noxious weed" as any exotic plant species established or that may be

introduced in the State which may render land unsuitable for agriculture, forestry, livestock, wildlife, or other beneficial uses and is further designated as either a State-wide or County-wide noxious weed (Idaho Code 24 Chapter 22; PF Doc. NW-5). Both Federal and State laws define noxious weeds primarily in terms of interference with commodity uses of the land. However, the impacts of noxious weeds on non-commodity resources such as water quality, wildlife and natural diversity are of increasing concern.

2. Methodology for the Noxious Weeds Analysis

Analysis was conducted using results of past noxious weed surveys, documented distribution of weed species in habitats similar to those found in the proposed treatment sites, types of proposed treatments and the risk of weed spread and introduction of new weed invaders from the proposed activity, based on current knowledge and professional judgment.

Design features of the Proposed Action include a noxious weed treatment program focused on limiting the spread of noxious weeds following timber harvest and prescribed burning activities. All roads used in implementation of project activities would be treated for noxious weeds both before and after use. Noxious weed prevention strategies on the Coeur d'Alene River Ranger District are conducted based on the Noxious Weeds Final Environmental Impact Statement and Record of Decision (USDA Forest Service, 1998; PF Doc. NW-02), which identified known infestation sites and established priorities for treatment. Measures to protect Threatened, Endangered, and Sensitive plant habitat capability and population viability would be implemented during noxious weed treatment, following the guidelines provided in that document. To help reduce the spread of noxious weeds and prevent the introduction of new invader species, a clause related to equipment washing would be included in all construction and timber sale contracts.

Indicators used to measure impacts on weed spread and introduction include the number of acres proposed for ground-based timber harvest and/or fuels treatment, the number of miles of proposed new road construction and reconstruction, and the proximity of proposed treatment areas to known weed infestations.

3. Affected Environment for Noxious Weeds

A. Characterization

The recent scientific assessment of the Interior Columbia Basin found that herbaceous and shrub wetland vegetation types in the Upper Columbia River Basin (including riparian habitats) have declined in area from historical conditions, in part due to invasion by certain noxious weed species (Quigley and Arbelbide 1997; PF Doc. NW-6). Wetland habitat in the analysis areas is also vulnerable to decline from encroaching weeds. Rangelands and dry forest types within the analysis areas and surrounding region were described in the above assessment as having low ecological integrity, again in part due to noxious weed invasions (Quigley, Haynes et al. 1996; PF Doc. NW-7).

The spread of noxious weeds can primarily be attributed to human-caused dispersal such as vehicles and roads (Roche and Roche 1991; PF Doc. NW-8), contaminated livestock feed, contaminated seed, and ineffective revegetation practices on disturbed lands (Callihan et al. 199; PF Doc. NW-9). Vallentine (1988; PF Doc. NW-10) explains that some of the worst noxious plant problems are caused by weed species such as leafy spurge, Canada thistle, the knapweeds, and Dalmatian toadflax. The introduction of these and other noxious weeds has occurred throughout the Coeur d'Alene River Basin, especially in urban and agricultural areas, along major highways and travel routes, and areas within the forest that have experienced disturbance from intense recreation, roading, and timber harvest (USDA Forest Service, Toward An Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin, February, 1998, pages 39-40; PF Doc. NW-11). Non-native species can impact the native flora and reduce native biodiversity, especially in diverse habitats like riparian zones, sensitive communities like wetlands, or inherently rare communities like subalpine balds, fens and seeps.

Roads and trails serve as corridors for the dispersal of many noxious weed species. Vehicles, people, wildlife and livestock inadvertently spread noxious weed seeds and plant parts along road systems, allowing the establishment of noxious weeds into previously uninfested areas. Improved roads can act as conduits for the

invasion of adjacent ecosystems by converting natural habitats to those highly vulnerable to invasion (Gelbard and Belnap, 2003; NW-12) Many of the road systems within the project area contain infestations of noxious weed species such as spotted knapweed, toadflax, and St. Johns wort.

In disturbed forested habitats, most weed species tend to proliferate in early successional stages and are reduced in density as canopy cover closes (Zack 1999; PF Doc. NW-13). However, in the interim, these transitory populations serve as seed sources for continued species expansion. Some species, such as spotted knapweed, produce large quantities of seed, which may remain dormant in the soil for many years until disturbance from fire, timber harvest or other disturbance provides favorable conditions for their germination and growth.

B. Existing Noxious Weeds Condition

A limited program of noxious weed treatment has been ongoing on the Coeur d'Alene River Ranger District since 1989. Until 1996, weed surveys were limited on the Coeur d' Alene River Ranger District. In 1996, noxious weed surveys were conducted at 76 sites. Over 1,800 acres of potential habitat for infestation were documented for these sites, with an estimated 822 acres of actual infestation (IPNF 2000; PF Doc. NW-2). The major noxious weed species and weeds of concern identified include:

- meadow hawkweed (*Hieraceum pratense*)
- spotted knapweed (*Centaurea biebersteinii*)
- orange hawkweed (*Hieraceum aurantiacum*)
- dalmatian toadflax (*Linaria genistifolia* ssp. *dalmatica*)
- Canada thistle (*Cirsium arvense*)
- St. Johnswort (*Hypericum perforatum*)
- yellow toadflax (*Linaria vulgaris*)
- oxeye daisy (*Leucanthemum vulgare*)
- common tansy (*Tanacetum vulgare*)
- Viper's bugloss (*Echium vulgare*)

All of the above listed species are documented from, or are suspected to occur in the Placer Creek Resource Area. Other species that would be considered for treatment if found to be present include leafy spurge (*Euphorbia esula*), hound's-tongue (*Cynoglossum officinale*), rush skeletonweed (*Chondrilla juncea*), sulfur cinquefoil (*Potentilla recta*), purple loosestrife (*Lythrum salicaria*), bull thistle (*Cirsium vulgare*), yellow star thistle (*Centaurea solstitialis*), musk thistle (*Carduus nutans*), and diffuse knapweed (*Centaurea diffusa*).

Inventories for noxious weeds were done in 1998 on BLM lands proposed for prescribed burning in the Resource Area (PF Doc. TES-21). Weed infestation data was collected during the course of road and rare plant inventories on Forest Service lands in 2003, and has been used in prioritizing proposed weed treatments. This information is contained in the rare plant survey documentation in the project file (PF Doc. TES-16). Spotted knapweed (*Centaurea biebersteinii*), meadow hawkweed (*Hieraceum pratense*), St. Johnswort (*Hypericum perforatum*), and Canada thistle *(Cirsium arvense)* are the most common weeds identified during the course of field surveys.

Vegetative communities within the Coeur d'Alene subbasin vary from dry and semi-dry to moist forest habitats and wetlands. A description of these communities and their susceptibility to weed invasions can be found in the project file in PF Doc. NW-14. The suitability of a site to weed invasion depends on the weed species, climatic factors that are expressed in the cover vegetation type, and the type of activity, when applicable. Table 1 of PF Doc. NW-14 has been adapted from the scientific assessment of the Interior Columbia Basin, and displays susceptibility of the Resource Area's major vegetative community types to invasion by several weed species of concern.

Dry community types are highly susceptible to weed invasion from such species as spotted knapweed, Dalmatian toadflax, and St. Johns wort (PF Doc. NW-14). These species are currently infesting many sites in the Resource Area. A high percentage of forest cover types in the Placer Creek area are of the weed-susceptible Douglas-fir, and ponderosa pine/larch types.

The diverse habitats and shifting dynamics of riparian zones make them uniquely susceptible to weed invasions. The richest plant communities along a river system are the most vulnerable to invasion (Planty-Tabbacchi et al. 1996; PF Doc. NW-15). Research has shown that the number of native species, as well as their total biomass, would decrease within locations infested by noxious weeds. Orange and meadow hawkweed, knapweed, blueweed, purple loosestrife, and common tansy are common riparian area invaders in the subbasin. Weeds have been brought into these areas by vehicle travel on roads. Drainages provide a means of dispersing weed seeds for long distances. Most of the listed Sensitive plants for the Coeur d'Alene River Ranger District are associated with moist to wet forests, and are at risk of losing suitable habitat due to weed invasion in these areas.

Certain cover types have a high degree of vulnerability to invasion by several weed species. A "high" risk rating indicates that a particular weed can successfully establish and become dominant in a cover type in the absence of intense or frequent disturbance. Weed species considered *invaders* in some of the forest cover types found in the Resource Area include spotted knapweed, diffuse knapweed, bull thistle, Canada thistle and sulfur cinquefoil.

Other weed species are considered *colonizers*, able to invade and establish in certain cover types after soil disturbance or canopy removal. Insect and root disease affected forest cover types within the Resource Area fall into this "moderate susceptibility" category for many weed species of concern, including oxeye daisy, Dalmatian toadflax, orange and meadow hawkweeds, leafy spurge and yellow star thistle.

Based on the information regarding susceptibility of broad scale cover types, the table below represents the amount of habitat vulnerable to invasion by one or more weed species. Acres displayed for the No-Action Alternative are the forest cover types existing on National Forest System lands in the Resource Area. Acres for the Proposed Action represent the change in cover types predicted to result from proposed activities.

Table NW-1. Changes in percent susceptible vegetative cover types, by alternative*.

Forest Cover Type	No Action	Proposed Action
Interior Douglas-fir and grand fir	40	39
White pine/Western larch	14	19
Lodgepole pine	15	13
Subalpine fir, Mountain hemlock and others	31	29

**Figures represent federally managed (National Forest System and Bureau of Land Management) lands in the Resource Area.*

4. Environmental Consequences to Noxious Weeds

A. Effects to Noxious Weeds Under the No-Action Alternative

Direct and Indirect Effects to Noxious Weeds Under No Action: Under the No-Action Alternative, there would be a natural reduction in forest canopy cover due to forest insect and disease induced mortality. Canopy loss would make conditions in the dry Douglas-fir and ponderosa pine/larch cover types more suitable to certain common weed species such as St. Johns wort, thistles, toadflax, and spotted knapweed. Where these species are already established in affected areas, they would likely increase. However, these effects would be limited because of the lack of ground disturbance occurring with this natural event. The direct effect of the loss of canopy and resulting indirect effect of increased light and a warmer, drier micro-environment, would be most pronounced on dry, Douglas-fir, ponderosa pine/larch habitat types. There would be little direct, indirect, or cumulative effect to moist forest and riparian habitats. In habitats with a developed shrub layer, the shrub cover would increase, limiting the risk of weed encroachment. Douglas-fir cover types with grass/forb understories would be affected to a greater degree by invading weeds. Indirectly, the lack of fuels treatment under the No-Action Alternative would, over time, increase the risk of high severity fire in the event of a

wildfire. High severity burned areas have more exposed mineral soil that would be susceptible to weed invasion.

Cumulative Effects to Noxious Weeds Under the No-Action Alternative: Cumulatively, areas where continued tree mortality results in substantial canopy loss would be at greater risk of weed spread, particularly in dry habitats which are already open to semi-open and dominated by grass-forb understories. Stands with higher rates of fuels accumulation would be at increased risk of a severe wildfire, exposure of mineral soils and increased risk of weed spread. The cumulative effects of the No-Action Alternative are expected to be low.

B. Effects to Noxious Weeds Under the Proposed Action Alternative

Areas of soil disturbance in susceptible habitats are at risk for weed invasion, particularly when ground-disturbing activities occur near existing infestations. Dry forest types in the Placer Resource Area are at risk of weed invasion and spread as displayed in Table NW-1. Different management activities vary in the level of risk for weed invasion on affected sites. There would be little direct effect to noxious weeds due to activities; most effects would be indirect or cumulative in nature. Features designed to reduce noxious weeds (described under Methodology) would help reduce, but not eliminate, the risk of weed spread due to proposed activities.

All roads used in the timber sale would be pre-treated for noxious weeds. A list of features and opportunities for noxious weed treatment is included in the project file (PF Doc. NW-16). Timber harvesting, road construction/ rehabilitation, and various fuels treatments would have the greatest risk of introducing and spreading weeds in the project area.

Timber harvesting under the Proposed Action Alternative would primarily include shelterwood, seed tree regeneration harvest, and commercial thinning. he regeneration treatments would remove most of the overstory trees and underburning would be used as site preparation for tree planting. Units where shelterwood or seed tree harvesting is implemented with skyline or tractor yarding and underburning would have the highest risk of weed invasion and spread. More soil disturbance would occur with this type of treatment when compared to intermediate harvests, such as commercial thinning. The increased amount of sunlight reaching the ground would also make regeneration units more prone to weed invasion by sun-dependent species such as spotted knapweed and Dalmatian toadflax. A combination of skyline, forwarder, tractor, and helicopter yarding would be used under the Proposed Action. Commercial thinning units would retain greater canopy closure and be slightly less prone to weed invasion by shade intolerant weed species.

Road construction, reconstruction, reconditioning, and fire line construction would cause soil disturbance. Many roads in the resource area are currently weed-infested and there is a risk of indirectly introducing noxious weeds into newly disturbed sites. Road construction could link already infested sites to further increase weed spread. This occurs by means of equipment, animals, off-road vehicles and other vehicles. Since new roads would be temporary, rehabilitation would occur, such as ripping and grass seeding, prior to road closure, therefore reducing the risk of invasion.

Fuels treatment is proposed in all activity units following harvesting. Underburning is the most common method for fuels treatment, with mechanical methods (such as grapple piling) proposed on fewer acres. Fuel treatments such as prescribed fire would directly affect some weeds, and may indirectly affect some habitats, making them more susceptible to weed invasion. Some of the documented effects of fire on weed species include:

- **Spotted knapweed *(Centaurea maculosa*)** plants present before burning may re-sprout from root crowns, and seedlings may emerge from the seed bank or invade bare ground from an off-site seed source following fire. Differences in the observed response of spotted knapweed to fire may be regional, may differ with the density of the infestation, may be different in low fire severity versus high fire severity microsites, and in spring versus fall burns (USFS 2003; NW-17).
- **Toadflax *(Linaria spp.)*** is likely to be top-killed by fire, however its deep, extensive root system is likely to survive even severe fire and allow re-establishment of the population

from vegetative buds on roots. Toadflax is able to recover after fire and may even be promoted by fire, especially if other species are reduced. The post fire environment is well suited to establishment by seed. (USFS 2003; NW-17).

- **Canada thistle *(Cirsium arvense)*** varies in its response to fire, depending on vegetation and site characteristics, as well as frequency, severity, and season of burning. This species is slightly damaged to enhance by fire. It can survive fire and re-sprout vegetatively from its extensive perennial root system, or colonize bare ground via seedling establishment after fire. Several studies have indicated the presence of Canada thistle in burned areas where it was absent from the pre-fire community and/or adjacent unburned areas (USFS 2003; NW-17).
- **Cheatgrass *(Bromus tectorum*)** is an invasive species that has been widely documented to increase on sites following fire (USDA Forest Service 2003; NW-17). The effect of cheat grass invasion on dry sites following fire is to out-compete native forbs for moisture, thus becoming the dominant ground cover.

Prescribed fire would be used to prepare regeneration harvest units for planting and for fuels reduction, following slashing in commercial and non-commercially treated units. Exposure of mineral soil is likely in regeneration units, thereby creating a suitable seedbed for weed introduction. Weed populations, constituting a ready seed source, are documented to exist on roads and within units proposed for treatment. Though many of the common weeds invade after site preparation, they tend to decrease as the site becomes stocked with planted conifers and native vegetation. This is a long-term process of vegetation succession, taking up to 20-30 years or more to achieve canopy closure. In all action alternatives, prescribed fire would be used both within and outside the boundaries of harvest units. The objective of these fires would be to reduce smaller diameter fuels with a low intensity burn. There would be a risk of fires burning outside of the unit boundaries or at a higher severity than desired, thereby increasing the spread of certain weed species on susceptible acres. Burning prescriptions would strive to minimize those risks.

As a ground-based mechanical fuels treatment, chipping would disturb the soil and provide areas for weed invasion, with no further prevention measures. There is also the potential for equipment to spread weed seeds from infested sites to newly disturbed ground. Contract provisions for construction equipment washing would greatly reduce this risk (EA, Part 3).

Direct and Indirect Effects to Noxious Weeds Under the Proposed Action Alternative

Most of the harvesting would occur in grand fir/Douglas-fir cover types. This alternative would increase the risk of weed invasion on harvested acres, newly constructed roads, and in burned areas, particularly on the drier cover types. Design features to reduce the spread of weeds, including roadside pre-treatment, grass seeding and equipment washing would reduce, but not eliminate weed spread. Post activity monitoring and weed treatment would be implemented given there are funds available. While existing infestations of certain weed species may continue to increase on Federal lands and adjacent private lands, proposed activities under all action alternatives would minimize the risk of weed spread by application of features designed to reduce the spread of noxious weeds (EA, Part 3). Weed treatment and prevention practices as proposed would minimize, but not eliminate, the risk of weed spread. The Forest Service does not have control over activities occurring on private lands; weed introduction and spread is likely occurring.

Cumulative Effects to Noxious Weeds Under the Proposed Action Alternative

Cumulative effects with this alternative would be low to moderate. Weed infestations are already present in the Resource Area on federal and private lands, and county road right-of-ways. The proposed action may increase the spread of some weeds despite design features. Weed control efforts in the area are ongoing. Federal agencies, the state of Idaho, county officials, and the public work together cooperatively to control noxious weeds within the Inland Empire Cooperative Weed Management Area.

A list of reasonably foreseeable and ongoing projects is included in the EA (Appendix B). Implementation of these activities on National Forest System lands will, in most cases, have a low level of cumulative impacts on

the risk of weed spread, since the Coeur d'Alene River Ranger District is committed to implementing treatment and prevention practices where ground or vegetation disturbance and/or canopy removal would occur (refer to the description of design features under Methodology in this report).

5. Consistency with the Forest Policy and Legal Mandates for Noxious Weeds

Under either alternative, the provisions for minimizing weed spread would meet the intent of the Forest Plan for noxious weeds (see Design Features under Methodology). The Forest Plan (1987, pp. II-7 and II-8; PF Doc. NW-18) lists objectives for noxious weeds:

Noxious weed control will be based on an integrated pest management approach, which includes, but is not limited to, the current practices of inventory, monitoring, some hand pulling, and some biological control.

Weed control on the Coeur d'Alene River Ranger District is conducted in accordance to guidelines established in the Noxious Weeds Final Environmental Impact Statement, 2000 (PF Doc. NW-2). The guidelines provide for a strategy of integrated weed control, including inventory, monitoring, and manual, chemical, biological, and cultural treatment methods. An "adaptive" strategy is outlined that allows for consideration of new treatment methods, if they become available, and treatment of new infestations that may be discovered. The FEIS identified a total of 76 infested sites across the District that are planned for weed treatment. Each site was analyzed for weed species present, infestation level, and the most effective method of treatment (PF Doc.NW-2). Infested roads, trails, and meadows in the Placer Creek Resource Area were considered for treatment. A list of priorities for weed treatment is included in Project File (PF Doc. NW-16). The extent of weed treatment is dependent of the availability of funding.

Noxious weed control will be conducted in Cooperation with counties, other agencies, and private landowners.

The Coeur d'Alene River Ranger District is an active member of the Inland Empire Cooperative Weed Management Area, a group of County, Federal, State, and other agencies and private citizens that work together on noxious weed control efforts in northern Idaho. District weed project managers coordinate and share information about planned weed treatments with the group on a regular basis. In accordance with the FEIS, the public is notified when weed treatments are planned to occur on Forest Service lands and on lands adjacent to private.

Many noxious weed species, including knapweed, St. Johns wort and common tansy, are widespread and control would require a major cooperative effort with counties and private landowners. Major programs to eradicate such species are not possible within expected budget levels. Priority will be given to small infestations of species new to an area, where moderate control actions have a good chance of preventing the establishment of new problems. (Forest Plan, p. II-7; PF Doc. NW-18).

The Noxious Weeds FEIS, 2000 (page 1, PF Doc. NW-2) listed elimination of new invaders (weed species not previously reported in the area) before they become established in the Purpose and Need for Action. Surveys conducted for the FEIS, and subsequent to it, identify sites of new invading species and make them a priority for treatment. New invaders that are found in the Resource Area would be treated, given the availability of funding.

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Specialist's Report on Aquatic Resources in the Placer Resource Area

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January 2006

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SPECIALIST'S REPORT ON AQUATIC RESOURCES IN THE PLACER RESOURCE AREA

1. Regulatory Framework for Aquatic Resources

The regulatory framework governing management of watershed and fisheries for the analysis is based on:

- *Forest Plan – Idaho Panhandle National Forest (IPNF)*
- *National Forest Management Act (NFMA)*
- *Endangered Species Act (ESA)*
- *Clean Water Act (CWA) and amendments.*
- *Idaho Department of Environmental Quality (IDEQ) implementation of the Clean Water Act*
- *Rules Pertaining to the Idaho Forest Practices Act (Title 38, Chapter 13, Idaho Code, 2000)*
- *Executive Order 12962 (Recreational Fishing)*
- *State of Idaho Governor's Bull Trout Plan*

The National Forest Management Act (NFMA 1976) requires that the Forest Service manage for a diversity of fish habitat to support viable fish populations (36 CFR 219.19). Regulations further state that the effects on these species and the reason for their choice as management indicator species (MIS) be documented (36 CFR 219.19(a)(1)). Direction is also included in the Idaho Panhandle National Forests Forest Plan (USDA 1987). The Inland Native Fish Strategy (INFS; USDA 1995; PF Doc. AQ-9) amended some Forest Plan direction regarding stream and fish habitat protections measures (see Appendix B).

Section 7 of the 1973 Endangered Species Act (ESA) includes direction that Federal agencies, in consultation with the U.S. Fish and Wildlife Service, will not authorize, fund, or conduct actions that are likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat. Currently, bull trout are not known to inhabit any watersheds in the Placer Resource Area. The South Fork Coeur d'Alene River is not designated as critical habitat by the U.S. Fish & Wildlife Service (Federal Register, October 6, 2004).

Under authority of the Clean Water Act, the Environmental Protection Agency (EPA) and the states must develop plans and objectives that will eventually restore identified water bodies that are not meeting State water quality standards. Stream segments of concern are identified under the anti-degradation policy of the State's water quality standards as meeting or exceeding standards. Placer Creek is not listed on the 303(d) water quality limited segment list. Placer Creek flows into the South Fork Coeur d'Alene River which is a listed 303(d) water quality limited segment from Placer Creek to Big Creek (Water Quality Limited Segment 3518, IDEQ 1998; PF Doc. AQ-10). The pollutants of concern are metals and sediment. There is a Sediment Total Maximum Daily Load (TMDL), for the South Fork of the Coeur d'Alene River Subbasin (approved in August, 2003). The completion of the implementation plan is pending. Under this status, there should be no net increase in sediment through management activities in the South Fork Coeur d'Alene River. There are no streams in the Placer Resource Area that are listed on the 303d list.

The Forest Service will develop an implementation plan for its portion of the TMDL in the South Fork Coeur d'Alene River in cooperation with IDEQ, other Federal, State and local Governments, and interested local parties. In the interim, any activities we undertake or permit on National Forest System lands will be designed to reduce pollutants of concern, where feasible. The timeframe for completion of the implementation plan has not yet been determined.

The Forest Service has agreements with the State of Idaho to implement Best Management Practices (BMPs) or Soil and Water Conservation Practices for all management activities. Proposed activities will be in compliance with the guidelines in the Soil and Water Conservation Handbook (Forest Service Manual 2509.22), which outlines BMPs (Aquatics Appendix A) that meet the intent of the water quality protection elements of the Idaho Forest Practices Act.

Executive Order 12962 (June 7, 1995) states objectives "to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by: (h) evaluating the effects of Federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order."

The mission of the Governor's Bull Trout Plan is to "…maintain and or restore complex interacting groups of bull trout populations throughout their native range in Idaho" (State of Idaho 1996; PF Doc. AQ-11). The Governor's Bull trout plan incorporates the entire Coeur d'Alene River drainage and its tributaries, which in this project would include the South Fork Coeur d'Alene River and its tributaries.

2. Affected Aquatic Environment

A. Methodology Used in the Assessment and Description of the Affected Aquatic Environment

Geographic Scale of the Analyses

For this analysis, the resource area was subdivided into manageable units referred to as "subwatersheds" (Figure AQ-1). The discussions focus on the three subwatersheds of the Placer Resource Area and the two smaller Subwatersheds within those. A summary of cumulative effects will also be discussed for the entire 6th Hydrologic Unit Code (HUC) of Placer Creek. These discussions will be arranged in the following order

1) *West Fork Placer Subwatershed (within Lower Placer)*
2) *Experimental Draw Subwatershed (within Middle Placer)*
3) *Upper Placer Subwatershed*
4) *Summary of entire 6th Code Placer Creek Watershed*

Each of the subwatersheds in the Placer Resource Area was analyzed as its own cumulative effects area using WATSED to look at cumulative effects at a smaller scale (see Aquatics Appendix D for model limitations). The entire 6th code Hydrologic Watershed (all of Placer Creek), is the appropriate scale to analyze and summarize cumulative effects from this proposed project. This scale is also consistent with the analysis in the Geographic Assessment. The entire South Fork Coeur d'Alene River including Placer Creek was not selected as the appropriate cumulative effects area for these reasons;

1. *The Placer Resource Area occupies only 12% of the South Fork Coeur d'Alene Basin from the confluence with Placer Creek, upstream to the headwaters.*
2. *The past and current mining activities in the South Fork Coeur d'Alene River are unrelated to the potential impacts from fuels related activities. Hard rock mining in the South Fork has left behind metal contaminants that leach into surface water and placer mining has altered aquatic habitat.*
3. *The drinking water supply that Placer Creek provides for the City of Wallace is a high priority for protection from potential effects of the proposed activity. Disturbances in the South Coeur d'Alene River do not influence the quality of water in Placer Creek.*

Aerial photographs were used to estimate location and types of vegetative management on non-federally managed lands and Bureau of Land Management (BLM) records were used on BLM-managed land so that all land management activities could be accounted for in each of the cumulative effects analysis areas.

Water quality in the South Fork Coeur d'Alene River at the confluence with Placer Creek is qualitatively addressed based on changes in contribution of pollutants. The Geographic Assessment recommends one integrated strategy that will help respond to issues and process of the terrestrial, aquatic and recreation components of the ecosystem (Geographic Assessment, page 59; PF Doc. AQ-12). This strategy identified different implementation strategies for different areas, so native aquatic resources can be conserved and protected.

The aquatic ecosystems of the Placer Resource Area were identified as falling into one of three condition classes, as defined in the Geographic Assessment (USDA Forest Service, 1998, pages 59-61; PF Doc. AQ-12):

- *Properly functioning: Within the scope of this assessment, a properly functioning watershed system is one that is exhibiting dynamic equilibrium characteristics and whose streams are operating and responding appropriately under their current environment. These systems can absorb and respond to disturbances that they have evolved under their historic range. Typically, parts of these systems, or the system as a whole, can move toward a more stable condition over time following a disturbance (or a series of disturbances) within a certain time period. As a system, these watersheds will not benefit from large-scale watershed restoration actions (although local, site-specific improvements may be productive).*

Placer Watershed
"Functioning at Risk"

Upper Placer Subwatershed
"Properly Functioning."

Lower Placer Subwatershed
"Functioning at Risk"
except for the lowest reach (that flows through a concrete flume) which is "Not Properly Functioning"

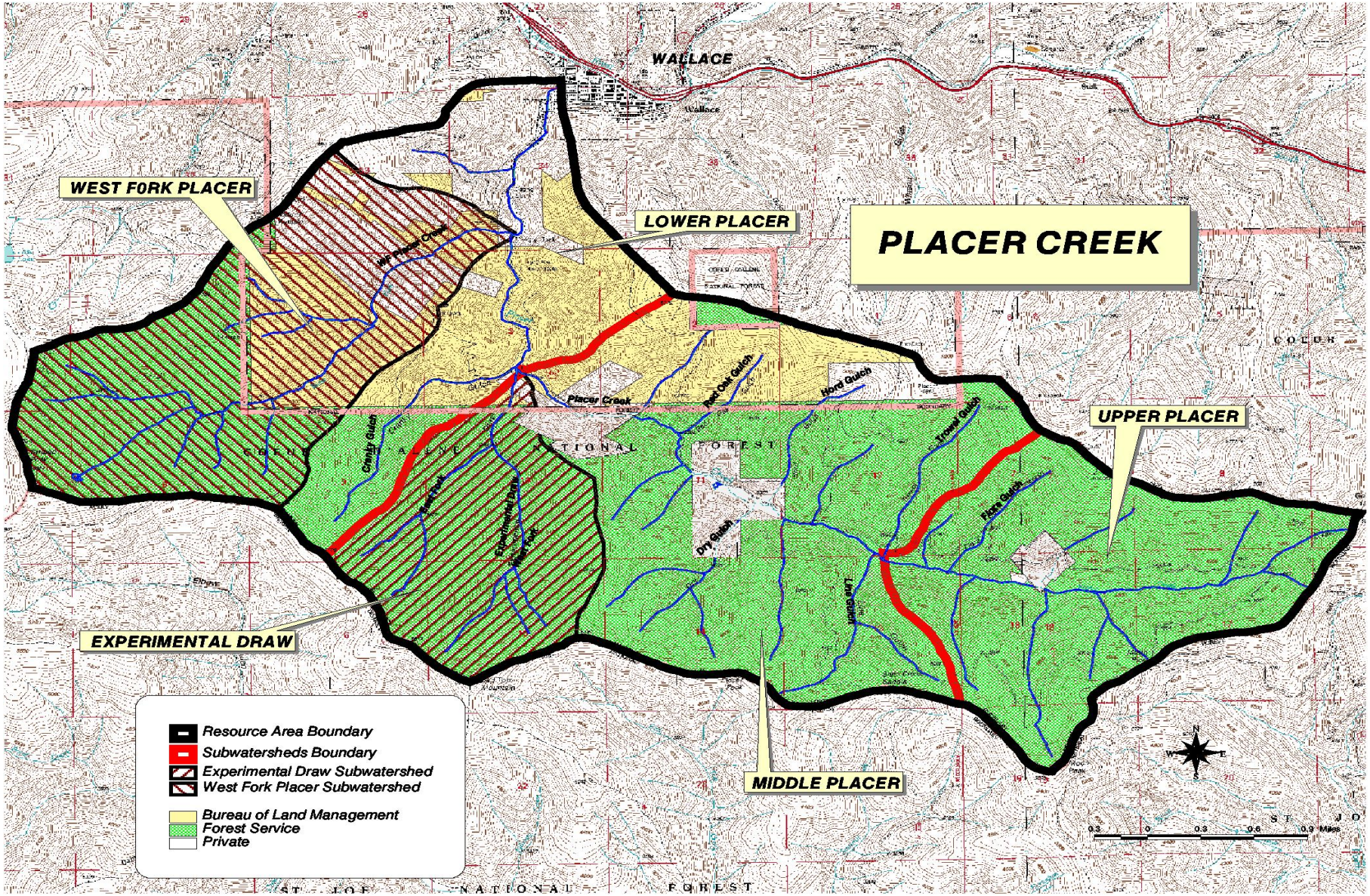
- *Functioning at risk: A watershed system that is functioning-at-risk is one that is essentially still properly functioning. However, it may be exhibiting trends or it may contain known risks that are likely to compromise that status and the ability to fully support beneficial uses in the future. This status may be assigned where the apparent watershed status is uncertain because the complexity of the system and disturbances. These systems are the first priority for large-scale watershed system restoration and improvement programs. Such programs will often produce effective and timely responses in the near future.*

- *Not properly functioning: Watershed systems that are not properly functioning often exhibit rapid adverse trends and may not fully support beneficial uses. These systems may appear to be responding to their own last adjustment, rather than toward stabilizing the last disturbance. They are "out-of-balance" with their environment and may not be in dynamic equilibrium, in periods of at least several decades. These systems are in need of large-scale restoration. These watersheds are usually second priority due to limited availability of resources, uncertain technology, and the long time period expected for positive responses.*

Literature and Office Review

The assessment of existing conditions is critical to an environmental analysis because it describes the current condition of the Placer Resource Area and provides a basis for comparing the effects of management alternatives. Information for the watershed and fisheries analysis was compiled using data from the field observations and measurements made in 2003. Additional information was gathered from district files, historical records, aerial photographs, and published scientific literature. Also, discussions with the Idaho Department of Fish and Game (IDFG) provided electrofishing and stocking data and comprehensive knowledge of the fisheries resources in the South Fork Coeur d'Alene River Watershed. The Roads Analysis Process (USDA 1999c; PF Doc. AQ-13) was also completed, which established recommendations for long-term road management objectives within the Placer Resource Area.

Figure AQ-1. The Cumulative Effects Area for Aquatic Resources in the Placer Resource Area. *There were different scales used for WATSED cumulative effects modeling in Placer Creek: 1) The entire watershed (the 6th Code HUC); 2) Three smaller subwatersheds (Lower Placer, Middle Placer, and Upper Placer); and 3) Two smaller scale subwatersheds (West Fork Placer within the Lower Placer subwatershed, and Experimental Draw within the Middle Placer subwatershed).*



The WATSED Model

Anticipated sediment and water yield runoff modification for the Placer Creek watershed was estimated from the methods documented in the R1/R4 Sediment Guides (USDA 1981; PF Doc. AQ-14), (Appendix D, WATSED Model Limitations), and the WATBAL Technical User Guide (Patten 1989; PF Doc. AQ-15). The version calibrated for the IPNFs, known as WATSED, is an analysis tool that spatially and temporally organizes typical watershed response relationships as a result of forest practices. The estimated responses are combined with other sources of information and analyses to help determine the findings of probable effects.

WATSED estimates a series of anticipated annual values over a period of years. The model predicts an estimate of most likely mean annual sediment loads (reported as tons per square mile per year, or as routed tons per year), and the expected sediment load modifications over time. The estimate of additional loading is expressed as a percent of the "natural" (i.e., historic mean load prior to significant development activities) sediment load, which is based on the history of disturbances and average climate patterns in the watershed. In this analysis, the existing condition represents the year 2006, which is prior to any anticipated disturbances related to the proposed activities.

The estimates of sediment and peak flow reflect how watersheds with similar conditions and landtypes have responded over time to a similar history of disturbance. WATSED is neither intended nor designed to model event-based processes and functions, or specific in-channel responses. It does, however, incorporate the results of those processes in the calibration of its driving coefficients. WATSED does not evaluate increases in sediment and peak flows specifically resulting from "rain-on-snow" events or other stochastic events, nor does it attempt to estimate in-channel and stream-bank erosion. The IPNFs frequently validate the WATSED coefficients and estimates using long-term water quality monitoring networks on the IPNFs (USDA 1998b, 1999, and 2000; PF Doc. AQ-5 through AQ-7).

The forest management activities used to calibrate the model include standard BMPs and Soil and Water Conservation Practices; therefore, standard BMPs and Soil and Water Conservation Practices are necessary requirements for maintaining an effective confidence level in the model's use. Non-standard BMPs, management or natural disturbances not related to forest practices, and site-specific non-standard BMPs must be integrated into the final analysis to fully determine watershed response.

WATSED was designed to address a complex array of landtypes and disturbances within the context of a watershed, and organize the evaluation according to rule sets established by the author and cooperators. In the case of WATSED, the rule sets reflect watershed processes and functions based on research, data, and analyses collected locally and regionally. Forest Plan monitoring reports (USDA 1998b, 1999, and 2000; PF Doc. AQ-5 through AQ-7) describe how the calibration and validation of WATSED has been an annual process on the forest and where changes have been made. The model, however, also includes simplifying assumptions, and does not include all possible controlling factors. Therefore, the use of models only provides one set of information to the technical user, who, along with knowledge of the model and its limitations, other models, data, analysis, experience and judgment must integrate all those sources to make the appropriate findings and conclusions.

Field Review

Roads within the Placer Resource Area were surveyed during the 2003 field season (PF Doc. AQ-86). Sites where roads cross drainages (road-stream crossings) were inventoried to assess erosional hazards and risks to aquatic ecosystems, using a protocol developed locally for the Coeur d'Alene River Ranger District. This method gathered information on road-stream crossings that included fill volumes, culvert sizes, erosional features, and other variables, so that sediment risk from culvert failure could be assessed. Perennial crossings where known fish presence occurred were inventoried and evaluated for fish passage using R-1 protocols for road-stream crossings (Clarkin et al. 2003; PF Doc. AQ-56b). From this information culverts and stream crossings could be prioritized for upgrading or removal (Sediment Risk Analysis, PF Doc. AQ-72).

Stream information was collected in main Placer Creek and some of its tributaries during the 2003 field season (Project File Doc. AQ-43). Representative segments within the lower reaches and those that are most

sensitive to watershed disturbance were selected for collecting information to determine stream channel types, cross sectional profiles, longitudinal profiles, woody debris composition, bank erosion, and stream temperature. A modified version of the R1/R4 fish and fish habitat inventory (Overton et al. 1997; PF Doc. AQ-16) was conducted along these same index reaches. These sites are mapped, documented, and marked on the ground so that repeat measurements can be accomplished to track changes in stream conditions (Aquatics Appendix C, and PF Doc. AQ-43).

GIS Technology

Geographical Information System (GIS) technology was used to combine existing databases, proposed activities and data taken from aerial photos to create maps and summary tables of existing conditions. Landtype maps and descriptions were input into GIS layers to evaluate the existing condition and for the effects analysis.

B. Characterization of the Affected Watershed and Subwatersheds

Designated Beneficial Uses in the Placer Resource Area

The status of Beneficial Uses comes from Idaho Department of Health and Welfare, 1992 (PF Doc. AQ-17). Beneficial uses in Placer Creek include:

- *salmonid spawning and rearing habitat*
- *cold water biota*
- *primary contact recreation*
- *secondary contact recreation*
- *drinking water*

Public Water Supply

Placer Creek watershed is a primary drinking water supply for the City of Wallace. This watershed does not have an official designation of a "Municipal Watershed" according to the IPNF Forest Plan and the State of Idaho, even though it does supply water for a major city. Best Management Practices and INFS guidelines (PF Doc. AQ-9) would apply any management activities within the watershed to protect water quality and beneficial uses. Lands will be managed for multiple-uses within the water quality standards for public water supplies (1987 Forest Plan, p. II-9; PF Doc. AQ-24). The source on information that provides the Forest Service and other land management agencies with guidance and protection measures within Placer Creek, public water supply are found in the East Shoshone County Water District-Wallace Source Waters Assessment Report (Idaho DEQ 2000; PF Doc. AQ-55).

Impaired Waters

There are no streams within the Placer Resource Area that are water quality impaired (303d listed) for any pollutant. All streams in the Placer Resource Area flow through private land or BLM-managed land in their lower reaches, and then flow into South Fork Coeur d'Alene River. The South Fork Coeur d'Alene River is identified as water quality limited (303d listed) for both metals and sediment.

Subwatersheds

The Geographic Assessment lists the entire Placer Creek watershed as "Properly Functioning," which is a high priority to maintain and protect aquatic resources. Field review and data analysis was used to further scale down the conditions call from the Geographic Assessment to the subwatershed scale, and Lower Placer Subwatershed was determined to be "Functioning at Risk." The lowest reach of Placer Creek is highly altered and probably would rate as "Not Properly Functioning;" it would not meet beneficial uses. This is a result of flood control infrastructures such as a dam and concrete lined channels constructed through the town of Wallace. Lower Placer Subwatershed, which is the most downstream section of Placer Creek on National Forest, was found to be "Functioning at Risk" based on field reviews and data on channel conditions. The

following outline is used for each watershed to characterize the current conditions in the Resource Areas:

- *Overview (size, topology, and past activities)*
- *Stream Flow Regime (water yield, peak flows, and rain-on-snow sensitivity)*
- *Stream Channel Morphology - narrative results from stream surveys, 2003*
- *Water Quality - number of inventoried road channel crossings*

Table AQ-1. Summary of existing conditions for each subwatershed in the Placer Resource Area.

Subwatershed Name	Acres (NFS + Private)	% NFS lands	Ave. Precip. (inches/ year)	Ave. Road Density on NFS (mi/mi2)	303d water quality limited?
Placer Creek *(entire watershed)*	**9,984**	**67**	**36**	**2.12**	**None**
Lower Placer Creek	3,712	40	32	1.42	**None**
Middle Placer Creek	4,352	78	45	1.93	**None**
Upper Placer Creek	1,920	97	45	3.88	**None**
WF Placer Creek *(within Lower Placer)*	2,176	54	42	1.73	**None**
Experimental Draw *(within middle Placer)*	1,216	98	40	0.18	**None**

Lower Placer Subwatershed Conditions

Overview: Lower Placer Creek is within a 3,712-acre drainage; 40 percent (1,481 acres) are managed as National Forest System lands, 37 percent (1,382 acres) are managed by the Bureau of Land Management (BLM), and 23 percent (849 acres) are privately owned. Lower Placer Creek flows in a northwesterly direction to the South Fork Coeur d'Alene River. Lower stream reaches indicate the channel is out of equilibrium and still adjusting from past disturbances.

Stream Flow Regime: Past private activities and fire have altered the flow regime in much of the Lower Placer Creek. In general hydrologic changes are caused by many factors including canopy removal, increased drainage efficiency due to the road network, and the increased gradient from stream straightening (Thomas and Megahan 1998, PF Doc. AQ-18; Jones and Grant 1996, PF Doc. AQ-19; Brooks 1991, PF Doc. AQ-20; Harr 1986, PF Doc. AQ-21; Troendle and King 1983, PF Doc. AQ-22). WATSED model results estimate that average peak month flows in the Lower Placer subwatershed have been modified to approximately one percent above baseline conditions. This level of modification is too small to measure in the field. Harvest activities in the early 1990's opened up enough to only cause a one percent increase in peak flows. Stream flow conditions and hydrologic recovery are still responding to many types of activities, such as mining, timber harvest, floodplain alteration, and especially stream channelization in the lowest reach through the town of

Figure AQ-2. Lower Placer Creek. *One of the isolated sections of Road 456 that encroaches into Placer Creek is along of the lower reaches in Middle Placer Creek.*

Figure AQ-3. *West Fork Placer Creek, 250 feet up from the mouth.*

Wallace. For a more detailed discussion of processes and the interpretation of WATSED, refer to the WATSED project reports (PF Doc. AQ-77).

Stream Channel Morphology: Road 456 (the main road up Placer Creek valley bottom), has partially constricted the stream within the lower reaches. This road has decreased the channel's ability to handle the increased energy associated with large flows or sediment input in a few locations. Channel pattern changes resulting from streamside road placement may cause long-term changes to the stream flow and sediment routing regime. Additionally, streamside roads in only a few isolated segments are subject to frequent or continual stress of flow against the road fill, particularly during peak discharges. These isolated road segments along Road 456 are not the rule but the exception along the entire length of Placer Creek; they do manifest chronic surface sediment to the stream, as seen in Figure AQ-2). Fine sediment introduced from roads has been deposited in slower downstream segments, decreasing channel capacity and altering channel morphology from its natural state of equilibrium.

Evidence of riparian harvest (most likely from post-1910 fire salvage), was observed during the 2003 field surveys. Large old stumps and remnant scars of roads and skid trails remain visible along some sections of Placer Creek.

This activity can increased bedload supply and bed mobility which can cause bank erosion. Toews and Moore (1982; PF Doc. AQ-23b) report stream bank erosion was more than 250 percent greater after logging than before in clearcut areas where no buffers strips were left.

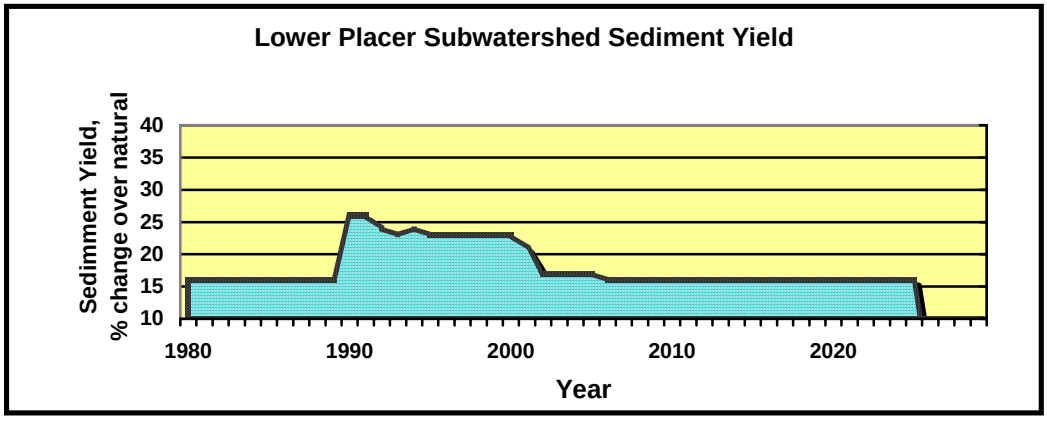
Channel stability of the West Fork Placer Creek is very good. This stream flows through a steep, high gradient, narrow valley and is controlled by boulders and bedrock. This type of channel is very stable, is resilient to disturbance and does support its beneficial uses (i.e.: cold water biota) very well.

Riparian Road Density…

…is an estimation of the amount of roads (miles of road per square mile of land) that are located within approximately 300 feet of any stream channel. These riparian roads could potentially influence the stream and its flood plane and affect natural stream function (derived through GIS mapping).

Water Quality: Road density within the West Fork of Placer Creek subwatershed is 1.73 miles per square mile (PF Doc. AQ-62), which is largely accounted for by upland roads in the headwaters. The riparian road density within this subwatershed is 0.4 miles per square mile. Inventories of roads and their conditions including culvert conditions were completed in the Placer Creek subwatershed. Of the seven inventoried road-stream crossings in Lower Placer Creek, there is a risk of 213 tons of sediment per year being routed and delivered downstream if all of these stream crossings were to fail (PF Doc. AQ- 66, 72 and 74).

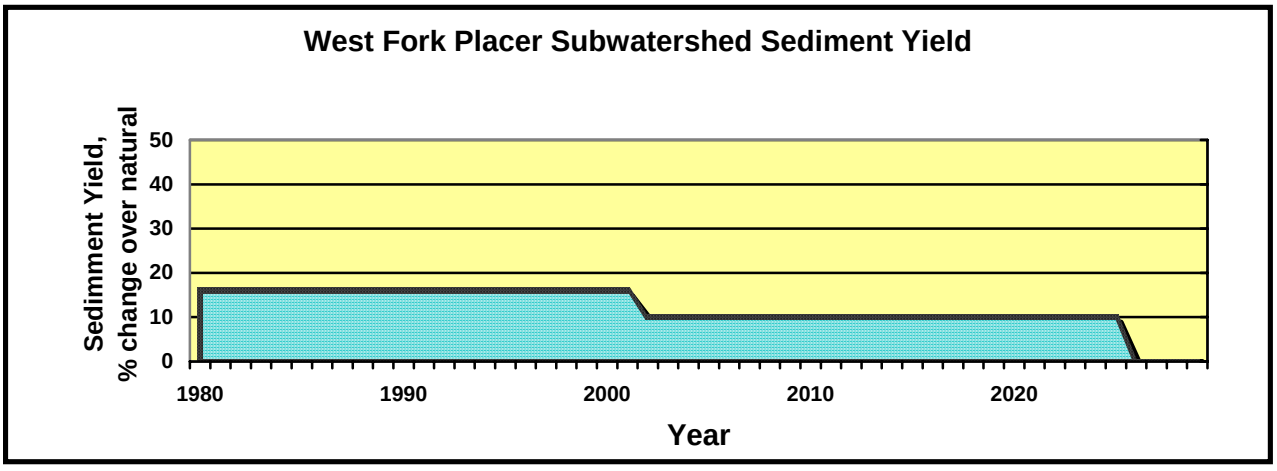
Figure AQ-4. Existing Sediment Yield in Lower Placer Creek.



Timber harvest has occurred on private lands in the Lower Placer Subwatershed in 1990, 1998 and 2002. Vegetation and soil response from that activity has almost fully recovered according to modeled result. Field observations and stream survey data support this predicted condition.

Sediment Yield is in percent change over natural conditions. For the purposes of this analysis, sediment yield is considered to be zero in a watershed that never receives any land management or human development.

Figure AQ-5. Existing Sediment Yield in West Fork Placer Creek.



Little activity has occurred in the West Fork Placer Creek subwatershed since 1980. The reduction in sediment in 2002 (displayed in the WATSED output graph above) is interpreted as the tail end of recovery from the ground-based logging of the eighties. The existing sediment modification is 10 percent over baseline and is accounted for by existing roads still on the landscape.

Middle Placer Creek Subwatershed Conditions

Overview: This section of Placer Creek encompasses an area of 6.8 square miles, with a road density of 1.93 miles per square mile. Middle Placer Creek has experienced some past harvest activities and mining activities in and near riparian areas. About 10 percent of the Middle Placer subwatershed is within private ownership that has been intensively managed and developed (EA Appendix B).

Stream Flow Regime: The channel is formed primarily by storm events that occur from rain-on-snow events and spring run-off during years when snow-pack is above normal. In general, hydrologic changes are caused by many factors including canopy removal, increased drainage efficiency due to the road network, and the increased gradient from stream straightening (Thomas and Megahan 1998, PF Doc. AQ-18; Jones and Grant 1996, PF Doc. AQ-19; Brooks 1991, PF Doc. AQ-20; Harr 1986, PF Doc. AQ-21; Troendle and King 1983, PF Doc. AQ-22). WATSED model results estimate that average peak month flows in Middle Placer Subwatershed are currently modified to approximately two percent above baseline conditions. This level of modification is not measurable in the field. In 1999, harvest activities on private lands affected approximately 20 acres and created only five ECA's, with no increase in monthly peak flows. Stream flow conditions and hydrologic recovery are still responding to some of these activities. WATSED model outputs show that recovery occurs slowly as overstory canopy increases and ground cover improves through 2020 when peak flows would theoretically stabilize around six percent of pre-1980 conditions. For a more detailed discussion of processes and the interpretation of WATSED, refer to the WATSED project file reports (PF Doc. AQ-78).

Figure AQ-6. Reach 2 – Riffle cross-section 2. *Photo point and channel cross-section site established for future channel stability trend monitoring (T47N, R 4E, Sec 11, just upstream of Red Oak Creek). In this representative stream segment, the encroaching road is without evidence of bank erosion or failing road fills.*

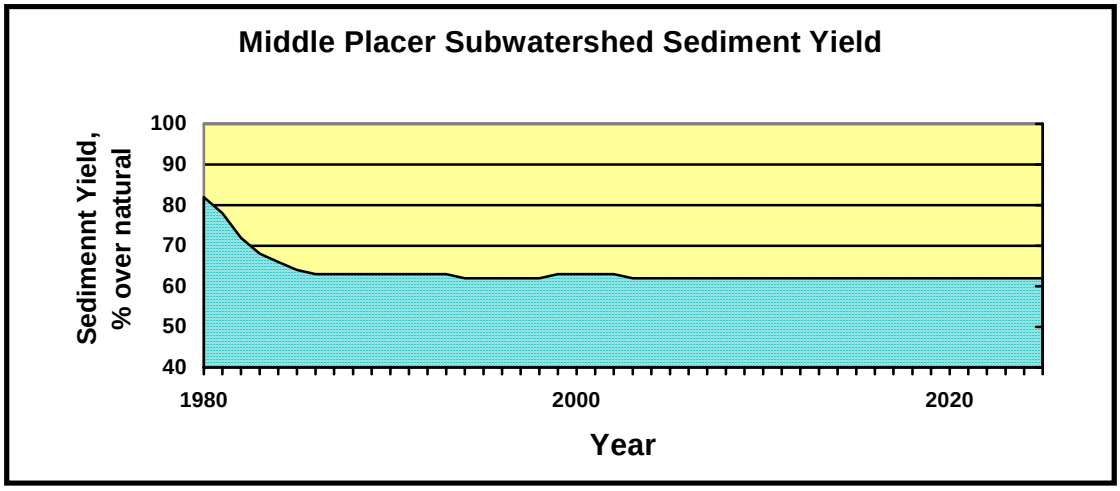
Stream Channel Morphology: Road 456 is encroaching along a portion of Middle Placer Creek. The existence of the road creates only minor constriction of the stream and its floodplain over approximately 15% of its length within Middle Placer Creek subwatershed. Road 456 encroaches on the stream channel, as seen in Figure AQ-2, but only at several meander bends and only in the more downstream sections. Road 456 gradually leaves the stream's edge and floodplain as you go upstream in this subwatershed. Channel pattern changes resulting from this streamside road could potentially cause changes to the stream flow and sediment routing regime if a large flood event were to occur. Other contributors have altered stream morphology in headwater road failures and bank damage from unauthorized vehicle use, which have added sediment to the stream. There is a site observed by the junction of Road 456 and Road 985 where a broad water crossing through Placer Creek has been developed by motorized users. This site has bank damage and channel alteration. Flooding in 1996 and 1997 were 100+ year events and only caused minor road fill erosion and channel adjustments. The risk of large channel adjustments from future flood events is low based on the small degree of the stream (15 percent) within the influence of Road 456.

The Middle Placer Creek subwatershed contains Rosgen C channel types (PF Doc. AQ–33) in the most downstream portion. This reach has lower energy flow regimes and is more depositional than other reaches. There are portions of this lower reach showing higher levels of bank an and bottom degradation compared to all other reaches of Placer Creek The lower reach is more responsive to disturbance compared to other reaches in the Placer Watershed because of it's low energy regime. This reach may show channel adjustments if upstream impacts were to occur. For example, if large watershed areas of forest vegetation

were removed, either by management activities or natural wildfire, the stream reaches in Middle Placer Creek subwatershed would show channel adjustment through aggradation, movement, and deposition of gravels and cobbles.

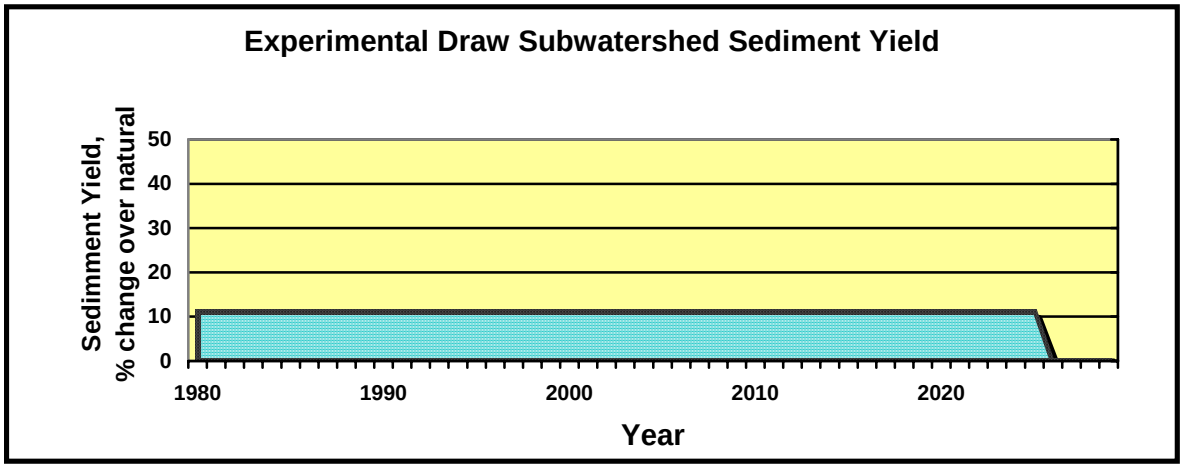
Water Quality: There are approximately 1.93 miles of road per square mile of land within the Middle Placer subwatershed. The riparian road density is approximately 0.42 miles of road per square mile of land. In Middle Placer there are eleven inventoried road/stream crossings that have a risk of failing and potentially contribute approximately 73 tons per year.

Figure AQ-7. Existing Sediment Yield in Middle Placer Creek.



The high sediment yield in 1980 was from past timber harvest within Middle Placer Creek that occurred in the late 1970's. Recovery occurred quickly and sediment yield came down to baseline in approximately 1985. Prescribed fire activities have occurred on BLM and National Forest Lands in the late 1990s and again in 2004. Vegetation and soil conditions have not reacted much from these activities and conditions have recovered quickly. The burning has mostly occurred in brush fields with no removal of canopy and very little ground disturbance. Quick vegetative recovery occurs from these activities as observed in the field and WATSED Modeling reflects this principle. Sediment yield is shown in percent change over natural conditions. Sediment yield would be zero in a watershed that never receives any land management or human development.

Figure AQ-8. Existing Sediment Yield in Experimental Draw.



Existing Trail 39 in Cranky Gulch is the only source that likely affects sediment in the Experimental Draw subwatershed. No new or recent activities have occurred in the area so sediment background levels are low (compared to other portions of Placer Creek) and have not changed over the last 20 years.

Upper Placer Subwatershed Conditions

Overview: Upper Placer encompasses an area of three square miles, with a road density of 3.88 miles of road per square mile of land. Harvest activity and prescribed fire has occurred in Upper Placer Creek, both in and near riparian areas. Several small intermittent tributaries feed the watershed for its entire length (97% of Upper Placer is in the National Forest System, and the other 3% is in private ownership. Upper Placer is "Properly Functioning" according to the Geographic Assessment and is a high priority to maintain and protect.

Stream Flow Regime: Flows are variable in Upper Placer Subwatershed. The main channel in this drainage is formed primarily by storm events that occur from rain-on-snow and spring run-off during above-normal snow-pack years. In general, hydrologic changes are caused by many factors including canopy removal, increased drainage efficiency due to the road network, and the increased gradient from culvert outlets that are over-steeped road fills where small tributaries cross roads (Thomas and Megahan 1998, PF Doc. AQ-18; Jones and Grant 1996, PF Doc. AQ-19; Brooks 1991, PF Doc. AQ-20; Harr 1986, PF Doc. AQ-21; Troendle and King 1983, PF Doc. AQ-22). WATSED modeling results estimated that average peak month flows are modified to approximately 4% above baseline conditions. This level of modification is not measurable in the field. In 1998 burning activities on National Forest opened up canopy by 2 ECA's. Peak flow increases are completely recovered as WATSED indicates and stable stream channels were observed in field reviews which supports the model results. A more detailed discussion of processes and the interpretation of WATSED, refer to the WATSED project reports (PF Doc. AQ-79).

Figure AQ-9. Reach 7*. Photo point and cross section monitoring site (T47N, R4E, Sec 13). This representative section of Placer Creek in Upper Placer Subwatershed shows good channel stability, well established riparian vegetation on the banks, and the presence of woody debris providing gradient control and high quality habitat for resident fish and aquatic biota.*

Stream Channel Morphology: Stream reaches in the Upper Placer Creek subwatershed are stable and resilient. If large watershed areas of forest vegetation were removed, either by management activities or natural wildfire, the stream reaches in Upper Placer subwatershed would not likely show stream channel adjustment due to the inherent stability of the stream reaches and resiliency of the Rosgen B Channel type. (Rosgen, 1996, AQ-33).

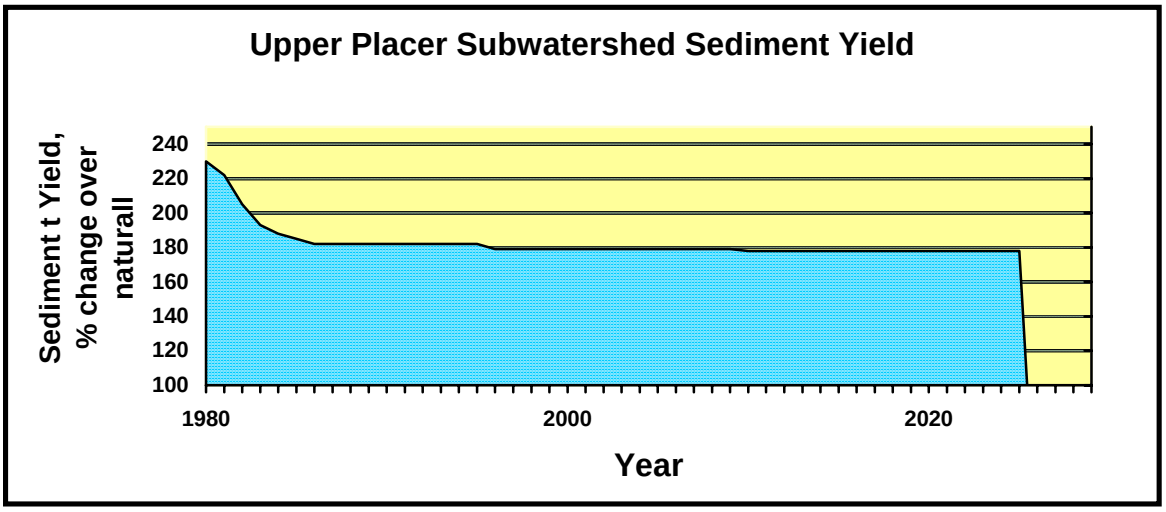
There are no encroaching roads that parallel Placer Creek in the Upper Placer Subwatershed. There is road encroachment at the fourteen inventoried road/stream crossings in Upper Placer Creek subwatershed.

Water Quality: There are approximately 3.88 miles per square mile of roads within Upper Placer subwatershed. The riparian road density is very low and places where roads are near stream channels only occur at road/channel crossing. There are several culverts under Road 456 that are undersized and at risk for failing. These culverts were installed in such a manor that road fill is failing through high water scouring and fine sediment is being transported into Placer Creek. Six of the 14 inventoried crossings in Upper Placer are at risk of failing. If these culverts were to fail, approximately 250 tons per year could potentially be delivered downstream. There are also road fill slopes near stream crossings that are eroding along Road 456 in the upper headwaters of Placer Creek. These sites do supply Placer Creek with a chronic supply of fine sediment during snowmelt and heavy precipitation and will continue to do so without remediation. The quantity of sediment produced from this area is approximately 39 tons per year as modeled from WEPP (PF Doc. AQ-82). If outlet armoring, cut-bank retaining walls, and fill slope stabilization were implemented, then fine sediment would be reduced and water quality could be measurably improved in Placer Creek. These known sediment sources do not route sediment directly into the South Fork Coeur d'Alene River but are transported and deposited throughout the middle reaches of Placer Creek. These conditions are a potential threat to the operations and efficient supply of drinking water to the City of Wallace.

Figure AQ-10*. Headwaters of Placer Creek road crossing with Road 456; a chronic sediment source.*

Figure AQ-11. *Road crossing with Road 456, chronic sediment source in the headwaters of Placer Creek subwatershed.*

Figure AQ-12. Existing Sediment Yield in Upper Placer Creek Subwatershed.



Sediment yield in Upper Placer Creek is displayed in percent change over natural conditions. The timber data base shows harvest occurred in the late 1970s. Recovery has almost completely occurred to baseline levels. Roads remain in place and the predicted sediment yield is persistent over time compared to pre-1910 conditions.

Summary of Conditions in the Entire Placer Creek (6th Code) Watershed

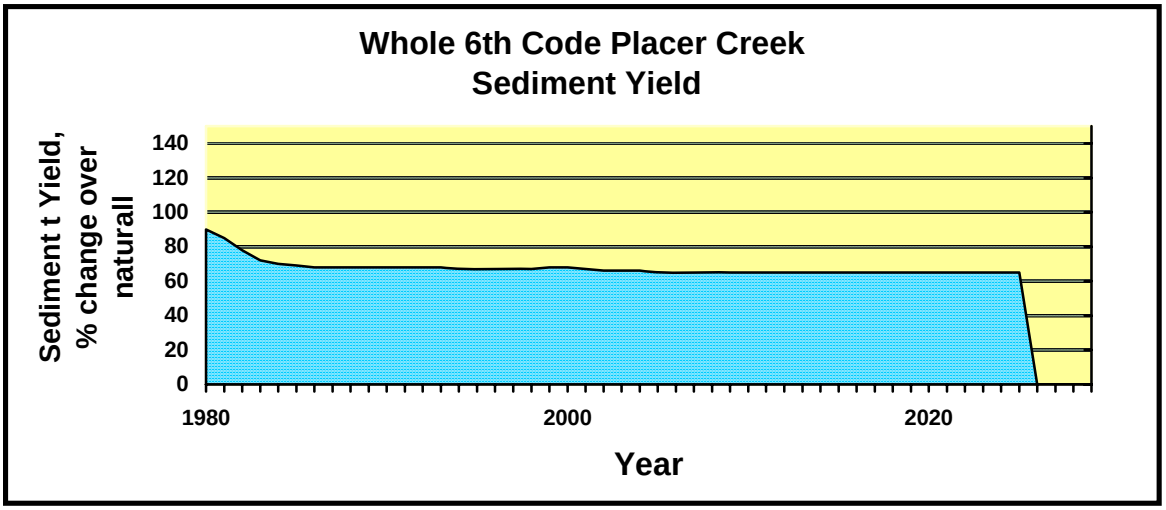
Stream Flow Regime: WATSED model results estimate that average peak month flows in the whole Placer Creek watershed are currently modified to approximately 2% above baseline conditions. This level of modification is not measurable in the field. Activities on the National Forest in 1990 such as timber harvest and prescribed burning opened up canopy by from between zero and 54 ECA's. Simulated peak flow did not go up from these events but conditions continued to recover as modeled by WATSED. Stream flow conditions and hydrologic recovery are still responding to many types of activities, such as timber harvest and stream canalization on other ownership in the lower reaches.

Stream Channel Morphology: Only portions of Road 456 near the lower reaches of Placer Creek are known to encroach on the stream channel and the floodplain of Placer Creek. These encroaching segments were able to withstand flooding in 1996 and 1997 without catastrophic negative impact to channel stability and stream health. The stream channels are mostly steep sided, high gradient channels in their upper reaches, with lesser gradients in the lower reaches. Some channel down-cutting and bank erosion is occurring on private lands in the lower stream reaches. This is probably a result of stream sections that have channelized and straightened in small isolated locations. Several road crossings on private lands pose an unknown risk to roads in the drainage area.

Water Quality: Fine sediment sources have been identified throughout the watershed and they are primarily associated with the road/stream crossings. Encroaching roads are present and do cause channel restriction and channel adjustments but only at isolated segments and mostly in the lower reaches of Placer Creek. Several culverts are undersized and the initial installation of some culverts has been inadequate causing erosion and scour at the outlets. Past management activities such have harvest, prescribed fire, and mining has had some minor impacts to the watershed but the fast re-growth of vegetation has caused background levels to be what they are. Recovery trends of stream flow regimes and sediment yield are neither positive nor negative but remain constant.

Sediment Yield: All the major streams in the Placer Resource Area have experienced some increased sediment yield from past timber harvest and/or prescribed fire activities except for Experimental Draw. Observations in the field concerning existing bedload movement and high deposition in downstream reaches support the conclusion that sediment yields are elevated but constant as a result of past activities. The following graphs display past changes to sediment yield and existing conditions based on WATSED modeling. Timing and type of timber harvest on other ownership in the Placer Resource Area were estimated using 2004, 1996, 1983-84 and 1973-74 aerial photographs and personal observations by Forest Service personnel (PF Doc. AQ-87). The degree of regeneration and amount of ground cover in the harvested units were estimated from observable evidence in aerial photographs. Ground scars seen in the photographs were also used to determine harvest methods. For example, skid trail scars could be observed in the photographs to help determine if a particular area was tractor logged, and skyline corridors were observed to help determine that a unit might have been skyline logged.

Figure AQ-13. Existing Sediment Yield in the Entire(6th Code) Placer Creek Watershed.



Sediment yield in the whole Placer Creek watershed is displayed in percent change over natural conditions. The timber data base shows some harvest in the early 1980s with the model predicting recovery in approximately 1987. Roads do remain in place and the predicted sediment yield is persistent over time from the existing condition. Sediment yield has fluctuated over the last 20 years, increasing with each timber harvest or fire related activity. Prescribed burning was modeled in WATSED, based on records that show activity in 1998 over 205 acres. WATSED modeling shows upward sediment trends with each activity, followed by downward trends as the ground disturbance recovers. The existing roads are the primary sediment producer within the Placer Resource Area. It generally takes about seven years after disturbance caused from tractor-based yarding systems for the vegetation to re-establish and for the disturbance area to stop producing sediment erosion and transport. Harvest activity has occurred on private and BLM lands within the Placer Resource Area in the early 1980's, early and late 1990's, and in 2004, along with prescribed burning on BLM-managed land.

C. Fisheries

Overview

The cumulative effects areas contain approximately 17.5 miles of a fish-bearing stream, all of which is contained within the Placer Creek watershed. Fish species that inhabit or potentially inhabit streams in the Placer Resource Area include native populations of westslope cutthroat (*Oncorhynchus clarki lewisi*) and sculpin (*Cottus spp*.; primarily slimy sculpin [*C. cognatus*]). Introduced fish species include populations of unspecified rainbow trout (*O. mykiss*) and eastern brook trout (*Salvelinus fontinalis*). The creation of hybrid fish between native westslope cutthroat trout and exotic rainbow trout may be present. Distribution of these fish is identified in the following table.

Table AQ-2. Stocking records (Idaho Fish & Game) and electrofishing records (Idaho Fish & Game and USDA Forest Service) for watersheds in the Placer Resource Area analysis. IDF&G stocking data was gathered using a search engine located on the website: http://www2.state.id.us/fishgame/. (PF Doc. AQ-23).

Stream	Species	Info. Source	Date of Sample	Species/Year Stocked by IDF&G
South Fork Coeur d'Alene River	Eastern brook trout/westslope cutthroat trout/rainbow trout/sculpin spp./ and westslope cutthroat trout/rainbow trout (WCTxRBT) hybrids	IDF&G USFS	2002	Kamloops, rainbow, Kokanee (1967-1999; various types/amounts)
Placer Creek	Eastern brook trout/westslope cutthroat trout/rainbow trout/sculpin spp./and WCTxRBT hybrids	IDF&G USFS	2003	Unspecified rainbow (1968-73 and 1975-76)
West Fork Placer Creek	Westslope cutthroat/rainbow/and WCTxRBT Hybrids	USFS	2003	
Cranky Gulch	Westslope cutthroat trout/rainbow trout/sculpin spp.	USFS	2003	
Experimental	Westslope cutthroat trout/rainbow trout/sculpin spp.	USFS	2003	
W.F. Experimental	Westslope cutthroat trout/rainbow trout/and WCTxRBT hybrids	USFS	2003	
Dry Gulch	Westslope cutthroat trout/rainbow trout/and WCTxRBT hybrids	USFS	2003	
Line Gulch	Westslope cutthroat trout/rainbow trout/and WCTxRBT hybrids	USFS	2003	
Red Oak	Westslope cutthroat trout/rainbow trout/and WCTxRBT hybrids	USFS	2003	
Hord Gulch	Westslope cutthroat trout/rainbow trout/and WCTxRBT hybrids	USFS	2003	
Trowel Gulch	Westslope cutthroat trout/rainbow trout/and WCTxRBT hybrids	USFS	2003	
Flora Gulch	Westslope cutthroat trout/rainbow trout/and WCTxRBT hybrids	USFS	2003	

Streams listed in the above table flow into other fish-bearing waterways, specifically the South Fork Coeur d'Alene and then the Coeur d'Alene River, respectively. Given the scope of this proposal and ensuing analysis, it was determined that cumulative effects would not be detected in the South Fork Coeur d'Alene River. Non-fish bearing perennial and intermittent streams occur within the Placer Resource Area, but are not named on Forest Service topographic maps.

The analysis of direct, indirect, and cumulative effects to fish is based on effects to sensitive and management indicator fish species (MIS). Under this concept, larger groups of organisms or communities are believed to be adequately represented by a subset of the group. The Forest Plan (IPNF 1987) identifies westslope cutthroat trout, bull trout, and rainbow trout as potential Management Indicator Species (MIS) for fisheries (Forest Plan Appendix L, PF Doc. AQ-24). Currently, westslope cutthroat and rainbow trout are known to utilize streams within the Placer Resource Area for spawning, rearing, and over-wintering. They have nearly similar habitat needs. Consequently, westslope cutthroat and rainbow have been selected as appropriate MIS for the fisheries analysis of this project.

The life history of the bull trout is included because it is listed as threatened under the Endangered Species Act (1973). However, there is no set or sub-set of data that has identified bull trout in Placer Creek watershed of the South Fork Coeur d'Alene River. Therefore bull trout will be recognized as listed within its larger geographical area for this document. White sturgeon, burbot, and interior redband are found to occur only in the Kootenai River system, and possibly the Kootenai River larger (e.g., Yaak River for sturgeon and burbot) and smaller tributaries (e.g. Long Canyon - interior redband trout). Therefore, these fishes will be given no further analysis within the context of this document since they do not naturally inhabit the South Fork Coeur d'Alene River drainage or its tributaries.

Bull Trout (Threatened and Endangered)

Bull trout are listed under the Endangered Species Act as a Threatened species. They are not known to reside in the South Fork Coeur d'Alene River or its tributaries. The Governor's Bull Trout Plan (1996, PF Doc. AQ-11), historical data for the watershed (IDF&G and USDA FS), and the bull trout recovery plan indicate that the larger Coeur d'Alene River drainage is occupied by bull trout. The South Fork Coeur d'Alene River drainage is not designated as critical habitat by the USFWS.

Westslope Cutthroat Trout (Sensitive)

Westslope cutthroat trout are listed as "sensitive" by Region 1 of the USDA Forest Service and are listed as a "species of special concern" by the State of Idaho. In addition, the U.S. Fish and Wildlife Service (USFWS) list westslope cutthroat trout as a "species of concern" with respect to section 7(c) of the 1973 Endangered Species Act (ESA; USDI 2002; PF Doc. AQ-26). The USFWS lists westslope cutthroat trout as to occur, potentially occur, and/or its habitat exists within the portion of the Idaho Panhandle National Forests where activities could be implemented in the Placer Resource Area. But first, a brief history is necessary to ascertain the background of status reviews on westslope cutthroat:

> *On two separate occasions (1997 and 1998) petitioners petitioned to list westslope cutthroat trout as threatened. On June 10, 1998, the USFWS published a Federal Register notice announcing a 90-day finding that an amended petition to list the westslope cutthroat trout as threatened under the Endangered Species Act, where substantial information was provided to indicate that such a listing may be warranted. After review, the USFWS concluded in April 2000 that listing westslope cutthroat trout as a threatened or endangered species under the act was not warranted at that time.*
>
> *However, in 2001 the court ordered USFWS to review the status of westslope cutthroat trout based on three key points. In response, on September 3, 2002 in the Federal Register (vol. 67, #170: 50 CFR Part 17), the USFWS set forward a notice of intent to prepare a status review for the westslope cutthroat trout. In summary, the USFWS announced the initiation of a new status review for the westslope cutthroat trout in the U.S. pursuant to a recent court order and the Endangered Species Act of 1973, as amended.*
>
> *After a thorough review of all the available scientific information, the USFWS reaffirmed their previous decision that the westslope cutthroat trout did not warrant listing as a threatened species because abundant, stable, and reproducing populations remain well distributed throughout its historic range.*

Westslope cutthroat trout have been identified in nearly all streams in the Placer Resource Area. Unknown variations of cutthroat trout and other salmonids have been previously stocked in the South Fork Coeur d'Alene River basin from 1968-1999 by Idaho Department of Fish and Game (Table AQ-2). However, the populations that resided there prior to the introductions were likely native westslope cutthroat trout.

There are three possible life-history forms that westslope cutthroat trout could exhibit within the South Fork Coeur d'Alene River system. The most likely life form within the Placer Creek watershed is resident, since the stream resides in a concrete corridor through the down of Wallace that is impassable from recruitable stocks from the South Fork Coeur d'Alene River. Westslope cutthroat trout are spring spawners (April – June); there is a possibility that they have much more habitat available to them than fall spawning salmonids, principally due to higher water conditions creating more habitat.

The preferred habitat of westslope cutthroat trout is cold, clear streams with rocky, silt-free riffles for spawning and slow, deep pools for feeding, resting, and over-wintering (Reel et al. 1989; PF Doc. AQ-27). Pools are a particularly important habitat component as cutthroat trout occupy pool habitat more than 70 percent of the time (Mesa 1991; PF Doc. AQ-28). Other key features of westslope cutthroat habitat are large woody debris (LWD) for persistent cover and habitat diversity as well as small headwater streams for spawning and early rearing.

A population status review of westslope cutthroat trout in Idaho has determined that populations in northern Idaho have declined over their historic distribution with viable populations existing in only 36 percent of the original Idaho range. The primary cause of the decline was found to be habitat degradation (Rieman and Apperson 1989; PF Doc. AQ-29).

Reference Condition for Fisheries

The reference condition for fish habitat is based on reference reaches in Placer Creek watershed, habitat surveys in Placer Creek to headwater tributaries (see "Watershed Reference Condition"), historic information, electrofishing data, knowledge of basic ecological processes, and professional judgment. Physical attributes of fish habitat are mainly defined by stream channel condition.

Salmonids generally require cool, clear water, clean gravel substrates; well-vegetated banks for shading and bank stability; abundant instream cover such as boulders, logs, and undercut banks; and unobstructed migratory corridors (Bjornn and Rieser 1991; PF Doc. AQ-31).

The historic distribution of westslope cutthroat in the tributaries within the Placer Resource Area is speculated, but no known 'natural' mainstem barriers would have limited access (except headwater stream gradient). If adfluvial or fluvial stocks of westslope cutthroat trout were present they would utilize main channel and headwater habitat with resident forms, however these forms are absent due to many conditional factors in the system (i.e. years of mining, human-caused barriers, etc). Several data sources have identified westslope cutthroat trout within the Placer Creek drainage (for example, the electrofishing records, PF Doc. AQ-43). These include Forest Service and IDFG records that indicate westslope cutthroat trout have been identified within the system and that other species of salmonids have also been identified (Table AQ-3). Historical plantings of unspecified fingerling rainbow trout are known (Table AQ-3); eastern brook trout are not known to be stocked (post-1967), but occur in the lower Placer Creek watershed as likely result of past legal and/or illegal stocking.

Existing Condition for Fisheries

Stream Channel Characteristics

Stream habitats are influenced by woody debris constrictions and local confinement, which typically produce scour pools and riffles. Stream bank degradation rates are generally low in Placer Creek and it tributaries as is channel aggradation except for a portion of the lower reach of middle Placer Subwatershed. For a complete review of each watershed's condition, refer to the characterization of the affected watersheds in Section 2.C of this report.

Stream temperature data from 2003 (PF Doc. AQ-32) have shown that temperature requirements for cold-water aquatic life (i.e. salmonids) are being met. Consequently, these standards are more inclusive than INFS (1995; PF Doc. AQ-9) for meeting the RMO set-forth for temperature requirements.

Fish Populations

Bull trout are not currently known to use the South Fork Coeur d'Alene River drainage or its tributaries (including the Placer Creek watershed) for spawning or rearing. Populations of sculpin *spp*. and westslope cutthroat, rainbow, rainbow/westslope hybrids, and eastern brook trout inhabit Placer Creek and its tributaries (Table BE-Fish-1). Westslope cutthroat, eastern brook, rainbow, westslope cutthroat x rainbow hybrids, and sculpin *spp*. densities calculated from electrofishing samples in 2003 are summarized below for Placer Creek and its tributaries in each watershed area.

Fish Habitat

The mainstem of Placer Creek is approximately 6.5 miles in length before entering the South Fork Coeur d'Alene River. Placer Creek encompasses an area of approximately 16 square miles, with a road density of approximately 2.2 mi/mi², and a road-to-stream ratio of approximately 0.9. The Placer Creek drainage has experienced past levels of harvest activity, including some harvest and roads near and in riparian areas. Several small intermittent and perennial non-fish bearing tributaries feed Placer Creek for its entire length.

Fisheries habitat data was collected in Placer Creek watershed and its tributaries in 2003 (PF Doc. AQ-43). In addition, water temperature and large woody debris was collected at points throughout the Placer Creek drainage.

Stream channel habitat and morphology were evaluated using modified R1/R4 (Overton et al. 1997; PF Doc. AQ-16) stream survey methodologies; Rosgen (1996) channel analysis (PF Doc. AQ-33); Stream Channel Reference Sites (Harrelson et al. 1994; PF Doc. AQ-56c) guide and large woody debris collections. A modified R1/R4 stream survey (Overton et al. 1997; PF Doc. AQ-16), protocol was used to sub-sample an identified monitoring reach and collect important variables (e.g. large woody debris information; pool, riffle, and run habitat information; pool volume, etc.)

In 2003, Forest Service stream survey crews conducted electrofishing in Placer Creek to determine fish density and presence/absence data. Westslope cutthroat trout (including westslope cutthroat trout/rainbow trout hybrids) in all reaches surveyed had a mean density of 16.3 fish/100m^2 (range 2 to 35 fish/100m^2). Eastern brook trout was found in lowermost portion of mainstem Placer Creek with a density of 0.22 fish/100m^2, and sculpin *sp*. (either slimy or shorthead) had a mean density of 71.5 fish/100m^2 (range 0 to 251 fish/100m^2).

The only likely form of westslope cutthroat trout in the Placer watershed is resident. Historical introductions or stocking of rainbow trout in Placer Creek (Table AQ-2) may have altered fish populations and/or spawning and rearing habitat for westslope cutthroat trout.

Fisheries Monitoring

Placer Creek was surveyed throughout the drainage to establish long-term monitoring sites, where Rosgen (1996) stream channel types were identified. Overall, Placer Creek had a moderate pool to riffle ratio (approximately 1:3) and most pools surveyed were created by large woody debris. Single pieces of large woody debris within the monitoring site equaled 38.9-pieces/100m. Most single pieces surveyed (64%) were either very small in length and diameter (Class I: less than 10-feet length by 10-inch diameter at breast height, or dbh) or associated within the channel as aggregates.

The Placer Creek monitoring sites survey data indicated the following: 1) fish density was relatively high and included non-native eastern brook trout in lowest reaches; 2) channel stability was good; 3) pool-to-riffle ratio was moderate; and 4) large woody debris class was small in length and diameter, with few aggregates surveyed.

Fisheries Habitat Conditions in the Primary Placer Creek Tributaries

West Fork Placer Creek is approximately four miles in length and is the largest tributary to the mainstem Placer Creek drainage, where its confluence is near the Shoshone County Water Districts water storage tank. The drainage encompasses an area of approximately 3.4 square miles, with a road density of 1.8 mi/mi². West Fork Placer has experienced past levels of harvest and developmental activity. Some examples include: 1) near and in riparian harvests; 2) water district intake development, which has included stream rerouting, gabion-fish barrier construction, and riparian disturbance; and 3) small-parcel private land development. Approximately 50% of the drainage is managed as National Forest System, 32% by BLM and the remaining 18% by private owners.

Several small intermittent tributaries feed the watershed for its entire length (Figure AQ-1). Forest Service personnel collected westslope cutthroat trout and slimy/shorthead sculpin during presence/absence electrofishing surveys (PF Doc. AQ-43). The stream was surveyed throughout the drainage to establish long-term monitoring sites. Overall, West Fork Placer Creek had a moderate pool-to-riffle ratio (approximately 1:3) and most pools surveyed were created by large woody debris. Single pieces of large woody debris within the monitoring sites equaled 30-pieces/100m. Most single pieces surveyed (63%) were either very small in length and diameter (Class I: less than 10-feet length by 10-inch diameter at breast height) or associated within the channel as aggregates.

The West Fork Placer Creek monitoring site data indicated the following: 1) fish density was relatively high; 2) channel stability was good; 3) pool-to-riffle ratio was moderate; 4) large woody debris class was small in length and diameter, with few aggregates surveyed; and 5) multiple fish barriers exist due to multiple gabion structures that span and block the channel (approximately five total).

Red Oak, Hord, Trowel, and Dry Gulches all have fish crossing barriers across the road/stream prism. These barriers are either year-round or seasonal in nature to migrating resident salmonids and likely pose a higher level or migration risk to other non-salmonid and aquatic species. Cranky Gulch drainage also has culvert crossing barriers on BLM-managed lands near its confluence with mainstem Placer Creek. Nearly all tributary streams that were perennial (i.e. year round flow) to Placer Creek mainstem had identifiable fisheries within their lowermost reaches. Where applicable, habitat surveys were conducted (PF Doc. AQ-43) that indicated these stream had good pool-to-riffle ratios (< 1:3); high quality habitat; more than 55% of large woody debris in a size class larger than Class 1 (small diameter wood); and lower than mainstem mean temperatures during peak summer maximums (i.e. <12ºC). However, the primary absence of connected habitat (due to the constructed barrier falls just upstream of the town of Wallace and several tributaries with culvert barriers) is a concern to fish population reliance.

3. Environmental Consequences to Aquatic Resources

A. Methodology Used in the Assessment and Description of Environmental Consequences to Aquatic Resources

Overview

The main concerns related to aquatic resources are the potential effects to drinking water, stream channels, and fish habitat. Hillslope conditions are reflected in stream channels, which in turn are the formative features of aquatic habitat. The analysis of direct and indirect effects is based on how the various components of the project (*e.g.,* location, size of cutting units, methods of logging systems, road construction and road work, and reasonably foreseeable actions) are expected to affect each subwatershed within the Placer Resource Area.

Direct effects: *those immediately detected in time or space as a result of activities. Example: an immediate delivery of sediment to a creek.*

Indirect effects: *those that are detected at a later time or place and occurring separate from actual activities. Example: an increase in water yield as a result of removing canopy closure.*

Cumulative effects: *based on the existing condition, the direct and indirect effects of proposed activities and any ongoing or reasonably foreseeable actions.*

For this environmental analysis, the WATSED model was used to compare the cumulative effects of the No-Action Alternative to the Proposed Action. The risk analysis applied the design features described in the EA, Part 3.C(3).

Methodology Used in Estimating Effects to Water Yield and Peak Flow (Stream Flow Regime)

Peak flows represent the change in runoff and is expressed as the percent change from the estimated "natural" peak month discharge. The WATSED model was used for this analysis to estimate the effects of the proposed timber harvest, construction, reconstruction and decommissioning of temporary and classified roads, and site preparation treatments. Reasonably foreseeable actions are included in this analysis. Changes in peak flows are compared to the existing peak flows discussed in the affected environment section. The timeframes for the estimated direct and indirect effects is 2005 (estimated start of activity) through 2031.

Guidelines for Changes to Water Yield and Peak Flow	
Zero	If the increase over the existing level is zero, there is no potential for an increase in water yield and peak flow or delay of watershed recovery.
0 to 5%	Potential exists for an increase in water yield and peak flow or delay of watershed recovery, but the increase would not be measurable. For example, if you dumped a cup of water into a stream, you know the flow has increased; yet it would not be measurable at a gauging station.
5 to 10%	There is a slight potential that there would be a measurable increase in water yield and peak flow or delay of watershed recovery.
10% or more	There would likely be a definite increase in water yield and peak flow resulting in a measurable or even visible change in stream morphology and delay of watershed recovery.

Methodology Used in Estimating Effects to Stream Channel Morphology

Morphology is the shape of the stream channel – such as bank height, bank slope, channel width, and pool size. The stability of a stream channel and morphology is dependent on variations of the stream channel type. Stream channels that are primarily alluvial systems (sediment deposited and formed) are the most susceptible to stream bank erosion, changes in sediment supplies, and large woody debris removal (Chamberlin et al. 1991, PF Doc. AQ-34; Rosgen 1996, PF Doc. AQ-33). Stream channels are more stable with respect to fluctuations in flow and sediment yields when the substrate is composed of bedrock and boulders that have a good portion of large woody debris jams and are more confined within the valley bottom (Chamberlin et al 1991, PF Doc. AQ-34; Rosgen 1996, PF Doc. AQ-33). This analysis compares effects of proposed activities under Alternative 2, in regard to changes in channel morphology (such as bank erosion, downcutting, and deposition of bedload sediment). The analysis stems from interpretation of WATSED's sediment and water flow changes and where (or if) any changes may be occurring in the more sensitive reaches of the streams. The analysis is based on judgment supported by WATSED modeling by subwatershed.

Methodology Used to Estimate Effects to Sediment Yield: Percent increase in sediment yield is estimated as the annual sediment above existing levels loading into Upper Placer, Middle Placer, Lower Placer, WF of Placer Creeks, and Experimental Draw subwatersheds. This percent is compared to the current sediment load discussed in the existing conditions section. Sediment yield percent is calculated for each alternative using the WATSED model. The proposed timber harvest units, construction, reconstruction, and decommissioning of temporary and classified roads, and site preparation treatments are included in the analysis. Some of the reasonably foreseeable actions discussed below are also calculated in the analysis. The estimated short-term or direct and indirect effects analysis timeframe for sediment yields is through 2009, the latest year that sediment yield would recover to baseline.

Guidelines for changes to Sediment Yield	
Zero	If the increase over the existing level is zero, there is no potential for an increase in sediment or delay of watershed recovery.
0 to 10%	Potential exists for an increase in sediment or delay of watershed recovery, but the increase would not be measurable. For example, if you dumped a cup of dirt into a stream, you know the sediment has increased; yet it would not be measurable at a gauging station or by using a sampler.
10 to 20%	There is a slight potential that there would be a measurable increase in sediment or delay of watershed recovery.
20% or more	There would likely be a definite increase in sediment resulting in a measurable or even visible change in stream morphology and delay of watershed recovery.

Methodology Used to Estimate Effects to Sediment Risk Associated with Drainage Structures: This is the anticipated change in sediment risk associated with stream crossings that were inventoried within the scope of the project. The associated risk is presented in terms of tons of sediment as discussed in the affected environment section. This figure was calculated based on measurements or estimates of road through-fill located at stream crossings.

Methodology Used to Estimate Effects to Fisheries: Estimated effects to fish and fish habitat reflect the interpretation of information developed from peak flows, water yield, and sediment yield modeling and how these levels based on guidelines developed above would influence fish and fish habitat. In part the effects of the above stated parameters and the use of the developed guidelines would aid in determining the effects on channel morphology. Also, estimates effects are determined on the use of INFS (1995; PF Doc. AQ-9) standards and guidelines (Appendix B) and how these protective measures are applied and measured for effectiveness for project implementation.

B. Direct and Indirect Effects to Aquatic Resources

Direct and Indirect Effects to Aquatic Resources under the No-Action Alternative

Since no management activities would be implemented with this alternative, there would be no direct effects associated with this project. Sediment yield values and trends as discussed in the existing conditions would not change from predicted trends. Water yield values would continue to decrease very slowly by an average of approximately 0.5% for the next 18 years in Middle and Upper Placer as vegetation recovers from recent harvest. Water yields in Lower Placer, Experimental Draw, and West Fork Placer would remain at current levels due to vegetation of past harvest activities already recovered to effectively intercept, utilize, and transpire water. Sediment yield values would continue to recover to a baseline condition after recovery from past activities because no sediment sources from roads would be corrected or culverts upgraded.

The effects analysis for the No-Action Alternative includes the reasonably foreseeable fuel break on BLM and private lands along Road 456, with no expected increase in water yield, peak flow or sediment. The fuel break proposed along Road 456 would be 150 feet wide on either side of the road and would include a combination of various treatments including thinning, pruning, piling and burning. These activities would only be implemented upslope of the road when the road is 150 feet or less from the stream, which would not affect the stream-side buffers. This 150 feet of no treatment between the road and any stream, would allow water runoff and surface sediment to be filtered before reaching the stream. This 150 feet no treatment between the road and the stream would also prevent loss of any potential woody debris recruitment to Placer Creek and its tributaries. This conclusion is based on the fact that any tree that would naturally fall towards the stream (upslope of the road) would be removed for public safety and passage on the heavily used Road 456, which is maintained by Shoshone County. The existence of the road itself generates more potential fine sediment than the fuel break treatment.

Direct and Indirect Effects to Water Yield and Peak Flow (Flow Regime) Under the No-Action Alternative

Under the No-Action Alternative vegetation will continue to grow and recover and from past logging and prescribed fire activities increasing absorption of precipitation and reducing runoff and peak flows. The only potential change to peak flow and water yield with the no action would be if a large scale, high intensity wild fire occur within the watershed. If this were to occur measurable changes to peak flows and water yield would occur with the degree of change dependent on how wide spread the high severity fire was. The no action would have a slight decrease in risk of this event from implementing the fuel break project.

Direct and Indirect Effects of Water Yield and Peak Flow Increases on Fisheries under the No-Action Alternative

Increases in water yield and peak flows would be zero (Table AQ-3), consequently there would be no change to fisheries habitat conditions (salmonid redds, aquatic life, and their associated habitat) in any of the fish-bearing stream segments. Since any change in water yield associated with this project probably would not be differentiated from normal climatic fluctuations in the Placer Resource Area watersheds, no additional bedload scour would be expected during high flows.

Direct and Indirect Effects to Channel Morphology under the No-Action Alternative

Channel morphology changes are typically in response to peak flow events. There would be no change to peak flows or water yield with the No-Action alternative therefore there would be no change to channel morphology. Large scale, high severity wildfire could cause increased peak flows and water yield altering channel morphology should a large runoff event occur. The fuel break activities would slightly reduce the risk of a large scale, high severity wildfire and reduce the risk of changes to channel morphology.

Direct and Indirect Effects of Channel Morphology Changes on Fisheries under the No-Action Alternative

Based on the zero estimated changes in peak flows, water yield, and sediment yields, the stream channel morphology in Placer Creek and its subwatersheds would not be affected by the No-Action Alternative. Rather it would continue to be active based on current baseline condition, therefore would not have measurable direct or indirect effects to fish, fish habitat, aquatic biota or their habitat.

Direct and Indirect Effects of Water Quality (Sediment Yield) under the No-Action Alternative

Based on modeling there would be no increase in sediment yield under the No-Action alternative from current baseline condition (Table AQ-3). Existing fine sediment from the roads within the watershed and the conditions of culverts and drainage features will continue to supply Placer Creek with fine sediment. The No-Action alternative would not correct any problems and sediment levels would remain the same as they are now.

Direct and Indirect Effects of Sediment Yield on Fisheries under the No-Action Alternative

Based on modeling there would be no increase in sediment yield under the No Action alternative from current baseline condition (Table AQ-3), consequently there would be no change to fisheries habitat conditions (salmonid redds, aquatic life, and their associated habitat) in any of the fish-bearing stream segments. Since any change in sediment yield associated with this project probably would not be differentiated from normal climatic fluctuations in the Placer Resource Area watersheds, no additional bedload scour would be expected above current baseline.

Direct and Indirect Effects to Aquatic Resources under the Proposed Action

Direct and Indirect Effects to Water Yield and Peak Flow (Flow Regime) Under the Proposed Action

The Placer Creek subwatersheds would have peak flow and water yield increases ranging from 0 to 5% over existing, which constitutes a slight potential that there would be a measurable increase in water yield and peak flow or delay of watershed recovery (see Table AQ-4). There would be very little difference in peak flow changes between the No-Action and Proposed Action Alternatives. The Proposed Action could result in a slight increase in peak flows within the first-order headwater drainages. This potential for a slight increase would be localized in the headwaters and would not be enough to cause measurable channel degradation or a measurable increase in fine sediment or coarse bedload particles in Placer Creek or its tributaries.

The Proposed Action includes the fuel break on National Forest System land along Road 456. The fuel break would be 150 feet wide on either side of the road and would include a combination of various treatments including thinning, pruning, piling and burning. The fuel break would reduce surface and ladder fuels, while reducing crown fuels where necessary. Because this activity would not remove over-story canopy (except for very tightly spaces stands), and not cause ground disturbance (no tractor skidding), there would be no measurable change to water or sediment yield. This activity would occur outside of RHCA's except at locations where Road 456 is within 300 feet of the stream. In these cases the fuel break activities would occur only on the upslope side of the road. This provision allows the road itself along with another 150 feet to become a fuel break that won't carry crown fires. By removing understory and overstory trees that are tightly spaced, there would not be an effect on streamside buffers to filter sediment or large woody debris recruitment to Placer Creek. This conclusion is based on the fact that any tree that would naturally fall towards the stream (upslope of the road) would be removed for public safety and passage on the heavily used Road 456. The existence of the road itself also generates more potential fine sediment than the fuel break treatment itself.

The burning activities would be low intensity under-story and brush field burns when soils or cool and damp with no expected impacts to soil production. The burning and trail construction activities would cause very little over-story mortality. With overstory mortality ranging from one to two percent, there would not be enough heat to scorch soils or kill trees that provide canopy and there would be no change in water yield or peak flows.

Table AQ-3. Comparison of Changes to Peak Flow and Water Yield in the Placer Resource Area, by alternative.

Indicator	% increase over existing under the No-Action Alternative	% increase over existing under the Proposed Action Alternative	Difference in % Increase Between the No-Action and Proposed Action Alternatives
WATER YIELD Effects of commercial harvest and resulting canopy openings on % increase in water yield.	Lower Placer 0% West Fork Placer 0% Middle Placer 0% Experimental Draw 0% Upper Placer 0% **Entire Placer 0%** Range = 0 to 0% Mean = 0%	Lower Placer 2% West Fork Placer 3% Middle Placer 1% Experimental Draw 0% Upper Placer 3% **Entire Placer 2%** Range = 0 to 3% Mean = 1.8%	Lower Placer 2% West Fork Placer 3% Middle Placer 1% Experimental Draw 0% Upper Placer 3% **Entire Placer 2%** Range = 0 to 3% Mean = 1.8%
PEAK FLOW Effects of commercial harvest and resulting canopy openings on % increases in peak flows.	Lower Placer 0% West Fork Placer 0% Middle Placer 0% Experimental Draw 0% Upper Placer 0% **Entire Placer 0%** Range = 0 to 0% Mean = 0%	Lower Placer 3% West Fork Placer 4% Middle Placer 2% Experimental Draw 0% Upper Placer 4% **Entire Placer 3%** Range = 0 to 4% Mean = 2.7%	Lower Placer 3% West Fork Placer 4% Middle Placer 2% Experimental Draw 0% Upper Placer 4% **Entire Placer 3%** Range = 0 to 4% Mean = 2.7%

Direct and Indirect Effects of Water Yield and Peak Flow Increases on Fisheries under the Proposed Action

Increases in water yield and peak flows would be too small to be measurable in the mainstem of Placer Resource Area streams, and would not change fisheries habitat conditions (salmonid redds, aquatic life, and their associated habitat) in any of the fish-bearing stream segments. Since any change in water yield associated with this project probably would not be differentiated from normal climatic fluctuations in the Placer Resource Area watersheds, no additional bedload scour would be expected during high flows.

Direct and Indirect Effects to Channel Morphology under the Proposed Action

Changes in the magnitude, intensity or duration of peak flows, water yield, and sediment yield have the potential to change stream channel characteristics. The action alternative would modify the magnitude, intensity and duration of peak flows and sediment yields, but this increase based on WATSED would not be measurable. The most sensitive stream segments, prone to channel morphology changes from management activities are located in Middle Placer. These C-channel reaches have dominant stream bed material composed of sand, gravels and small cobbles, (particle sizes ranging from 1 mm to 152 mm [approximately1/16th inch to 6 inches]), and are easily scoured, transported and deposited with high stream flows.

Stream survey data from 2003 (PF Doc. AQ-95) indicates that woody debris recruitment levels are high, and that woody debris exists in the form of single pieces that were classified as relatively small in length and diameter or grouped as aggregates. These pool formative features can dissipate stream energy. A maximum increase in water yield of 2%, peak flow of 3 %, and sediment yield of 6 % over the existing baseline would not likely result in any measurable changes to channel morphology or stream flow in any of the reaches of Placer Creek or its tributaries. There would be a zero to very low risk of measurable changes in the South Fork Coeur d'Alene River at the confluence of Placer Creek because the predicted water yield change is 2% for the entire Placer watershed and this watershed is only 12% of the South Fork Basin at the confluence with Placer Creek.

Changes in the magnitude, intensity or duration of peak flows and sediment yields have the potential to change stream channel characteristics. Stream channels that are primarily alluvial systems (sediment deposited and formed) are the most susceptible to stream bank erosion, changes in sediment supplies, and large woody debris removal (Chamberlin et al. 1991; PF Doc. AQ-34; Rosgen 1996; PF Doc. AQ-33). Stream channels where the substrate is composed of bedrock and boulders that have a good portion of large woody debris jams and are more confined within the valley bottom are more stable with respect to fluctuations in flow and sediment yields (Chamberlin et al 1991; PF Doc. AQ-34; Rosgen 1996; PF Doc. AQ-33).

Activities under the Proposed Action could modify the magnitude, intensity and duration of peak flows and sediment yields but the risk of measurable effects and detection of stream channel changes is low to none. The estimated changes in peak flows and sediment yields would not affect stream channel morphology and therefore would not change fish habitat. The dominant stream bank material is gravels, small/large cobbles, and boulders within the most sensitive reaches of Middle Placer; they are easily scoured, transported, and deposited with high flows. The other channel types upstream and downstream of the Middle Placer subwatershed are well confined and entrenched, which allow sediment and debris to be easily transported, without effecting channel morphology.

Direct and Indirect Effects of Channel Morphology Changes on Fisheries under the Proposed Action

Based on the estimated changes in peak flows, water yield, and sediment yields, the stream channel morphology in Placer Creek and its subwatersheds would not be affected by the Proposed Action activities, and therefore would not have measurable direct or indirect effects to fish, fish habitat, aquatic biota or their habitat.

Direct and Indirect Effects of Water Quality (Sediment Yield) under the Proposed Action

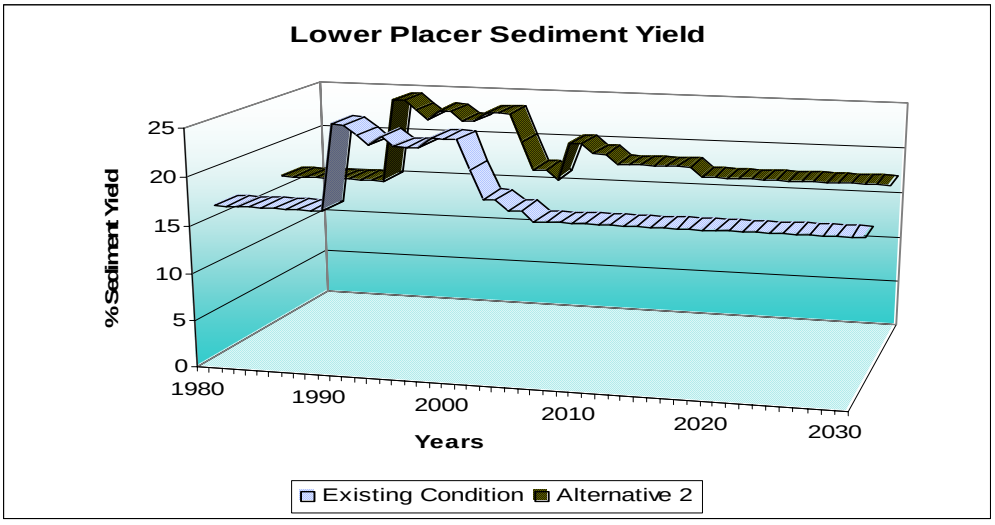
Figures AQ-14 through AQ-19 display the differences in sediment yield increases resulting from vegetative treatments and associated road construction/reconstruction. Because the road construction/reconstruction would occur on a ridge top far from streams, and involves no water crossings or sensitive soils, it was not modeled. The impacts would create sediment during reconstruction but due to its location routing of sediment to any stream course would be unlikely and a very low risk.

Following is a comparison of effects of the activities under the No-Action and Proposed Action Alternatives. All results are based on the assumption that treatments would be implemented in 2006.

Table AQ-4. Comparison of Sediment Yield changes by alternative for the Placer Resource Area.

Indicator	% increase over existing under the No-Action Alternative	% increase over existing under the Proposed Action Alternative	Difference in % increase over existing between the No-Action and Proposed Action Alternatives
SEDIMENT YIELD *Effects of commercial harvest and road activity on % increase in sediment yield.*	*Lower Placer 4%* *West Fork Placer 6%* *Middle Placer 0%* *Experimental Draw 0%* *Upper Placer 0%* ***Entire Placer 2%*** *Range = 0 to 6%* *Mean = 1.7%*	*Lower Placer 4%* *West Fork Placer 6%* *Middle Placer 2%* *Experimental Draw 0%* *Upper Placer 4%* ***Entire Placer 6%*** *Range = 0 to 6%* *Mean = 3.7%*	*Lower Placer 0%* *West Fork Placer 0%* *Middle Placer 2%* *Experimental 0%* *Upper Placer 4%* ***Entire Placer 4%*** *Range = 0 to 4%* *Mean = 1.7%*

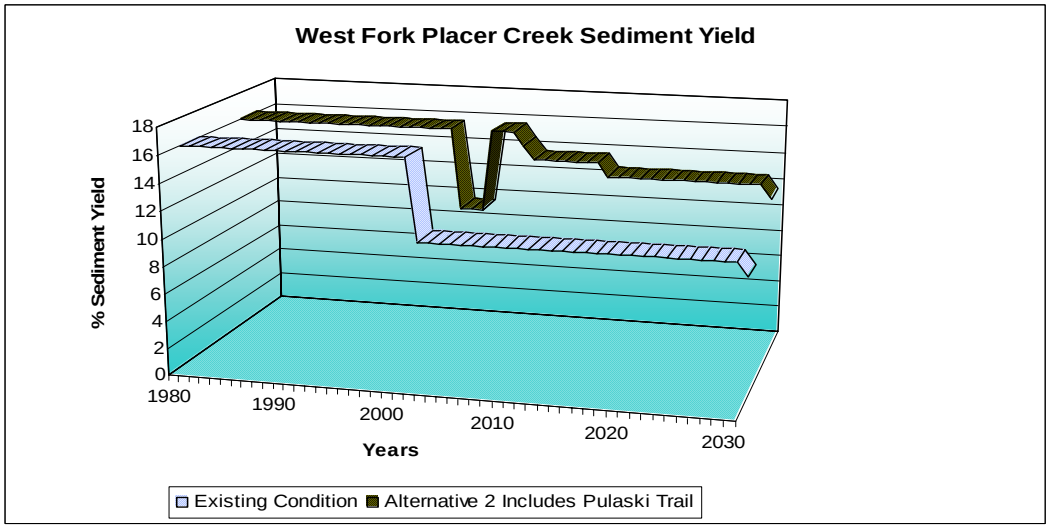
Figure AQ-14. Sediment Yield in Lower Placer Creek Under the Proposed Action.



Timber harvest has occurred in the Lower Placer Creek drainage within the last 15 years, with almost complete recovery from those activities (back to baseline). The baseline sediment yield is a result of the existing roads and trails within the subwatershed that are still on the landscape, potentially contributing a constant level of sediment. This constant level of sediment is theoretical and is based on WATSED modeling. Under either alternative, the modeled increase in sediment in 2005 are cumulative effects resulting from the activities associated with the ongoing Pulaski Trail project.

The Proposed Action has a 4% predicted sediment yield increase above baseline which, with recovery, would be the same as under the No-Action Alternative. The increase in sediment as modeled is not expected to show any measurable effects to sediment in Lower Placer Creek. Application of BMPs (Aquatics Appendix A) and INFS guidelines (1995; PF-AQ-9) that restrict harvest and road building activities in riparian areas are expected to minimize increases in sediment levels to the point that there would not be any direct or indirect negative effects to beneficial uses or detectable changes in water quality or stream morphology.

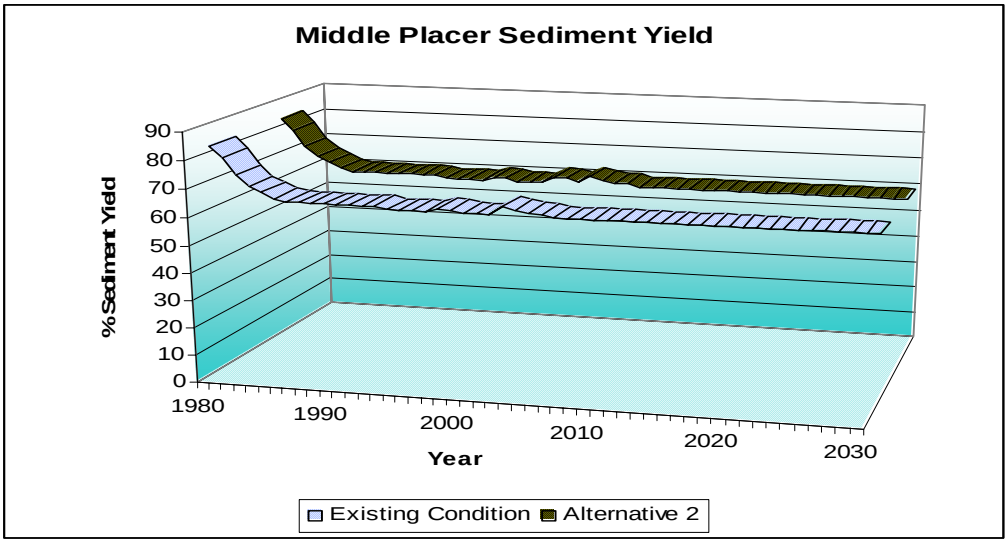
Figure AQ-15 Sediment Yield in West Fork Placer under the Proposed Action in Comparison to the Existing Condition.



The modeled increase in sediment in West Fork Placer Creek would result from proposed activities (harvest, road reconstruction and burning activities) in the headwaters of this subwatershed. Sediment yield increases under the No-Action Alternative are accounted for by the construction of the Pulaski Trail project.

The Proposed Action shows a predicted sediment yield increase of 6% above baseline in West Fork Placer Creek, which is the same as the No-Action Alternative. The increase in sediment as modeled is not expected to show any measurable effects to sediment in Lower Placer Creek. There is a low risk that measurable sediment could be detected in the upper reaches of West Fork Placer Creek, and a very low risk of detection at the bottom of this drainage. Application of BMPs (Aquatics Appendix A) and INFS guidelines (1995; PF-AQ-9) that restrict harvest and road building activities in riparian areas are expected to minimize increases in sediment levels to the point that there would not be any direct or indirect negative effects to beneficial uses or detectable changes in water quality or stream morphology in West Fork Placer Creek.

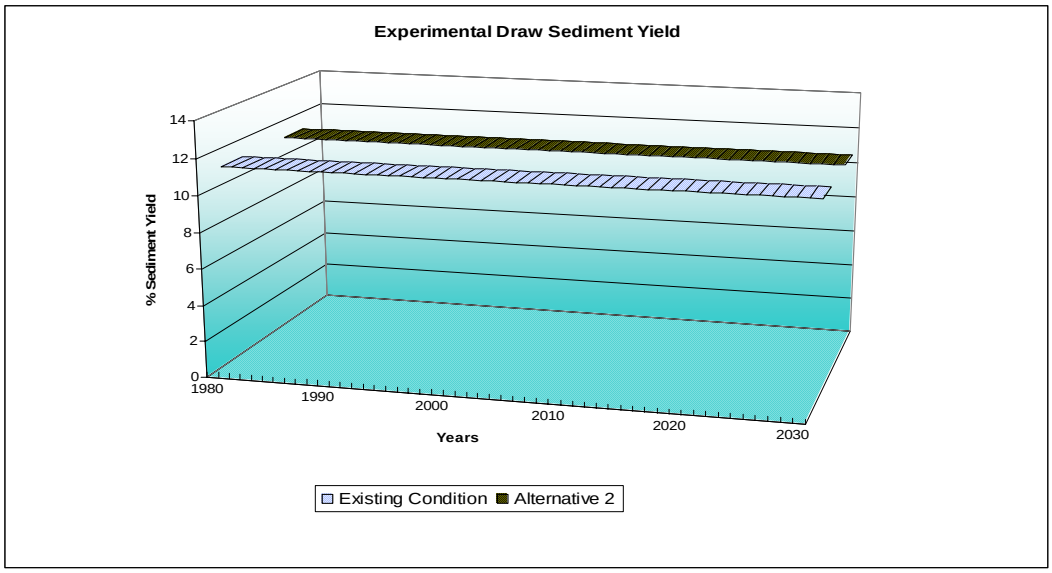
Figure AQ-16 Sediment Yield in Middle Placer Creek under the Proposed Action in Comparison to the Existing Condition.



The modeled increase in sediment yield for Middle Placer Creek would result from the harvest and burning activities in the headwaters of this subwatershed (no new road construction would occur in this drainage under the Proposed Action). These actions are expected to occur during the 2006 field season, one year after the Pulaski trail work. Under the Proposed Action, there would be a predicted sediment yield increase of 2% above baseline. There would be a very low risk of measurable sediment yield increases in Middle Placer Creek as a result of applying site-specific BMPs (Aquatics Appendix A).

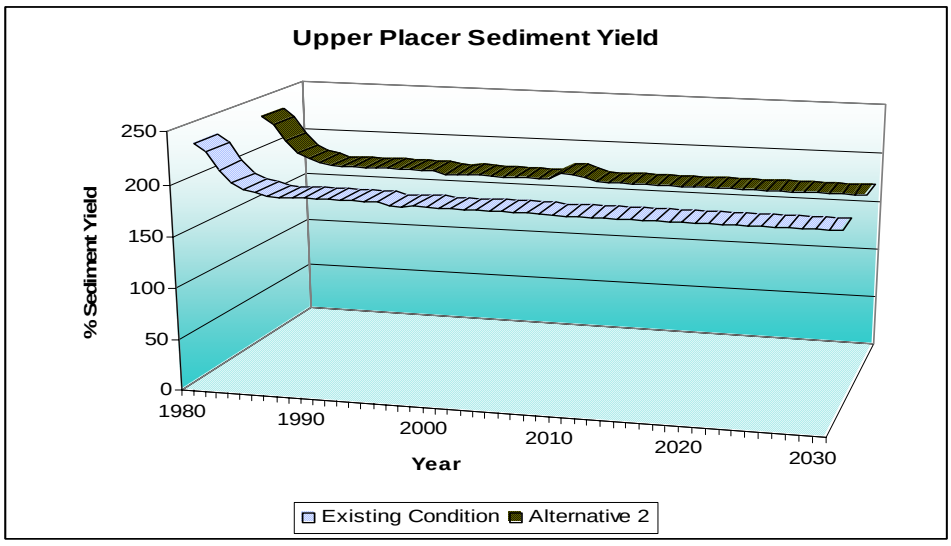
Under the No-Action Alternative, fuel reduction activities would occur on private land along Road 456. These activities include the slashing of brush and understory trees, dead and unmerchantable timber, pruning of the lower branches and piling and burning to reduce fuels. Commercial harvest would be limited to scattered small diameter trees in over-crowded areas. These activities were not modeled in WATSED because the limited removal of green trees would not show any measurable adverse effects to peak flows or sediment yields.

Figure AQ-17 Sediment Yield in Experimental Draw under the Proposed Action in Comparison to the Existing Condition.



No change in sediment yield would be expected in Experimental Draw because of the low level of management activities or ground disturbance from the prescribed fire activities within this subwatershed under the Proposed Action.

Figure AQ-18 Sediment Yield in Upper Placer under the Proposed Action in Comparison to the Existing Condition.



The modeled increase in sediment in Upper Placer would result from the harvest and burning activities in the headwaters of this subwatershed. These actions are expected to occur during the 2006 field season, with the predicted sediment yield increase of 4% above baseline. This predicted increase is based on potential ground disturbance from the tractor yarding in the thinning units, and 0.8 miles of temporary road construction. Application of BMPs (Aquatics Appendix A) and INFS guidelines (1995; PF-AQ-9) that restrict harvest and road building activities in riparian areas are expected to minimize increases in sediment levels to the point that

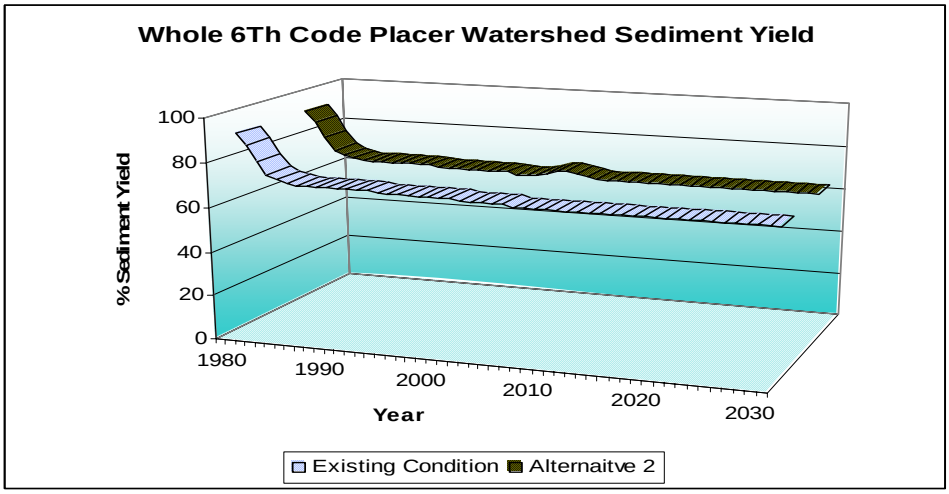
there would not be any direct or indirect negative effects to beneficial uses or detectable changes in water quality or stream morphology in Upper Placer Creek or downstream.

Summary of Direct and Indirect Effects in the Entire Placer Creek (6th Code) Watershed

Timber harvest and prescribed burning activities occurred through the Placer Creek watershed in the early 1990's, with almost full recovery from those activities back to baseline. The baseline sediment yield is a result of the existing roads and trails within the subwatershed that are still on the landscape and still potentially contributing sediment at a constant level. This constant level of sediment is theoretical and is based on WATSED modeling. The predicted 2% increase in sediment in 2005 under the No-Action Alternative is the result of activities associated with the Pulaski Trail.

Modeling of the Proposed Action shows a predicted sediment yield increase of 6% above baseline and 4% above the No-Action Alternative. The increase in sediment as modeled is not expected to show any measurable increases in sediment in Placer Creek. Application of BMPs (Aquatics Appendix A) and the absence of any harvest or road construction in INFS riparian areas (1995; PF-AQ-9) are expected to prevent sediment levels from increasing; there would be no negative effects to beneficial uses or detectable changes in water quality or stream morphology.

Figure AQ-19 Sediment Yield in Placer Creek Under the Proposed Action in Comparison to the Existing Condition.



In summary, there would be only a slight difference in sediment yield increases between the No-Action and Proposed Action Alternatives. The risk of measurable sediment under the Proposed Action would be low for the subwatersheds within the Placer Creek drainage and even lower for the entire Placer (6th Code) watershed. If any sediment increase were to occur, it would be localized near road reconstruction activities in the West Fork Placer Creek or in the Upper Placer subwatershed. Approximately 879 acres of mechanical treatment would occur in this 9,984-acre drainage, with 1,160 acres of prescribed fire treatment and no harvest in RHCA's . This level of treatment, BMP's, and location of treatments far enough away from streams would prevent sediment from being routed downstream through Placer Creek into the South Fork Coeur d'Alene River. Sediment yield increases under the Proposed Action would not be enough to cause measurable effects to water quality or impair beneficial uses.

Direct and Indirect Effects of Sediment Yield on Fisheries under the Proposed Action

Increases in sediment delivery can affect fish habitat by filling in the interstitial spaces in spawning gravels. This results in decreased water flow through the gravels necessary for oxygen delivery and waste removal for incubating eggs. Filling of interstitial spaces can also displace macroinvertebrates, thereby reducing an important food source for fish and other aquatic life. High amounts of sediment can fill in pools and reduce rearing habitat for juvenile fish. Since all ground-disturbing activities (e.g. roading, skyline and helicopter logging; etc) would occur outside of RHCAs, the risk of any sediment generated by logging activities actually reaching a live channel is very low (Belt et al. 1992; PF Doc. AQ-42). By using timing restrictions (see Fisheries BA/BE), onsite direction, and BMPs, sediment delivery to occupied fish habitat associated with culvert removals and upgrades would be minimized and risk of failure eliminated or reduced.

Reasonably foreseeable watershed restoration activities are located throughout the drainage (two within fish bearing waterways). Sediment yield into stream courses during road reconstruction and temporary road construction would likely be too small to measure. The risk of measurable effects to fish habitat from sediment being transported into depositional zones of Placer Creek based on the watershed analysis, and application of BMPs (Aquatic Appendix A and INFS 1995; PF Doc. AQ-9) and INFS standards and guidelines. The higher-gradient channel types present in the headwaters of project drainages would likely route any sediment to the nearest low gradient stream reaches where it would settle out, given the amount of large woody debris component found in the project watersheds (USDA Forest Service, 2002 Stream Surveys; PF Doc. AQ-43). The predicted increase in sediment delivery would likely be transported or stored within the system. During high flows, silts would likely stay suspended, be carried through the system and be re-deposited near large woody debris or off-channel microsites (i.e. depositional zones) influenced by high flows. Salmonid redds, aquatic life, and their associated habitat existing in the cumulative effects area would not be directly or indirectly affected by the expected increases in water yield and peak flow changes.

C. Cumulative Effects to Aquatic Resources

Influences of Past Actions on Existing Watershed Conditions

The following is a description of past actions, to establish the appropriate geographic and time boundaries for the cumulative effects analysis. Activities identified below were ones that are relevant to the watershed and fisheries cumulative effects analysis. Activities which created no disturbance to watershed or fisheries resources are not discussed here.

Prescribed Burning: Historically, the greatest natural agent of disturbance in the Placer Resource Area was the natural wildfire. Fire history of the area is explained in detail in the Fire/Fuels section of Chapter 3.3. Generally speaking, frequent, low-intensity fires were common on the dry aspects of the watershed, occurring on average once every 20 to 30 years. Throughout the entire area, including the moist sites, Zack and Morgan (1994***;*** PF Doc. FF-18) established a historic fire return interval of 54 years for all types of fires (mixed and lethal severity). The very moist riparian stands likely burned less often and less severely, due to their topographic position and fuel moisture conditions during most fire seasons. Past fire suppression has occurred since natural fire cycles, contributing to the continual increase in fuel-loading on both dry and moist sites. Consequent reaction to this suppression has been an attempt to reduce built-up fuels using methods of prescribed burning. This past burning activites have reduced fuel loads which tactically will provide fuel breaks should a fire start occur in the watershed and indirectly this will help protect riparian areas for fish and watershed resource concerns.

Timber Harvest After the 1910 Fire: The post-timber harvest of Placer Creek after the 1910 fires very likely altered fish and fish habitat conditions within the watershed due the fires and post-harvest timber harvest and road construction activities increasing water and sediment yields, changing peak flow duration and timing, which all of these factors likely resulted in substantial channel morphology change. These changes consisted of bed-load scouring of the steeper gradient reaches and deposition in the lower gradient reaches. Shallow braided channels from bedload deposition can still be found in a few reaches Middle Placer Creek (page AQ-10) as residual effects from 1910 fires and post fire salvage activities.. The results of the post-fire harvest

activities likely altered fish populations and fish habitat recovery time after such an intense and severe fire in the basin. At the time there were no riparian protection measures in place (i.e. INFS buffers) and consequently the removal of riparian timber resulted in losses to future instream woody debris recruitment that would have developed fish habitat.

Slate Creek Timber Sale: At the time that this activity was implemented there were no stream buffer guidelines to protect riparian areas from harvest and road building activities that occurred with the implementation of this small (<360 acre) timber sale. The location of this sale was in the Placer Creek, Line Gulch and Slate Creek headwater areas. All of these locations are known to be non-fish bearing, the likely effects of this past activity would have been local in nature (e.g. increases in headwater peak flow and water and sediment yields), but would not have altered fish habitat or communities. Sediment yield, water yield, and channel morphology changes may have been measureable within several years after this activity but recovery has mostly occurred but changes in Placer Creek, Line Gulch and Slate Creek headwater areas are no longer detectable.

Timber Harvest on Private Lands: These types of activities have been principally located in the lowermost portion of the Lower Placer subatershed, Cranky Gulch, and West Fork Placer Creek within the Placer Resource Area. Effects from these actions are variable depending on intensity and location of activities.

Tree Planting: There is no effect of past tree planting activities on water yield, sediment yield, channel morphology, and fisheries resources. If anything there would be a beneficial effect from tree planting activities by speeding vegetative response, and speeding the ability of stands to absorb water within in the Placer Creek Watershed. . If planting occurred within riparian zones (e.g. shade – temperature and future woody debris recruitment) would be improved.

Road Building: Road construction within the Placer Resource Area has been only moderate in Placer Creek compared to other areas within the South Fork of the Coeur d'Alene River Basin. Access to the St. Joe Watershed over Moon Pass and other forest management activities as past fire and timber projects has determined the existing road networks. Many of the roads in the Placer watershed were built in the early 1900s for mining purposes. The Forest Service required access to parts of the watershed for vegetation management and some exploratory mining then built more roads in the 1950s. In all, there are approximately 2.2 miles of road per square mile of land ($mi/mi^{2)}$; of these approximately 60% are brushed in and closed. Small portions of these roads have been opened up by motorized recreation use. The Upper Placer Creek subwatershed has the highest density of roads based on drainage size in the Placer Resource Area (approximately 3.88 mi/mi^2). With the majority of road brushed in and located in the headwaters of Upper Placer Creek, the only significant effects from these roads are the chronic erosion sites (culverts and cut and fill slope identified in existing conditions) that supply sediment to the streams, and the annual maintenance of Road 456. The maintenance activity on Road 456 mostly entails grading, which causes a short-term sediment increase at sites close to the stream as side cast material may spill onto the fill slope. The long-term sediment reduction is achieved through road maintenance by reduced rutting and road surface erosion on this heavily traveled road during the summer and fall months.

Waterfalls, channel flow intermittency, and some debris jams are part of the reference conditions that naturally and continually fragment aquatic habitats for various periods of time. In the Placer Resource Area, high gradient stream reaches in headwater locations are the predominant form of natural barriers. There are 12 human-caused fish barriers in the Placer Resource Area, 10 are located on private or county managed lands, and 2 on federally managed lands (Figures AQ-1 and AQ-2). The fish barriers that exist on private land include non-removable barriers such as the gabion walls on West Fork Placer Creek; cleaning gates in Placer Creek; and the concrete corridor that channels Placer Creek through the town of Wallace. Those that can be removed and replaced include three on County Road 456 (Red Oak, Hord, and Trowel Gulches); one on Cranky Gulch (BLM); and one on Dry Gulch (USFS). Effects analysis for work related activities to upgrade, replace, and improve culverts for fish passage including instream channel work is covered in this analysis.

Mining: Hardrock mining occurred around the turn of the century with no known point sources of contaminants from mill tailings or waste rock. There may have been some localized negative effects, only at the reach level, to water quality, channel morphology, and fisheries habitat but no know disturbances are still causing detrimental effects to the aquatic resources (Jeff Johnson, US Forest Service Geologist, personal communication). The bulldozer prospecting occurred along the North side of Placer Creek along the midslopes and upperslopes of the watershed, far from stream channels. The effects from this likely resulted in soil disturbance and local sediment runoff that did not likely reach any water course because of its location. The disturbance has almost completely recovered as seen from 2004 aerial photos where dozer ground disturbance is barely visible due to vegetative re-growth. There are no other potential effects from past mining that would contribute to cumulative effects to water quality and fish habitat when considering new proposed activities.

Fire Suppression: Over the last century, stands within the Placer Resource Area have been allowed to progress towards climax vegetative condition. The current trend is toward more shade tolerant species that are not as long-lived and are more susceptible to insects and disease (Specialist Report on Forest Vegetation). Since changes in water yield are associated with vegetation conditions, the existing and future trends would have an effect on water yield. The ongoing and foreseeable fire suppression techniques, if areas in Placer Creek watershed are not allowed to be treated (i.e. brush field burning) will continue to fuel load, as a result, should a ignition occur, there would be a severe and intense stand replacing fire. Also, should this type of fire occur, aquatic resources would be measurably impacted as a result of increases in sediment and water yield and peak flow changes.

Shoshone County Fire Mitigation: The fire mitigation activities implemented by the Shoshone County Fire Mitigation Group emphasizes fire protection measures for structures on these lands. It is not anticipated that their actions would result in changes to watershed or fisheries resources.

Cumulative Effects of Ongoing and Reasonably Foreseeable Activities on Aquatic Resources

The following is a description of Ongoing and Reasonably Foreseeable Activities, to establish the appropriate geographic and time boundaries for the cumulative effects analysis. Activities identified below were ones that are relevant to the watershed and fisheries cumulative effects analysis. Activities which created no disturbance to watershed or fisheries resources are not discussed here.

Cumulative Effects of Pulaski Trail Project: Most of the Pulaski Trail project resides on private land inholdings in the analysis area, with the majority of the land within the lower- and mid-valley segments of project area. The private lands primarily consist of year round homes in small communities; county water district lands; and timber company lands.

The following is a synopsis of what the Watershed Report concluded. There was no predicted increase in water yield or peak flows for the Pulaski Trail Project based activities. At the sub-watershed scale the W.F. Placer Creek would have a 6% increase in sediment yield from the proposed activities, including the effects from past and foreseeable activities. At the watershed larger scale (i.e. Placer Creek watershed), WATSED outputs showed a sediment yield increase from 0% to 4% from the proposed activity (See Table AQ-5). Due to only small levels of increased sediment yield, from past and foreseeable projects, no measurable effects would occur in the Placer Creek cumulative effects area. The proposed activities would not cause a net increase in metal or sediment through management activities in the South Fork Coeur d'Alene River.

In consideration of this, the Fisheries BA/BE concluded for the Pulaski Trail Project that from the low sediment yield increases that would occur with the implementation of the trail project in W.F. Placer Creek from direct and indirect effects associated with the proposed project, the cumulative effects are not expected to change the existing trend for fisheries resources. The Pulaski Trail Project, in conjunction with reasonably foreseeable actions, would result in a net increase in sediment yield at the subwatershed scale (i.e. West Fork Placer; $\leq$5 %) in the short term. In conclusion, the potential short-term increase in sediment **may affect** individual westslope cutthroat trout, ***but would not lead toward a trend in federal listing.***

Also, there was no predicted increase in water yield or peak flows (see Watershed Report) for project based activities. Consequently, there is **no effect** to fisheries from water yield of peak flow changes within the drainages in the Pulaski Trail Project.

Cumulative Effects of Noxious Weeds Monitoring and Treatment: This activity would follow guidelines established in the Coeur d'Alene Noxious Weeds FEIS (USDA 2000; PF Doc. AQ-44). Effects to aquatic resources were analyzed in that document and its adaptive strategy. No additional effects to watershed or fisheries are expected to occur.

Cumulative Effects of BLM Timber Harvest: These activities are principally located in the lowermost portion of each watershed analyzed for within this document and will continue to occur with or without the implementation of this project. Planned future activities on BLM Lands are expected to be similar to Forest Service activities, but not implemented until sometime in the future.

Cumulative Effects of County Fuel Break along Road 456: The Shoshone County Fire Mitigation Plan has included primary travel route fuel breaks from cities that could be overrun by a 1910 like fire. In this case the mitigation plan will be implemented in 2005 or 2006 and will involve thinning ladder fuels along road #456 to develop a fuel break corridor from Wallace to Upper Placer Subwatershed. The short term effects would have a low risk of effecting aquatic resources because of BMPs and treating areas almost exclusively outside of RHCA's. Long term effects from having a fuel break would reduce the risk of large scale high severity fires and reduce the risk of negative effects from a fire similar to the 1910 event.

Direct and Indirect Effects of Reasonably Foreseeable Aquatic Restoration

The road segments and the drainages at the outlets of these culverts would be reshaped and stabilized. Two of these sites (#3, unnamed tributary to Placer, and #4 Flora Gulch) would involve culvert replacement with the new culverts, upgraded to pass 100 year flow events. During the restoration activities there would be a slight risk of erosion and sediment delivered downstream if a large precipitation event were to occur. This risk would last through the first year after the activity, while vegetation is being established. The long-term benefits from implementing these mitigation projects would reduce chronic sediment sources and would out-weigh the short-term risks of temporary sediment. Planting, seeding, and mulching are effective BMPs when applied to these restoration sites, to reduce potential for short-term negative effects. The long-term reduction of erosion and sediment delivery to Placer Creek would benefit water quality, and reduce threats to the drinking water supply of Wallace.

Table AQ-5. Reduction in Sediment through Stream Crossing Treatments.

Site	Treatment at Crossing	Existing Erosion and Sediment Risk (Tons/Yr)	Methodology used for calculating sediment	Reduction in Sediment (Tons/Yr)
Site #1	Stabilize and revegetate banks at ford crossing	**.06 tons/yr**	WEPP Road	**.06 tons/yr**
Site #2	Upgrade culvert to larger size	**3.4 tons/yr**	Risk Analysis	**3.4 tons/yr**
Site #3	Upgrade culvert with larger size	**18.1 tons/yr**	Risk Analysis	**18.1 tons/yr**
Site #4	Armor outlet	**.30 tons/yr**	WEPP X-drain	**.13 tons/yr**
Site #5	Armor outlet, stabilize fill slope	**27.74 tons/yr**	WEPP X-drain	**20.80 tons/yr**
Site#6	Armor outlet	**39.50 tons/yr**	WEPP X-drain	**17.56 tons/yr**
Total	**6 sites**	**89 tons/yr**		**60 tons/yr**

Summary of Cumulative Effects on Aquatic Resources Under the Proposed Action

Cumulative Effects to Sediment Yield: The combination of direct and indirect effects of the proposed alternative with past, present and reasonably foreseeable activities would result in no detectable changes in sediment yield within the whole Placer Creek Watershed. The Proposed Action Alternative would have a very low risk of sediment increase because of the 6 stream crossings that will be either replaced or upgraded with this foreseeable activity. The No-Action Alternative includes effects of the Pulaski Trail project, the fuel break project on private, and the fire mitigation activities with a net increase in sediment yield of 2% over existing conditions (Table AQ-4). The additional treatments proposed with Alternative 2 (including the fuel break treatments on National Forest System lands, the past actions, ongoing actions, and foreseeable activities described on pages AQ-31 through AQ-35) would increase sediment yield by 4% within the whole watershed (Table AQ-4). This level of increase would only cause a slight delay of a year or two in recovery of sediment yield from all activities. When considering the 60 tons of sediment reduction that would be accomplished under the Proposed Action there would be a very low risk of detectable negative effects to water quality and beneficial uses. In the long term there would be a reduction of chronic sediment within the Placer Watershed the table below summarizes sediment input/reduction within the three subwatersheds. The improvement and replacement of the high-risk culverts would directly reduce the net associated risk of sediment delivery by at least 60 tons per year.

Studies have revealed that disturbance patterns created by timber harvesting, when used to achieve some of the benefits of natural disturbances, cause less disturbance to aquatic resources if concentrated in a smaller drainage rather than dispersed throughout the whole drainage, assuming riparian areas are protected, and harvest rotations occur over longer intervals (Reeves et al 1995; PF Doc. AQ-46). Alternative 2 would best address these criteria because no new permanent roads would be constructed and left on the landscape. Vegetative conditions would move towards natural disturbance intervals and more natural conditions in the watershed.

Table AQ-6. Summary of estimated risk of sediment delivery within the Placer Resource Area.

Issue Indicator	No Action	Proposed Action	Comments
Estimated risk of sediment **delivery** in the Placer Creek watershed (tons/year) under the Placer Resource (all sediments sources from inventory data	536 tons/year (no change from existing)	476 tons/year (reduction of 60 tons/year from existing)	Estimated delivery over the life of the project. Values include timber harvesting, temporary road construction, road maintenance, temporary road decommissioning, and post-harvest activities are modeled. These values are reflected in WEPP modeling and Risk Analysis Modeling. Sediment reduction is based on reducing the potential for culvert failure and upgrading of culvert sizes to meet 100 year flow events and applying mitigation such as armoring culvert outlets, stabilizing cut-slopes / fill-slopes which Indirectly reflects aquatic required mitigation activities.

Within the Placer Resource Area, the ongoing activities and reasonably foreseeable projects (such as maintenance of stands treated by fire) would not have any measurable effect on sediment yield. Decommissioning of temporary roads and all other reasonably foreseeable watershed restoration activities would reduce chronic sediment that is contributed to Placer Creek. Therefore, this project would not impair beneficial uses within Placer Resource Area or downstream in the South Fork Coeur d'Alene River.

Cumulative Effects to Water Yield and Peak Flows: With the action alternative, the direct and indirect effects of increased peak flows combined with the effects from past, present and reasonably foreseeable activities, would not result in any cumulative effects to subwatershed in the Placer Resource Area. Estimated water yield increases are within the historic range of variability for magnitude, intensity and duration when compared with estimates for past natural events. The effects of Alternative 2 are more consistent with what likely occurred with natural events (Table 3 AQ-5) where water yield increases are a low risk of being great enough to be measurable. The proposed activities would not increase peak flows in Placer Creek Watershed by more than 3% above existing conditions. Based on the historic fires in the Resource area it can be assumed that the magnitude, intensity and duration of the peak flows were very similar if not greater that what is

predicted with the action alternative. The proposed treatment reduces canopy over only 4% of the total area within the Placer Resource Area and the reasonably foreseeable activities would not significantly increase peak flows, the increases in flows for the proposed activities would be within the historic range of variability.

Cumulative Effects to Stream Channel Morphology: Estimated peak flow increases would also not effect channel degradation or stream bank erosion. The estimated increases in water yield (2%) and peak flows (3%) for the entire Placer Creek watershed are judged to be within the historic range of variation and would not be a factor in any cumulative effects to changes in stream channel morphology. The existing condition in the streams of the Placer Creek watershed are such that they are well armored with mixed substrate and large woody debris, have good to excellent stream vegetation, and are stable and resilient (except for lower portions of Middle Placer Creek). The estimated short-term increases in sediment yield associated with this project, for example the pipe upgrades/removal and restoration projects are expected to be routed through the stream channel and would not be of a magnitude that would cause changes to stream channel morphology (e.g. migration, braiding, and widening of channels). Stream channel morphology in Placer Creek would be maintained and likely improved as known sediment delivery sources are rehabilitated as opportunity allows. This includes: 1) the reduction (via removal) and upgrade of at-risk culverts; 2) near channel and in-channel restoration work in Placer Creek watershed and subwatersheds; and 3) road maintenance/reconstruction work along primary travel roads in project subwatersheds.

Cumulative Effects to Fisheries Habitat: In consideration of the influences from direct and indirect effects associated with the proposed project, the cumulative effects are not expected to change the existing condition trend for fisheries resources. In general, there would be "long-term benefits" to fisheries if the proposed fuels reduction work is implemented under the action alternative. Specifically, non-commercial thinning within some units in the RHCA's will meet INFS (1995; PF Doc. AQ-9) standards and guidelines. The non-commercial (i.e. brush field burn) treatments were deemed necessary in order to reduce fuel hazards and loading adjacent to surrounding communities that are threatened if a wildland urban interface fire became ignited. This form of activity would meet the intent of silvicultural practices that would not retard RMOs (INFS: TM-1) and avoid adverse cumulative effects to inland native fish (see Fire/Fuels) by preventing long-term RMO damage or reduction from severe fire.

The Placer Resource Area roadwork, in conjunction with reasonably foreseeable actions, would result in a net increase in sediment, peak flow, and water yields in the short term, and an overall reduction in sediment risk in the long term with the stand treatments and implementation of restoration activities. Based on the direct and indirect effects discussed above, the cumulative effects risk of any sediment delivery actually reaching a live channel is relatively low. The modeled annual estimated percent increase in sediment yield (4% over the no action, 6% over the in the whole Placer Creek Watershed) based on the risk analysis is less than the overall reduction in sediment yield 60 tons per year in the Placer Creek watershed and risk of sediment delivery resulting from the culvert upgrades (5-culverts, and one stream ford restoration). The predicted increase in water yield (mean = 1.8%; range 0-3%) would be localized and would likely not be measurable in fish-bearing channels. The potential short-term increase in sediment may affect individual westslope cutthroat trout, but would **not** lead toward a trend in federal listing. In the long term, the reduction in sediment yield is expected to benefit survival of individuals (e.g. viability and emergence) and habitat.

The cumulative effects from road decommissioning show that planting, seeding, and mulching are effective BMP's when applied to these restoration sites, to reduce potential for short-term effects. The long-term gain from restoration activities would be reduction of roads near riparian areas that would reduce water and sediment yields and reduce erosion and sediment delivery, resulting in a benefit in water quality in the Placer Creek watershed. As a consequence these road-decommissioning activities benefit fisheries in that the risk of sediment delivery would be immediately reduced when, near riparian road erosional sources are restored and high-risk-to-fail culvert crossings are removed.

Primary and secondary contact recreation (also see summary of Executive Order 12962 – Recreational Fishing under section 3.12d); the action alternative is consistent with this executive order regarding aquatic systems and recreational fisheries. Short-term effects of this project may affect westslope cutthroat trout

individuals, but would **not** lead toward a trend in federal listing. Long-term effects (i.e., net reduction in sediment) are expected to benefit westslope cutthroat trout survival and habitat.

4. Consistency with Regulatory Framework for Aquatic Resources

A. Consistency with the Forest Plan

All alternatives would meet the requirements of the Forest Plan for water resources and fisheries. Specific requirements and how this project meets them are listed in Aquatics Appendix A – BMPs (watershed) and Aquatics Appendix B INFS (fisheries). Alternative 1 would not change riparian habitat conditions, except for a steady increase in the risk of a stand replacement fire over time and the potential for road drainage failures from high-risk culverts. The action alternative also met the requirements for fisheries resources in the Forest Plan, as amended by the Inland Native Fish Strategy (see Appendix B). The following are the water and fish standards to the Forest Plan and responses on each (USDA 1987, pp II 29-31; PF Doc. AQ-24).

Consistency With Forest Plan Water Standards

Water Standard 1: Management activities on Forest Lands will not significantly impair the long-term productivity of the water resource and ensure that state water quality standards will be met or exceeded.

Idaho State BMPs (BMPs) are designed to protect the long-term productivity of the water resource and ensure state water quality standards will be met. The Placer Resource Area will meet standard BMPs. Site-specific BMPs were also included with this project as mitigation measures to improve water quality.

Water Standard 2: Maintain concentrations of total sediment or chemical constituents within state standards.

The net production and delivery of sediment would be a maximum of 6% above existing conditions in the W.F. Placer Creek in the no action alternative and the Placer Creek watershed under the action alternative) and an average of (3.7%) for all the subwatersheds as modeled by WATSED. This increase in sediment will not further degrade water quality in streams of the resource area or downstream in the South Fork Coeur d'Alene River. The proposed activities in conjunction with past and foreseeable actions would not impair beneficial uses. Implementation of the aquatic restoration would reduce the risk of further sediment delivery from the treatment of 6 stream crossings by at least 60 tons per year. Decommissioning of roads not needed for long-term use will further reduce chronic sediment sources in the Placer Creek Drainage. The action alternatives would likely meet State standards for chemical constituents given that "Required Design Criteria for All Action Alternatives," State and site-specific BMPs, and INFS standards would be applied if an action alternative is selected.

Water Standard 3: Implement project level standards and guidelines for water quality contained in the BMPs (IPNF Forest Plan - Appendix S), including those defined by State regulation and agreement between the State and Forest Service such as: Idaho Forest Practices Rules, Rules and Regulations and Minimum Standards for Stream Channel Alterations, and BMPs for Road Activities.

Specific road maintenance and repair is needed for Alternative 1 to be consistent with Idaho Forest Practices Rules. The action alternatives are consistent with this criterion. In addition to standard State BMPs, other soil and water conservation practices that are approved BMPs are built into the timber sale contract. Site-specific BMPs are specified and are listed in the BMP portion of this appendix. Soil and water conservation principles were used during alternative design to determine the location and types of treatments including which areas should be avoided or restored. The specified and designed measures surpass those required by the State Forest Practices Act and are consistent with Forest Service standards.

Water Standard 4: Cooperate with the states to determine necessary instream flows for various uses. Instream flows should be maintained by acquiring water rights or reservations.

Instream flows are not an issue with any portion of the proposed project. Therefore, this Standard is not applicable to any alternative.

Water Standard 5: Manage public water system plans for multiple uses by balancing present and future resources with public water supply needs. Project plans for activities in public water systems will be reviewed by the water users and the State.

Streams not defined as public water systems, but used by individuals for such purposes, will be managed to standards established by the state's forest practices rules and/or the National Forests' BMPs or to the INFS standards and guidelines whichever is applicable. Streams within the Placer Resource Area are not defined as a "Municipal Watershed" but the streams of this watershed are the public water supply for the town of Wallace, Idaho.

Water Standard 6: Activities within non-fishery drainages, including first and second order streams, will be planned and executed to maintain existing biota. Maintenance of existing biota will be defined as maintaining the physical integrity of these streams. BMPs (Forest Plan Appendix S), Appendix 0, and riparian guidelines will be used to accomplish this objective.

The existing biota will be maintained in first and second order streams through standard and site specific BMPs and the application of INFS standards and guidelines. Site Specific BMPs and applicable INFS standards and guidelines are listed and described in the BMP portion Aquatic Appendix A.

Water Standard 7: It is the intent of this plan that models be used as a tool to approximate the effects of National Forest activities on water quality values. The models will be used in conjunction with field data, monitoring results, continuing research and professional judgment, to further refine estimated effects and to make recommendations.

All alternatives meet this standard. The WATSED model was used to predict water and sediment yield changes. The WEPP and Risk analysis models along with inventoried data were used for analyzing road drainage crossings and erosional hazards and risks to aquatic ecosystems, (Flanagan et al 1998; PF Doc. AQ-52). This method gathered information on road-stream crossings that included fill volumes, culvert sizes, erosional features, and other variables, and then ranked each crossing for treatment (project file).

Consistency With Forest Plan Fish Standards

Fish Standard 1: Activities on National Forest lands will be planned and executed to maintain existing water uses. Maintain is defined as "limiting effects from National Forest activities to maintain at least 80 percent of fry emergence success in identified fishery streams." The percent is measured from pristine conditions. Current methodology will not detect an impact of less than 20 percent. During the life of the plan, new technologies may permit more precise assessments; however, the goal of this standard will remain as "to maintain 80 percent of fry emergence success.

Fish Standard 2: Streams providing spawning and rearing habitat, which are considered critical to the maintenance of river and resident populations of special concern *["high value streams"],* will be managed at a standard higher than the 80 percent standard. Monitoring will be needed to detect this higher standard.

On June 2, 2005, the Forest Supervisor for the Idaho Panhandle National Forests signed a Decision Notice and Finding of No Significant Impact that amended the Forest Plan to modify or remove objectives, standards, and monitoring requirements pertaining to fry emergence success (USDA Forest Service 2005; PF Doc. AQ-56d). The amendment was implemented because the fry emergence objectives, standards and monitoring requirements that were in the IPNF Forest Plan did not contribute as well as INFISH objectives,

standards, guidelines, and monitoring direction towards meeting the goals of providing sufficient habitat in support of maintaining diverse and viable populations of fish species across the forest. In addition, because of the limited application of the fry emergence models and their unreliability, and the inability to determine fry emergence success in the field due to high variability affected by multiple natural and human-caused factors, the Forest Service was not able to state with any degree of certainty whether measures of fry emergence success were accurate or precise.

Fish Standard 3: The stream and river segments (if listed) will be managed as low access fishing opportunities to maintain a diversity of fishing experiences for the public and to protect sensitive fish populations. Special road management provisions will be used to accomplish this objective.

This standard is not applicable to this analysis because no streams in the Placer Resource Area are listed as "low access fishing streams."

Fish Standard 4: Provide fish passage to suitable habitat areas, by designing road crossings of streams to allow fish passage or removing in-stream migration barriers.

Within the Placer Resource Area, known fish barriers were identified through surveys and planned activities include the removal of known barriers with culverts that do not intrude on fish passage.

Fish Standard 5: Utilize data from stream, river, and lake inventories to prepare fishery prescriptions that coordinate fishery resource needs with other resource activities. Pursue fish habitat improvement projects to improve habitat carrying capacities on selected streams.

This analysis was based on Information from stream inventories, field reviews, historical records, aerial photographs, analysis of watershed conditions, published scientific literature, discussions with Fisheries Biologists and Idaho Department of Fish and Game electrofishing/stocking data, and discussions with fisheries biologists from the Idaho Fish and Game and U.S. Fish and Wildlife Service.

Fish Standard 6: Coordinate management activities with water resource concerns as described in MA 16, Appendix I, and Appendix O.

Water resource concerns are protected in Management Area 16 through INFS standards and guidelines.

B. Consistency with the National Forests Management Act – Species Viability

Fish species that may be affected by the project (westslope cutthroat trout and rainbow trout) are also distributed across the Forest. For example, westslope cutthroat and rainbow trout are found in 13 of 13 (100 %) of 4th code HUC watersheds (i.e., large watersheds, such as Couer d'Alene River) on the IPNF. There is possible connectivity between the Coeur d'Alene River basin (which includes Placer Creek) and one of the twelve other 4th code HUC watersheds on the Forest (i.e. St. Joe River).

Further westslope cutthroat are well distributed and found in 100% of the 6th code HUCs in the Coeur d'Alene River basin. Though introduced, rainbow are not as well distributed. At the smaller watershed scale, westslope cutthroat and rainbow are known to inhabit Placer Creek (a 6th Code HUC watershed). Based on the distribution of species across the Forest, the lack of connectivity between large watersheds, and the limited cumulative effects area (i.e. Placer Creek), the Placer Resource Area will not affect viability of any threatened, endangered, sensitive, or MIS fish species on the IPNF. The project is expected to yield long-term benefits to fish, including westslope cutthroat, because of reduce sediment risk from culvert upgrades, decommissioning and road improvements/upgrades. Therefore, the project will not affect viability, not only because of species distribution, but also because the project is supposed to lead to an improvement in habitat conditions.

C. Consistency with the Endangered Species Act

Either alternative would meet requirements of the Endangered Species Act, with no effect on threatened bull trout. Critical habitat has been proposed for bull trout in the Coeur d'Alene River basin, but does not include the South Fork Coeur d'Alene River or its tributaries.

D. Consistency with the Clean Water Act (Including State of Idaho Implementation)

Either alternative would be consistent with the requirements of the Clean Water Act, 33 U.S.C. §1251. The pollutants of concern (sediment and metals)would not increase in the water quality-limited segment of the South Fork Coeur d'Alene River (from Placer Creek to Big Creek). Risks to beneficial uses in all streams of the Placer Resource Area would not be changed by this project. In compliance with the current draft TMDL implementation plan for the South Fork Coeur d'Alene River, there would be no net increase in sediment or metals into the South Fork Coeur d'Alene River through the proposed management activities.

E. Consistency with the Safe Drinking Water Act and Amendments of 1996 Act (Including State of Idaho Implementation)

Either alternative would be consistent with the requirements of the Safe Drinking Water Act and Amendments of 1996. Placer Creek was assessed for its relative sensitivity to containments regulated by the Act. The assessment was based on land use inventory, sensitivity factors and watershed characteristics. This assessment was accomplished in 2000 with the East Shoshone Water District-Wallace Source Water Assessment Report (PF Doc. AQ-55). BMP's were developed from protection measures recommended from this assessment along with site specific BMP's (Aquatics Appendix A).

F. Consistency with the Idaho Forest Practices Act

BMPs (Aquatics Appendix A) or Soil and Water Conservation Practices (PF Doc. AQ-53) would be applied, and all activities would be in compliance with the guidelines in the Soil and Water Conservation Handbook.

G. Consistency with Executive Order 12962 – Recreational Fishing

Either alternative would be consistent with this executive order regarding aquatic systems and recreational fisheries. Short-term effects of this project may affect westslope cutthroat trout individuals, but would not lead toward a trend in federal listing. Long-term effects (i.e., net reduction in sediment) are expected to benefit westslope cutthroat trout survival and habitat.

H. Consistency with the State of Idaho Governor's Bull Trout Plan

The mission of the Governors Bull Trout Plan (1996; PF Doc. AQ-11) is to "…maintain and or restore complex interacting groups of bull trout populations throughout their native range in Idaho." Bull trout in the South Fork Coeur d'Alene River system are not known to currently persist based on all the information available at the time of this developed document. In the Bull Trout Plan, the Coeur d'Alene River basin is defined as a key watershed for a bull trout metapopulation, however no map is provided to explain watershed boundary and scope.

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AQUATICS APPENDIX A
BEST MANAGEMENT PRACTICES

The wildlife analysis is commensurate with the importance of the impact (40 CEQ 1502.15), the risk associated with the project, the species affected, and the level of knowledge already on hand (USDA Forest Service, 1992; PF Doc. WL-R65. Some wildlife species or their habitat are present in the analysis area, but would not be measurably affected because they would not be impacted by the proposed activities, the impacts would not be sufficient to influence their use or occurrence, or their needs can be adequately addressed through design of the project. No further discussion or analysis is necessary for those species and/or suitable habitat that are not found within the resource area or for those which would not be measurably affected. These species and the rationale for dismissing them from further consideration are described below and in the Project Files (PF Doc. WL-48).

INTRODUCTION

The Forest Service is required by law to comply with water quality standards developed under authority of the Clean Water Act. The Environmental Protection Agency and the State of Idaho are responsible for enforcement of these standards. The Idaho Panhandle National Forest Plan states (Chapter II, p. 27) that the Forest will "maintain high quality water to protect fisheries habitat, water based recreation, public water supplies and be within state water quality standards". The use of BMP's is also required in the Memorandum of Understanding between the Forest Service and the State of Idaho as part of our responsibility as the Designated Water Quality Management Agency on National Forest System lands. The State's water quality standards regulate nonpoint source pollution from timber management and road construction activities through application of Best Management Practices (BMPs). The BMPs were developed under authority of the Clean Water Act to ensure that Idaho's waters do not contain pollutants in concentrations, which adversely affect water quality or impair a designated use. State recognized BMPs that will be used during project design and implementation are contained in these documents:

a. Rules and Regulations Pertaining to the Idaho Forest Practices Act, (IFPA), as adopted by the Idaho Land Board; and

b. Rules and Regulations and Minimum Standards for Stream Channel Alterations, as adopted by the Idaho Water Resources Board under authority of the Idaho Stream Channel Protection Act (ISCPA).

Many of the rules and regulations for stream channel alterations are contained, in slightly different forms, in two Memorandum of Understandings (MOU) between the USFS and the State of Idaho. These MOUs are incorporated into the Forest Manual and R-1 Supplement 31, contains provisions which are not currently state recognized BMPs.

The practices described herein are tiered to the practices in FSH 2509.22. They were developed as part of the NEPA process, with interdisciplinary involvement, and meet state and Forest water quality objectives. The purpose of this appendix is to: 1) establish the connection between the Soil and Water Conservation Practice (SWCP) employed by the Forest Service and BMP's identified in Idaho Water Quality Standards (IDAPA 16.01.2300.05) and 2) identify how the SWCP Standard Specifications for the Construction of Roads, and the Timber Sale Contract provisions meet or exceed the Rules and Regulations pertaining to the Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code. The relevant portions of the Rules and Regulations developed under the Idaho Stream Protection Act are also covered.

The objective of this appendix is to provide conservation practices for use on National Forest Lands to minimize the effects of management activities on soil and water resources. The conservation practices were compiled from Forest Service manuals, handbooks, and contract and permit provisions, to directly or indirectly

improve water quality, reduce losses in soil productivity and erosion, and abate or mitigate management effects, while meeting other resource goals and objectives. They are of three basic forms: administrative, preventive and corrective. These practices are neither detailed prescriptions nor solutions for specific problems. They are purposely broad. These practices are action initiating process mechanisms, which call for the development of requirements and considerations to be addressed prior to and during the formulation of alternatives for land management actions. They serve as checkpoints, which are considered in formulating a plan, a program and/or a project.

Although some environmental impacts may be characteristic of a management activity, the actual effects on soil and water resources will vary considerably. The extent of these management effects on soil and water resources is a function of:

1. The physical, meteorological and hydrologic environment where the activity takes place (topography, physiography, precipitation, channel density, geology, soil type, vegetative cover, etc.);

2. The type of activity imposed on a given environment (recreation, mineral exploration, timber management, etc.) and its extent and magnitude;

3. The method of application and the duration of the activity (grazing system used, types of silvicultural practice used, constant vs. seasonal use, recurrent application or onetime application, etc.);

4. The season of the year that the activity occurs or is applied.

These factors vary within the National Forests in the Northern Region and from site to site. It follows then that the extent and kind of impacts are variable, as are the abatement and mitigation measures. No solution prescription, method, or technique is best for all circumstances. Thus the management practices presented in the following include such phrases as "according to the design", "as prescribed," "suitable for," "within acceptable limits," and similar qualifiers. The actual prescriptions, specifications, and designs are the result of evaluation and development by professional personnel through interdisciplinary involvement in the NEPA process. This results in specific conservation practices that are tailored to meet site specific resource requirements and needs.

BMP IMPLEMENTATION PROCESS

In cooperation with the States, the USDA Forest Service's primary strategy for the control of nonpoint sources is based on the implementation of BMP's determined necessary for the protection of the identified beneficial uses. The Forest Service Nonpoint Source Management System consists of:

1. BMP selection and design based on site-specific conditions; technical, economic and institutional feasibility; and the designated beneficial uses of the streams;

2. BMP Application;

3. BMP monitoring to ensure that they are being implemented and are effective in protecting designated beneficial uses;

4. Evaluation of BMP monitoring results;

5. Feeding back the results into current/future activities and BMP design.

The District Ranger is responsible for insuring that this BMP feedback loop is implemented on all projects. The Practices described herein are tiered to the practices in the R1/R4 FSH 2509.22. They were developed as

part of the NEPA process, with interdisciplinary involvement, and meet State and Forest water quality objectives. The purpose of this appendix document is to: 1) establish the connection between the SWCP employed by the Forest Service and BMP's identified in Idaho Water Quality Standards (IDAHO APT 16.01.2300.05) and 2) identify how the SWCP, Standard Specifications for the Construction of Roads, and the Timber Sale Contract provisions meet or exceed the Rules and Regulations Pertaining to the Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code (BMP's). The relevant portions of the Rules and Regulations developed under the Idaho Stream Protection Act are also included.

FORMAT OF THE BMPS

Each Soil and Water Conservation Practice (SWCP) is described as follows:

Title: Includes the sequential number of the SWCP and a brief title.

OBJECTIVE: Describes the SWCP objective(s) and the desired results for protecting water quality.

EFFECTIVENESS: Provides a qualitative assessment of expected effectiveness that the implemented BMP will have on preventing or reducing impacts on water quality. The SWCP effectiveness rating is based on: 1) literature and research (must be applicable to area 2) administrative studies (local or within similar ecosystem); and 3) professional experience (judgment of an expert by education and/or experience). The expected effectiveness of the SWCP is rated either High, Moderate or Low.

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

a) Literature/Research - must be applicable to area;
b) Administrative studies - local or within similar ecosystem;
c) Experience - judgment of an expert by education and/or experience;
d) Fact - obvious by reasoned (logical response).

Moderate: Documentation shows that the practice is effective less than 90% of the time, but at least 75% of the time.

Or

Logic indicates that this practice is highly effective, but there is little or no documentation to back it up.

Or

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

Low: Effectiveness unknown or unverified, and there is little to no documentation

Or

Applied logic is uncertain in this case, or the practice is estimated to be less than 75% effective.

Or

This practice is speculative and needs both effectiveness and validation monitoring.

The effectiveness estimates given here are general, given the range of conditions throughout the Forest. More specific estimates are made at the project level when the BMPs are actually prescribed.

COMPLIANCE: Provides a qualitative assessment of how the implementation of the specific measures will meet the Forest Practice Act Roles and Regulations pertaining to water quality.

IMPLEMENTATION: This section identifies: (1) the site-specific water quality protection measures to be implemented and (2) how the practices are expected to be applied and incorporated into the Timber Sale Contract.

ITEMS COMMON TO ALL SOIL & WATER CONSERVATION PRACTICES

Responsibility For Implementation: The District Ranger (through the Presale Forester) is responsible for insuring the factors identified in the following SWCP's are incorporated into: Timber Sale Contracts through the inclusion of proper B and/or C provisions; or Public Works Contracts through the inclusion of specific contract clauses.

The Contracting Officer, through his/her official representative (Sale Administrator and/or Engineering Representatives for timber sale contracts; and Contracting Officers Representative for public works contracts) is responsible for insuring that the provisions are properly administered on the ground.

Monitoring: Implementation and effectiveness of water quality mitigation measures are also monitored annually. This includes routine monitoring by timber sale administrators, road construction inspectors, and resource specialists which is documented in diaries and project files. Basically, water quality monitoring is a review of BMP implementation and a visual evaluation BMP effectiveness. Any necessary corrective action is taken immediately. Such action may include modification of the BMP, modification of the project, termination of the project, or modification of the state water quality standards.

Table 1.1: Key to abbreviations.	
TSC = Timber Sale Contract	**SAM** = Sale Area Map
TSA = Timber Sale Administrator	**COR** = Contracting Officer Representative
PWC = Public Works Contract	**IFPA** = Idaho Forest Practices Act
SCA = Stream Channel Alteration Act	**SWCP**= Soil and Water Conservation Practices
BMP = Best Management Practices	**SMZ** = Streamside Management Zone
SPS = Special Project Specifications	**EPA** = Environmental Protection Zone
CFR = Code of Federal Regulations	

KEY SOIL & WATER CONSERVATION PRACTICES

Class * Soil and Water Conservation Practice (FSH 2509.22)

11 WATERSHED MANAGEMENT

W 11.05 - Wetlands Analysis and Evaluation
W 11.07 Oil and Hazardous Substance Spill Contingency Planning
W 11.09 Management by Closure to Use
W 11.11 Petroleum Storage & Delivery Facilities & Mgt

13 VEGETATION MANIPULATION

G 13.02 Slope Limitations for Tractor Operation
G 13.03 Tractor Operation Excluded from Wetlands, Bogs, and Wet Meadows
E 13.04 Revegetation of Surface Disturbed Areas
E 13.05 Soil Protection During and After Slash Windrowing

E 13.06 Soil Moisture Limitations for Tractor Operation

14 TIMBER

A 14.02 Timber Harvest Unit Design
A 14.03 Use of Sale Area Maps for Designating Soil and Water Protection Needs
A 14.04 Limiting the Operating Period of Timber Sale Activities
E 14.05 Protection of Unstable Areas
A 14.06 Riparian Area Designation
G 14.07 Determining Tractor Loggable Ground
E 14.08 Tractor Skidding Design
E 14.09 Suspended Log Yarding in Timber Harvesting
A 14.10 Log Landing Location and Design
E 14.11 Log Landing Erosion Prevention and Control
E 14.12 Erosion Prevention and Control Measures During Timber Sale Operations
E 14.13 Special Erosion Prevention Measures on Areas Disturbed by Harvest Activities
E 14.14 Revegetation of Areas Disturbed by Harvest Activities
E 14.15 Erosion Control on Skid Trails
E 14.16 Meadow Protection During Timber Harvesting
S 14.17 Streamcourse Protection (Implementation and Enforcement
E 14.18 Erosion Control Structure Maintenance
A 14.19 Acceptance of Timber Sale Erosion Control Measures Before Sale Closure
E 14.20 Slash Treatment in Sensitive Areas
A 14.22 Modification of the Timber Sale Contract

15 ROADS AND TRAILS

A 15.02 General Guidelines for Road Location/Design
E 15.03 Road and Trail Erosion Control Plan
E 15.04 Timing of Construction Activities
E 15.05 Slope Stabilization and Prevention of Mass Failures
E 15.06 Mitigation of Surface Erosion and Stabilization of Slopes
E 15.07 Control of Permanent Road Drainage
E 15.08 Pioneer Road Construction
E 15.09 Timely Erosion Control Measures on Incomplete Road and Streamcrossing Projects
E 15.10 Control of Road Construction Excavation & Sidecast Material
S 15.11 Servicing and Refueling of Equipment
S 15.12 Control of Construction In Riparian Areas
S 15.13 Controlling In-Channel Excavation
S 15.14 Diversion of Flows Around construction Sites
S 15.15 Stream crossings on Temporary Roads
S 15.16 Bridge & Culvert Installation (Disposition of Surplus Material and Protection of Fisheries)
E. 15.17 Regulation of Borrow Pits, Gravel Sources, and Quarries
E 15.18 Disposal of Right-of-Way and Roadside Debris
S 15.19 Streambank Protection
E 15.21 Maintenance of Roads
E 15.22 Road Surface Treatment to Prevent Loss of Materials
E 15.23 Traffic Control During Wet Periods
G 15.24 Snow Removal Controls
E 15.25 Obliteration of Temporary Roads
E 15.27 Trail Maintenance and Rehabilitation

18 FUELS MANAGEMENT

E 18.02 Formulation of Fire Prescriptions

E 18.03 Protection of Soil and Water from Prescribed Burning Effects

Table 1.2: Classes of SWCP (BMP)	
A = Administrative	**G** = Ground Disturbance Reduction
E = Erosion Reduction	**W** = Water Quality Protection
S = Stream Channel Protection/Stream Sediment Reduction	

SITE-SPECIFIC BEST MANAGEMENT PRACTICES

PRACTICE 11.05 - Wetlands Analysis and Evaluation;

OBJECTIVE: To delineate wetlands within sale areas in order do o facilities or degradation of soil and water resources.

EFFECTIVENESS: High

COMPLIANCE: FPA Rule 4.d.v(c) - Meets

PRACTICE 11.07 - Oil and Hazardous Substance Spill Contingency Planning
PRACTICE 11.11 - Petroleum Storage and Delivery Facilities & Management
PRACTICE 15.11 - Servicing and Refueling of Equipment

OBJECTIVE: To prevent contamination of waters from accidental spills of fuels, lubricants, bitumen's, raw sewage, wash water, and other harmful materials by prior planning and development of Spill Prevention Control and Countermeasure Plans.

EFFECTIVENESS: Although SPCC Plans cannot eliminate the risk of materials being spilled and escaping into waters, they can if followed be effective at reducing adverse effects to tolerable levels. Depending on the location and quantity of a spill, a properly implemented Plan can provide for up to 100 percent containment of a spill.

COMPLIANCE: FPA Rule 2.j.i,ii - Meets

IMPLEMENTATION: TSC provisions holds the purchaser responsible for taking appropriate preventive measures to insure that any spill of oil or oil products does not enter any stream or other waters of the United States. If the total oil or oil products storage exceeds 1320 gallons or if any single container exceeds a capacity of 660 gallons, the purchaser will prepare a Spill Prevention Control and Countermeasures Plan. The plan shall meet EPA requirements including certification by a registered professional engineer. If necessary, specific requirements for transporting oil to be used in conjunction with the contract will be specified in TSC provisions.

The Contracting Officer Representative will designate the location, size and allowable uses of service and refueling areas. The criteria below will be followed at a minimum:

1. Petroleum product storage containers with capacities of more than 200 gallons, stationary or mobile, will be located no closer than 100 feet from stream, water course, or area of open water. Dikes, berms, or embankments will be constructed to contain the volume of petroleum products stored within the tanks. Diked areas will be sufficiently impervious and of adequate capacity to contain spilled petroleum products. [FPA RULE 2(j)]

2. Transferring petroleum products: During fueling operations or petroleum product transfer to other containers, there shall be a person attending such operations at all times [FPA Rule 2(j)(i)].

3. Equipment used for transportation or storage of petroleum products shall be maintained in a leak proof condition. If the Forest Service Representative determines there is evidence of petroleum product leakage or spillage he/she shall have the authority to suspend the further use of such equipment until the deficiency has been corrected. [FPA Rule 2(j)(ii)]

4. For longer-term storage, a sump pond lined with plastic will be constructed equal to the volume of fuel stored on the site.

In the event any leakage or spillage enters any stream, water course or area of open water, the operator will immediately notify the COR who will be required to follow the actions to be taken in case of hazardous spill, as outlined in the Forest Hazardous Substance Spill Contingency Plan.

PRACTICE 11.09 - Management by Closure to Use
PRACTICE 15.23 - Traffic Control During Wet Periods

OBJECTIVE: To reduce the potential for road surface disturbance during wet weather and to reduce sedimentation probability by excluding activities that could result in damages to facilities or degradation of soil and water resources.

EFFECTIVENESS: Moderate

COMPLIANCE: FPA Rule 4.d.v(c) - Meets

IMPLEMENTATION: Specific guidelines for closure of roads during the period of the contract and at the end of the purchasers operations will be spelled out in the TSC provision (Closure to Use by Others):

Roads that must be used during wet periods should have a stable surface and sufficient drainage to allow such use with a minimum of resource impact. Rocking, paving and armoring are measures that may be necessary to protect the road surface and reduce erosion potential. Roads not constructed for all weather use should be closed during the wet season. Where winter field operations are planned, roads may need to be upgraded and maintenance intensified to handle the traffic without creating excessive erosion and damage to the road surfaces.

PRACTICE 13.02 - Slope Limitations for Tractor Operation
PRACTICE 14.07 - Determining Tractor Loggable Ground

OBJECTIVE: To reduce gully & sheet erosion and associated sediment production by restricting tractor operation to slopes where corrective measures for proper drainage are easily installed and effective.

EFFECTIVENESS: In general, the less the slope percentage, the less are the chances of rilling, gullying, and soil displacement as a consequence of tracked or wheeled skidding.

COMPLIANCE: FPA Rules 3.c.i. & c.ii - **VARIES FROM FPA RULE - FPA Rules 3.c.i**

IMPLEMENTATION:

Example 1:

1) Tractor or wheel skidding shall not be conducted on geologically unstable, saturated, or easily compacted soils. On slopes exceeding 35 percent gradient, tractor or wheel skidding shall be conducted during the winter with a minimum of 18 inches of snow cover or with a softtrack skidding machine. On slopes exceeding 45 percent gradient and which are immediately adjacent to a class I or II stream, tractor or wheel skidding shall not be conducted unless the operation can be done without

causing accelerated erosion. Where slopes in the area to be logged exceed 45 percent gradient, skidding shall be done in the winter with a minimum of 18 inches of snow cover and a softtrack skidding machine shall be used. [FPA Rule 3.c.i.]

a. This provision applies to units: 1blm, 2blm, and 3blm .

2) Constructed skid trails on geologically unstable, saturated, or highly erodible or easily compacted soils on slopes over 20 percent will be prohibited [FPA Rule 3.c.ii and TSC Provisions].

Example 2:

1) Tracked or wheel skidding shall not be conducted on geologically unstable, saturated, or easily compacted soils or on slopes exceeding 30 percent. Constructed skid trails on geologically unstable, saturated, or highly erodible or easily compacted soils on slopes over 20 percent will be prohibited [FPA Rules 3.c.i and ii and TSC Provisions].

a. This provision applies to units: 1blm, 2blm, and 3blm .

Mandatory: When tractor skid trails are required on geologically unstable, saturated, or highly erodible or easily compacted soils, the maximum grade of the trail shall be limited to 30 percent. The Forest Service shall document any differences from the FPA Rule requirements in a variance and so note the variance in the Decision Document.

PRACTICE 13.03 - Tractor Operation Excluded from Wetlands, Bogs, & Wet Meadows

OBJECTIVE: To maintain wetland functions and avoid adverse soil and water resource impacts associated with the destruction or modification of wetlands, bogs and wet meadows.

EFFECTIVENESS: Much of this mitigation consists of avoiding the impact [40 CFR 1508.20(a)]. The Forest Service has near-complete control over construction operations. Effectiveness is expected to be high.

COMPLIANCE: FPA Rule 3.h.iii - Meets

IMPLEMENTATION: At a minimum, the following specific protective requirements for wetlands identified on the Sale Area Map (SAM) will be incorporated into CT6.61# (Wetlands Protection):

1. Soil and vegetation along lakes, bogs, swamps, wet meadows, springs, seeps, or other sources where the presence of water is indicated will be protected from disturbance which would cause adverse effects on water quality, quantity, and wildlife and aquatic habitat (FPA Rule 3.h.iii].
2. An equipment exclusion zone shall extend a minimum of 65 feet from the wetlands, bogs, and wet meadows or as directed by INFS (1995) Standards and Guidelines under category 4 definitions.

PRACTICE 13.04 - Revegetation of Surface Disturbed Areas

PRACTICE 14.14 - Revegetation of Areas Disturbed by Harvest Activities

OBJECTIVE: To protect soil productivity and water quality by minimizing soil erosion.

EFFECTIVENESS: Revegetation can be moderately effective at reducing surface erosion after one growing season following disturbance and highly effective in later years. Effectiveness has been shown to vary from 10 percent on 3/4:1 slopes to 36 percent on 1:1 slopes to 97 percent on 1:1 slopes in later years (King, John G. and

E. Burroughs. Reduction of Soil Erosion on Forest Roads. Intermountain Research Station General Technical Report, 1988).

COMPLIANCE: FPA Rules 3.d.iii & e.i, ii - Meets

IMPLEMENTATION: All temporary roads, landings, and skid trails in the sale area will be seeded within one year after harvesting is completed. Seed mixes and fertilizer specifications will be incorporated into Timber Sale Contract provision CT6.601# (Erosion Control Seeding). Timber Sale Contract provision CT6.623# (Temporary Road, Skid Trail/Skid Road and Landing) will identify that scarification/ripping of compacted landings and closed roads will be a minimum of 4 inches, not to exceed 2 feet.

a. All temporary roads, landings, and skid trails will also be fertilized to give the new plants extra support in becoming established.

b. The standard Idaho Panhandle National Forests moist site erosion control seed mix will be used.

PRACTICE 13.05 - Soil Protection During and After Slash Windrowing

OBJECTIVE: To reduce erosion and sedimentation from road surfaces and fill slopes, slash is windrowed below the fill slope.

EFFECTIVENESS: Slash filter windrows are logging slash placed at the base of fill slopes and below culverts where fish passage is not required has been shown to reduce sediment leaving fill slopes by 75 to 85 percent (Cook and King, "Construction Cost and Erosion Control Effectiveness of Filter Windrows on Fill Slopes," Research Paper INT-335, Intermountain Research Station, 1983; Burroughs, *et al.*, "Relative Effectiveness of Fillslope Treatment in Reducing Surface Erosion, Horse Creek Road, Nez Perce National Forest" Intermountain Research Station, 1985.) Slash filter windrows are effective immediately and during the first few years thereafter; they may later be near capacity and in some cases would have begun to decompose. By that time, though, revegetation would have become more effective.

COMPLIANCE: No directly related FPA Rule.

IMPLEMENTATION: Slash windrows will be installed 100 feet on both sides of all new stream crossings where sediment delivery from the fill slope can be expected. Slash filter windrows will also be used on fill slopes where there is a possibility of erosion or sedimentation into a nearby stream or channel (STD FS Spec 201).

PRACTICE 13.06 - Soil Moisture Limitations for Tractor Operation

OBJECTIVE: To minimize soil compaction, puddling, rutting, and gulling with resultant sediment production and loss of soil productivity by ensuring that activities are done when ground conditions are such that erosion and sedimentation can be controlled.

EFFECTIVENESS: Responsible implementation and enforcement are required for high effectiveness.

COMPLIANCE: No Related FPA Rule

IMPLEMENTATION:

1. Tractor operations will be limited to periods when the soil moisture content is 18% or less, the ground

is frozen, or there is at least 18 inches of snow depth. Tractor operations will only be allowed outside of these specifications through the use of designated skid trails. These requirements will be incorporated into TSC provisions.

PRACTICE 14.02 - Timber Harvest Unit Design;
PRACTICE 14.08 - Tractor Skidding Design;
PRACTICE 14.10 - Log Landing Location and Design

OBJECTIVE: To insure that timber harvest unit design will maintain water quality and soil productivity by locating/designing landings and skidding patterns to best fit the terrain and avoid soil erosion.

EFFECTIVENESS: Restricting tractor skidding to designated skid trails can reduce the areal extent of soil disturbance from the typical 18-36 percent to 10 percent or less. Properly located landings and skid trails produce similar results. Effectiveness is expected to be moderate.

COMPLIANCE: FPA Rules 3.c.iii; 3.d.i & ii - Meets

IMPLEMENTATION: TSC provision B6.422 (Landings and Skid Trails) requires that the location of all skid trails and landings must be agreed upon before construction. Specific criteria that will be addressed during sale-layout and pre-work with the operator will include:

General: All new or reconstructed landings, skid trails, and fire trails shall be located on stable areas outside riparian areas. Side casting will be held to a minimum [FPA Rule 3.d.i].

Skid Trails:

a. Skid trails shall be kept to the minimum feasible width and number [FPA Rules 3.c.iii];

b. Located skid trails to avoid concentrating runoff and provide breaks in grade and waterbars;

c. Use existing skid trails wherever possible as long as the existing trails meet INFISH requirements.

Landings:

1. Landing sizes will be the minimum necessary for safe, economical operation [FPA Rule 3.d.ii];
2. Landings and log decks will not be located within Riparian Areas;

Landings, log decks, and/or burn piles will be located a minimum of 100 feet from streams, far enough away that direct (unfiltered) entry of sediment, bark, or ash and burning products, will not occur.

PRACTICE 14.03 - Use of Sale Area Maps for Designating Soil & Water Protection Needs

OBJECTIVE: To delineate the location of protection areas and special treatment areas, to insure their recognition, proper consideration, and protection on the ground.

EFFECTIVENESS: High

COMPLIANCE: No related FPA rule.

IMPLEMENTATION: The following features will be designated on the SAM:

1. The stream courses (Category 1, 2, and 4) listed below will be designated as Stream Course Protection areas to be protected under the TSC. During layout of the units these areas will be excluded where possible. Where these areas cannot be easily excluded from the unit, these areas will be excluded by designating the timber as leave trees. INFS (1995) standards and and guidelines using buffer categories will be applied to the following areas:
    a) Placer Creek - The entire mainstem length and its tributaries as delineated on project GIS maps for all alternatives;

    b) Any unnamed channels that are shown on the sensitive landtype map;

2. Wetlands (meadows, lakes, potholes, etc.) to be protected per the timber sale contract clauses are those designated on the Fish and Wildlife Service 1:24000 scale wetland maps;

3. Ephemeral channels will be protected through unit layout, marking plans, and/or designation on sale area maps;

The Purchaser and the Sale Administrator prior to harvesting will review these features on the ground.

MONITORING: A Watershed Specialist (Forest or District) will insure that the above features have been designated on the Sale Area Map during contract development.

PRACTICE 14.04 - Limiting the Operating Period of Timber Sale Activities;
PRACTICE 15.04 - Timing of Construction Activities

OBJECTIVE: To minimize soil erosion, sedimentation and soil productivity loss by insuring activities, including erosion control work, road maintenance, etc., are done: (1) within the time period specified in the TSC; or (2) when ground conditions are such that erosion and sedimentation can be prevented.

EFFECTIVENESS: Moderate

COMPLIANCE: FPA 4.c.ix - Meets

IMPLEMENTATION: Within the sale area, the following specifications relating to operating periods have been identified and recommended by the IDT:

1. Earthwork shall be postponed during wet periods if, as a result, erodible material would enter streams (FPA 4(c)(ix));

TSC provisions allows operations to occur outside Normal Operating Season subject to requirements in stated in the TSC.

G. The following requirements apply to operations outside the Normal Operating Season (see H-1, 2 for specific winter operations):

    1. Drain dips will be built into skidtrails and temporary roads at the time of construction, where feasible. Where draindips are not feasible, or are not functioning, trails and temporary roads will be waterbarred and maintained as necessary and/or prior to any prolonged shutdown;

    2. Pioneering on specified road construction will be limited to 1,000 feet after October 31;

3. Temporary Roads will be seeded immediately following construction;

4. All surface erosion and stabilization activities will be placed prior to November 1 of each year.

H. The following requirements apply to winter operations:

1. Skid trails will be constructed with waterbars and/or draindips, and allowed to freeze prior to skidding operations;

2. Prior to spring shutdown, slash and/or cull logs will be placed into skidtrails to approximate waterbars;

3. Breaks will be provided in the snow berm during snowplowing activities;

Winter operations will also require the following language in the referenced TSC provisions:

a. All streams and channels within harvest units will be flagged or otherwise identified;
b. During all snowplowing activities, breaks will be maintained in the snow berm along the outside of roads, particularly in the areas where needed for road drainage.

Operations will be discontinued if conditions change and activities are no longer operating on frozen or snow covered ground, the intent of winter logging.

PRACTICE 14.05 - Protection of Unstable Areas
PRACTICE 15.05 - Slope Stabilization and Prevention of Mass Failures

OBJECTIVE: To identify and protect unstable areas and to avoid triggering mass movements of the soil mantle and resultant erosion and sedimentation.

EFFECTIVENESS: Avoidance is the most effective measure on high-risk landforms. Risk assessment based on experience is essential. Effectiveness is expected to be moderate

COMPLIANCE: FPA Rule 3.d.iii - Meets

IMPLEMENTATION: Unstable areas will be avoided by project design within the sale area. The following are guidelines that will be followed:

1. Avoid road locations or timber harvesting on or adjacent to active landslides, slump blocks and other mass wasting processes;

2. To prevent landslides, fill material used in landing construction shall be free of loose stumps and excessive accumulations of slash. On slopes where sidecasting is necessary, landings shall be stabilized by use of seeding, compaction, riprapping, benching, mulching, or other suitable means [FPA Rule 3.d.iii];

3. If road construction is necessitated in an area of moderate instability, the embankment should be layer placed or as recommended by a geotechnical engineer;

Identify any opportunities to stabilize existing unstable areas or minimize the adverse impacts associated with the unstable areas.

PRACTICE 14.09 - Suspended Log Yarding in Timber Harvesting

OBJECTIVE: To protect the soil from excessive disturbance and accelerated erosion and to maintain the integrity of the Riparian Area and other sensitive watershed areas.

EFFECTIVENESS: The more suspended log yarding can be used, the less soil disturbance will result. Effectiveness is expected to be moderate

COMPLIANCE: FPA Rule 3.g.ii - Meets

IMPLEMENTATION: The TSC provisions, requires that areas requiring special yarding, as identified in TSC provisions (Skidding and Yarding), be identified on the SAM. Cable yarding (partial or full suspension) will be used on all areas identified for such logging on the SAM. Uphill cable yarding is preferred. Where downhill yarding is used, reasonable care shall be taken to lift the leading end of the log to minimize downhill movement of slash and soils [FPA Rule 3.c.iv].

The following requirement will be included in TSC (Conduct of Logging):

Units 1, 2, 3, 4, 5, 7blm, 8, 9, 10, 11, 12, 13, 15, 16, 17, 21, 22, 23, 24, 26, and 27 (all skyline units) will be uphill yarded with at least one end of the logs suspended.

PRACTICE 14.11 - Log Landing Erosion Prevention and Control;

PRACTICE 14.12 - Erosion Prevention & Control During Timber Sale Operations;

PRACTICE 14.15 - Erosion Control on Skid Trails.

OBJECTIVE: To protect water quality by minimizing erosion and subsequent sedimentation derived from log landings and skid trails.

EFFECTIVENESS: Moderate

COMPLIANCE: FPA Rules 3.e.i, ii; 3.d.iii - Meets

IMPLEMENTATION: The following criteria will be used in controlling erosion and restoring landings and skid trails to minimize erosion:

General:

4. Deposit waste material from construction or maintenance of landings and skid and fire trails in geologically stable locations outside of Riparian Habitat Conservation Areas.
5. Skid trails and landings, seeding will be done with a seed/fertilizer mix specified in the contract.

Landings:

1. During period of use, landings will be maintained in such a manner that debris and sediment are not delivered to any streams. Landings will not be located in ephemeral draws or swales that were created by or are prone to landslides.
2. Landings shall be reshaped as needed to facilitate drainage prior to fall and spring runoff. Landings shall be stabilized by establishing ground cover or by some other means within one year after harvesting is completed [FPA Rule 3.e.ii].

3. Landings will drain in a direction and manner that will minimize erosion and will preclude sediment delivery to any stream.

4. After landings have served the Purchaser's purpose, the Purchaser shall ditch or slope them to permit the water to drain or spread [Provision BT6.63 (Landings)].

Skid Trails:

1. Skid trails and fire trails shall be stabilized whenever they are subject to erosion, by waterbarring, cross-draining, outsloping, scarifying, seeding, or other suitable means. This work shall be kept current to prevent erosion prior to fall and spring runoff [FPA Rule 3.e.i].

2. The sale administrator and/or watershed specialist will designate the spacing of water bars on skid trails. [Reference FSH 7709.56].

3. Unit design and location will facilitate logging with a minimum amount of excavated skid trails. Where excavated trails are constructed they will be kept to a minimum and must be decommissioned by the purchaser following completion of the logging activities. The decommissioning will include restoring natural slope contours and placing slash and logs on top of the disturbed soil, and use of seeding where needed.

4. Skid trails and fire trails shall be stabilized whenever they are subject to erosion, by waterbarring, cross draining, outsloping, scarifying, seeding, or other suitable means. This work shall be kept current to prevent erosion prior to fall and spring runoff.

5. Spacing of water bars on skid trails will be based on guides for controlling sediment from secondary logging roads (no date). If necessary, additional water bars will be prescribed by the sale administrator and/or watershed specialist.

6. All skid trail and landing locations will be approved by the Forest Service prior to harvesting and will be rehabilitated as necessary to assure that normal drainage patterns are maintained, and that exposed soil surfaces are seeded or covered with slash. This will minimize the potential for sediment production and delivery.

7. Skid trail distance will average 100 feet or greater on ground skidded units, except where the trails converge to landings and as terrain dictates otherwise. This measure will help assure that no more than 15 percent of the activity area will be detrimentally disturbed per Region 1 soil standards;

8. Mechanical fellers will only be allowed off skidtrails if they travel on 18 inches of snow, frozen ground, or a slash mat (to avoid soil compaction levels that exceed Region 1 standards).

Corridors:

1. Corridors that have become entrenched below the litter layer into the top soil and could channel water will be water-barred and/or covered with debris.

PRACTICE 14.13 - Special Erosion Prevention Measures on Areas Disturbed by Harvest Activities
PRACTICE 14.14 - Revegetation of Areas Disturbed by Harvest Activities

OBJECTIVE: To establish a vegetative cover on disturbed sites in order to reduce erosion and sedimentation on disturbed areas where **normal revegetation methods where other contract provisions will not apply**.

EFFECTIVENESS: Moderate

COMPLIANCE: FPA Rules 3.e.i and 3.d.iii - Meets

IMPLEMENTATION: Revegetation by seeding and fertilization to control erosion is planned for all temporary roads, skid trails, and landings. If erosion problems still occur on these areas, or other problem areas are discovered or are brought to the attention of the Sale Administrator, KV Plans will be revised to reseed and/or fertilize, or provide for other control measures. If KV Funds are not available, Appropriated Funds will be used.

PRACTICE 14.16 - Meadow Protection During Timber Harvesting

OBJECTIVE: To avoid damage to the ground cover, soil and water in meadows.

EFFECTIVENESS: High. INFS standards and guidelines un applied category deliniations protect meadows from such described activity as well as botany buffers.

COMPLIANCE: No Related FPA Rule

IMPLEMENTATION: Vehicular or skidding equipment shall not be used on meadows except where roads, landings, and tractor roads are approved. In all cases, soil and vegetation will be protected from disturbance which would cause adverse affects on water quality, quantity and aquatic habitat. The TSC Provision (Meadow Protection) is a standard provision in all contracts.

Unless otherwise agreed, trees felled into meadows shall be removed by end lining, and resulting logging slash shall also be removed. Damage to meadows, stream courses, and riparian areas caused by unauthorized Purchaser's operations shall be repaired by the Purchaser in a timely manner to restore and prevent further damage.

PRACTICE 14.17 - Stream Channel Protection (Implementation and Enforcement).
PRACTICE 15.19 - Streambank Protection

OBJECTIVE: To protect stream beds and streamside vegetation, during and after forest practice operations and road construction, by (1) maintaining unobstructed passage of stormflows; and (2) reducing sediment and other pollutants from entering streams.

EFFECTIVENESS: Much of this mitigation consists of avoiding the impact, minimizing the impact, or rectifying the impact [40 CFR 1508.20 (a-c)]. The Forest Service has near-complete control over construction operations. Effectiveness is expected to be high.

COMPLIANCE: FPA Rules 3.f.i, ii; 3.g.i,ii – Meets SCA Rules

IMPLEMENTATION: To reduce sediment and channel bank degradation at sites disturbed by construction of stream crossing or roadway fill, it may be necessary to incorporate "armoring" in the design of a structure to allow the water course to stabilize after construction. Riprap, gabion structures, and other measures are commonly used to armor stream banks and drainage ways from the erosive forces of flowing water. These measures must be sized and installed in such a way that they effectively resist erosive water velocities. Stone used for riprap should be free from weakly structured rock, soil, organic material and materials of insufficient size, all of which are not resistant to stream flow and would only serve as sediment sources. Outlets for drainage facilities in erodible soils commonly require rip-rapping for energy dissipation (FSH 7709.56B, and Std. FS Spec. 619).

The intent of the regulations and clauses is to protect the integrity of stream channels, and minimize adverse

impacts to the channel and downstream resources and beneficial uses. To list all of the regulations that would be implemented to protect and restrict channel alterations, would require a small book. The following items however, highlight some of the principal provisions incorporated into the TSC that will govern channel protection in the sale area.

1. Care shall be taken to cause only the minimum necessary disturbance to the natural appearance of the area. Streambank vegetation shall be protected except where its removal is absolutely necessary for completion of the work [SCPA Rule 9,1(c) and TSC Provisions];

    a. All streambanks will be avoided by design.

2. If the channel is damaged during construction, it will be restored as nearly as possible to its original configuration without causing additional damage to the channel;

3. Purchaser shall repair all damage to a stream course if the Purchaser is negligent in their operations, including damage to banks and channel, to an acceptable condition as agreed to by the certified Sale Administrator and Purchaser's representative;

4. All project debris shall be removed from stream course, in an agreed manner that will cause the least disturbance. (TSC, Stream course Protection). Specifically:

    a. Whenever possible trees shall be felled, bucked, and limbed in such a manner that the tree or any part thereof will fall away from any Class I streams. Slash that enters Class I streams as a result of harvesting operations shall be continuously removed, as will other debris that enters Class I streams whenever there is a potential for stream blockage or if the stream has the ability for transporting such debris. Material removed shall be placed five feet slope distance above the ordinary high water mark [FPA Rule 3.f.i];

    b. Material to be removed will be all logging debris that is less than six inches in diameter and less than six feet long;

        ii. Slash and other debris that enters Class II streams whenever there is a potential for stream blockage or if the stream has the ability for transporting the debris shall be removed immediately following skidding and placed above the ordinary high water mark [FPA Rule 3(f)(ii)].

Material to be removed will be all logging debris that is less than six inches in diameter and less than six feet long.

PRACTICE 14.18 - Erosion Control Structure Maintenance

OBJECTIVE: To insure that constructed erosion control structures are stabilized and working effectively.

EFFECTIVENESS: High

COMPLIANCE: No directly related FPA Rule

IMPLEMENTATION: TSC provisions requires that during the period of the contract, the Purchaser shall provide maintenance of soil erosion control structures constructed by the Purchaser until they become stabilized, but not for more than one year after their construction. After 1 year, any erosion control work needed is accomplished through performance bond earmarked for that use. TSC provisions requires the

Purchaser to maintain erosion control structures concurrently with his operations under the sale and in any case not later than 15 days after completion of skidding each unit or subdivision.

PRACTICE 14.19 - Acceptance of Timber Sale Erosion Control Measures Before Sale Closure

OBJECTIVE: To assure the adequacy of required timber sale erosion control work.

EFFECTIVENESS: High

COMPLIANCE: No directly related FPA Rule

IMPLEMENTATION AND RESPONSIBILITY: Timber Sale Contract provisions requires that upon the purchaser's written request and assurance that work has been completed, the Forest Service shall perform an inspection. Areas that the purchaser might request acceptance for are specific requirements such as logging, slash disposal, erosion control, or snag felling. In evaluating acceptance the following definition will be used by the Forest Service: "Acceptable" erosion control means only minor deviation from established standards, provided no major or lasting impact is caused to soil and water resources. Certified Timber Sale Administrators will not accept as complete erosion control measures that fail to meet these criteria.

PRACTICE 14.22 - Modification of the Timber Sale Contract

OBJECTIVE: To modify the Timber Sale Contract if new circumstances or conditions indicate that the timber sale will cause irreversible damage to soil, water, or watershed values.

EFFECTIVENESS: High

COMPLIANCE: No directly related FPA Rule

IMPLEMENTATION: Over time, the Forest Service adopts new policies and direction that amend how we address timber harvest operations. An example is the recent change in direction to leave some large organic debris in stream channels instead of removing it all. In cases such as this, modifications to the TSC would occur under the appropriate provisions.

If evidence indicates that unacceptable impacts would occur to soil and water resources if the sale was harvested as planned, the Forest Service Representative will request the Contracting Officer to gain Regional Forester advice and approval to proceed with a resource environmental modification, mutual cancellation, or unilateral cancellation of the Timber Sale Contract as allowed by TSC Provisions. If the decision is for a resource environmental modification, once the action is approved by the Regional Forester, the appropriate Line Officer will assign an interdisciplinary team to make recommendations of implementation.

PRACTICE 15.02 - General Guidelines for the Location and Design of Roads and Trails

OBJECTIVE: To locate and design roads and trails with minimal soil and water resource impact while considering all design criteria.

EFFECTIVENESS:

1. Route location ground-truths the results of transportation planning and provides site-specific information on possible problem areas (Gray and Megahan, 1981; Cline et. al., 1981; Megahan and Kidd, 1972; King and Gonsior, 1980);

2. Designed and controlled cut slopes, fill slopes, road width, and road grades effectively reduce sediment production by fitting the roads to the land (Bethalmy and Kidd, 1966; Burroughs, Watts, King, and Hanson, 1985; King, 1979; Megahan, 1978).

COMPLIANCE: FPA Rules 4.b.i,ii,iii & 4.c.i – Meets SCA Rules 9,7 - Meets

IMPLEMENTATION: The following listed items are incorporated in general road location and design guidelines for minimizing impacts on water quality:

Design:

1. Roads shall be planned no wider than necessary to safely accommodate the anticipated use and equipment needs . Cut and fill volumes shall be minimized by designing the road to fit natural terrain features as closely as possible. As much of the excavated material as possible shall be used in fill sections. Minimum cuts and fills shall be planned, particularly near stream channels [FPA Rule 4.b.ii]

Location:

1. Utilize natural benches, follow contours, avoid long, steep road grades. Balance cut/fill where possible to avoid waste areas;

2. Embankments and waste shall be designed so that excavated material may be disposed of on geologically stable sites [FPA Rule 4.b.iii];

3. Avoid slumps and slide-prone areas, and steep sidehills;

4. Road construction shall be minimized within stream protection zones. Areas of vegetation shall be left or re-established between roads and streams [FPA Rule 4.b.i and Standard Road Specifications-Special Project Specification 204.01];

5. Where possible, locate turnouts and turn-arounds at least 200 feet from water bodies or riparian zones. Where placement within 200 feet is necessary due to safety considerations, emphasize erosion control measures to protect water quality; i.e additional windrowing, seeding, etc.

Stream crossing sites:

1. Minimize the number of stream crossings, and choose stable sites. Major culverts will be sized, based on hydrologic analysis, to function effectively at 50-year peak flows, without water backing up. These culverts will be tested to withstand 100-year peak flows without failing. All other live streams will be sized, based on hydrologic analysis, for 20 year peak flows with maximum headwater depth ratios of 1.2, and withstand 50 year peak flows without failing;

Road drainage: SEE SWCP 15.07

1. Locate and design roads and trails to drain naturally by appropriate use of out-sloping, rolling dips, and grade changes, where possible. Cross drains will be installed in ditched areas to 1) carry intercepted flow across constructed areas; 2) to relieve the length of undrained ditch; and 3) to reduce disruption of normal drainage patterns. Road and trail drainage should be channeled to effective buffer areas, either natural or manmade, to maximize sediment deposition prior to entry into live water;

2. Ditch lines and road grades will be designed to minimize unfiltered flow into streams. A rolling dip,

relief culvert or similar structure will be installed as close as practical to crossings to minimize direct sediment and/or water input directly into streams. Route the drainage through SMZ, buffer strips, or other sediment settling structures where possible;

3. Roads shall be planned to drain naturally by out-sloping or in-sloping with cross drainage and by grade changes where possible. Dips, water bars and/or cross drainage will be planned when necessary [FPA Rule 4(b)(iv)];

Relief culverts and roadside ditches shall be planned whenever reliance upon natural drainage would not protect the running surface, excavation, or embankment. Culvert installations shall be designed to prevent erosion of the fill. Drainage structures shall be planned to achieve minimum direct discharge of sediment into streams [FPA Rule 4.b.v].

PRACTICE 15.03 - Road and Trail Erosion Control Plan

OBJECTIVE: To minimize the effects of erosion and the degradation of water quality through erosion control work and road design.

EFFECTIVENESS: Moderate

COMPLIANCE: No Related FPA Rule

IMPLEMENTATION: Prior to the start of construction, the Contractor shall submit a schedule for proposed erosion control work as required in the Standard Specifications. The schedule shall include all erosion control items identified in the specifications. Erosion control work to be done by the Contractor will be defined in Standard Specification 204 and/or in the Drawings. The schedule shall consider erosion control work necessary for all phases of the project. The Engineer will certify that the Contractors Erosion Control Plan meets the specifications of Std. FS Spec. Section 204.

PRACTICE 15.06 - Mitigation of Surface Erosion and Stabilization of Slopes:

OBJECTIVE: To minimize soil erosion from road cutslopes, fillslopes, and travelway.

EFFECTIVENESS: Moderate

COMPLIANCE: FPA Rule 4.c.iii & d.ii - Meets

IMPLEMENTATION: Areas requiring mitigation of surface erosion will occur during the life of the timber sale contract. When these are found, the following provisions will be implemented.

a. All disturbed areas associated with road construction and reconstruction will be seeded. The first seeding will be applied as soon as practical after cuts and fills are brought to grade within seeding seasons as established in specification 625. A second seeding in the fall or spring season following road construction will be required where original seeding did not adequately revegetate exposed soil area;

b. Where surface erosion is occurring because of inadequate vegetative cover, additional seeding and re-fertilization will occur using recommended seed and fertilizer mixes. A T108 specification covers re-seeding of cut slopes if bared by the purchaser's maintenance operation. If the purchaser has done his required seeding, or bare spots are not caused by the purchaser, revise the KV Plan to cover costs;

c. Where ditches are carrying erosion products into stream channels, straw bale and erosion cloth ditch blocks will be installed to "short-circuit" the delivery. Seeding of the eroding surfaces, and seeding of the stored sediment in the ditch will also be accomplished. If problem areas are known before contract award, add C6.602# to require cross ditching on segments of road;

d. Where either straw bale/erosion cloth structures are not felt to be effective, underdrains or other measures will be installed to drain the ditches onto suitable ground, or at least reduce erosion impacts to the stream. If problem areas are known before contract award, add C6.602# to require cross ditching on segments of road;

e. Slumping of cutslopes will require a combination of both mechanical and vegetative controls. If/when this problem is found, a solution will be determined in consultation with Engineers and resource specialists and appropriate actions taken to remedy the situation or minimize adverse impacts.;

Additional underdrains and/or french drains will be constructed where intercepted moisture is encountered on incised stream approaches. Erosion control blankets and straw bales will be used to dissipate ditch scour and stabilize fill slopes.

PRACTICE 15.07 - Control of Permanent Road Drainage

OBJECTIVE: To minimize the erosive effects of concentrated water and the degradation of water quality by proper design and construction of road drainage systems and drainage control structures.

EFFECTIVENESS: Moderate. Designed and controlled ditches, cross drain spacing, and culvert discharge prevent water from running long distances over exposed ground.

COMPLIANCE: FPA Rules 4.c.viii; 4.d.iii(a) & (b) - Meets

IMPLEMENTATION: The following items will be included in the timber sale contract provisions or road contract special project specifications.

1. Drainage ways shall be cleared of all debris generated during construction and/or maintenance that potentially interfere with drainage or water quality [IFPA Rule 4(c)(ii), Timber Sale Contract Clause C5.4, and Standard Road Specifications-Special Project Specification 204.04].

2. During and following operations on out-sloped roads, out-slope drainage shall be retained and berms shall be removed on the outside edge except those intentionally constructed for protection of road grade fills [IFPA Rule 4(c)(vi) and Timber Sale Contract Clause C5.4].

3. Cross drains and relief culverts shall be constructed to minimize erosion of embankments. The time between road construction and installation of erosion control devices shall be minimized. Drainage structures or cross drains shall be installed on uncompleted roads which are subject to erosion prior to fall or spring runoff. Relief culverts shall be installed with a minimum grade of 1 percent [IFPA Rule 4(c)(viii) and Standard Road Specifications-Special Project Specification 204.1].

4. Cross drains and relief culverts will be installed so as to minimize concentrations of intercepted water (see also Practice 15.02 f.(3)).

5. For New Construction and Reconstruction - The following criteria will be incorporated into the road:

    a. Design:

i. The temporary road will be constructed as an outsloped road that follows the natural terrain. Following use: the purchaser will obliterate this road by restoring natural slope contours and placing slash and logs on top of the disturbed soil, and use of seeding if needed. The purpose of this requirement is to minimize potential for increasing sediment production and delivery.

ii. The reconstruction will include increasing pipe sizes or changing design on many of the existing stream crossings to provide fish passage (if needed) and pass 100 year flood discharges and prevent diversion of streamflow by the road.

iii. Unstable cut and fill slopes will be stabilized.

iv. Additional relief culverts will be installed to very frequently cross drain the road. Distances between relief pipes will generally not exceed 200 to 250 feet.

v. The grade of outsloped and insloped roads will be varied with graded rolling dips, drivable dips, or drivable waterbars to frequently cross drain surface water and to safely return water to stream channels in the event the culvert plugs.

vi. During and following operations on out sloped roads, retain out slope drainage and remove berms on the outside except those intentionally constructed for protection of road grade fills.

vii. Construct cross drains and relief culverts to minimize erosion of embankments. Minimize the time between construction and installation of erosion control devices. Use riprap, vegetative matter, downspouts and similar devices to minimize erosion of the fill.

viii. Prior to fall or spring runoff, install drainage structures or cross drain uncompleted roads that are subject to erosion;

ix. Install relief culverts at a minimum grade of 1 percent greater than road gradient;

x. Energy dissipaters or downspouts will be placed below problem culvert outlets (Reconstruction item).

xi. Roads restricted after use will also have erosion control measures in place prior to final pull-out. Roads to be closed by any closure device other than a gate will be decommissioned.

PRACTICE 15.08 - Pioneer Road Construction

OBJECTIVE: To minimize sediment production and mass wasting associated with pioneer road construction.

EFFECTIVENESS: Moderate

COMPLIANCE: No directly related FPA Rule

IMPLEMENTATION: The following contract specifications will be required:

1. Construction of pioneer roads shall be confined to the designed location of the road prism unless otherwise approved by the Contracting Officer (Std. FS Spec. 203.11).

2. Pioneering shall be conducted so as to prevent undercutting of the designated final cut slope, and to prevent avoidable deposition of materials outside the designated roadway limits (Std. FS Spec. 203).

3. Permanent culverts will be installed at wet crossings during the pioneer phase unless positive control of sediment can be accomplished during installation, use, and removal of the temporary structure.

PRACTICE 15.09 - Timely Erosion Control Measures on Incomplete Road and Stream crossing Projects

OBJECTIVE: To minimize erosion of, and sedimentation from, disturbed ground on incomplete projects.

EFFECTIVENESS: Moderate

COMPLIANCE: FPA Rules 4.c.ii,iii,iv; & 4.d.iii - Meets

IMPLEMENTATION: The following measures will be implemented during projects:

1. Temporary culverts, side drains, flumes, cross drains, diversion ditches, energy dissipaters, dips, sediment basins, berms, debris racks, or other facilities needed to control erosion will be installed as necessary. The removal of temporary culverts, culvert plugs, diversion dams, or elevated stream crossing causeways will be completed as soon as practical;

2. The removal of debris, obstructions, and spoil material from channels and floodplains;

3. Seeding with an erosion control seed mix approved for use on the Idaho Panhandle National Forests to minimize erosion.

4. Install drainage structures or cross drain uncompleted roads that are subject to erosion prior to fall or spring runoff. (Std Spec 204)

Erosion control measures must be kept current with ground disturbance, to the extent that the affected area can be rapidly "closed," if weather conditions deteriorate. Areas must not be abandoned for the winter with remedial measures incomplete.

PRACTICE 15.10 - Control of Road Construction Excavation and Sidecast Material

PRACTICE 15.18 - Disposal of Right-of-Way and Roadside Debris

See also Practice 13.05

OBJECTIVE: To insure that unconsolidated excavated and sidecast material, construction slash, and roadside debris, generated during road construction, is kept out of streams and to prevent slash and debris from subsequently obstructing channels.

EFFECTIVENESS: High

COMPLIANCE: FPA Rule 4.c.iii,iv; & 4.d.i,ii,iii

The slash windrow and other erosion control devices will not be placed in existing stream channels or obstruct culvert outfalls. Large limbs and cull logs may be bucked into manageable lengths and piled alongside the road for fuelwood.

IMPLEMENTATION: In the construction of road fills near streams, compact the material to reduce the entry of water, minimize the amount of snow, ice, or frozen soil buried in the embankment. No significant amount of woody material shall be incorporated into fills. Slash and debris may be windrowed along the toe of the fill, but in such a manner as to avoid entry into a stream and culvert blockage.

Where slash windrows are not desirable or practical, other methods of erosion control such as erosion mats, mulch, and straw bale or fabric sediment fences will be used. Where exposed material (excavation,

embankment, borrow pits, waste piles, etc.) is potentially erodible, and where sediments would enter streams, the material will be stabilized prior to fall or spring runoff by seeding, compacting, rip-rapping, benching, mulching or other suitable means.

The following standard specs will be included in all road contracts that include clearing and excavation.

1. Standard Specification 201 (Slash Treatment)
2. Standard Specification 203 (Excavation and Embankments)

PRACTICE 15.13 - Controlling In-Channel Excavation

OBJECTIVE: To minimize downstream sedimentation by insuring that all in-channel excavations are carefully planned.

EFFECTICENESS: High

COMPLIANCE: SCA Rule 9,1(a) - Meets

IMPLEMENTATION: Location and method of stream crossings will be designed and agreed to prior to construction. The following items highlight some of the principal provisions incorporated into the TSC that will govern channel protection:

1. Construction equipment may cross, operate in, or operate near stream courses only where so agreed to and designated by the Forest Service prior to construction. Crossing of perennial stream channels will be done in compliance with the specifications in the Stream Channel Alteration Act Rules and Regulations and included in the project specifications.
2. No construction equipment shall be operated below the existing water surface except that fording the stream at one location only will be permitted, and work below the water level that is necessary for culvert bedding or footing installations will be permitted to the extent that it does not create unnecessary turbidity or stream channel disturbance [SCA Rule 9,1 (a) and Standard Road Specifications-Special Project Specification 204.04].
3. Wheeled or track laying equipment shall not be permitted to operate within 5 feet slope distance of the apparent high water mark of Class II streams and 75 feet of Class I streams. (C6.6 Erosion Prevention and Control).
4. Construction of any hydraulic structures in stream channels will be in compliance with the Rules and Regulations pertaining to the Stream Channel Protection Act, Title 42, Chapter 38, Idaho Code).

PRACTICE 15.14 - Diversion of Flows Around Construction Sites

(See also Practice 15.13)

OBJECTIVE: To restore the natural course of any stream as soon as practical if the stream is diverted as a result of timber management activities.

EFFECTIVENESS: High

COMPLIANCE: Meets SCA Rule

IMPLEMENTATION: Flow in stream courses may only be diverted if the Forest

Service deems it necessary for the contractor to do the job. Such a diverted flow shall be restored to the natural stream course as soon as practicable and, in any event, within the period stated in Stream Channel Alteration Act Rules and Regulations. Stream channels impacted by construction activity will be restored to their natural grade, condition, and alignment. (Std. FS Spec. 206, 206A).

1. On perennial Class I and II streams dewatering shall be accomplished prior to excavation for culvert installation;

2. Filter cloth, erosion control blankets, plastic, straw bales, and rip-rap can be used to keep live water from contacting new fill during culvert installations;

When dewatering of stream crossings is required, a non-erodeable conduit, flex pipe or geotextile fabric will be used. Diversion dams above the crossing shall be hand constructed. Sediment traps shall be constructed below the stream crossing.

PRACTICE 15.15 - Stream Crossings on Temporary Roads

(See also Practice 15.13)

OBJECTIVE: To keep temporary roads from unduly damaging streams, disturbing channels, or obstructing fish passage.

EFFECTIVENESS: Moderate

COMPLIANCE: SCA Rules - Meets

IMPLEMENTATION: Culverts, temporary bridges, low-water crossings, or log-fords will be required on all temporary roads and crossings. Streams that will have flowing water during the life of the temporary crossing will normally use culverts or a bridge. The number of temporary crossings will kept to the minimum needed for access.

a. Temporary crossings on temporary roads will be removed when no longer needed, and any fills will be removed and the channel restored to pre-project condition (TSC);

b. Material from temporary road and skid trail stream crossings will be removed and streambanks restored to an acceptable condition. (Temporary Roads);

Temporary crossings on temporary roads will only be allowed where anticipated or calculated flow is 40 CFS or less (approx. 48" CMP). Flow situations greater than this will normally not allow temporary crossings. Larger temporary crossing structures may be allowed following IDT review.

PRACTICE 15.16 - Bridge and Culvert Installation (Disposition of Surplus Material and Protection of Fisheries)

(See also Practice 15.13)

OBJECTIVE: To minimize sedimentation and turbidity resulting from excavation for in-channel structures.

EFFECTIVENESS: High

COMPLIANCE: SCA Rule - Meets

IMPLEMENTATION: The following preventive measures will be included in contract specifications for such installations:

1. Diverting stream flow through or around project sites if needed during construction in order to minimize erosion and downstream sedimentation. Active streams will be de-watered or diverted during culvert installations;

2. Erodible material shall not be deposited into live streams;

3. Any material stockpiled on floodplains shall be removed before rising waters reach the stockpiled material;

4. During excavation in or near the stream course, it may be necessary to use suitable cofferdams, caissons, cribs or sheet piling. This will usually be the case where groundwater is contributing a significant amount of water to the immediate excavation area. If any of the aforementioned devices are used, they will be practically watertight and no excavation will be made immediately outside of them;

5. Water pumped from foundation excavation shall not be discharged directly into live streams, but shall be pumped into settling ponds or into locations where water will not re-enter water;

All fill material shall be placed and compacted in horizontal lifts. Areas to be filled shall be cleared of all vegetation, debris, and other materials that would be objectionable in the fill [SCPA Rule 9,1(d) and Standard Road Specifications-Special Project Specification 203.15].

PRACTICE 15.17 - Regulation of Borrow Pits, Gravel Sources and Quarries

OBJECTIVE: To minimize sediment production from borrow pits, gravel sources, and quarries, and limit channel disturbances in those gravel sources suitable for development in floodplains.

EFFECTIVENESS: High

COMPLIANCE: No Related FPA Rule

IMPLEMENTATION: Minimize opportunities for erosion from Borrow pits and gravel sources from entering streams.

1. Complete any crushing and/or screening of excavated bedload away from any active stream channels and minimize future opportunities for waste materials to enter area streams, even under flood conditions;

2. Identify opportunities to minimize erosion from existing borrow pits within the drainage;

If development of new rock sources are needed within the watershed, complete a pit development plan or rock source development plan which outlines all mitigation measures needed to control future erosion at the rock source.

PRACTICE 15.21 - Maintenance of Roads

OBJECTIVE: To conduct regular preventive maintenance operations to avoid deterioration of the roadway surface and minimize disturbance and damage to water quality, and fish habitat.

EFFECTIVENESS: Moderate

COMPLIANCE: FPA Rule 4.d.i, ii, iii, iv, v - Meets

IMPLEMENTATION: For roads in active timber sale areas standard TSC provisions (Road Maintenance) requires the purchaser to perform or pay for road maintenance work commensurate with the purchasers use. Purchaser's maintenance responsibility shall cover the before, during, and after operation period during any year when operations and road use are performed under the terms of the timber sale contract (Road Maintenance). Purchaser shall perform road maintenance work, commensurate with purchaser's use, on roads controlled by Forest Service and used by purchaser in connection with this sale except for those roads and/or maintenance activities which are identified for required deposits in the TSC. All maintenance work shall be done concurrently, as necessary, in accordance with T-specifications set forth herein or attached hereto, except for agreed adjustments.

1. Sidecast all debris or slide material associated with road maintenance in a manner to prevent their entry into streams [IFPA Rule 4(d)(i), Timber Sale Contract Clauses, and Standard Road Specification-Special Project Specification T108].

2. Repair and stabilize slumps, slides, and other erosion features causing stream sedimentation [IFPA Rule 4(d)(ii), Timber Sale Contract Clauses, and Special Project Specification T108].

3. Active Roads. An active road is a forest road being used for hauling forest products, rock and other road-building materials. The following maintenance shall be conducted on such roads.

    (a) Culverts and ditches shall be kept functional.

    (b) During and upon completion of seasonal operations, the road surface shall be crowned, out-sloped, in-sloped or water barred, and berms removed from the outside edge except those intentionally constructed for protection of fills.

    (c) The road surface shall be maintained as necessary to minimize erosion of the subgrade and to provide proper drainage.

    (d) If road oil or other surface stabilizing materials are used, apply them in such a manner as to prevent their entry into streams [IFPA Rule 4(d)(iii)] and Timber Sale Contract Clauses C5.441 and C6.341].

EFFECTIVENESS: These measures should effectively minimize erosion from roads.

4. Inactive roads. An inactive road is a forest road no longer used for commercial hauling but maintained for access (e.g., for fire control, forest management activities, recreational use, and occasional or incidental use for minor forest products harvesting). The following maintenance shall be conducted on inactive roads.

    (a) Following termination of active use, ditches and culverts shall be cleared and the road surface shall be crowned, out-sloped or in-sloped, water barred or otherwise left in a condition to minimize erosion. Drainage structures will be maintained thereafter as needed.

    (b) The roads may be permanently or seasonally blocked to vehicular traffic [FPA Rule 4.d.iv].

    (c) Roads will be seeded and fertilized.

(d) The roads may be permanently or seasonally blocked to vehicular traffic.

5. Abandoned Roads. An abandoned road is not intended to be used again. No subsequent maintenance of an abandoned road is required after the following procedures are completed:

   (a) The road is left in a condition suitable to control erosion by out-sloping, water barring, seeding, or other suitable methods.

   (b) Ditches are cleaned.

   (c) The road is blocked to vehicular traffic.

   (d) The department may require the removal of bridges and culverts except where the owner elects to maintain the drainage structures as needed.

For roads not in an active timber sale area, road maintenance must still occur at sufficient frequency to protect the investment in the road as well prevent deterioration of the drainage structure function. This will be accomplished by scheduling periodic inspection and maintenance, including cleaning dips and cross drains, repairing ditches, marking culvert inlets to aid in location, and cleaning debris from ditches and culvert inlets to provide full function during peak runoff events (FSH 7709.15).

PRACTICE 15.22 - Road Surface Treatment to Prevent Loss of Materials

OBJECTIVE: To minimize the erosion of road surface materials and consequently reduce the likelihood of sediment production.

EFFECTIVENESS: Stabilization of road surface and ditch lines over 6 percent with competent rock (rock that does not rapidly disintegrate) is often over 90 percent effective (Burroughs, et.al., 1983a, 1983b, 1984, 1985; King and Burroughs, 1988). High

COMPLIANCE: No directly related FPA Rule

IMPLEMENTATION: On timber sale roads, the Purchaser shall undertake measures to prevent excessive loss of road material if the need for such action has been identified. Road surface treatments may include: watering, applying magnesium chloride, sealing, aggregate surfacing, chip-sealing, or paving.

PRACTICE 15.24 - Snow Removal Controls

Objective: To minimize the impact of snow melt on road surfaces and embankments and to reduce the probability of sediment production resulting from snow removal operations.

Effectiveness: Moderate

Compliance: No directly related FPA Rule

Implementation: For Forest roads that will be used throughout the winter, the following measures will be employed:

1. The Purchaser is responsible for snow removal in a manner that will protect roads and adjacent resources.

2. Rocking or other special surfacing and/or drainage measures may be necessary before the operator is allowed to use the roads.

3. During snow removal operations, banks shall not be undercut nor shall gravel or other selected surfacing material be bladed off the roadway surface. Ditches and culverts shall be kept functional during and following roadway use. If the road surface is damaged, the Purchaser shall replace lost surface material with similar quality material and repair structures damaged in blading operations.

4. Snow berms shall not be left on the road surface or shall be placed to avoid channelization or concentration of melt water on the road or erosive slopes. Berms left on the shoulder of the road shall be removed and/or drainage holes opened at the end of winter operations and before the spring breakup. Drainage holes shall be spaced as required to obtain satisfactory surface drainage without discharge on erodible fills. On insloped roads, drainage holes shall also be provided on the ditch side, but care taken to insure that culverts and culvert inlets are not damaged.

PRACTICE 15.25 - Decommissioning of Temporary Roads

OBJECTIVE: To reduce sediment generated from temporary roads by decommissioning them at the completion of their intended use.

EFFECTIVENESS: High

COMPLIANCE: FPA Rule 4.d.v. - Meets

IMPLEMENTATION: Effective decommissioning is generally achieved through a combination of the following measures: (TSC)

1. Road effectively drained and blocked;

2. Temporary culverts and bridges removed and any modified channel slopes stabilized and revegetated;

3. Road returned to resource production through revegetation (native species, or trees);

Sideslopes reshaped and stabilized.

PRACTICE 18.02 - Formulation of Fire Prescriptions

OBJECTIVE: To provide for soil and water resource protection while achieving the management objective through the use of prescribed fire.

EFFECTIVENESS: High

COMPLIANCE: No Related FPA Rule

IMPLEMENTATION: The prescription elements are defined by the interdisciplinary team during the environmental analysis. Field investigations are conducted to identify site-specific conditions, which may affect the prescription. Both the optimum and tolerable limits for soil and water resource needs should be established. Prescription elements will include such factors as fire weather, slope aspect, soil moisture and fuel moisture, which influence the fire intensity. These elements have a direct effect on whether or not a litter layer remains after burning and whether or not a water repellent layer is formed. The amount of remaining litter significantly affects erosion rates, water quality and runoff volumes.

PRACTICE 18.03 - Protection of Soil and Water from Prescribed Burning

OBJECTIVE: To maintain soil productivity, minimize erosion, and prevent ash, sediment, nutrients, and debris form entering surface water.

EFFECTIVENESS: High

COMPLIANCE: No Related FPA Rule

IMPLEMENTATION: Forest Service and/or other crews are used to prepare the units for burning. This includes water barring firelines and reducing fuel concentrations. The interdisciplinary team identifies Riparian Areas and soils with water repellant tendencies as part of the environmental analysis. Some of the techniques used to prevent soil erosion and water quality degradation are: (1) construct water bars in fire lines; (2) reduce fuel loadings in drainage channels; (3) maintain the integrity of the Riparian Area; (4) avoid intense fires, which may promote water repellency, nutrient leaching, and erosion; (5) retain or plan for sufficient ground cover to prevent erosion of the burned sites and (6) removal of all debris added to stream channels as a result of prescribed burning, unless debris is prescribed to improve fisheries habitat.

7. Foaming agents will not be used for water control lines where any of the category INFS buffers have been applied nearer units which these channels could carry the material to intermittent or perennial streams;
8. Machine constructed firelines will not be used on the sensitive landtypes displayed in Figures 3.5;
9. Firelines must be frequently waterbarred (not to exceed 50 foot spacing when going up and down the hill);

10. Maintain large organic debris appropriate to the habitat type (see "Managing Coarse Woody Debris in the Forests of the Rocky Mountains" by Graham et. al. 1994);

11. Limit prescribed burning to those times when surface soil moisture is above 25 percent to reduce the potential for damage from hot burns (Guideline developed by J. Neihoff, USFS – IPNF).

AQUATICS APPENDIX B

INFS STANDARDS & GUIDELINES APPLICABLE TO THE PLACER RESOURCE AREA

TIMBER MANAGEMENT (A-7)

TM-1. Prohibit timber harvest, including fuelwood cutting, in Riparian Habitat Conservation Areas, except as described below.

a. Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting in Riparian Habitat Conservation Areas only where present and future woody debris needs are met, where cutting would not retard or prevent attainment of other Riparian Management Objectives, and where adverse effects can be avoided to inland native fish. For priority watersheds, complete watershed analysis prior to salvage cutting in RHCAs.

b. Apply silvicultural practices for Riparian Habitat Conservation Areas to acquire desired vegetation characteristics where needed to attain Riparian Management Objectives. Apply silvicultural practices in a manner that does not retard attainment of Riparian Management Objectives and that avoid adverse effects on inland native fish.

Using "Standard Widths Defining Interim RHCAs," no commercial timber harvest activities are proposed under the action alternatives within RHCAs in the project area. In some units, non-commercial (i.e. ladder fuel reduction) treatments were deemed necessary in order to reduce fuel hazards and loading. This form of activity would meet the intent of silvicultural practices that would not retard RMOs and avoid adverse effects to inland native fish (see Fire/Fuels) by preventing long-term RMO damage or reduction.

Effectiveness*: *High. No commercial harvest is to occur within the RHCAs.

ROADS MANAGEMENT (A-7, A-8)

RF-1. Cooperate with Federal, Tribal, State, and county agencies, and cost-share partners to achieve consistency in road design, operation, and maintenance necessary to attain Riparian Management Objectives.

The proposed activities are all on USFS and BLM publicly managed lands and the activities associated with the project have been coordinated with all those listed where applicable (e.g. RAC, Community of Wallace and BLM Projects).

Effectiveness*: *High. This coordination is standard policy.

RF-2. For each existing or planned road, meet the Riparian Management Objectives and avoid adverse effects to inland native fish by:

a. Completing watershed analyses prior to construction of new roads or landings in Riparian Habitat Conservation Areas (RHCAs) within priority watersheds.

   This project area is not within an INFS priority watershed nor are any activities (e.g. roads, landings, etc.) proposed within RHCAs.

b. Minimizing road and landing locations in Riparian Habitat Conservation Areas.

   No new roads or landings are proposed within RHCAs under any of the action alternatives.

Effectiveness*: *High.

c. Initiating development and implementation of a Road Management Plan or a Transportation Management Plan. At a minimum, address the following items in the plan:

(1) Road design criteria, elements, and standards that govern construction and reconstruction.

(2) Road management objectives for each road.

(3) Criteria that govern road operation, maintenance, and management.

(4) Requirements for pre-, during-, and post-storm inspections and maintenance

(5) Regulation of traffic during wet periods to minimize erosion and sediment delivery and accomplish other objectives such as protection of the road surface.

(6) Implementation and effectiveness monitoring plans for road stability, drainage, and erosion control.

(7) Mitigation plans for road failures.

The interdisciplinary team (IDTeam) evaluated access and road improvement needs within the project area (i.e. Placer RAP process). Several access options were critically reviewed and selected on based on the implementation of these actions having the least impact on all resources. The project includes several opportunities to improve road surfaces and decommissioning.

***Effectiveness*: Moderate to High. The Roads Analysis Process (RAP) will be employed to assist in making these management decisions.**

d. Avoiding sediment delivery to streams from the road surface.

(1) Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe.

This standard is applied directly for the proposed temporary roads.

***Effectiveness*: High. Roads would be constructed with this design criterion.**

(2) Route road drainage away from potentially unstable stream channels and hillslopes.

***Effectiveness:* High. Improved road drainage would be part of the road package. Water would be less concentrated below existing roads than at present.**

e. Avoiding disruption of natural hydrologic flow paths.

Roadwork associated with this project including road reconstruction, storage and decommissioning will be completed.

***Effectiveness:* High. Road related work of any kind that would be improvement by classification would restore the hydrologic flow paths.**

f. Avoid sidecasting of soils or snow. Sidecasting of road material is prohibited on road segments within or abutting RHCAs in priority watersheds.

No streams in the Placer Project Area are listed as priority watersheds.

***Effectiveness:* High. Sidecasting of snow and/or soils would be prohibited at all stream crossings**

RF-3. Determine the influence of each road on the Riparian Management Objectives. Meet Riparian Management Objectives and avoid adverse effects on inland native fish by:

a. Reconstructing road and drainage features that do not meet design criteria or operation and maintenance standards, or that have been shown to be less effective than designed for controlling sediment delivery, or that retard attainment of Riparian Management Objectives, or do not protect priority watersheds from increased sedimentation.

b. Prioritizing reconstruction based on the current and potential damage to inland native fish and their priority watersheds, the ecological value of the riparian resources affected, and the feasibility of options such as helicopter logging and road relocation out of Riparian Habitat Conservation Areas.

c. Closing and stabilizing; or obliterating and stabilizing; roads not needed for future management activities. Prioritize these actions based on the current and potential damage to inland native fish in priority watersheds, and the ecological value of the riparian resources affected.

The proposed road reconstruction and maintenance described in Chapters II and III originate from the above standards. The action alternatives would meet this standard.

Effectiveness: High. Existing roads are proposed for reconstruction with the Timber Sale Contract, so the likelihood that the projects would be completed is high.

RF-4. Construct new, and improve existing, culverts, bridges, and other stream crossings to accommodate a 100-year flood, including associated bed load and debris, where those improvements would/do pose a substantial risk to riparian conditions. Substantial risk improvements include those that do not meet design and operation maintenance criteria, or that have been shown to be less effective than designed for controlling erosion, or that retard attainment of Riparian Management Objectives, or that do not protect priority watersheds from increased sedimentation. Base priority for upgrading on risks in priority watersheds and the ecological value of the riparian resources affected. Construct and maintain crossings to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

The proposed road crossing improvements originate from the above standard. The action alternatives would meet this standard.

Effectiveness: High.

RF-5. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.

These types of crossings were identified for this project to minimally provide and maintain fish passage, under the current proposed road reconstruction and temporary road construction plan these crossings were identified in the access routes with the implementation of the Placer Project Area. However, with the NEPA process complete the five identified locations where road crossings exist on fish bearing streams would likely be funded by other dollars, specifically RAC monies since they exist under county road jurisdiction for maintenance. Decommissioning other roads in the project area would automatically follow this standard.

***Effectiveness*: Low to High. There are currently five crossings that are known fish barriers in the project area.**

RECREATION MANAGEMENT (A-9)

RM-1. Design, construct, and operate recreation facilities, including trails and dispersed sites, in a manner that does not retard or prevent attainment of Riparian Management Objectives and avoids adverse effects on inland native fish. Complete watershed analysis prior to construction of new recreation facilities in Riparian Habitat Conservation Areas within priority watersheds. For existing recreation facilities inside Riparian Habitat Conservation Areas, assure that the facilities or use of the facilities would not prevent attainment of Riparian Management Objectives or adversely affect inland native fish. Relocate or close recreation facilities where Riparian Management Objectives cannot be met or adverse effects on inland native fish cannot be avoided.

RM-2. Adjust dispersed and developed recreation practices that retard or prevent attainment of Riparian Management Objectives or adversely affect inland native fish. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective in meeting Riparian Management Objectives and avoiding adverse effects on inland native fish, eliminate the practice or occupancy.

RM-3. Address attainment of Riparian Management Objectives and potential effect on inland native fish in Wild and Scenic Rivers, Wilderness, and other Recreation Management plans.

These standards are part of the design criteria of the Pulaski Trail Project or have been incorporated to meet fisheries and watershed concerns through field reviews and its design.

Effectiveness of Standards: High.

FIRE/FUELS MANAGEMENT (A-11)

FM-1. Design fuel treatment and fire suppression strategies, practices, and actions so as not to prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could perpetuate detrimental conditions, or be damaging to, long-term ecosystem function or inland native fish.

FM-2. Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of Riparian Habitat Conservation Areas. If the only suitable location for such activities is within the Riparian Habitat Conservation Area, an exemption may be granted following a review and recommendation by a resource advisor. The advisor would prescribe the location, use conditions, and rehabilitation requirements, with avoidance of adverse effects to inland native fish a primary goal. Use an interdisciplinary team, including a fishery biologist, to predetermine incident base and helibase locations during presuppression planning.

FM-3. Avoid delivery of chemical retardant, foam, or additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or, following a review and recommendation by a resource advisor and a fishery biologist, when the action agency determines that an escape fire would cause more long-term damage to fish habitats than chemical delivery to surface waters.

FM-4. Design prescribed burn projects and prescriptions to contribute to the attainment of the Riparian Management Objectives.

The proposed prescribed burn projects described in the EA originate from the above standards. The action alternatives would meet this standard.

***Effectiveness*: High. Planting of long-lived tree species to provide for large woody debris recruitment would follow prescribed burning within the RHCAs.**

FM-5. Immediately establish an emergency team to develop a rehabilitation treatment plan to attain Riparian Management Objectives and avoid adverse effects on inland native fish whenever a wildfire or a prescribed fire burning out of prescription significantly damages Riparian Habitat Conservation Areas.

The proposed fires/fuels management described in Chapter II and III originate from the above standards. The action alternatives would meet this standard.

Effectiveness: Moderate to High. Prescribed fire in the project area is designed to meet these standards.

GENERAL RIPARIAN AREA MANAGEMENT (A-12)

RA-1. Identify and cooperate with Federal, Tribal, State and local governments to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.

This project does not adversely affect instream flows.

RA-2. Trees may be felled in Riparian Habitat Conservation Areas when they pose a safety risk. Keep felled trees on site when needed to meet woody debris objectives.

Slashing of the understory may occur within RHCAs in order to accomplish burning and planting of long-lived species such as cedar, larch, and white pine.

RA-3. Apply herbicides, pesticides, and other toxicants, and other chemicals in a manner that does not retard or prevent attainment of Riparian Management Objectives and avoids adverse effects on inland native fish.

By following the BMPs (Appendix A) and fisheries criteria as listed in the Coeur d'Alene River Ranger District Noxious Weed FEIS, all alternatives would meet this standard.

Effectiveness: High. Standards would be met as required by the Coeur d'Alene River Ranger District Noxious Weed FEIS.

RA-4. Prohibit storage of fuels and other toxicants within Riparian Habitat Conservation Areas. Prohibit refueling with Riparian Habitat Conservation Areas unless there are no other alternatives. The Forest Service must approve refueling sites within a Riparian Habitat Conservation Area or Bureau of Land Management and have an approved spill containment plan.

Effectiveness: High. This is a standard BMP that is part of the timber sale contract.

RA-5. Locate water-drafting sites to avoid adverse effects to inland native fish and instream flows, and in a manner that does not retard or prevent attainment of Riparian Management Objectives.

This standard would be applied in the prescribed burn plans associated with the Placer Project Area. However, wildfire suppression is beyond the scope of this project and water drafting associated with such an emergency would be addressed as a separate issue.

Effectiveness: Moderate to High.

GENERAL RIPARIAN AREA MANAGEMENT (A-12)

WR-1. Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to attainment of Riparian Management Objectives.

The proposed watershed restoration projects originate from the above standard. The action alternatives would meet this standard.

Effectiveness: Moderate to High.

WR-2. Cooperate with Federal, State, local, and Tribal agencies, and private landowners to develop watershed-based Coordinated Resource Management Plans (CRMPs) or other cooperative agreements to meet Riparian Management Objectives.

Cooperation at the multiple levels as listed occurred within the framework for developing the proposed activities of this project and that future resource management will develop a CRMP for the South Fork Coeur d'Alene system.

Effectiveness: Low to Moderate.

FISHERIES & WILDLIFE RESTORATION (A-13)

FW-1. Design and implement fish and wildlife habitat restoration and enhancement actions in a manner that contributes to attainment of the Riparian Management Objectives.

Improvements to culverts, road decommissioning, and riparian plantings are habitat enhancement actions that will be implemented in a manner that contributes to attainment of Riparian Management Objectives.

Effectiveness: High.

FW-2. Design, construct, and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of the Riparian Management Objectives or adversely affect inland native fish. For existing fish and wildlife interpretive and other user-enhancement facilities inside Riparian Habitat Conservation Areas, assure that Riparian Management Objectives cannot be met and adverse effects on inland native fish are avoided. Where Riparian Management Objectives cannot be met or adverse effects on inland native fish avoided, relocate or close such facilities.

FW-4. Cooperate with Federal, Tribal, and State fish management agencies to identify and eliminate adverse effects on native fish associated with habitat manipulation, fish stocking, fish harvest, and poaching.

Cooperation at the multiple levels as listed occurred within the framework for developing the proposed activities of this project. Using the INFS Standard Widths Defining Interim RHCAs for the project activities, habitat manipulation does not apply. Fish stocking, harvest and/or poaching are all regulated by State management guidelines.

Effectiveness: High. Existing habitat would be preserved under this project.

FOREST PLAN FISH GUIDELINES (USDA 1987, pp. II-29 through II-31)

Fish Standards:

1. Activities on National Forest lands will be planned and executed to maintain existing water uses. Maintain is defined as "limiting effects from National Forest activities to maintain at least 80 percent of fry emergence success in identified fishery streams." The percent is measured from pristine conditions. Current methodology will not detect an impact of less than 20 percent. During the life of the plan, new technologies may permit more precise assessments; however, the goal of this standard will remain as "to maintain 80 percent of fry emergence success.
2. Streams providing spawning and rearing habitat, which are considered critical to the maintenance of river and lake populations of special concern, will be managed at a standard higher than the 80 percent standard. Monitoring will be needed to detect this higher standard. "*High Value Streams*"

The IPNF Forest Plan contains standards for fry emergence that are no longer valid since the Inland Native Fish Strategy (INFS, 1995) was developed. This section explains why.

The objectives for fisheries in the Forest Plan state that the forest "will be managed to maintain and improve fish habitat capacities in order to achieve cooperative goals with the State Fish and Game Department and to comply with state water quality standards. Sediment arising from land management activities will be managed so that in forest fisheries streams the objective is to maintain 80 percent fry emergence success as measured from pristine condition" (II-7). The first two standards for fish use similar language (II-29). The Fishery/Watershed Analysis to determine effects of land management activities on fry emergence is described in the Forest Plan in Appendix I (I-1, 2).

Appendix I (Forest Plan) requires that if, during the environmental assessment process, cumulative effects of the proposed and past activities on stream sedimentation are projected to result in greater than 20% reduction in fry emergence, then additional detailed analysis will be undertaken. The analysis is then used to determine the significance of the project on water resources. If the project is judged to have a "significantly negative effect" on water resources, it will be reviewed by the State for conformance with water quality standards prior to the final decision.

At the time the Forest Plan was written, models determining fry emergence (e.g., Stowell et al. 1983) were popular. These empirical models were later found to have limited application and were unreliable outside of where they were developed (Kershner 2001 personal communication). In addition, the use of fry emergence survival (regardless of the threshold) as a surrogate for viability came into question, primarily for two reasons:

- *First, fry emergence is highly variable. This can be due to changing natural conditions (e.g., floods, temperature regimes, geology) or human-induced causes (e.g., increased sediment input, chemical spills). Both agents are at work in most cases so it is difficult to determine what proportion of egg-to-fry mortality is due to each cause. As a result the underlying relationship between sediment in redds and survival is difficult to predict (Chapman 1988).*
- *Second, and more important, egg-to-fry mortality is usually density-independent (i.e., a percentage of fry will survive regardless of the number of eggs). This means that in most cases there are enough fry to inhabit all available habitat within a stream. Therefore fry-to-smolt (sub-adult) survival, where density dependent mortality plays a significant role, is a more effective and appropriate predictor of population viability than egg-to-fry survival (for a review of these concepts see Hilborn and Walters 1992). Currently the indicator used as a surrogate of fry-to-smolt survival is stream habitat characteristics.*

The 1989 Forest Plan Evaluation and Monitoring Report documents the change away from use of the fry emergence standard (Item G-1, pages C-1 and C-2). The findings were that it was not a good monitoring tool to report stream health. G-1 was combined with item G-3, which includes a comprehensive array of fisheries and hydrology parameters.

The Inland Native Fish Strategy (INFS; USDA 1995) amended the Forest Plans "…except where existing Plan direction would provide more protection" for inland native fish habitat (page 4). All INFS standards and guidelines are intended to either make progress toward Riparian Management Objectives (which describe "good" fish habitat within the context of what is capable of the watershed) or to ensure that activities will not retard the natural rate of recovery of RMOs in a watershed (USDA 1995, A6-A16). In addition, the strategy states that actions that reduce habitat quality, whether existing conditions are better or worse than objective values, are not consistent with INFS direction (USDA 1995, A-3).

INFS (1995) supersedes the original IPNF Forest Plan direction because it offers far more protection to inland native fish habitat for the following reasons:

- *INFS (1995) directs the establishment of Riparian Habitat Conservation Areas (RHCAs) and only allows activities within RHCAs that maintain or improve, and do not retard, the attainment of the RMOs. The original Forest Plan direction actually permitted degradation of water resources at the discretion of the line officer, and allowed "significant" degradation after review by the State.*
- *Activities that reduce habitat quality to any extent are contrary to INFS direction, regardless of whether RMOs have been attained. The original Forest Plan direction allowed for apparent degradation of fish habitat by permitting up to a 20 percent reduction of potential fry emergence.*

In The Lands Council v. Vaught the U. S. District Court for the Eastern District of Washington, in its reading of the plain language of the INFS documents and giving deference to the Forest Service's expertise in interpreting its Forest Plans, concluded that INFS does supersede the Forest Plan in all areas where RHCA guidelines and standards apply (i.e., where delivery of sediment to streams is the identified threat that proposed project activities pose to fish habitat). The Forest Plan standards remain in effect in all other areas.

In conclusion, this project complies with original Forest Plan direction because, although fry emergence was not computed, a detailed analysis of the effects to fish habitat and water resources was developed as required in Appendix I; and the project has been determined to be fully consistent with the INFS Forest Plan amendment and state water quality standards for supporting beneficial uses (see Watershed discussion).

3. The stream and river segments (if listed) will be managed as low access fishing opportunities to maintain a diversity of fishing experiences for the public and to protect sensitive fish populations. Special road management provisions will be used to accomplish this objective. "Low Access Fishing Streams"

   Forest Plan standards 3 are not inclusive to this analysis because no streams in the analysis area are listed under "low access fishing streams." However, streams within the analysis area are recognized as to providing beneficial uses.

4. Provide fish passage to suitable habitat areas, by designing road crossings of streams to allow fish passage or removing in-stream migration barriers.

   Within the project area, known fish barriers were identified through project review. Currently there are two human-caused fish migration barriers identified in the Placer Project Area (EA, Chapters 2 and 3; Fisheries BA/BE; above INFS standards and guidelines).

5. Utilize data from stream, river, and lake inventories to prepare fishery prescriptions that coordinate fishery resource needs with other resource activities. Pursue fish habitat improvement projects to improve habitat carrying capacities on selected streams.

As stated in Chapter 3, information was utilized from stream inventories, field reviews, historical records, aerial photographs, analysis of watershed conditions, published scientific literature, discussions with Fisheries Biologists and electrofishing/stocking data from the Idaho Department of Fish and Game (IDF&G), and the United States Fish and Wildlife Service (USFWS).

6. Coordinate management activities with water resource concerns as described in MA 16, Appendix I, and Appendix O.

   Water resource concerns are protected in Management Area 16 through INFS standards and guidelines.

STATE OF IDAHO, GOVERNOR'S BULL TROUT PLAN

The following describes the mission from the Governors Bull Trout Plan. Governors Bull Trout Plan (State of Idaho 1996):

- The mission of the plan is to "…maintain and or restore complex interacting groups of bull trout populations throughout their native range in Idaho.

Based on all the information available during development of this EA, bull trout in the South Fork Coeur d'Alene River drainage do not persist; rather they are recognized as historic in the drainage. The Plan, under the Pandhandle Basin (Appendix F- F6) identifies "the entire Coeur d'Alene River Drainage" as a key watershed for a bull trout metapopulation.

AQUATICS APPENDIX C
AQUATICS CORPORATE MONITORING

Table AQ-A-1. Issues and core data tracked for this project.

Issue	Core Data	Unit of Measure	No Action	Proposed Action
Water Yield	Intensity and duration of peak flow increases above existing condition. Comparison to Historic Range of Variation	Percent increase	**0%** increase above existing levels due to dead and dying trees.	**0% to 3%, Mean of 1.5%** increase above existing levels. Intensity and duration of peak flows within HRV.
Sediment Yield	Anticipated percent increase in sediment yield above existing condition. Comparison to Historic Range of Variation	Percent Increase	**0%** increase above existing levels due to ground disturbance associated with logging activities	**0% to 8%, Mean of 2.7%** increase above existing levels due to ground disturbance associated with logging activities.
Net Associated Risk of Sediment Delivery.	Anticipated change in sediment risk associated with high risk stream crossing.	Tons of sediment.	Current net associated risk of sediment delivery is **536 tons.**	Reduction in sediment by **203 tons.**
Hydrologic Integrity	Road Density within the short term (including temp roads) and long term (decommissioning of all roads).	Miles/Mi^2	**2.12** mi/mi2 (Placer Sub-watershed Only)	Short Term: **2.12** Long Term**: 1.51**

Table AQ-A-2. Issues and core data <u>not</u> tracked for this project.

Issue/Core Data	Reason not considered in analysis
Riparian Function	Riparian road density would not change with the project within the Placer Drainage, as no roads within the riparian area will be decommissioned. The construction of temporary roads and the decommissioning of existing roads are not within riparian areas
Mass Failures and Erosion – Road density on sensitive landtypes	Does not apply. No proposed new or temporary roads are on sensitive landtypes with high landslide potential or high sediment erosion / delivery.
Riparian Function, temperature, and large wood recruitment	INFS (1995) standard and guidelines are included as design criteria for this project. The only work proposed in the Riparian Habitat Conservation Areas is the improvement of 10 road crossings. No change in riparian hydrologic opening acreage is expected with this work.
Restricted Fish Use	There are a total of 9 culverts that restrict fish passage in the Placer Drainage. Six of the culverts are on the road #456 at the Red Oak, Hord, Trowel, Flora, Main Placer stream crossings and two unnamed tributaries. One culvert on road #985 at Dry Gulch and another on road # 456-UAB also restrict fish passage.

AQUATICS APPENDIX D
WATSED MODEL LIMITATIONS

Introduction

WATSED is a computer program watershed response simulation model used by several Forests in the Northern Region, developed and updated specifically to do the following:

- Estimate changes in watershed responses in terms of stream flows and sediment yields as a cumulative result of logging, roading, and fire;
- compare differences among management alternatives in forested mountain watersheds;
- identify trends; and
- characterize potential risks.

The model is a tool that objectively estimates expected changes in water and sediment regimens that are likely to result from the cumulative forest practices over time throughout a watershed. It is not designed to produce absolute or accurately quantified solutions; rather, the model is meant to be reasonably precise in terms of changes and trends. It is supported with scientific literature, field review, and field data collected by qualified scientists (hydrologists, fluvial geomorphologists, or soil scientists) and used to provide decision makers with an understanding of different likely watershed responses in response to various forest management alternatives.

WATSED is a watershed response model designed to address the cumulative effects of timber harvest operations, roads, and fire on watersheds generally between 4 and 40 square miles in size. Its precursor the WATBAL model was developed using empirical data primarily from the Clearwater National Forest and north-central Idaho; and its precision has been validated with averaged measured data collected on Forests within the Northern Region of the USDA Forest Service over sequences of years. This validation work will be expanded during 2006.

WATSED is designed to objectively compare relative differences among forest management alternatives in terms of changes in trend, risks, and regimen of water and sediment yield. Estimates are calibrated using measured data that include a combination of primary watershed processes. The model is driven by local climatic conditions and it uses Equivalent Clearcut Area (ECA) notation to represent the apparent degree of landscape disturbance through time. Recovery curves for various road designs and configurations (clearing width, cutslope area, width, and length), logging systems and harvest methods (tractor, cable, aerial), wildfire, and site preparation (mechanical, prescribed fire, or hand) are used to characterize the watershed disturbances that result in cumulative effects.

Watershed processes in WATSED are stratified relative to *landtypes* (USDA Forest Service, 1992). The Forests have measured and rated the typical erosion and slope stability hazards of the landtypes that characterize the Forests' watersheds. They use that information to calibrate the model and resulting interpretations. Slope characteristics and activity data are WATSED input information used to modify the typical values for mapped landtypes. Project-level field investigations may identify local unusual or non-typical conditions. Such information is used to adjust model input or it can be factored into interpretation of the modeled results by the watershed specialist with appropriate skills and experience (e.g., wildland hydrologist, fluvial geomorphologist, or soil scientist).

WATSED incorporates the concepts of the R1/R4 Sediment Guides (Cline et al, 1981), which focus on slope hydrology, erosion, stability, and sediment delivery processes. It generally estimates the water flow and sediment likely to be delivered to the channel network of a study watershed over time as forest management actions occur within the entire watershed from its headwaters to a downstream reach. The routing of sediment and water through the main channel system is estimated using broadly based regional curves. Channel erosion is not modeled directly; however it is represented in the empirical data used to calibrate the model.

WATSED is not intended to simulate watershed response for individual or episodic storm, mass erosion events or extreme drought or flood years. It is not intended to accurately predict sediment and water yields that

might occur as a result of stochastic events or non-forest related actions. It does not address or analyze the effects of grazing or mining (other than vegetation removal and road construction) or other non-silviculture related practices.

The expected response to individual events, including singular rain-on-snow events, high intensity thunderstorms, and extreme runoff events (e.g. flood flows) can be addressed using other modeling tools and methods Several supplemental hydrology and watershed analysis tools are available in Region One:

- *Surface erosion models such as WEPP can be used to help address some episodic events at the site scale for a specific hillslope. These models and tools coupled with other available information (climate and runoff) and spatial data (soil type, topography, vegetation cover, etc.) may also help estimate the risks and likely impacts of some episodic events. The assumptions and limitations of WEPP (or any model used) should also be documented when they are utilized. These include scale or aerial extent and specific site factors.*

- *Slope stability (including mass erosion and delivery potential can be addressed on a broad scale using the databases associated with the Land System Inventory (landtypes) and the known history of mass erosion. On-the-ground reviews and observations by trained personnel must be conducted to address project level mass erosion potential. In cases where roads or other ground disturbing activities are proposed in unstable sites, geotechnical experts must be utilized to access specific risks. Tools such as the "Level I Stability Analysis" (LISA) are available to estimate the risks associated with slope stability and mass erosion under certain circumstances.*

- *Flood and peak flow in response to storm events can be addressed using many tools published and available from USGS and other sources.*

Model results are not the sole source of information used to support important resource decisions.

The WATSED Model used in this analysis was not the only tool utilized for analysis of watershed responses. The model results have been incorporated with other analysis tools and sources of information to provide the basis for interpretation by the watershed specialist. Important sources of information include:

- *Locally-derived monitoring or monitoring of similar systems;*
- *Reviews of pertinent scientific literature and reports;*
- *Reasonably local calibration of the driving variables used in the models (i.e., land type response variables and hydrologic response curves);*
- *Validation of the model, using independent data for major geomorphic groups used on the Forest (i.e., rock belts, border zone, granitics, etc.); and*
- *Professional judgments and interpretations of skilled watershed specialists with local experience and observations.*

The resource interpretations are based on the integration of these sources and with model results have been used to provide a clear understanding of expected hydrologic responses and changes produced by alternative. The judgments and determinations of the professional resource specialists were based on the integration of available tools and were factored into resource recommendations and considered in management decisions. This relationship should is documented in Decision document, supporting NEPA and project files.

Concluding Remarks

WATSED like any quantitative model is only a tool. Estimates have been verified with, compared to, and evaluated against measured flow and sediment yield data from sites with similar characteristics. User interpretations are expected to have the best possible degree of validity when they are made by trained and experienced water resource specialists who have the basis to understand the logical framework of the model

itself as well as the hydrologic, hydraulic, and slope stability principles and processes that are actually taking place on the watershed and in the stream.

It is the author's intention that WATSED model and its supporting databases and landtype interpretations be continually calibrated and validated and re-calibrated again. The specialists on this project have verified for themselves the results and trends that WATSED simulates. Significant decisions have not been made solely on the results of the model. Interpretation of modeling results, review of pertinent scientific literature, on the ground field observations and measurements have all be used in concert with the informed and educated judgment of the water resource scientist.

Specialist's Report on Soils in the Placer Resource Area

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SPECIALIST'S REPORT ON SOIL PRODUCTIVITY IN THE PLACER RESOURCE AREA

1. Regulatory Framework

The regulatory framework providing direction for protecting a site's inherent capacity to grow vegetation comes from the following principle sources:

- *The Multiple Use-Sustained Yield Act of 1960*
- *The National Forest Management Act of 1976 (NFMA)*
- *The Code of Federal Regulations for Forest Planning (36 CFR 200.1)*
- *The Forest Plan and Regional Soil Quality standards (FSH 2509.18)*

The Multiple Use-Sustained Yield Act of 1960 directs the Forest Service to achieve and maintain outputs of various renewable resources in perpetuity without permanent impairment of the land's productivity.

Section 6 of the National Forest Management Act of 1976 (NFMA) charges the Secretary of Agriculture with ensuring research and continuous monitoring of each management system to safeguard the land's productivity.

The Code of Federal Regulations for Forest Planning that followed NFMA requires the Forest Service to measure effects of prescriptions, including "without impairment of the productivity of the land" (Code of Federal Regulations 36, CFR Part 219.7, 2003; PF Doc. SOIL-21).

To comply with NFMA, the Chief of the Forest Service has charged each Forest Service Region with developing soil quality standards for detecting soil disturbance and indicating a loss in long-term productive potential. These standards and guidelines are built into Forest Plans.

Forest Plan direction (Forest Plan, p. II-17; PF Doc. SOIL-38) is to manage the soil resource to maintain long-term productivity. The objective is that management activities on forest lands will not significantly impair the long-term productivity of the soil or produce unacceptable levels of sedimentation resulting from soil erosion. Forest plan standards are addressed in Section 5 of this report.

The Regional Soil Quality standards were revised in November 1999 (R-1 Supplement 2500-99-1). Under Forest Plan Standard (1) as discussed above, detrimental soil disturbance includes the effects of compaction, displacement, rutting, severe burning, surface erosion, loss of surface organic matter and soil mass movement. The revised standard specifies that 85 percent of an activity area (cutting unit) must have soil that is in satisfactory condition. In areas where more than 15 percent detrimental soil conditions exists from prior activities, the cumulative detrimental effects from project implementation and restoration should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality. These standards do not apply to intensively developed sites such as mines, developed recreation sites, administrative sites and permanent roads or landings.

These standards are based on the lowest magnitude of adverse change detectable, given the current monitoring technology (Powers 1990; PF Doc. SOIL-36).

2. Methodology Used in the Soil Productivity Analysis

Analysis of the soil resource was carried out utilizing a landtype map that displays the entire analysis area. The Proposed Action was analyzed to allow for the various harvest unit proposals and to identify those units that would require design modifications to achieve Regional and Forest Plan standards. A systematic procedure was established to identify the existing condition of each proposed unit in terms of highly disturbed soils, low potassium and units that do not meet the standard.

Data lists were developed for all the proposed treatment units under the Proposed Action. Existing conditions include the acres of constructed or designated trails, and roads (permanent/temporary) within or adjacent to

harvest units and logging systems. The activities were compiled into lists from aerial photographs, timber stand data base (TSMRS) and roads database. On the ground reviews were conducted to assess conditions within past harvest disturbance areas. Calculations were performed utilizing the data sheets to determine the disturbance factor for previously harvested activity areas. The disturbance factors represent an average percentage of detrimentally disturbed soils and were obtained through past monitoring results over several years (Forest Plan Monitoring and Evaluation Reports, 1988, 1991, 1993 and 1997; PF Doc. SOIL-39, SOIL-40, SOIL-41 and SOIL-42).

All of the proposed activities related to harvest (including specific features designed to protect soils) were compared to existing conditions as a rough evaluation for each unit and their relation to the Forest Plan Standards.

Affected Environment

Soils in the project area are generally weakly weathered and have moderately good timber production potential. The practice of timber management can have long-lasting impacts on the soil resource if precautions are not taken. The following three design and management criteria relate to soil productivity in the Placer Resource Area.

1. Detrimentally disturbed soils within activity areas (harvest units).

Detrimental soil impacts are defined as the proportion of an activity area that may be subjected to compaction, displacement, or severe burning due to a particular management activity (such as harvest or fuels treatment), exclusive of dedicated resources (such as system roads). The soils in an activity area are considered detrimentally disturbed when the following soil conditions exist as a result of Forest practices.

a. *Soil displacement results in the loss of either one inch of or half of the humus-enriched surface layer (A-soil horizon), whichever is less. The loss of the litter layer alone could be detrimental on some marginal sites. Displacement removes the most productive part of the soil resource. Roading, ground-based yarding, dozer piling and cable corridors are the major contributors to displacement.*

b. *Soil compaction that results in a 20 percent or more increase in bulk density, or a 50% reduction in water infiltration rates typical for volcanic ash influenced surface soils. Soil compaction reduces the supply of air, water and nutrients to plants. Roading, ground based yarding and piling are the major contributors to compaction.*

c. *Fire consumes most woody debris and the entire duff and litter layer, exposing mineral soil. Burn ash that is white or reddish color, indicates that much of the carbon was oxidized by fire (Burned-Area Emergency Rehabilitation Handbook FSH 2509.13). Burns that create very high temperatures at the soil surface when soil moisture content is low result in almost complete loss of surface and upper soil horizon organics. Many of the nutrients and ectomycorrhizae associated with these organics can be lost to the atmosphere through volatilization and removed from the site in fly-ash (Garrison and Moore, 1998; PF Doc. SOIL-23) or lost to high ground temperature flux (Harvey, et al, 1986 p. 7; PF Doc. SOIL-57).*

2. Low Potassium Sites - Sites containing geologic formations that are naturally deficient in potassium bearing minerals.

Natural deficiencies of potassium may occur with Belt series, metasedimentary rock formations. The Belt Series Group is the main bedrock component throughout the Coeur d' Alene River Ranger District. Areas of lower tree productivity appear to be related to the bedrock's weathering characteristics. Some of the calsite and carbonate bearing rock of the Lower and Middle Wallace Formation are now possibly the more productive sites on Belt series rock (Johnston 2004; PF Doc. SOIL-56). Geologic formations and their descriptions within the project area are taken from Hobbs et al. (1965; PF Doc. SOIL-27).

Potassium is derived almost entirely from the underlying rock formations as potassium feldspar. A study by the Intermountain Forest Tree Nutrition Cooperative (IFTNC) is comparing area lithology to its weathering potential index (WPI). The IFTNC believes the percentage of potassium alone does not characterize 'good'

rock from 'bad' rock (Johnston 2004; PF Doc. SOIL-56), but rather that the WPI may provide a means of quantifying bedrock weathering patterns and their release of potassium from their mineral composition of potassium feldspar. Harrison and Campbell (1963, PF Doc. SOIL-26) state that most Belt metasedimentary rocks have percentages of potassium feldspar within their mineral composition that vary from 2 to 12 percent and past studies by the IFTNC characterized the Prichard and Lower Wallace Formations as having the lowest percentage of potassium feldspar. The cooperative's present research using the WPI indicates that non-carbonate bearing argillites and quartzites weather slowly and their release of potassium is low. Most of the Placer Resource Area's underlying bedrock are the Belt series group and include: 86 percent Lower Wallace, 12 percent Burke, 0.5 percent Striped Peak, and 1 percent of a dioritic intrusive (Resource Area Geology Map, PF Doc. SOIL-13).

In general, 45 percent of a site's potassium is held in trees, with the remainder being tied up in subordinate vegetation, the forest floor, and soil pools (Garrison and Moore, 1998; PF Doc. SOIL-23). Within the trees, about 85 percent of the potassium is held in the branches, twigs and foliage. Under natural circumstances, the potassium returns to the soil when the tree dies. Whole tree yarding, removal of treetops, and grapple piling can therefore lead to the direct loss of potassium (Morris and Miller, 1994; PF Doc. SOIL-32), which can be long-term depending on the site's geology and silvicultural prescription.

Further research shows a possible correlation of potassium deficiency to the lack of tree resistance against root rot (Garrison-Johnston, 2003; PF Doc. SOIL-53). On the other hand, results from the seedling establishment/nutrition experiment conducted by the IFTNC show that potassium was non-limiting from a tree growth standpoint on the Flat Creek Belt Metasedimentary site (Garrison and Moore, 1998; PF Doc. SOIL-23). This site is on the metasedimentary Striped Peak Formation and, according to Harrison and Campbell (1963; PF Doc. SOIL-26), contains about seven percent potassium feldspar in its mineral composition.

Additional research on the nutrient contents within tree species and different rock types may establish more definite minimum thresholds and effects on tree growth and resistance to diseases (Mika, 2005, PF Doc. SOIL-54; Shaw 2005; PF Doc. SOIL-55). Until these minimum thresholds are developed, the Idaho Panhandle National Forests are using management recommendations from the IFTNC as a guideline for maintaining sufficient potassium on a site. In the winter of 2002, the Idaho Panhandle National Forests initiated tree foliar analysis in cooperation with the Cooperative in order to gather more information on forest potassium levels. Additional sampling is planned in upcoming years. Information gained from these samples will be used to obtain baseline data pertaining to soil nutrient levels and their effect on tree growth and health.

The IFTNC (1998, PF Doc. SOIL-58) has made the following management recommendations to retain potassium on site after logging:

a. *Practice conventional removal (lop and scatter) rather than whole-tree removal. The lop and scatter technique should be used during intermediate as well as final harvest operations.*

b. *Let slash remain on site over winter so mobile nutrients such as potassium can leach from fine materials back to the soil.*

c. *Light broadcast burn or underburn for release of potassium and other nutrients.*

d. *Avoid mechanical site preparation.*

e. *Plant appropriate species that are more potassium efficient (western larch, white pine).*

3. Maintenance of large woody debris and organic matter.

The third soil productivity criterion relates to the management of coarse woody debris and organic matter, and follows the research guidelines contained in Graham et al. (1994; PF Doc. SOIL-25). Retaining coarse woody debris and organic matter is important to maintaining the soils most productive layer. Coarse wood debris is defined as woody material derived from tree limbs, boles, and roots greater than three inches in diameter and in various stages of decay. It performs many physical, chemical and biological functions in forest ecosystems and is a key habitat component for many wildlife species and for stream ecology (Graham

et al., 1994; PF Doc. SOIL-25). Because coarse woody debris is such a valuable part of a functioning ecosystem, a portion of the material must be maintained to ensure that organic matter is recycled for long-term productivity.

The optimum level of fine organic matter is 21 to 30 percent, which equates to 1 to 2 inches of surface litter and humus. Optimum levels of fine organic matter relate to ectomycorrhizae fungus, which is a good indicator of healthy forest soil. In moist western hemlock and cedar habitat types, strong levels of ectomycorrhizae exist when organic levels exceed 30 percent. Soil survey data indicates that most forest sites have adequate organic matter levels to support strong ectomycorrhizae populations.

This soil productivity criterion is addressed as a guideline and is not part of the alternative evaluations because project alternatives are designed to meet the large woody debris guidelines as referred to in Graham et al., 1994; (PF Doc. SOIL-25) and silvicultural prescriptions.

Features Designed to Protect Soil Resources

The Proposed Action was designed with specific features to protect soil resources in the Placer Resource Area. The following guidelines would be followed during project implementation:

- *Fine organic matter and large woody debris would be retained on the ground in harvest units, which is necessary for sustained nutrient recycling (especially in areas of low potassium). In addition, only log-length yarding (no whole-tree yarding) would be allowed during harvest.*
- *On units designated for tractor harvest, planned skid trails would be established at 150-foot spacing to reduce overall soil compaction and displacement.*
- *Scheduling harvest activities to occur when the soil profile is dry helps to reduce the effects from compaction (Poff, 1996, p. 482; PF Doc. SOIL-35). Tractor harvest and wood removal would be scheduled to occur when the soil profile is dry. Prescribed broadcast burning and underburning would be of low intensity and would occur when the soil's surface horizon has at least 25% moisture content in order to protect the site's surface organic component.*
- *To minimize erosion and ensure compliance with State water quality standards, all proposed road construction and timber harvest activities associated with the project would be completed using Best Management Practices (refer to the Specialist's Report on Aquatic Resources, PF Doc. SR-05, Aquatics Appendix A).*
- *In those areas where machine or hand piling of slash is proposed, the foliage and branches would be allowed to over-winter on the site, allowing potassium to leach out from the slash material. Management of large coarse woody debris and other organic matter (limbs and tops) would follow the research guidelines in Graham et al (1994; PF Doc. SOIL-25). Yarding would not remove tops from the site. Tops and branch slash would remain on site over a winter before further treatment.*

3. Existing Soil Conditions

3.A. Soil Productivity

Soil productivity is the output of a specified plant or group of plants under a defined set of management practices, or the total plant mass that is produced annually per unit area.

The most productive part of the Resource Area's soil occurs near the surface at the contact between the forest litter and the mineral soil. Here, the litter has been highly decomposed into dark colored amorphous material, which is the richest and most productive part of the soil. This layer is frequently only a few inches thick but its presence is much more important than its thickness would indicate. The rich organic matter layer contains most of the soil nitrogen, potassium and mycorrhizae that must be present for a site to be productive.

Below the organic horizon is volcanic ash, which occurs at the surface layer of the mineral soil. In north Idaho, the ash layer is typically 16 inches thick, ranging between 7 and 24 inches on most sites (refer to the pedon descriptions, PF Doc. SOIL-10). The top part of the ash is usually enriched in organic matter, which also contributes nitrogen, potassium and mycorrhizae to this part of the soil. The lower part of the volcanic

ash has less organic matter and is not as fertile as the upper portion. The ash has a high water holding capacity and nutrient-holding capacity, both of which are important for soil productivity.

Below the volcanic ash, the subsoil and substratum tend to be medium textured in the metasedimentary Belt rock derived soils of the project area. These subsoil and substratum materials are very weakly weathered and tend to have a high component of rock fragments, although this can be quite variable, particularly in the alluvial bottoms and outwash materials, (PF Doc. SOIL-17 and SOIL-51).

Most of the productivity of the Resource Area is found near the soil surface, which is also the part that is most easily disturbed by management activities. Retaining large woody debris and organic matter is therefore important to maintaining this productive layer (Graham et al., 1994; PF Doc. SOIL-25).

3.B. Past Activities

Past timber management activities within the proposed treatment areas (EA, Appendix B) were queried from the District's Timber Stand Management Record System (TSMRS) database and checked against timber sale maps, aerial photographs, and on the ground surveys. Out of a total of 56 proposed treatment areas (43 Forest Service, 13 Bureau of Land Management) portions of 9 units have had previous harvest treatments with all of the second entry harvest units being on National Forest System land. Areas within Units 17, 21, 22, 23, and 26 through 30 (proposed for commercial thinning to enhance western larch) were commercially thinned and cable-yarded with no substantial impacts.

In general, past monitoring of cable logging systems have been shown to produce minor (2 percent) detrimental impacts (Niehoff, 2002; PF Doc. SOIL-34; McIver and Star 2000, pages 11-16; PF Doc. SOIL-30). Other logging activities have occurred on 2,540 acres in the resource area, but were post 1910 fire salvage, occurring between the mid 1910's through the mid 1920's as horse skidding operations. Little evidence of the salvage activity remains except for a few remnant stumps, suggesting that all post-1910 fire salvage areas have recovered as 70 to 80 year old timbered stands.

Within the resource area there are 624 acres of private inholdings, of which approximately 30 percent (250 acres) have had some logging. The typical practice on these lands is to leave submerchantable stands after being logged by tractor, cable, or helicopter methods, with most of the slash left on site and not burned. The residual stocking follows State of Idaho Best Management Practices (BMPs).

The mining activities that have occurred within the project area include both surface exploration and underground (hard rock) development. Underground work has resulted in 17 known waste rock features, of which 5 are of moderate size. The total area of disturbance that resulted from this work is approximately 10 acres. Exploration of a mechanized nature came about in the early 1950's as design of the bull dozer improved, resulting in approximately 12 miles of dozer prospect trails and associated trenching. The trenching as affected approximately 3 acres of ground within the project area.

3.C. Existing Roads

The present road system designated as "classified" (Forest Development Roads) on the National Forest transportation system are considered dedicated lands and total six miles within the Resource Area. There are approximately 11 miles of unclassified roads that are not considered Forest Development Roads, the majority of which were created during bulldozer mineral exploration activities in the 1950's and 1960's. A number of these roads access proposed harvest activity units. The BLM does not have a formal category for unclassified roads; when incorporated into project use, they are known as forest roads. Approximately four miles of roads extend through private land. County Road 456 is 9 miles in length and maintained on a right-of-way through the Resource Area. Roads are categorized as "classified" (dedicated under the area transportation plan) or "unclassified" (non-dedicated roads, which are not considered necessary for long-term forest management objectives). In both cases, the loss of soil productivity on either category of road is considered irretrievable. See Road Inventory PF Doc. SOIL-5.

3.D. Potassium Limitations

Potassium limited areas are attributed to non-carbonate bearing argillites and siltites within Belt Series bedrock and could potentially reduce tree growth and increase susceptibility to root disease (Garrison-Johnston et al., 2003, PF Doc. SOIL-59). Although pockets of root disease occur throughout the Resource Area and may correlate with specific geologic formations, its cause can be initiated by a variety of environmental factors. Research by the IFTNC continues to look at the bedrock lithology and the weathering characteristics in relationship to available potassium (Mika 2005; PF Doc. SOIL-54 and Shaw, 2004; PF Doc. SOIL-55). Most of the proposed harvest units are situated on the Lower Wallace formation, a formation that has previously been identified as potassium deficient, while segments of the fuel break adjacent to Road 456 are on an intrusive dioritic rocks.

The recommendation for all fuels reduction management is to allow the slash to over winter before the unit is burned. In harvest treatment areas on National Forest System lands, tree tops are to be lopped/scattered and allowed to over winter before underburning occurs. Hand piling is to occur within the road fuel break. Slash reduction on the BLM harvest units consists of grapple pile and burning in Units 1, 4, 5 and half of Unit 6; a track-mounted slash buster would be used in Units 2, 3 and 7. On these units the slash would be left in place for biomass recycling, and not burned. The lower half of Unit 6 would be lopped/scattered and burned. This would allow most of the foliar potassium to leach from the fine vegetative debris (Baker et al., 1989, PF Doc. SOIL-45; Garrison and Moore, 1998; PF Doc. SOIL-23; Laskowski et al., 1995, PF Doc. SOIL-47; Palvianen et al. 2004, PF Doc. SOIL-49).

3.E. Potential for Erosion

The potential for soil erosion concerns on the Coeur d'Alene River Ranger District is not so much associated with harvest treatments, as with existing roads (Cacek, 1998; PF Doc. SOIL-20). Landtypes within the Resource Area have a predominately low to moderate erosion hazard potential, as displayed in the following table.

Table SOIL-1. Percentage of sensitive landtypes in the Placer Resource Area (including 624 acres of private lands), and their potential for erosion hazards.

Surface Erosion Potential			Sediment Yield Potential			Mass Failure Potential		
Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
97	3	0	38	8	54	41	32	27

Proposed harvest units on National Forest System lands that are partially situated on high sediment yield landtypes are displayed in the following table ("High Sediment Delivery" column). In total, these units have 213 acres of landtypes classified as high sediment yield, which amounts to 30 percent of the proposed harvest activity areas on National Forest System lands. Except for their segment of the fuel break along Road 456, the BLM proposes no harvest activity on any high sediment yield landtypes.

Harvest activity units with high landslide potential total 167 acres or 23 percent of the proposed harvest activity areas on National Forest System lands (refer to the table below, "High Landslide" column). The BLM proposes no harvest activities on high landslide potential landtypes.

Table SOIL-2. Soil Hazard Potentials in Proposed Activity Units.

Unit	Acres	Landtype Unit	Unit Acres	High Surface Erosion?	High Sediment Delivery?	High Landslide Potential?
1	19	409	7.0	NO	NO	NO
		440	4.96	NO	NO	NO
		470	7.0	NO	NO	NO
1a	22	409	2.48	NO	NO	NO
		440	3.72	NO	NO	NO
		470	13.6	NO	NO	NO
		483	2.2	NO	NO	NO
2	53	243	4.36	YES	YES	NO
		409	41.5	NO	NO	NO
		440	4.34	NO	NO	NO
		468	2.8	NO	NO	NO
2a	41	409	7.6	NO	NO	NO
		468	17.3	NO	NO	NO
		470	16.1	NO	NO	NO
3	10	466	1.2	NO	NO	NO
		470	2.6	NO	NO	NO
		491	6.2	NO	NO	NO
3a	16	470	11.7	NO	NO	NO
		479	4.3	NO	YES	YES
4	10	468	7.4	NO	NO	NO
		470	2.6	NO	NO	NO
5	12	409	4.0	NO	NO	NO
		440	8.0	NO	NO	NO
6	40	470	14.8	NO	NO	NO
		479	24.1	NO	YES	YES
		483	1.1	NO	NO	NO
8	23	409	10.3	NO	NO	NO
		410	1.8	NO	NO	NO
		440	10.9	NO	NO	NO
8a	10	409	1.4	NO	NO	NO
		440	8.6	NO	NO	NO
8b	9	409	.8	NO	NO	NO
		410	1.0	NO	NO	NO
		440	7.2	NO	NO	NO
9	6	409	2.9	NO	NO	NO
		440	3.1	NO	NO	NO
10	7	406	2.4	NO	NO	NO
		440	3.7	NO	NO	NO
		470	.90	NO	NO	NO
10a	5	440	5.0	NO	NO	NO
11	17	406	6.5	NO	NO	NO
		440	10.5	NO	NO	NO
12	7	406	5.3	NO	NO	NO
		440	1.7	NO	NO	NO
12a	7	440	7.0	NO	NO	NO
13	37	466	8.6	NO	NO	NO
		477	17.3	NO	NO	NO
		480	11.1	NO	YES	NO
14	8	406	8	NO	NO	NO
15	18	466	1.4	NO	NO	NO
		477	14.2	NO	NO	NO
		480	2.4	NO	YES	NO
16	22	406	4.9	NO	NO	NO
		410	9.3	NO	NO	NO
		415	7.8	NO	YES	YES

Table SOIL-2. Soil Hazard Potentials in Proposed Activity Units, continued.

Unit #	Acres	Landtype Unit	Unit Acres	High Surface Erosion?	High Sediment Delivery?	High Landslide Potential?
17	15	415	15	NO	YES	YES
21	28	410	1.2	NO	NO	NO
		415	26.8	NO	YES	YES
21a	4	415	4	NO	YES	YES
22	7	243	2.4	YES	YES	NO
		410	1.4	NO	NO	NO
		440	1.1	NO	NO	NO
		466	2.1	NO	NO	NO
23	16	415	1.9	NO	YES	YES
		466	13.6	NO	NO	NO
		480	.50	NO	YES	YES
24	10	243	6.8	YES	YES	NO
		466	1.4	NO	NO	NO
		480	1.8	NO	YES	NO
25	11	410	9.8	NO	NO	NO
		415	1.2	NO	YES	YES
26	13	415	13	NO	YES	YES
27	23	243	7.1	YES	YES	NO
		440	11.1	NO	NO	NO
		470	4.8	NO	NO	NO
28	53	243	17.2	YES	YES	NO
		410	21.6	NO	NO	NO
		440	14.2	NO	NO	NO
29	25	410	19.8	NO	NO	NO
		415	2.1	NO	YES	YES
		440	2.4	NO	NO	NO
		466	.70	NO	NO	NO
30	7	410	6.1	NO	NO	NO
		415	.90	NO	YES	YES
31	13	243	4.3	YES	YES	NO
		410	6.3	NO	NO	NO
		466	2.4	NO	NO	NO
Rd 456 fuel break	95	130	11.0	NO	YES	NO
		477	4.3	NO	YES	NO
		479	65.0	NO	YES	YES
		483	11.0	NO	NO	NO

Soil disturbance factors associated with skyline/cable and helicopter yarding range from 0 to 2 percent with most of the disturbance being caused by dragging logs on the ground prior to becoming suspended. Tractor/forwarder yarding can produce soil disturbance levels that are much greater when not restricted to properly spaced skid trails or additional ground protecting measures such as slash mats or winter logging.

Canopy cover and rooting strength within the managed units will maintain soil stability and evapotranspiration whereas soil strength would be sustained through the retention of trees that mitigate for landslide or sediment yield concerns (Megahan 1990; PF Doc. SOIL-31).

4. Environmental Consequences to Soils

4.A. Methodology Used to Analyze Environmental Consequences to Soils

This analysis includes potential effects from proposed logging systems, permanent and temporary roads, landings and fuel treatments on soils. To determine whether proposed activities would detrimentally impact or have cumulative effects on soils the IPNF Soil NEPA Analysis Process (Niehoff 2002; PF Doc. SOIL-34) was used. For each alternative the detrimentally disturbed acres were calculated using coefficients based on past IPNF soil monitoring data. The coefficients were developed as an average soil disturbance level, and

equated to harvest equipment, time of year (summer vs. winter logging), fuel treatment methods, and the time of year fuel treatment took place. Since the coefficients are based on an average, areas that have had prior harvest activities could have soil disturbance levels lower or greater then the coefficient's average. This monitoring information is contained in Forest Plan Monitoring and Evaluation Reports and is summarized in the IPNF Soil NEPA Analysis Process. For direct and indirect effects the calculations incorporated the acres and types of proposed logging, burning, and roads/landings constructed.

Based on past monitoring efforts (Niehoff 2002; PF Doc. SOIL-34), tractor logging prior to 1990 has had the most detrimental soil impact and ranged between 24 and 42 percent. Since 1990, tractor logging methods and recommended protection measures have decreased most detrimental impacts to an average of 13 percent (Niehoff 2002; PF Doc. SOIL-34), which is two percent less than the maximum allowable criteria established by the Regional guidelines. Helicopter and skyline/cable logging systems tend to have between 0 and 2 percent detrimental effects (Niehoff 2002; Doc. SOIL-34) and (McIver and Starr 2000, pp. 11-16; PF Doc. SOIL-30). These logging systems have less impact than tractor systems because the equipment stays on the road and the logs are partially suspended, restricting impacts to times when logs are being dragged over the ground (Krag 1991; PF Doc. SOIL-29; Seyedbagheri, 1996, pages. 7-9; PF Doc. SOIL-37). Helicopter logging has minimal impacts as the logs are lifted into the air and transported to a landing site (Poff 1996; PF Doc. SOIL-35; McIver and Starr, 2000, pages 11-16; PF Doc. SOIL-30). The landing site is usually one-half to one acre in size and receives the most impact from ground-based equipment that processes and transports the logs.

Direct effects on soils from proposed activities were measured by analyzing the effects of compaction, severe burning, and displacement on the soil surface that is the most productive layer and also the easiest to disturb through activities. Potential impacts would result from the type of logging system and fuel treatments used, and area disturbed due to construction of roads and landings.

Compaction, displacement, and severe burning can affect the soil's physical, chemical and biological properties, which indirectly can affect the growth and health of trees and other plants. Compaction reduces soil permeability and infiltration, which can cause soil erosion. Displacement reduces plant growth where topsoil and organic matter are removed. Severely burned soils can become hydrophobic (water repellent) and lead to increased erosion, runoff, and/or reduced productivity.

Tractor, forwarder, skyline/cable and helicopter logging systems would be utilized under the Proposed Action. Roads and landings that are to remain on the landscape for future use cause irretrievable effects on productivity as those lands become "dedicated" lands. Those roads that are temporarily needed for project work and are planned for decommissioning have detrimental effects initially, but rehabilitation efforts (ripping, recontouring) would initiate a long-term recovery sequence. Vegetative recovery time is approximately 30 to 40 years as the second growth timber becomes established around the disturbed areas and develops enough crown foliage to intercept and evapotranspirate moisture (Dykstra and Curran 2002, PF Doc. SOIL-60; and Froehlich et al. 1985, PF Doc. SOIL-61).

Acres of detrimental disturbance were calculated by multiplying the areas of activity disturbance by the disturbance coefficient derived from monitoring reports. Coefficients used for proposed logging systems are:

Tractor/Forwarder Logging

With spring burning or grapple piling	*13 percent (>25 percent soil moisture)*
With fall burning, no grapple piling	*15 percent (>25 percent soil moisture)*

Skyline/Cable and Aerial Logging

With spring burning	*1 percent (>25 percent soil moisture)*
With fall burning on south/southwest aspects	*3 percent (>25 percent soil moisture)*

Coefficients for road construction used 35-foot widths, which take into account a 14-foot wide running surface and includes the cut and fill slope disturbance. Log landing areas associated with new road construction are accounted for in the road calculations. Log landings that are proposed outside of any harvest units are each calculated as one acre. Effects to these areas would be considered irretrievable, and they would be identified as "dedicated" lands (Table SOIL-4).

Indirect effects include the loss of site productivity due to the removal of large woody debris and potassium. Large woody debris is essential for maintenance of sufficient microorganism populations and long-term site productivity. Research has indicated that potassium (among other nutrients) is an important element for site productivity and may be deficient among certain Belt supergroup formations. Design features are incorporated into the activities to meet the management of large woody debris and organic matter as detailed in the research guidelines contained in Graham et al., (1994, PF Doc. SOIL-32). These recommendations emphasize tons/per acre and are defined as any woody residue larger than three inches in diameter. On potassium limited sites, tree tops, foliage and branches would be left to over winter, which allows potassium to leach out of these materials (Baker et al., 1989, PF Doc. SOIL-45; Edmonds, 1987, PF Doc. SOIL-46; Garrison and Moore 1998, PF Doc. SOIL-23; Laskowski et al., 1995, PF Doc. SOIL-47; and Palviainen et al. 2004, PF Doc. SOIL-49). The reduction of available potassium leaching back into the soil profile could affect tree growth.

Cumulative effects include the combination of direct and indirect effects from past, present and reasonably foreseeable activities. Since direct and indirect effects on soils are measured within the activity areas, the cumulative effects analysis area for the soil resource consists of those activity areas proposed for soil disturbing activities within the Placer Resource Area. Reasonably foreseeable actions, such as road construction/reconstruction and timber harvesting, would continue to affect the soil (EA, Appendix B).

Existing roads and landings designated as classified on the National Forest transportation system are considered dedicated lands. The loss of soil productivity on these sites occurred when the roads and landings were constructed and are an irretrievable effect. These lands are not considered a part of the cumulative effects because they are now included as a capital investment to the permanent transportation system.

4.B. Effects to Soil under the No-Action Alternative

No direct effects to the soil resource would occur under the No Action Alternative since there would be no road construction, logging or fuel treatment activities. There would be no compaction or displacement beyond what currently exists. Throughout the silvicultural landscape, tree mortality from pathogens and weather events would continue as in the past, which have a direct influence on the area's recycling of organic matter and changes in fuel loading. In moist habitat sites the increase in organic matter is a benefiting function to overall soil productivity. In dry habitat types, increases of organic matter may result in a negative response. Soil damage risks could increase as fuel loading levels rise and are followed by a high severity fire. The effects of such a fire would result in a greater loss to the soil's organic matter, nutrient availability, and could reduce water infiltration, which affects soil productivity. In addition the effects of such a fire followed by heavy storms could greatly increase surface erosion and sediment deliveries.

Under the No-Action Alternative, no new management-induced detrimental impacts would occur in the resource area. Stands currently at high risk for mortality would not be treated, which may increase the risk of stand loss due to wildfire, severe burning, and loss of soil nutrients. Moreover, the introduction of weeds and unwanted flora following a fire could lead to higher competition between less desirable and native vegetation. In the absence of such a hot fire, nutrients would be retained on site. However, stand conversion back to more site-appropriate tree species would be delayed in comparison to the Proposed Action.

4.C. Effects to Soil Under Both the No-Action and Proposed Action Alternatives

Given the decades of fire suppression in the Resource Area, the chance of a lethal wildfire occurring could be high if an ignition starts in an untreated area during extreme, dry weather conditions. As stated in the Specialist's Report on Fire and Fuels (PF Doc. SR-01), the proposed vegetation and fuels treatment in the Resource Area would not necessarily prevent lethal wildfires from occurring, but would increase the ability to suppress such a fire should the ignition occur in the treated areas. Vegetation and fuels treatments would

reduce the chance that a wildfire could have as severe an effect on the soils in treated areas as it could in untreated areas because there would be a reduction in the tons per acre of fuels on those treated sites.

The occurrence of a high intensity wildfire would have a high potential for impacts to soils and soil productivity in severely burned areas, especially since the risk of soil erosion increases proportionally with fire intensity (Megahan 1990, p. 146; PF Doc. SOIL-31). Ashes that have burned white or a reddish color indicate that much of the organic carbon was oxidized and is no longer available to the soil. Other effects would include the loss of organics, loss of nutrients and a reduction of water infiltration (Wells et. al. 1979, p. 26; PF Doc. SOIL-44). When the soil moisture content is low, burns can create high surface temperatures that can result in a complete loss of almost all of the woody debris and usually the entire organic layer, exposing mineral soil. Nutrients stored in the organic layer (such as potassium and nitrogen) can also be lost or reduced through volatilization and as fly ash (DeBano 1991, pp. 152-153; PF Doc. SOIL-22; Amaranthus et. al. 1989, p. 48; PF Doc. SOIL-18).

If hydrophobic soils result from severe, high temperature fire, moderate surface erosion would occur but the potential for mass failures would be low to moderate because of the Placer Resource Area's overall landtype characteristics. The areas of primary risk after a severe burn are toe slopes adjacent to streams, stream banks and possible debris flows. Following a severe fire, rehabilitation efforts to mitigate the fire's effects on erosion and sediment delivery would be performed as funding became available. If completed in a timely manner, rehabilitation work could negate most of the erosion concerns.

4.D. Effects to Soil under the Proposed Action

Minor disturbances would occur on skyline and helicopter yarded harvest units and where hand line is constructed around specified units. Forest monitoring indicates these activities typically result in minor detrimental effects (USDA 1991; PF Doc. SOIL-40). Activity areas that propose tractor yarding, new roads or road reconstruction, and new helicopter landings would have the highest probability of detrimental effects to the soil resource. Skyline and helicopter logging systems that are proposed in conjunction with spring underburning and no new road construction would have much lower detrimental effects, usually one to three percent (Niehoff 2002; PF Doc. SOIL-34). See Tables SOIL-3 and SOIL-4.

Effects of Road Construction: Under the Proposed Action, the construction of eight-tenths of a mile of new temporary road would produce an irreversible effect to site productivity through compaction and displacement. Once sale activity ends, the temporary roads would be obliterated, which would begin to reduce compaction of the soil and return a portion of the topsoil to the surface, which helps restore soil productivity and decreases hydrologic effects from road surface runoff.

Effects of Road Maintenance: No additional soil impacts would occur from proposed road maintenance activities such as blading, drainage improvements, and surfacing on existing dedicated roads. Where culvert upgrades are installed, there will be short durations of increased sediment yields while in-stream work is accomplished.

Effects of Harvest Treatments: To consider the worst-case scenario, the analysis assumes that all proposed harvest treatments would occur during non-winter conditions when the disturbance potential would be the greatest. If some harvest units were logged during the winter months the effects from compaction and soil displacement could be reduced (Krag 1991, p. 64; PF Doc. SOIL-29). Proposed management activities would increase detrimental soil disturbances (specifically related to soil compaction and displacement), especially where roads and log landings are proposed. There would be no increase in detrimental impacts from the proposed brush field burn units on National Forest System or BLM-managed lands. For all of the proposed harvest treatments, 19 units have an average predicted detrimental effect of 2.3 percent, with the highest being 4.8 percent in unit 31. This higher percentage is primarily the result of past bulldozer mining exploratory roads within the unit (Table SOIL-3).

The highest harvest equipment-related disturbance would occur on 3 BLM units (95 acres) that are proposed for tractor yarding and associated slash reduction (Units BLM1, BLM2, and BLM3). Slash reduction on the 3 units specifies tracked equipment for grapple piling and slash busting. Tractor yarding alone can result in soil disturbances over 11 percent when skid trails are designated at 100-foot intervals. With additional use of

ground based equipment for slash reduction, the soil disturbance could exceed 15 percent. To keep the disturbance level below 15 percent, the equipment should work on a slash mat as it moves across the harvested units.

There would be minor disturbances as a result of skyline and helicopter yarding in proposed harvest units. Forest monitoring indicates these activities result in minor detrimental effects (USDA 1991; PF Doc. SOIL-40).

The effects from proposed helicopter log-landing sites have been calculated into the overall effects related to the proposed harvest treatments. Helicopter landings average one acre in size; disturbance to these sites from compaction, displacement and pile burning are considered irreversible effects. All of the proposed helicopter landings would become dedicated lands for future use at the end of project's activities. They are classified as a capital improvement in the same manner as a National Forest system road and not considered as part of the Resource Area's cumulative disturbance level.

The logging slash would remain within all harvest units and be allowed to over winter one or two seasons before underburning. This would allow the foliage and branches to leach into the soil's organic layer to recycle nutrient capital, especially potassium and nitrogen.

The commercial thinning of Douglas-fir and grand fir in association with leaving western larch would allow the release of stored foliar potassium from the Douglas-fir as a beneficial nutrient for up take by the western larch (Garrison and Moore 1998; PF Doc. SOIL-23). Western larch is a more potassium-efficient species and would be planted throughout the units where it is already is a primary stand component. Where western larch is not a primary stand component, white pine would also be planted.

Effects of Prescribed Burning and Slash Disposal: As part of the Proposed Action, all units on National Forest System lands would be underburned or hand piled after harvest activities are complete. The BLM units would have their slash managed through grapple piling or slash busting. Where grappled the piles are to be burned, which totals 60 acres. In units where slash busting occurs (85 acres) the chopped woody material will be left for nutrient capital and not burned. The burning especially in the fuel reduction only units would reduce the fuel loadings to a manageable level. Slash would remain in each unit instead of being whole-tree yarded to the landing. There would be some incidental piling of materials at landings as logs are processed for transport. In either case the residual tops, branches and foliage would be allowed to over winter, giving the leaching process enough time to recycle nutrients before the areas are burned. Before ignition can take place, the soil moisture is to be 25 percent or greater, which would reduce the potential for soil resource damage. There could be detrimental effects to the soil as a result of severe burning if, after curing, the logging slash should ignite with soil moistures below 25 percent and before the proposed fuel treatments are implemented.

Effects of Prescribed Burning in Brush Fields: The Proposed Action would re-introduce fire to dry-site ecosystems using prescribed underburns. No direct effects would occur from new road construction or logging activities. The only effect is from prescribed fuel treatments in the drier brushfields with scattered timber to reduce hazardous fuel loadings that have built up over the past 70+ years.

To retain potassium levels, all slash treated areas must be left to over winter, which allows the foliage, small branches and fine litter to leach out the foliar potassium (Baker et al., 1989, PF Doc. SOIL-45; Edmonds, 1987, PF Doc. SOIL-46; Garrison and Moore 1998; PF Doc. SOIL-23; Laskowski et al. 1995, PF Doc. SOIL-47; Palviainen et al., 2004, PF Doc. SOIL-49). Before the areas are burned, soil moisture must be greater than 25 percent. This would maintain the integrity of the soil surface organic layer and its capacity to infiltrate water, and also reduce the potential of severe burning to the soil resources (Niehoff 1985; PF Doc. SOIL-33). If these management concerns are addressed, there would be little to no effect on the soil resource concerning the proposed fuel treatments.

Cumulative Effects of Ongoing and Reasonably Foreseeable Activities

Effects of Trail Construction: Trail #35 (on Bureau of Land Management and private lands along the West Fork Placer Creek) has been in existence since the early 1900's. As a result of the proposed work, minor sediment yields of short duration could occur when the bridges are set and some soil disturbance is anticipated with tread work. Grass seed would be applied where soil disturbances occur to abate any sediment yield concerns.

The majority of ongoing and reasonably foreseeable activities (EA, Appendix B) applicable to the soil analysis are fire suppression and native seeding. Helicopter landings and existing roads are dedicated lands for specific uses. Pre-suppression activities have identified the need to establish six new helispots. If possible, natural openings would be used, with some improvements. Natural openings will be used with minor clearing of brush to allow safe approaches and departures. Successful fire suppression activities would eliminate the change of a severe wildfire that could impact soil productivity. When suppression activities are needed, light hand line work causes minor effects to the soil and in some cases forms a seedbed opportunity. The use of large ground-based machinery for firebreak construction would increase the cumulative soil effects within the Resource Area; however, steps are taken during post-fire rehabilitation work to avoid or ameliorate detrimental soil effects.

Noxious weed treatment and timber stand improvement would not be a concern to the soil resource, since large equipment or fire use is not required.

5. Consistency with Forest Policy and Legal Mandates

Both alternatives would comply with Forest Plan standards (PF Doc. CR-002, pages II-32 and II-33) and Regional Soil Quality Standards (FSH 2509.18 and R-1 Supplement 2500-99-1) related to detrimentally disturbed soils.

Forest Plan Soil Standard #1

Soil disturbing management practices will strive to maintain at least 80 percent of the activity area in a condition of acceptable productivity potential for trees and other managed vegetation. Unacceptable productivity potential exists when soil has been detrimentally compacted, displaced, puddled, or severely burned as determined in the project analysis.

Both alternatives would comply with this standard; soil disturbing management practices would not exceed 15 percent detrimental conditions and would maintain at least 85 percent of each activity area in a condition of acceptable productivity potential for trees and other managed vegetation.

Forest Plan Soil Standard #2

Projects should strive to maintain sufficient large woody debris to maintain site productivity. Large woody debris is essential for maintenance of sufficient micro-organism populations.

Both alternatives would comply with this standard; large woody debris would follow the research guidelines of Graham et al. (1994; PF Doc. SOIL-25) to ensure the maintenance of site productivity.

Forest Plan Soil Standard #3

In the event of whole tree logging, provision for maintenance of sufficient nutrient capital should be made in the project analysis.

The No-Action Alternative does not propose any logging; therefore this standard would not apply. IFTNC guidelines would ensure the retention of the maximum amount of potassium on sites after treatments under the Proposed Action.

Table SOIL-3. Soil Disturbance as a Result of Activities on National Forest System Lands.

Proposed Harvest Units	Acres	Existing Condition		Proposed Actions								
		Ac. Disturbed Soil	% of Area	Disturbed Soil Ac.	New Road Const./Ac.	% Activity Area	Cumulative Effects		Yarding	Slash	Geology	Harvest
							Acre	Percent				
1	19	0.45	2.3	0.38	0	2	0.83	4.4	Sky	Underburn	Wallace	Initial
1a	22	1.35	6.1	1.76	0	8	3.11	14.1	Forw	Underburn	Wallace	Initial
2	53	1.07	2	1.06	0	2	2.13	4	Sky	Underburn	Wallace	Initial
2a	41	1.4	3.4	3.28	0	8	4.68	11.4	Forw	Underburn	Wallace	Initial
3	10	0.36	3.6	2	0	2	0.56	5.6	Sky	Underburn	Wallace	Initial
3a	16	0	0	0.16	0	1	0.16	1	Heli	Underburn	Wallace	Initial
4	10	0.76	7.6	0.2	0	2	0.96	9.6	Sky	Underburn	Wallace	Initial
5	12	1.7	14	0.96	0	8	2.7	22	Trac	Underburn	Wallace	Initial
6	40	0	0	0.4	0	1	0.4	1	Heli	Underburn	Wallace	Initial
8	23	0.58	2.5	0.46	1.2	7.2	2.24	9.7	Sky	Underburn	Wallace	Initial
8a	10	0.72	7.2	0.8	0	8	1.52	15.2	Trac	Underburn	Wallace	Initial
8b	9	0.49	5.4	0.72	0.49	13.4	1.7	19	Trac	Underburn	Wallace	Initial
9	6	0.45	7.5	0.48	0	8	0.93	15.5	Trac	Underburn	Wallace	Initial
10	7	0	0	0.14	0	2	0.14	2	Sky	Underburn	Wallace	Initial
10a	5	0.5	10	0.4	0	8	0.9	18	Trac	Underburn	Wallace	Initial
11	17	0	0	0.34	1.3	9.6	1.64	9.6	Sky	Underburn	Wallace	Initial
12	7	0.54	7.7	0.14	0	2	0.68	9.7	Heli	Underburn	Wallace	Initial
12a	7	0.54	7.7	0.56	0	8	1.1	15.7	Trac	Underburn	Wallace	Initial
13	37	0	0	0.74	0	2	0.74	2	Sky	Underburn	Wallace	Initial
14	8	0.6	7.5	0.08	0	1	0.68	8.5	Heli	Underburn	Wallace	Initial
15	18	0	0	0.36	0	2	0.36	2	Sky	Underburn	Wallace	Initial
16	22	0.4	1.8	0.22	0	1	0.62	2.8	Heli	Underburn	Wallace	Initial
17	15	0.3	2	0.3	0	2	0.6	4	Sky	Underburn	Wallace	Second
21	28	0.4	2	0.56	0	2	0.96	3.4	Sky	Underburn	Wallace	Second
21a	4	0	0	0.4	0	1	0.4	1	Heli	Underburn	Wallace	Initial
22	7	0.14	2	0.14	0	2	0.28	4	Sky	Underburn	Wallace	Second
23	16	0.32	2	0.32	0	2	0.64	4	Sky	Underburn	Wallace	Second
24	10	0	0	0.2	0	2	0.2	2	Sky	Underburn	Wallace	Initial
25	11	0	0	0.88	0	0.08	0.88	8	Forw	Underburn	Wallace	Initial
26	13	0.23	0.02	0.26	0	0.02	0.49	3.8	Sky	Underburn	Wallace	Second
27	23	1.19	0.051	0.46	0	0.02	1.65	7.1	Sky	Underburn	Wallace	Second
28	53	0.58	0.011	4.2	0	0.08	4.78	9.1	Forw	Underburn	Wallace	Second
29	25	0.42	0.016	2	0	0.08	2.42	9.7	Forw	Underburn	Wallace	Second
30	7	0.1	0.02	0.07	0	0.01	0.17	2.4	Heli	Underburn	Wallace	Second
31	13	0.45	0.035	0.26	0	0.02	0.71	5.4	Sky	Underburn	Wallace	Initial
Fuel Break Road 456	89	1.3	0.014	1.8	0	0.02	3.1	3.5	Cable	Hand Pile	Wal/Int	Initial
4 Helicopter landings = 4 Dedicated Acres				Area harvested = 713 acres					Past disturbance = 17.3 acres			
Proposed road construction area = 3 acres				Area treated with fire = 671 acres					Proposed disturbance = 27.5 acres			
				Amount of fire line = 80,740 feet					Average disturbance per unit = 1.24%			

Table SOIL-4. Soil Disturbance as a Result of Activities on Lands Managed by the Bureau of Land Management.

Proposed Harvest Units	Acres	Existing Condition		Proposed Actions								
		Ac. Disturbed Soil	% of Area	Disturbed Soil Ac.	New Road Const./Ac.	% Activity Area	Cumulative Effects		Yarding	Slash	Geology	Harvest
							Acre	Percent				
1 BLM	18	0	0	2.3	0.9	0.13	2.3	12.7	Trac	Grap/Burn	Wallace	Initial
2 BLM	25	0	0	3.25	3.15	0.13	3.25	13	Trac	Slash bust	Wallace	Initial
3 BLM	52	0	0	6.8	0.9	0.13	6.8	13	Trac	Slash bust	Wallace	Initial
4 BLM	7	0	0	0.42	0	0.06	0.42	6	Heli	Grap/Burn	Wallace	Initial
5 BLM	30	0	0	1.8	0	0.06	1.8	6	Heli	Grap/Burn	Wallace	Initial
6 BLM	10	0	0	0.35	0	0.35	0.35	3.5	Heli	Grap/Burn/UB	Wallace	Initial
7 BLM	8	0	0	0.42	0	0.52	0.42	5.2	Sky	Slash bust	Wallace	Initial
Fuel Break Road 456	6	0	0	0.12	0	0.02	0.12	2	Cable	Hand Pile	Wallace	Initial
1 Helicopter landing = 1 Dedicated Acre				Area harvested = 156 acres					Past disturbance = 0 acres			
Proposed road construction area = 4.95 acres				Area treated with fire = 71 acres					Proposed disturbance = 15.4 acres			
Proposed road construction on NFS = 1.4 acres				Amount of fire line = 80,740 feet					Average disturbance per unit = 1.9%			

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Specialist's Report on Wildlife in the Placer Resource Area

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SPECIALIST'S REPORT ON WILDLIFE IN THE PLACER RESOURCE AREA

1. Regulatory Framework for Wildlife

Although a variety of sources are used to assess wildlife species and habitat (including historic records, current databases, large scale assessments, scientific studies and management recommendations), the regulatory framework providing direction for the protection and management of wildlife and habitat comes from the following principle sources:

- *Endangered species Act of 1973 (as amended)*: Section 7 of the Endangered species Act (ESA) directs that actions authorized, funded, or carried out by federal agencies do not jeopardize the continued existence of any threatened or endangered species, or result in the adverse modification of habitat critical to these species.
- *National Forest Management Act of 1976:* The National Forest Management Act (NFMA) provides for balanced consideration of all resources. It requires the Forest Service to plan for a diversity of plant and animal communities. Under its regulations the Forest Service is to manage for viable populations of existing and desired species, and to maintain and improve habitat of management indicator species.
- *Forest Plan:* The IPNF Forest Plan (1987), in compliance with NFMA, establishes Forest-wide management direction, goals, objectives, standards and guidelines for the management and protection of wildlife habitat and species, including old-growth habitat, management indicator species, sensitive species, and threatened and endangered species. Sensitive species are designated by each Region of the Forest Service as according to the occurrence of the species and its habitat within Regional boundaries. Region 1 sensitive species are evaluated in this document.
- *Migratory Bird Executive Order:* The Migratory Bird Executive Order (2001) describes the responsibilities of federal agencies to protect migratory bird species through a Memorandum of Understanding (MOU) with the Fish and Wildlife Service. The order directs federal agencies to consider these species in agency plans, and to evaluate the effects of proposed actions on migratory bird populations and their habitat, with emphasis on species of concern (PF Doc. WL-R67).

2. Methodology Used in the Wildlife Analysis

2.A. Introduction

USDA Forest Service policy (Forest Service Manual 2670.32) requires a documented review of Forest Service programs or activities in sufficient detail to determine how an action may affect threatened, endangered, candidate, or sensitive species. This environmental assessment serves as the primary **biological evaluation (BE)** for sensitive wildlife species. Effects to wildlife species listed under the Endangered Species Act are addressed separately in a **biological assessment (BA).** Much of the wildlife analysis is tiered to the following documents and information, which provide the primary direction and methods used to develop the analysis for potential effects on wildlife**:**

- *Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin*
- *Toward an Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin*
- *The Road Analysis Process and the District Travel Plan*
- *Recorded species observations*
- *Suitable and potential habitat models*
- *Applicable scientific research, literature, management recommendations and conservation strategies*

The wildlife analysis is done at different levels (ranging from coarse filter to fine filter) as appropriate to address issues and concerns relative to each species. According to CEQ regulations, the level of analysis should be commensurate with the importance of the impact, the risk associated with the project, the species involved, and the current level of knowledge (CEQ 1502.15). Species for which it has been determined there would be no measurable effects are not analyzed in detail.

Direct, indirect, and cumulative effects are disclosed by alternative and by species. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action but occur later in time, yet are still reasonably foreseeable to occur (40 CEQ 1508.8). CEQ regulations (40 CFR 1608.7) define cumulative effects as impacts that result from the incremental impact of an action when added to other past, present and reasonably foreseeable actions, regardless of what agency or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Refer to the EA (Appendix B) for a list of ongoing and reasonably foreseeable projects.

For each wildlife species analyzed, the cumulative effects analysis area has been identified based on the species' or guilds' relative home range size in relation to available habitat, topographic features that affect how species move and utilize their home range (such as watershed boundaries), and boundaries that represent the furthest extent of effects. Maps depicting wildlife habitat by species are provided in the project files (PF Docs. WL-3, WL-10, WL-11, WL-18, WL-26, WL-31 through WL-34, and WL-36).

Based on habitat relationships, appropriate indicators of habitat with a potential to be impacted by the proposed action have been measured. Queries of the Timber Stand Management Records System database (TSMRS) were used to identify capable and suitable habitat within each wildlife analysis area (PF Doc. WL-11). Changes in habitat for each relevant species are disclosed with a discussion of the effects on species. Queries have been designed to best utilize the information stored within the TSMRS database (PF Doc. WL-12). Field surveys by the wildlife biologist were conducted to verify the habitat queried in the TSMRS database (PF Doc. WL-29, WL-59).

2.B. HSI Habitat Model Validation

The IPNF has developed Forest-wide wildlife habitat capability/suitability models for several Threatened, Sensitive, and Management Indicator wildlife species or species guilds (Canada lynx, fisher/marten, Northern goshawk, black-backed woodpecker, pileated woodpecker, and elk). Information used for suitable habitat included: habitat type, size class, past activities, forest type, elevation, basal area, and number of trees above a specific size class (PF Doc. WL-64). Information used varies with each species based on the species particular needs. Vegetation data was validated to insure the stand characteristics queried were accurate (PF Doc. VEG-4).

In addition, Forest Service personnel conducted site visits of representative suitable and capable habitats for these species, with emphasis placed on stands modeled as "currently suitable." However, the Placer Resource Area lacked suitable habitat for all species except lynx. The only suitable lynx habitat is a patch of denning habitat and since the Lynx Analysis Unit (LAU) lacks denning habitat, no activities were proposed within this area. A small number of proposed treatment areas were not visited if they were determined to be obviously either capable or unsuitable for modeled species based upon field notes and unit descriptions provide by the project team silviculturalist or verification by aerial photo interpretation.

Capable habitat is determined by habitat type and topographic factors. Since these do not change over time, the data offers reliable information on habitat capability. Data used in wildlife habitat suitability models was validated for each species, as follows:

Canada Lynx: Suitable lynx habitat was determined using the Forest-wide Habitat Suitability Index (HIS) model (PF Doc. WL-17, WL-18). Suitable lynx denning habitat was identified within the Placer Resource Area. Low quality forage habitat was located both on National Forest System and BLM-managed land. Low quality forage habitat is used primarily for travel habitat. No high quality forage habitat was identified in the Placer Resource Area. Field validation of these habitats was done by the wildlife biologist (PF Doc. WL-29,

WL-59). Field reviews found low quality forage habitat that, due to fires in the early 1900s, lacked trees and downed wood of sufficient size to provide lynx denning habitat. The area also lacked stands between 25 and 40 years old that could provide habitat for the snowshoe hare; therefore there was little forage available for the lynx.

Northern Goshawk: Northern goshawk nesting habitat was initially determined using the Forest-wide HSI model (PF Doc. WL-10). No suitable or capable habitat was identified for the Northern goshawk. Much of the validation for the lack of goshawk habitat was done using aerial photography and forester's reconnaissance notes. Fires around the turn of the century have resulted in a lack of large trees (goshawk habitat) in the Placer Resource Area. To further validate the lack of habitat, calling surveys were done along Placer Creek and Experimental Draw; no responses by goshawks were detected (PF Doc. WL-9).

Fisher/Marten: Within the Placer Resource Area, low to moderate quality marten habitat was identified through queries. This low quality habitat is provided by moist forest habitat types with an average diameter tree size of nine inches (PF Doc. WL-46). There is no high quality marten habitat within the Resource Area. No suitable habitat for the fisher (old/mature forest) was queried (PF Doc. WL-10). This is consistent with the history of large fires that burned in the early 1900s within the Resource Area that resulted in the mid-aged forest found today. Within the Placer Resource Area, capable fisher habitat was identified through the HSI Model. These capable habitats are stands with moist habitat types that currently do not have large enough trees to provide suitable habitat for the fisher (PF Doc. WL-25, WL-19). Moist habitats within Placer Resource Area lacked size classes of mature high-risk sawtimber, mature low-risk sawtimber, and sawtimber. In addition, the capable stands lacked trees in the "greater than 20-inch diameter" size class. Based on their current age, many of the capable stands would provide suitable fisher habitat in approximately 50 years. Validation of the lack of suitable habitat was done using field reviews and discussion between the project GIS specialist, silviculturalist, and assistant forest biologist (PF Doc. WL-19).

Pileated Woodpecker: Pileated woodpecker habitat was assessed based on stands with an average live tree diameter of "equal or greater than 14-inch diameter" in Douglas-fir, larch or ponderosa pine (PF Doc. WL-28). Based on this information and knowledge about the stands, a prediction can be made that adequate snags would be found within these stands (PF Doc. WL-63). Information used also includes forest type, age classes, current and projected canopy closure, number of snags across the Placer Resource Area (PF Doc. WL-34, WL-28), and presence of recruitment snags where diseases, bark beetles or structural damage to trees is known to occur (PF Doc. WL-38). The delineation of this habitat was field verified by the wildlife biologist (PF Doc. WL-29).

Black-backed Woodpecker: Black-backed woodpecker habitat was located by delineating stands with ponderosa pine, larch, lodgepole pine, spruce or white pine with an average diameter larger than 5 inches. In addition, stands with damage or past burns were mapped (PF Doc. WL-22). Aerial insect and disease detection maps were also used to locate forage habitat for the black-backed woodpecker (PF Doc. WL-38). Vegetation data was validated (PF Doc. VEG-4).

Elk: The elk model relies on security acres, road density, cover/forage ratio, and distance to cover. Components of the model were verified using information provided by the transportation specialist regarding road densities and condition (PF Doc. WL-43, WL-41). Security was calculated using GIS data (PF Doc. WL-8). This model does not rely on TSMRS data. The project wildlife biologist verified road and security status.

2.C. Wildlife Conservation Assessments and Strategies

Conservation assessments and strategies are written to assist federal agencies in managing habitat for Threatened and Endangered species and other species of concern. They are most often joint efforts between participating agencies to increase awareness and knowledge of the species by describing life history strategies and habitat requirements. Conservation strategies usually present management recommendations and guidelines to assist in maintaining suitable habitat. This information, in conjunction with scientific literature,

is used to assist in planning and in developing project design features that minimize or avoid effects to wildlife and wildlife habitat.

The *Pacific Bald Eagle Recovery Plan*, the *Northern Rocky Mountain Wolf Recovery Plan*, the *Recovery Plan for Woodland Caribou in the Selkirk Mountains* and the *Grizzly Bear Recovery Plan* provide requirements for habitat management for these species. The Placer Resource Area is not within a recovery area for the Threatened grizzly bear or the Endangered woodland caribou. In February of 2000, a *Lynx Conservation Assessment and Strategy* was released in an effort initiated by the Fish and Wildlife Service and in cooperation with the Forest Service and Bureau of Land Management. The purpose of the Strategy is to provide a consistent and effective approach to avoid or reduce adverse effects resulting from management activities to the species or its habitat. The assessment is based partly on the delineation of Lynx Analysis Units (LAUs) where habitat is managed to provide for lynx denning and foraging habitat.

2.D. Viability

The Northern Region, USDA Forest Service has developed a conservation assessment of the northern goshawk, black-backed woodpecker, flammulated owl and pileated woodpecker in the Northern Region (Samson, 2005; PF Doc. WL-67). The assessment is intended to satisfy the statutory requirement to provide for diversity of native animal communities based on suitability and capability of the specific land area to meet overall multiple-use objectives as required by the National Forest Management Act (16 U.S.C. 1604 (g)(3)(B)).

For each species, the conservation assessment includes:

1. *A brief overview of ecology, behavior and habitat use*
2. *A brief overview of habitat use in the Northern Region*
3. *Estimates of well distributed habitat and habitat amount by National Forest*
4. *Evaluation of short-term viability*
5. *Evaluation of long-term viability and ecosystem sustainability*

The conservation assessment was based on a principle-based approach to population viability (PVA). The methods and background for this principle-based approach use point observation data and vegetation inventory based on Forest Inventory and Analysis (FIA) to build wildlife habitat relationship models to analyze short-term viability. The conservation assessment included consideration of peer-reviewed literature, non-peer reviewed publications, research reports, and data accumulated by the Forest Service. Where possible, the peer-reviewed professional socity literature is emphasized in that it is the accepted standard in science (Samson, 2005; p. 4).

In summary, the conservation assessment shows that short-term viability (less than 100 years) is not an issue in Region 1 for the goshawk, black-backed woodpecker, flammulated owl or pileated woodpecker. Because of habitats trending away from historic range, long-term viability (more than 100 years) is low. An explanation of the reasons viability would be maintained in the Northern Region for the next 100 years is provided in the following table.

Table WL-0. Reasons why viability would be maintained in the Northern Region for the next 100 years, by species (from Samson, 2005; PF Doc. WL-67, at pages noted)

Species	Reasons Viability is Maintained
Northern goshawk *(Samson, 2005; pages 38-39)*	• No scientific evidence exists that the northern goshawk is decreasing in numbers. • Increases in the extent and connectivity of forested habitat have occurred since European settlement. • Well-distributed and abundant northern goshawk habitat exists on today's landscape. • Level of timber harvest is insignificant (in 2004, harvest occurred on 0.0009 percent of the forested landscape in the Northern Region). • The barred owl represents a significant threat to the northern goshawk. • Suppression of natural ecological processes has increased and continues to increase amounts of northern goshawk habitat.
Black-backed woodpecker *(Samson, 2005; pages 51-52)*	• No scientific evidence exists that the black-backed woodpecker is decreasing in numbers. • Increases in the extent and connectivity of forested habitat have occurred since European settlement. • Amounts of small and mid-size trees have increased since European settlement. • Well-distributed and abundant black-backed woodpecker habitat exists on today's landscape. • Level of salvage timber harvest or overall timber harvest of forested landscapes in the Northern Region is insignificant.
Flammulated Owl *(Samson, 2005; pages 62-63)*	• No scientific evidence exists that the flammulated owl is decreasing in numbers. • Increases in the extent and connectivity of forested habitat have occurred since European settlement. • Well-distributed and abundant flammulated owl habitat exists on today's landscape. • Level of timber harvest in the Northern Region is insignificant. • The barred owl represents a significant threat to the flammulated owl.
Pileated Woodpecker *(Samson, 2005; pages 68-69)*	• No scientific evidence exists that the pileated woodpecker is decreasing in numbers. • Increases in the extent and connectivity of forested habitat have occurred since European settlement. • Well-distributed and abundant pileated woodpecker habitat exists on today's landscape. • Level of timber harvest in the Northern Region is insignificant.

For more detailed information on methodology, peer-reviewed background literature, and statistical analysis in the conservation assessment refer to Wildlife PF Doc. Vol. 4-02.

2.E. Geographic Scope of the Wildlife Analysis

The geographic scope of analysis varies by species according to the appropriate methodology and level of analysis needed to determine potential effects. A number of variables define the level of analysis for each species including, but not limited to, species occurrence, presence of suitable or potential habitat, existing condition, the potential for impacts and the difference in effects between alternatives. Generally, the geographic scope is the Placer Resource Area; however, due to species and habitat distribution, home range size, linkages between suitable habitats or between winter and summer range, distances of dispersal, the potential for immigration and emigration into a population, and other variables, the analysis may include an area as large as northern Idaho or an area smaller than the Placer Resource Area.

Approximately one-third of the Placer Resource Area consists of private lands or lands managed by the BLM. Detailed information is available only for National Forest System and BLM-administered lands within the geographic areas considered in this analysis. Where information on land outside of Forest Service jurisdiction would assist in the analysis of effects, a combination of visual evaluation, aerial photo interpretation and extrapolation from available data was used to estimate habitat components associated with those lands. Due to the lack of detailed information and the unpredictability of future management on the adjacent non-Forest lands, effects from activities on these lands are difficult to quantify. Potential effects resulting from activities on these lands are therefore measured in more general terms than activities on public lands.

2.F. Wildlife Species Relevancy Screen

Wildlife species listed under the Endangered Species Act, Sensitive Species, Management Indicator Species, and Species of Special Concern known to occur on the IPNFs and lands managed by the BLM were screened for their relevancy to the Coeur d'Alene River Basin and to the Placer Resource Area by reviewing sighting records, planning documents, habitat suitability models and other sources such as historic records and scientific literature. Relevancy is determined based on whether there is evidence of species or habitat present within the affected area, and whether any such species or habitat could potentially be affected by the proposed activities. Some habitat and species may occur within the Coeur d'Alene River Basin yet not be applicable to the Placer Resource Area or surrounding areas. A coarse filter screen was applied at the Coeur d'Alene River Basin scale, and then a finer screen was used to assess species relevancy at the watershed scale.

The analysis is commensurate with the importance of the impact (40 CEQ 1502.15), the risk associated with the project, the species affected, and the level of knowledge already on hand (USDA Forest Service, 1992; PF Doc. WL-R65). Some wildlife species or their habitat are present in the analysis area, but would not be measurably affected because they would not be impacted by the proposed activities, the impacts would not be sufficient to influence their use or occurrence, or their needs can be adequately addressed through design of the project. No further discussion or analysis is necessary for those species and/or suitable habitat that are not found within the resource area or for those which would not measurably be affected (see Table WL-1). These species and the rationale for dismissing them from further consideration are described in the Project Files (PF Doc. WL-48).

Wildlife Species Considered

The US Fish & Wildlife Service provided an updated list of **Threatened, Endangered & Candidate Species** that may occur in the IPNFs on March 4, 2005 (No. 1-9-05-SP-0154; PF Doc. WL-R105). These species, their listing status and the probability that they occur in the Resource Area are displayed in Table WL-1.

Sensitive species are designated by each Region of the Forest Service based upon regional variations in species and habitat occurrence; the probability of each R1 Sensitive species occurring in the Placer Resource Area is indicated in Table WL-1. The analysis for Sensitive species serves as the primary biological evaluation for this project. A biological checklist with a summary of rationale and effects determinations is included in the wildlife project files (PF Doc. WL-49). In addition, the BLM manages their lands to protect federally listed, proposed and candidate species. Their management also addresses Rangewide/Globally Impaired Species, Regional/State Imperiled Species, Peripheral Species in Idaho, and Watch List Species in Idaho. These species have been addressed in a coarse filter screen for presence or absence of habitat within the Placer Resource Area and the Coeur d'Alene Ranger District in Wildlife Appendix A. Species that have a low to high likelihood of appearance within the resource area are addressed in analysis of species with similar needs. Other species' needs are addressed by Federal standards (addressed in Part 4 of this report).

The Forest Plan (Appendix L-4; PF Doc. WL-R53) identified elk and moose as **Big-game Management Indicator Species** because they are a general forest species easily affected by management activities, particularly access management. Moose frequently use the bottomlands associated with the South Fork Coeur d'Alene River, but since elk are the primary big-game species using the area, this analysis focuses on elk. The effect of management activities on elk is one of the main issues the Forest Plan (IPNF, 1987; PF Doc. CR-02) identified through public involvement. Elk are a priority big-game species for Idaho Fish and Game, and elk hunting is a significant economic factor in Northern Idaho.

The Forest Plan designated three **Old-growth Management Indicator Species** for the monitoring and management of old growth or late successional conditions: pine marten, pileated woodpecker, and northern goshawk (Table WL-1). The status of these species indicates the ability of forest structure to support wildlife populations that inhabit older forests and use large diameter trees, snags and down wood for nesting and/or foraging. Old growth is discussed in more detail in the Specialist's Report on Forest Vegetation (PF Doc. SR-02). The discussion of old growth habitats in this chapter tiers to that information. Goshawks have been placed on the list of sensitive species for Region 1 and are addressed under the sensitive species discussion.

Nongame species are those not managed by Idaho Fish & Game as a hunted species. They include many species of furbearers as well as raptors, amphibians, rodents and songbirds. Nongame species are often important prey for other furbearers and large predators like wolves, lynx and bears. Changes in vegetation composition and structure are used to assess effects to non-game species. Two basic types of habitat in the Placer Resource Area have changed dramatically over the last 100 years: riparian areas characterized by their abundance of water and old forests dominated by long-lived seral conifers such as western red cedar, white pine and western larch (PF Doc. SR-02). The effect of human activities on these two habitats has been analyzed and the changes to populations of nongame species dependent upon these forests are discussed.

Neotropical (migrant) birds are those that breed and nest in one area and migrate to another, usually a long distance away, to reside for the winter months. These birds are impacted in a variety of ways including loss of habitat due to agriculture, logging, and urbanization. The Upper Columbia Basin Draft Environmental Impact Statement (USDA et al., 1994; PF Doc. WL-R55) states that breeding bird surveys on National Forests found an increase of ten species of neotropical birds and a decrease of five species. Often the increases in populations are of less desirable species such as the brown-headed cowbird (Collopy and Smith 1995 in Upper Columbia River Basin Draft Environmental Impact Statement; PF Doc. WL-R10). Changes in habitat are discussed in a qualitative manner. It must be noted that there are many species of neotropical migrant birds for which there is very little population or habitat data available, and changes that may benefit one species may, at the same time, have undesirable effects on other species.

Probability of Wildlife Occurrence

The probability of a specific species occurring in the Resource Area is based on records of species sightings, presence of suitable habitat and the potential of the area under consideration to provide suitable habitat in the future.

Recorded observations come from several sources, including IPNF records, State Conservation Data Center information, Audubon Society, and other organizations that collect recorded observations or conduct surveys for wildlife species in the area. For species considered in this analysis, modeling methods for suitable and potential habitat, field verification, current knowledge of species distribution, scientific studies and applicable management recommendations are discussed in detail. Refer to the Wildlife Appendix A and PF Doc. WL-48 for specific justification of species not addressed further.

No probability of occurrence
No suitable habitat occurs in the area, and/or the area is outside the known range of the species, and there are no recorded observations in the area.

Low probability of occurrence
Marginally suitable habitat is limited, isolated, and there are no recorded observations of the species in the area.

Moderate probability of occurrence
Suitable habitat exists in the area and it is within the known range of the species, but there are no confirmed observations.

High probability of occurrence
Suitable habitat is present in the area and there have been confirmed observations of the species.

Table WL-1. Summary of Wildlife Presence and Level of Analysis.

Species Common Name	Species Scientific Name	Species or Habitat Present on District?	Probability of Occurrence in Resource Area?	Species or Habitat Potentially Affected?	Species Further Analyzed? (section)
Threatened & Endangered					
Gray Wolf (E)	*Canis Lupis*	Yes	High	Yes	Yes – 3.B.
Suitable habitat *defines wildlife habitat that has a combination of features meeting the habitat requirements of a given species at the present time.* ***Potential capable habitat*** *does not currently provide suitable habitat, but because of certain characteristics has the potential to provide suitable habitat in the future as stand conditions change. For example, changing stand conditions may include seral stage, cover type, stand density, tree size, stand age, and stand condition.*					
Bald eagle (T)	*Haliateetus leucocephalus*	Yes	Low	No	No
Canada Lynx (T)	*Lynx Canadensis*	Yes	Moderate	Yes	Yes – 3.C.
Grizzly Bear (T)	*Ursus Horribilis*	Yes	Low	No	No
Woodland Caribou	*Rangifer tarandus*	No	None	No	No
Sensitive					
Flammulated owl	*Otus flammeolus*	Yes	Low	No	No
Black-backed woodpecker	*Picoides arcticus*	Yes	Moderate	Yes	Yes – 3.D.
Fisher	*Martes pennanti*	Yes	High	Yes	Yes – 3.E.
Wolverine	*Gulo gulo*	Yes	High	Yes	Yes – 3.F.
Coeur d'Alene salamander	*Plethodon idahoensis*	Yes	Moderate	Yes	Yes – 3.G.
Townsend's big-eared bat	*Plecotus townsendii*	Yes	Low	Yes	Yes – 3.H.
Fringed Myotis	*Myotis thysanodes*	Yes	Low	Yes	Yes – 3.H.
Boreal toad	*Bufo boreas*	Yes	Low	No	No
Peregrine falcon	*Falco peregrinus anatum*	Yes	None	No	No
Common loon	*Gavia immer*	Yes	None	No	No
Harlequin duck	*Histrionicus histrionicus*	Yes	Low to none	No	No
Northern bog lemming	*Synaptomys borealis*	No	None	No	No
Black swift	*Cypeloides niger*	Yes	None	No	No
Pygmy nuthatch	*Sitta pygmaea*	Yes	Low	No	No
Old Growth Management Indicator Species					
Pileated woodpecker	*Dryocopus pileatus*	Yes	High	Yes	Yes – 3.I.
Pine marten	*Martes Americana*	Yes	High	Yes	Yes – 3.J.
Northern goshawk	*Accipiter gentiles*	Yes	Moderate	Yes	Yes – 3.K.
Big Game Management Indicator Species					
Rocky Mountain elk	*Cervus elaphus*	Yes	High	Yes	Yes – 3.L.
Moose	*Alces alces*	Yes	Moderate	No	No
Other Species & Habitats					
Nongame	*N/A*	Yes	High	Yes	Yes – 3.M.
Migrant birds	*N/A*	Yes	High	Yes	Yes – 3.M.

Suitable and Potential Wildlife Habitat

Of primary consideration in the wildlife analysis is the current and potential capability of the structure, composition, arrangement and patch size of the vegetation to provide the habitat components necessary to meet the life history requirements of a particular species.

Quantitative modeling to assess current habitat and potential effects are not always applicable due to a lack of available knowledge about many species and their habitat requirements, and limited amount of information regarding some key habitat components such as size and amount of down wood. Models are used when appropriate based on available information and applicability. When feasible, suitable and potential habitat is modeled using databases describing forest vegetation (such as TSMRS) and Geographic Information (mapping) Systems (GIS) delineating variables such as slope, aspect, soils, road density and riparian habitats. This data is supported by species observation records, field verification, and field surveys for specific species and habitats.

Acres displayed should be considered approximate due to the manner in which different habitat components are grouped and the detail of information available. Differences may occur in the values due to the scale at which the analysis is conducted, the level at which effects become apparent, and the consequences of the

action on different resource values. Detailed descriptions of the specific analysis method or modeling process used for each species can be found under the section of this report pertaining to that particular species, and in the associated project files cited in that section.

2.G. Features Designed to Protect Wildlife Habitat

The proposed action was designed to be implemented in a manner that would protect resources in the Placer Resource Area. The following guidelines would be met during implementation:

- *Snags would be retained to meet the Northern Region (Region 1) Snag Management Protocol (PF Doc. VEG-20 and VEG-21). White pine guidelines would be applied (PF Doc. VEG-22).*
- *Long-lived seral conifer species (western white pine and western larch) of all sizes (with emphasis on those 18 inches or greater in diameter) would be favored to remain on site unless removal is unavoidable due to safety reasons or special circumstances.*
- *All closed roads that are opened, constructed, or reconstructed during this project would be closed with a gate or barrier during project activities, and then effectively closed (as good as or better than existing closure) after activities are complete (not to exceed three years). If project activities were not complete within three years, a partial replacement of the closure structure (obliteration or other structures) would occur. The analysis of effects to wildlife under the Proposed Action is based upon meeting these guidelines.*
- *Prescribed burning would be implemented in a manner that would avoid disturbance of roosting bats (PF Doc. WL-58). This could be achieved by preventing fire within 400 meters of the entrance to a cave or mine when bats are present, unless a site-specific assessment indicates a more appropriate distance to avoid effects of heat and smoke on bats. Areas upslope of cave or mine openings would be protected to prevent erosion and disturbance.*
- *Incidental trees charred during prescribed burning operations would be retained on site for black-backed woodpecker habitat.*
- *If any Threatened or Endangered wildlife species are observed in the resource area during implementation, the District wildlife biologist would determine any project modifications necessary to protect the species and its habitat based on applicable laws, regulations and management recommendations for the species. If any Threatened or Endangered species is found to be nesting in an area scheduled for prescribed burning or silvicultural treatment, activities would be delayed in the area as recommended by the wildlife biologist.*

3. Affected Environment & Effects to Wildlife

3.A. Overview of Terrestrial Wildlife Habitat in the Placer Resource Area

Old and Mature Forests

Many wildlife species occurring on the IPNF prefer or occur only in mature and old forests. Stands with old and mature structure provide habitat for species that rely on large trees, snags, down logs and maximum structural diversity for nesting, foraging or raising young. Existing structurally immature stands could provide mature stands and old growth habitat over time if not disturbed, or if managed to maintain the large, old, dead and decaying structural components of the forest within the levels needed to provide suitable habitat. The IPNF requires maintenance of approximately ten percent across the Forest in old growth to provide for viable populations of old-growth dependent species (Forest Plan, p. II-5; PF Doc. WL-41, WL-R53).

This analysis reflects changes in habitat conditions (such as stand structure) resulting from past, present and reasonably foreseeable actions.

Except where specifically stated, it is assumed that private lands do not provide habitat, in order to provide the most conservative ("worst case") assessment on these lands, since the Forest Service has not authority or information base concerning private lands.

For more information on old growth, please refer to the Specialist's Report on Forest Vegetation (PF Doc. SR-02). The Placer Resource Area is within Old Growth Management Unit (OGMU) 119. Due to stand-replacing fires in the 1910s, the Placer Resource Area does not provide old and mature forest structure. However, there are 677 acres of allocated old growth elsewhere in OGMU 119, outside of the Placer Resource Area (PF Doc. SR-02).

Dry Forest Habitats

Some wildlife species prefer open, dry forests with large trees, including flammulated owls, white-headed wood-peckers, Lewis' woodpeckers, pygmy nuthatches, and western bluebirds, just to name a few. Forests that have lost much of their larger structural component and developed a dense understory of shade-tolerant conifers are often no longer suitable for these species. Dry forest habitats have evolved with frequent low or mixed intensity ground fires every 20 to 50 years, which leave large seral trees and decrease fuels in the understory (refer to the Specialist's Report on Fire/Fuels, PF Doc. SR-01). To protect human developments and future timber resources, fire suppression is ongoing in the Coeur d'Alene River Basin and has been practiced for an extended period of time. This practice allows the establishment of smaller shade-tolerant tree species under the canopy, changing the structure of dry site habitat from a relatively open-grown forest with a large diameter overstory into dense multi-canopy stands with many immature trees. Remaining stands are at higher risk for departure from normal non-lethal, mixed intensity fires to high intensity, stand-replacing fires and from high levels of insects and disease.

Dry forest habitats are found in limited amounts on the Coeur d'Alene River Ranger District and within the Placer Resource Area. Currently most of the dry site habitats are in brush fields. Since the Placer Resource area lacks dry site forested stands, there is no further analysis on these habitats and their effects on dry-forest dependent species.

Snag and Down Woody Habitat

The amount of snags and down woody material present has been identified as a measure of forest integrity (Quigley et al. 1996; PF Doc. WL-R44). Dead trees, both standing and on the ground are critical habitat components for nearly all wildlife species as they depend on snags to differing degrees for nesting, forage and cover. Sensitive and management indicator species which nest in snags include pileated woodpeckers, black-backed woodpeckers, white-headed woodpeckers, flammulated owls and boreal owls. Some of these species cannot excavate cavities and depend on the other species to create cavities for nesting, denning or shelter. Retaining habitat for cavity excavators is vital to other wildlife dependent on snags.

Within the Placer Resource Area, large-diameter standing and dead trees are less abundant now than they were historically, and the wildlife species associated with these habitat components are probably less abundant as well. Large fires after the turn of the last century consumed large live and dead trees. Today, the area is in young age classes that lack large diameter snags. Large diameter snags provide habitat for the greatest variety of wildlife and remain standing longer than smaller snags. Ponderosa pine and western larch tend to last longer than other snags. Even after falling to the ground, large diameter snags provide critical habitat. Down wood is essential in providing den sites, cover and foraging substrate for a variety of species including lynx, fishers, pine martens and other small mammals. Many birds that nest in snags promote forest health by controlling forest insect populations.

Figure WL-1. Tree cavities provide habitat for a number of wildlife species.

Selective harvest for seral species and salvage logging has occurred both historically and in the recent past, particularly on private lands, within the Coeur d'Alene River Basin. Fire suppression and road construction has been ongoing. Large stand-replacing fires occurred between 1910 and 1930, resulting in the current middle-aged stands. These types of activities have resulted in changes to snag habitat across the Coeur d'Alene River Ranger District and in the Placer Resource Area:

- *Old stands have shifted to mature or middle-aged resulting in a loss of large diameter, durable snags.*
- *Direct removal of large diameter snags and green trees has lead to decreased snag availability and loss of seed sources.*
- *Longer fire intervals have resulted in large diameter snag loss rather than frequent non-lethal, mixed severity fires important to snag recruitment. Longer fire intervals have resulted in an increase in non-seral species that are more prone to insects and disease and are less likely to live long enough to provide large snags.*
- *Patch size has decreased.*

Recognizing changes in snag habitat has lead to management plans designed to provide an amount of snags and down wood shown to support viable populations of species that use these habitat components.

Several studies have suggested the number of snags that should be made available or retained for snag-dependent species. This assessment uses the Region 1 Snag Protocol (USDA 2000; PF Doc. WL-R44) and Upper Columbia River Basin snag guidelines in Bull et al. 1997 (PF Doc. WL-R52, WL-41). In summarizing 10 years of monitoring information, the 1998 IPNF Forest Plan Monitoring Report (PF Doc. WL-R51) found that on monitored plots, snag retention guidelines were met. In some areas of Region 1, monitoring has shown that snag retention may not be fully met following the many stages of project implementation (PF Doc. WL-R51). Several factors can impact snags during a project including inadequate marking of leave trees, inadequate contractual control, activities involved with felling and yarding, fuels treatment and woodcutting following logging.

Fragmentation and Road Density

One of the main habitat components considered in this analysis is road density. Road density affects the degree to which a species is vulnerable to disturbance and the degree to which the habitat has the potential for providing species needs. Openings associated with roads may act as a barrier to some species. For other species, roads affect movement patterns and the ability for dispersal. Often roads are in preferred wildlife habitat such as riparian areas, ridge tops and flat benches, resulting in displacement or decreased habitat suitability. Roads increase habitat fragmentation and add to edge effects. The access provided by roads can cause direct and indirect mortality to wildlife. Direct mortality may result from vehicle collisions, incidental trapping and random shooting. Indirect mortality is caused primarily by the level of disturbance and by alteration of habitat.

The primary causes of fragmentation on forestlands are roads and regeneration harvests (which were once typically 40-acre blocks). Roads and urban development have caused fragmentation on private lands.

The current level of open road density in the Placer Resource Area is one mile of road per square mile of land (please refer to PF Doc. WL-43 and PF Doc. TRAN-1 for more on road densities). A road density less than one mile per square mile is considered a high security area, providing habitat for wide-ranging carnivore species (PF Doc. WL-R95).

All closed roads that are constructed, reconstructed, or reconditioned for this project would be closed during and following project activities. Reconstruction would re-open roads that have been brushed in, had earth-barriers installed, had the front-end of the road obliterated (PF Doc. WL-43). These roads would be gated during project activities, and then returned to their former state of closure (for example, replacing barriers or decommissioning the road) after all project activities are complete. Short-term disturbance would be

moderate to high depending on how effective the gates are. Over the long term, wildlife security would be improved with the installation of barriers that discourage unauthorized use of roads. Following project activities, there would be no increase in open road density in the Placer Resource Area, but constructed and reconstructed roads would provide increased access even with barriers in place. Continued implementation of the District Travel Plan under either alternative will identify roads closed to motorized use and improve enforcement of existing closures. For more information on fragmentation and road density refer to the management indicator species discussion.

3.B. Gray Wolf (Endangered Species – Experimental Population)

Life History of Gray Wolves

Historically, wolves roamed widely throughout North America. In 1915, the United States Government began sponsoring control programs providing for the extirpation of the species to reduce perceived threats to humans and to reduce livestock and big game depredations. The program was very successful in its objective, and by the late 1930s wolves were virtually eliminated from the western United States. Although government control programs ceased in the early 1960s, it was over 50 years before wolf reproduction was again confirmed in the western U.S. in 1986.

The northern Rocky Mountain wolf (a subspecies of the gray wolf) was listed as endangered in 1973. However, based on enforcement problems and a trend to recognize fewer subspecies of wolves, the entire species was listed as endangered throughout the lower 48 states, except Minnesota, in 1978 (USDI 1987). In 1994, the Fish and Wildlife Service published final rules in the Federal register (Volume 59, Number 224) making a distinction between wolves that occur north of Interstate 90 and wolves that occur south of Interstate 90, in Idaho. Gray wolves occurring north of Interstate 90 are listed as endangered species and receive full protection in accordance with provisions of the Endangered Species Act. Gray wolves occurring south of Interstate 90 are listed as a nonessential experimental population, with special regulations defining their protection and management.

Reference Condition for Gray Wolves

Conservation requirements for wolf populations are not fully understood, but the availability of prey and limiting the risk of human-caused mortality are considered key components (USDI 1987; Northern Rocky Mountain Wolf Plan; Tucker et al 1990). The risk of human-caused mortality can be directly related to the density and distribution of open roads. Security for the wolf, primarily achieved through access management, is important primarily to meet the needs of its prey and as it relates to direct human-caused mortality. However, wolf packs have recently been found occupying areas in Montana with road densities greater than two miles of road per square mile of land. Reducing human-caused mortality is an important factor in maintaining wolf populations. Reducing access becomes an issue only when human-caused wolf mortality cannot be reduced. The primary method of reducing human-caused wolf mortality is through public education (Koch and Fontaine, 1993 per. com.).

Management Recommendations for Gray Wolves

Wolves are highly social animals requiring large areas to roam and feed. Key elements in gray wolf habitat include a year-round prey base, secluded areas for raising pups, and isolation from frequent human disturbance (Hansen, 1986). Studies suggest that there is a strong relationship between key big game summer ranges and calving and fawning areas, and reliable reports of wolves (US Fish and Wildlife Service, 1987).

Affected Environment for Gray Wolves

Wolves are known to occur in the Placer Resource Area as transient visitors. A pack has been documented on the St. Joe Ranger District, south of the Placer Resource Area. Although a transient individual could use the area, there is no known pack activity within the Placer Resource Area.

Figure WL-2. Gray wolf near the Placer Resource Area in 2003 (photo courtesy of Idaho Fish & Game).

Environmental Consequences to Gray Wolves

Since the Placer Resource Area is south of Interstate 90, the gray wolf is part of the experimental population and does not fall under the Endangered Species Act. Under the No-Action Alternative vigor of brush fields could be reduced over the long term, resulting in a reduction of prey for wolves.

Under the Proposed Action Alternative, elk habitat effectiveness potential for the EHU would return to existing levels after activities are complete (refer to section 3.L. in wildlife report). Therefore, activities under this project **would not jeopardize gray wolves or gray wolf populations**. Viability of the species would be maintained, since the goal to have 30 breeding pairs well distributed throughout three states for three successive years has been met (2001 Wolf Recovery Report; PF Doc. WL-30).

3.C. Canada Lynx (Threatened Species)

Life History of Canada Lynx

Canada lynx (Figure WL-3) are most likely a transient visitor to the Placer Resource Area. Resident populations currently exist only in Maine, Montana, Washington, and possibly Minnesota. They are considered still existing but no longer sustaining self-supported populations in Wisconsin, Michigan, Oregon, Idaho, Wyoming, Utah, and Colorado; they may no longer exist in New Hampshire, Vermont, New York, Pennsylvania, and Massachusetts (Ruediger, et al. 2000 WL-R80).

Snowshoe hares are the primary prey of the lynx, comprising 35 to 97 percent of the diet. Other prey species include red squirrel, grouse, flying squirrel, and ground squirrels.

Southern populations of lynx may prey on a wider diversity of species than northern populations because of lower average hare densities and differences in small mammal communities.

Lynx occur in mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare (McKelvey et. al 2000, PF Doc. WL-R82; Ruggiero et. al. 2000, PF Doc. WL-R81). Primary vegetation that contributes to the lynx habitat is lodgepole pine, subalpine fir, and Engelmann spruce (Aubry et al. 2000; PF Doc. WL-R83). In extreme northern Idaho, northeastern Washington, and northwestern Montana, cedar-hemlock habitat types may also be considered primary vegetation. In central Idaho, Douglas-fir on moist sites at higher elevations may also be considered primary vegetation. Secondary vegetation that, when interspersed within subalpine forests, may also contribute to lynx habitat include cool, moist Douglas-fir, grand fir, western larch and aspen forests.

Reference Condition for Canada Lynx

Historical records of lynx are relatively numerous in the Idaho Panhandle (Davis 1939, PF Doc. WL-R85) as this species appears to have always had a scattered distribution in the U.S. In 1946 lynx were fairly well distributed in wooded areas of the northern counties with 25 to 30 being taken annually by trappers and hunters (Rust 1946, PF Doc. WL-R84).

The Placer Resource Area provides habitat for lynx and lies within an LAU, and lynx are probably an infrequent visitor to the area. The St. Joe Divide provides a movement corridor for the lynx. It is possible that transient lynx may move through the area.

Although lynx are relatively common throughout forested areas of Alaska and Canada, past trapping in the lower forty-eight states of the U.S., and recent lynx hunting in Canada has eliminated or reduced numbers in localized areas. The conservation of lynx populations is a concern particularly in the western mountains of the contiguous United States, at the southern periphery of the species' range.

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

Lynx are considered low-density species with home ranges averaging 24 square miles, depending on prey abundance. They occur primarily in moist habitat in Northern Idaho above 3,000 to 4,000 feet in elevation**.** Even though lower elevations can be important in some instances, evidence suggests lynx tend to use these areas less because of competition with other predators and overheating in the summer.

Lynx (*Lynx Canadensis)* are associated with the cold winters and deep snows of northern latitudes occurring primarily above 4,000 feet in Washington, Idaho, and Montana, above 6,500 feet in Wyoming, and above 8,000 feet in Colorado and Utah. Lynx habitat includes subalpine fir, spruce, and lodgepole pine forests above 4,000 feet in Idaho. The home range of females is from 15 to 30 miles. At least 80 percent of their diet consists of snowshoe hares, which require deciduous browse and dense lodgepole pine and/or subalpine fir canopies. Lynx also need mature forests for denning and cover. Lynx avoid large openings (greater than 330 feet from cover) and very large openings may disrupt movement between isolated populations (Koehler and Aubry, 1994; PF Doc. WL-R86).

They prefer to hunt in sapling stands adjacent to old growth. Low numbers and a dispersed population make lynx vulnerable to over exploitation and habitat disruption ((Koehler and Aubry, 1994; PF Doc. WL-R86).

Management Recommendations for Canada Lynx

In accordance with the Canada Lynx Conservation Assessment and Strategy, federal actions are analyzed relative to their potential for affecting lynx or lynx habitat according to the following recommendations, which are based on the most current information available. The analysis is based on LAUs, which approximate the home range of the species. LAUs were delineated on the Coeur d'Alene River Ranger

District by the Fish and Wildlife Service and the Forest Service according to protocol established in the Conservation Strategy. Topography, elevation and vegetation were the main characteristics used to identify LAUs on the District and across the IPNFs. The extent to which these recommendations are implemented assists in the evaluation of effects on lynx habitat and facilitates Section 7 conferencing and counter-part regulations with the U.S. Fish and Wildlife Service (PF Doc. WL-67):

- *Within each Lynx Analysis Unit (LAU), no more than 30% of lynx habitat can be unsuitable at any time. Management activities will not change more than 15% of lynx habitat into unsuitable condition within a 10-year period.*
- *Within a LAU, maintain denning habitat on at least 10% of the area that is capable of producing stands with these characteristics. Denning habitat should be well distributed and in patches larger than 5 acres.*
- *Allow no net increase of regularly used or groomed over-the-snow routes and play routes. Open road densities should be managed to not exceed 2 miles per square mile within the LAU.*
- *Maintain vegetative structure that facilitates movement of lynx along important connectivity corridors (e.g. riparian areas, saddles, ridges).*

Affected Environment for Canada Lynx

Although most sightings of lynx in the IPNFs have occurred on the northern Ranger Districts (Priest Lake, Bonners Ferry, and Sandpoint), lynx observations have been reported on the St. Joe District south of Interstate 90 and within the Coeur d'Alene River Ranger District. There have been no recorded observations of lynx in the Placer Resource Area. The nearest sighting occurred east of Mullan on the Lookout Pass (PF Doc. WL-16). This observation was made in 1998 and is considered very reliable. Other sightings in Kootenai County were at Honeysuckle Campground, Meyers Saddle and Stewart/Callis Creek. All other lynx records have occurred near the Bitterroot Divide.

Available lynx habitat was delineated within the St. Joe Divide West LAU (PF Doc. WL-18). This LAU is 23,334 acres in size (PF Doc. WL-51). Because stand-replacing fires in the early 1900s resulted in stands that are now aged 80-90 years, the St. Joe Divide West LAU provides, almost exclusively, low quality lynx forage. Low quality forage habitat functions primarily as travel habitat for the lynx (PF Doc. WL-R87). These stands have little potential snowshoe hare use and generally support only very low densities of hares (PF Doc. WL-19). The low quality forage habitat delineated was field verified by a district biologist (PF Doc. WL-20). There is a small amount (250 acres) of lynx denning habitat between Line Gulch and Moon Pass (PF Doc. WL-18). This is the only currently available denning habitat within the St. Joe Divide West LAU. There is no lynx forage habitat within the Placer Resource Area.

Table WL-2 Lynx Habitat Classification.

Lynx habitat classification	Placer Resource Area (acres)	St. Joe Divide LAU (acres)
Habitat change in the last decade	0	0
Pre-forage	0	0
Forage	0	0
Late forage	0	0
Denning	250	250
Low quality forage	5667	16,823

Environmental Consequences for Canada Lynx

No Action Alternative: The Placer Resource Area would continue to provide low quality forage habitat for lynx for the next 50 years. Snowshoe hare populations and prey for the lynx would remain low. In 50 to 100 years, some of the low quality forage stands would provide large diameter downed wood and would provide denning habitat for the lynx. As some of these stands begin to fall apart, understory regeneration could provide habitat for snowshoe hares. No change in movement corridors for the lynx would occur. Groomed snowmobile routes would remain at current levels. No habitat would be converted to unsuitable habitat. Potential stand replacing fires could result in large patches of high quality forage habitat 25 to 35 years after fires. Until then, these patches would be classified as "pre-forage." This forage component is currently lacking in the LAU.

Proposed Action: This alternative would maintain all habitat identified as current lynx denning habitat. In addition, 647 acres have been identified as future denning habitat based on their productivity and crown size. No harvest activities are proposed in these stands. It is anticipated that these acres would have trees that increase in diameter and mortality over time. In approximately 50 years, the stands would meet the structural requirements of denning habitat for the lynx.

There would be 237 acres commercial thinning treatments in areas that currently provide low quality forage habitat for lynx, primarily to reduce competition around individual larch trees. These thinned acres would continue to provide low quality forage for approximately 25 to 50 years. During this time remaining trees in these areas would increase in diameter, shifting the stands from low quality lynx forage habitat to lynx denning habitat.

There would be 229 acres shelterwood treatments in areas that currently provide low quality forage habitat for lynx. These regeneration cuts result in openings in the forest that are unsuitable for use by lynx for approximately 25 to 30 years. At 25 to 30 years age, the stands would have snowshoe hare habitat above the snowline and provide forage habitat for lynx for approximately 25 years. At the current time there is no lynx high quality forage habitat within the St. Joe Divide West LAU.

There would be 397 acres of low quality forage habitat treated with fire to reduce fuels. Prescribed burning activities would improve forage habitat for the snowshoe hare and subsequently for lynx. These activities would not change the low quality forage designation because shrubs would remain buried under snow for most of the winter.

Table WL-3. Changes to Lynx Habitat within the Placer Resource Area and St. Joe Divide West Lynx Analysis Unit.

Lynx Habitat Classification	Denning Habitat	Acres of High Quality Forage	Acres of Low Quality Forage (capable) Habitat	Percent change in habitat in the last decade
Existing in the Placer Resource Area	250 acres denning habitat	0	4,213	0
Existing in the St. Joe Divide West LAU	250 acres denning habitat	113	21,285	0
Predicted in the Placer Resource Area under the Proposed Action	250 acres denning habitat + 647 acres managed as future denning habitat	0	3.984	1
Predicted in the St Joe Divide West LAU under the Proposed Action	250 acres denning habitat + 647 acres managed as future denning habitat	113	21,056	0*

** The threshold is no more than 15% of lynx habitat changed into an unsuitable condition within an LAU during a 10-year period.*

Cumulative Effects to Canada Lynx: Activities on private lands would have little effect upon the lynx or its habitat because these lands lie at low elevations within the drainage. Noxious weed treatments by the county along Placer creek would have no effect to the lynx because no habitat would be altered by the treatments. The Pulaski Tunnel trail currently is in existence and bisects low quality habitat for the lynx. Trail improvements are not expected to affect the lynx because use is already occurring and the habitat quality is low.

Proposed commercial thinning would provide a larger diameter larch tree over the long term, which would ultimately improve lynx denning habitat. Openings created by shelterwood harvest would improve lynx forage habitat in 25-30 years.

Under either alternative, habitat would continue to be low in quality for lynx within the Placer Resource Area and the St. Joe Divide West LAU. The area would continue to function primarily as travel habitat for lynx. Over time, as trees within forested stands increase in size, the Placer Resource Area would trend towards an increase in denning habitat. There would be a slight increase in forage habitat in approximately 30 years where openings are created within the Placer Resource Area. Since there have been no sightings of lynx within the St. Joe Divide West LAU; habitat quality is currently low for the lynx; fuels and harvest activities would result in displacement of lynx during activities; and because low quality forage harvested would not provide travel habitat or forage habitat for lynx for 30 years, ***the Proposed Action may affect but would not adversely affect the lynx or its survival.*** There would be no effect to the lynx with the implementation of the No-Action Alternative.

3.D. Black-backed Woodpecker (Sensitive Species)

Life History of Black-backed Woodpeckers

Black-backed woodpeckers forage for insects in the bark of live trees such as lodgepole pine and larch. Live lodgepole pine provides an important food source in mountain pine bark beetle larve (Dixon et al., 2000; PF Doc. WL-R16). Some studies indicate that they also prefer to forage on burned snags (Dixon et. al. 2000; PF Doc. WL-R16), and may be concentrated in areas that have recently burned. Post-fire habitat is thought to have the greatest value as source habitat for black-backed woodpeckers (O'Connor et al. 2001; PF Doc. WL-R41). They forage in various levels of the canopy, from ground level to 60 feet high or more (Jewett, et al. 1953; PF Doc. WL-R28).

Figure WL-4. Black-backed woodpecker. (Photo from the National Image Library, //images.fws.gov).

Reference Conditions for Black-backed Woodpeckers

Black-backed woodpeckers are found within coniferous forests of North America including the Cascade Range, northern portions of the Sierra Nevada and the Rocky Mountains (Washington Department of Wildlife 1991; PF Doc. WL-R62). Black-backed woodpeckers have been found in scattered locations throughout Washington, with the heaviest concentrations east of the Cascade crest. Their distribution in Idaho is largely unknown. The species has been sighted during their breeding season on the Coeur d'Alene River Ranger District (PF Doc. WL-6). Annual breeding season surveys for black-backed woodpecker in the Coeur d'Alene Mountains have also confirmed their presence in the basin (PF Doc. WL-45).

There is little information about historic sightings or populations of black-backed woodpeckers. It is likely that their habitat has declined over the past century because of their preference for post-fire habitats and ongoing fire suppression for that time period. Fire exclusion has potentially reduced the amount of young

stands that originated from wildfire. Lodgepole pine may have had greater distribution and occurred in larger patches across the forest prior to fire suppression as this conifer species relies on fire to open cones and allow seeds to regenerate. Although the role of white pine in providing black-backed woodpecker habitat is largely unknown, this species may have used white-pine snags when it existed in large blocks across the basin.

Studies in Region 1 suggest that from 1940 to 1987, black-backed woodpecker habitat was below the historical range of variation in the region. From 1989 to the present, black-backed woodpecker habitat is thought to be well above the historic range on a regional scale as a result of the frequent high intensity fires that have occurred since that time (USDA 2003; PF Doc. WL-R58). A Conservation Assessment of black-backed woodpecker found habitat to be well-distributed and abundant across the Forest Service's Northern Region (Region 1) and concluded that viability for the species will be maintained for the next 100 years (Samson, 2005, p. 51-52; PF Doc. WL-67).

Management Recommendations for Black-backed Woodpeckers

Specific management recommendations for this species support re-introduction of fire into the ecosystem, particularly in larch (Dixon et al., 2000; PF Doc. WL-R16). Adhering to the Region 1 snag management protocol (USDA 2000; PF Doc. WL-R54), and to the snag guidelines developed in association with the Upper Columbia River Basin (UCRB EIS as described in Bull et. al. 1997, UCRB EIS, Appendix K; PF Doc. WL-30) would maintain snag availability for black-backed woodpeckers under either of the alternatives.

Affected Environment for Black-backed Woodpeckers

The species could inhabit the Placer Resource Area. Larch and lodgepole pine, which are preferred for breeding habitat, are found in the Resource Area. Root disease has resulted in insect infestations that provide foraging opportunities for the black-backed woodpecker in the resource area (Draft Assessment – BBWP, R1-11-5-2003; PF Doc. WL-R58). In addition, pine bark beetles provide an insect source for black-backed woodpeckers. Aerial surveys occurring in 2005 on the Idaho Panhandle National Forests found increasing pine bark beetle activity in the Placer Resource Area (PF Doc. WL-38).

Larch is scattered across the resource area and lodgepole is found primarily at the head of West Fork Placer Creek and Placer Ridge. Little information is available on the benefits of white pine to wildlife, but such stands may have historically provided habitat for black-backed woodpeckers in the resource area. Large-diameter snags within the Placer Resource Area are in very short supply due to stand-replacing fires in the early 1900s. Database queries show limited potential habitat for the black-backed woodpecker, identifying 224 acres of black-backed woodpecker nesting habitat within the resource area, all at the upper end of the main Placer Creek.

Database queries did not identify any forage habitat for black-backed woodpeckers and there have been no forest burns within the Placer Resource Area since 1997 (PF Doc. WL-21). However, the queries underestimate black-backed woodpecker forage habitat because the current model does not include pine beetle outbreaks that contribute to foraging opportunities. Insect outbreaks mapped during aerial detection surveys found additional forage habitat for black-backed woodpeckers scattered across the resource area and concentrated at the upper end of the East and West Forks of Placer Creek (PF Doc. WL-38). These surveys indicate increasing insect-killed lodgepole pine (which provides black-backed woodpecker forage) throughout the resource area (PF Doc. WL-38). Outside the project area in the upper end of the North Fork St. Joe River, there are extensive stands of lodgepole pine beetle-infected trees, which also provide forage for black-backed woodpeckers (PF Doc. WL-38).

Environmental Consequences to Black-backed Woodpeckers

The potential effects to black-backed woodpeckers and other snag-dependent species were determined by estimating the change in distribution, quantity and quality of snag habitat as a result of implementing proposed activities. Nesting and foraging habitat were modeled using stand data and fire occurrence based on tree species, damage, and size (PF Doc. WL-20, WL-21, WL-22). These components were validated for the data base (PF Doc. VEG-4). Under the Proposed Action, commercial thinning harvest

treatments would reduce the value of nesting habitat for black-backed woodpecker in the short term due to reduction in tree densities (PF Doc. WL-37).

Table WL-4. Acres of black-backed woodpecker nesting habitat remaining under each alternative.

Type of habitat	Acres Existing	Acres under the Proposed Action
Forage	0	0
Burns	0	0
Nesting	224	166

Direct and Indirect Effects to Black-backed Woodpeckers: Since this area provides less than optimal black-backed woodpecker habitat, there would be limited effects upon black-backed woodpecker habitat under either of the alternatives.

No short-term effects or changes would result from the implementation of the No-Action Alternative, because no activities are proposed. Over the long term, natural mortality due to insects would result in snag recruitment. Some mature stands would move towards old growth, while others may deteriorate before they meet old growth criteria. Potential stand-replacing fires would increase forage habitat for approximately five years, after that time insects would no longer use the burned snags and forage value would be greatly reduced.

Under the Proposed Action, treatments that promote larch over the long term would eventually benefit the black-backed woodpecker. The Proposed Action would result in a 58-acre reduction in black-backed woodpecker nesting habitat due to commercial thin harvests near Moon Pass at the upper end of Placer Creek. Prescribed burning treatments would enhance forage in the resource area for the black-backed woodpecker over the short term. Post-fire habitat is a short-lived resource for foraging black-backed woodpeckers. An abundance of woodborers in burned trees would begin to decline after three years, with substantial declines after five to six years (O'Connor et al., 2001; PF Doc. WL-R41).

Cumulative Effects to Black-backed Woodpeckers: Past harvest and historic stand-replacing fires have reduced the number of large snags across the Coeur d'Alene River Basin. The Placer Resource Area reflects this loss of snags in the landscape. Although habitat is reduced in the short-term, as the trees age these forested stands would provide a larger diameter component with more insect and disease, providing habitat for the black-backed woodpecker. Private lands within the Placer Resource Area may provide some habitat for black-backed woodpeckers, however these lands were not considered habitat for the black-backed woodpecker since the Forest Service and BLM have no authority over future management of private lands.

Over time, thinning in larch stands within the resource area would provide a larger diameter tree for black-backed woodpecker foraging. In untreated areas, forest pests and diseases would continue to provide foraging opportunities for black-backed woodpeckers.

In the event some trees are fire scorched during site preparation activities in the resource area under the Proposed Action, these trees would be retained for black-backed woodpecker foraging habitat.

Mountain pine beetle infestations would continue to provide foraging habitat for the black-backed woodpecker. Under the Proposed Action, where shelterwood harvests are implemented in lodgepole pine stands, mature trees would be retained that would provide some black-backed woodpecker habitat in the future. These retained trees would also provide a future snag component and provide another age class as the stand regenerates. Meanwhile, mountain pine beetle activity would increase forage habitat for the black-backed woodpecker (PF Doc. WL-38). Adhering to snag guidelines developed in association with the Upper Columbia River Basin (UCRB EIS as described in Bull et. al. 1997; PF Doc. WL-30), which would leave five to ten snags per acre in harvest units, would help to ensure viability of black-backed woodpeckers (UCRB EIS, Appendix K; PF Doc. WL-R52).

Although Northern Idaho is below the historic range for burned habitat on the landscape, large fires in Montana in 2002 and 2003 have created a source habitat for black-backed woodpeckers in the Northern Rockies Region; burned habitat is now above historic levels in Montana. A conservation assessment for the

black-backed woodpecker in the Northern Region found that viability will be maintained for the next 100 years (PF Doc. WL-67).

Therefore, the implementation of the Proposed Action Alternative **may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.** There would be no impact to the species under the No-Action Alternative.

3.E. Fisher (Sensitive Species)

Life History of Fishers

Fishers are associated primarily with northern coniferous forests (Powell 1982 in Arthur 1989; PF Doc. WL-R42). These species inhabit late successional coniferous forests preferring old growth or spruce-fir stands (Spencer 1981, PF Doc. WL-R50). Fishers den in hollow logs, under rocks, and in holes in trees. They are mostly arboreal and hunt in the trees. However, they also forage on the ground.

Figure WL-5. Fisher. (Photo source: www.fs.fed.us/r1/cohesive_strategy).

Today, the range of the fisher in the United States includes portions of the Appalachian Mountains from New England south to West Virginia, northern Wisconsin, Minnesota, Michigan, northern Idaho, western Montana, and as far south as northern California along the West Coast (Allen 1983 in: Washington Department of Wildlife 1990; PF Doc. WL-R1).

Reference Conditions for Fisher

The status of the fisher in the Western United States is poorly known but generally perceived as precarious and declining (Powell and Zielinski 1994 in USDA 1998, WL-R43) therefore, current populations may be extremely vulnerable to local and regional extirpation because of their lack of connectivity and their small numbers (USDA Forest Carnivore Conservation and Management in the Interior Columbia Basin 1998, page 14, WL-R64). Large fires between 1910 and 1934 were probably responsible for declines in fisher in Idaho (Jones 1991 in Idaho Fish and Game 1995; PF Doc. WL-R29). Fishers are also susceptible to over trapping and habitat loss. During the late 1800's and 1920's, fisher pelts were worth up to $300 and demand was high. Over-trapping, habitat losses from settlement and logging, and the widespread use of poisons as a predator control agent caused population reductions in many areas (Heinemeyer 1995 in: Idaho Fish and Game; PF Doc. WL-R70).

Management Recommendations for Fisher

Witmer et al (1998; PF Doc. WL-R64) describes the four major issues of concern to fisher conservation and management in the Columbia River basin in "Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Correlates":

- ***Conservation of late successional forest at low to mid elevations*** - Past decades of land management activities in the Coeur d'Alene basin have fragmented forest habitat, thereby reducing the contiguous area and creating barriers to movement. Fishers can probably tolerate small patch cuts or other small-scale disturbances, provided these occur in a larger matrix of relatively dense, closed canopy, late successional forest (Powell and Zielinski 1994, p. 64; PF Doc. WL-R43). The Habitat Conservation Assessment and Conservation Strategy for Forest Carnivores in Idaho" (Gibilisco et.al. Idaho Fish and Game. 1995. PF Doc. WL-R70) state that drainages with moderate quality fisher habitat should be managed for 40% late successional habitat in preferred or suitable habitat types for fisher.
- ***Maintenance of links between populations*** - Barriers to movement may include large non-forested openings and highways.
- ***Maintenance of riparian corridors*** – Waterways and riparian habitat provide travel corridors and often are found at the lower elevations fishers prefer within a given area.
- ***Trapping pressure and human disturbance*** - Fisher trapping in Idaho is closed. Road densities of less than 1 mile per square mile are a deterrent to incidental trapping of fisher.

Affected Environment for Fisher

Late Successional Forest: If 40 percent of a drainage is in late successional stage, the drainage provides moderate quality habitat for fishers (Idaho Fish and Game et. al. 1995, PF Doc. WL-R70; and USDA Forest Service, Douglas-fir Beetle Project Final EIS [Fisher Methodology]; PF Doc. WL-R57).

Historically in the Coeur d'Alene River Basin late successional stage forests (mature and old growth) were found across 23 to 55 percent of the landscape, with an average of 46 percent (Geographic Assessment, Appendix A: Report #2; PF Doc. WL-R71). The loss of late successional habitat in the Coeur d'Alene Mountains is probably the most important issue for the fisher in this area. Currently, across the Coeur d'Alene Basin about 21% of the forest is in late successional stage (mature and old growth) forest (Geographic Assessment, p. 39; PF Doc. WL-R71).

Linkages: In *Forest Carnivores in Idaho Habitat Conservation Assessments and Conservation Strategies* (1995, Figure 1, page 32; PF Doc. WL-R70), Idaho Fish and Game mapped the Coeur d'Alene Mountains as fisher habitat. The only linkage corridor mapped on Coeur d'Alene River Ranger District is the St. Joe Divide. The Placer Creek watershed has the St. Joe Divide as a boundary. The St. Joe Divide provides a ridge top corridor for large-ranging furbearers moving between Montana and Idaho. Interstate 90, just north of the Resource Area, is an obstacle to wildlife movement from north to south, and could result in isolated populations.

Riparian Habitat: The quality of riparian habitat in the Placer Resource Area has been reduced by road construction. The presence of Road 456 along Placer Creek has reduced the value of the riparian area for fisher. Remnant, large cedar snags in the Placer Creek riparian zone indicate large-diameter trees were present historically (Figure WL-18 in the nongame discussion). This large-diameter forest component would have provided optimal habitat for fishers, but was lost in the 1910 fire.

Trapping Risks: Trapping fishers has been illegal in Idaho since the 1930s, but fisher can be accidentally trapped in sets for other furbearers. This occurred as recently as 2003 on the St. Joe Ranger District of the IPNFs (Powell et al., 1994; PF Doc. WL-R97; Peterson, 2003, PF Doc. WL-R98; PF Doc. WL-55). The

proximity of the resource area to urban development may increase the potential for recreational trapping and incidental trapping risks.

Within the Placer Resource Area: The largest population of fisher in Idaho appears to occupy the area from north of the Salmon River to the Silver Valley (J. Jones, USDA Forest Service Eastside Assessment Team and May and Garton 1994, both in: Idaho Fish & Game, 1995; PF Doc. WL-R47 and WL-R70). Reports of fisher north of the Silver Valley are few (PF Doc. WL-R70). Fishers have been trapped in the past on the Coeur d'Alene River Ranger District, confirming their presence. A fisher was reported in the resource area along Placer Creek in April 2002 (PF Doc. WL-6). In addition, a fisher was photographed within the resource area during the winter of 2003 (PF Doc. WL-6). The proximity to a large roadless area and the travel corridor provided by the St. Joe Divide are probably the reasons fisher use the area, despite the lack of habitat within the Placer Resource Area.

The Placer Resource Area is sufficient in size to provide for a home range of a female fisher (PF Doc. WL-24), but probably too small to provide for the home range of a male fisher. There is some habitat for fisher outside of the analysis area (PF Doc. WL-10). A query for fisher habitat (late successional forest at low to mid-elevation) found no suitable habitat within the Placer Resource Area (PF Doc. WL-10). Field reviews by the District biologist, silviculturalist, and stand-exam crews verified query and TSMRS database information (PF Doc. WL-29). Field reviews confirmed the lack of late successional habitat (PF Doc. WL-29). However, based primarily on habitat types, queries found 3,634 acres of future/capable habitat (PF Doc. WL-23 and WL-25). Of this capable habitat, most would be suitable for fishers in 50 years or less. These stands are too young to qualify as suitable fisher habitat currently. The future habitat is well-dispersed across the resource area. Future habitat is found along the riparian corridors. In 50 years, these riparian stands would provide moderate quality habitat for fishers.

Environmental Consequences to Fisher

Direct and Indirect Effects to Fisher: The major issues of concern for fisher as described in the Columbia River Basin "Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Correlates" (Witmer et al 1998; PF Doc. WL-R64) are analyzed using TSMRS data, delineated corridors and security areas, and roads information. TSMRS data was also used to describe late successional habitats used by fishers in the Placer Resource Area.

Under either alternative, the Placer Resource Area would continue to lack late-successional forest (Table WL-5). Under the No-Action Alternative, most of the acres managed for future habitat would provide suitable habitat for the fisher in 50 years or less, as the habitat trends toward late-successional forest. As mortality of trees occurs within these stands, snags and downed wood would increase, improving habitat for fishers. Potential stand-replacing fires could set back the trend toward late successional forests (refer to the Specialist's Report on Fire/Fuels, sections 4.C. and 4.D., PF Doc. SR-01).

Table WL-5. Changes in fisher habitat in the Placer Resource Area.

Structural Stage	No Action	Proposed Action
Acres of Late Successional Forest	0	0
Percent of Resource Area that could provide habitat for the fisher in 50 years.	36	30

Under the Proposed Action, shelterwood or commercial thinning treatments would occur on approximately 607 acres of future fisher habitat, all of which would increase the time necessary for these stands to provide suitable fisher habitat from 50 to approximately 100 years (PF Doc. WL-39). Under the Proposed Action, forested habitat on 3,027 untreated acres of future habitat should provide suitable fisher habitat in less than 50 years.

Under either alternative, a large patch of roadless area on the St. Joe District would provide security and refugia, and would link habitat in the St. Joe drainage to the St. Joe Divide, Placer Resource Area, and forests of Montana (PF Doc. WL-26). In addition, large patches of unroaded habitat in the Upper Coeur d'Alene

River Basin would provide security for fishers and other large-ranging carnivores (Geographic Assessment, page 42; PF Doc. WL-R71). The large patches help facilitate movement of fisher between the Coeur d'Alene River Basin and Montana. However, the presence of Interstate 90 would continue to be a barrier to fishers and would impact dispersal of fishers from the Placer Resource Area to the Upper Coeur d'Alene Mountains. Providing security and movement corridors that link to "refugia" areas in western Montana are consistent with management recommendations by Idaho Fish and Game in the Habitat Conservation Assessment and Conservation Strategy for Forest Carnivores in Idaho (1995, pp. 45-47; PF Doc. WL-R70).

No **suitable** fisher habitat would be altered under either alternative; future fisher habitat would provide suitable habitat in approximately 50 years, primarily along Placer Creek and Experimental Draw. The potential fisher habitat modified under the Proposed Action would require a longer time period (approximately 100 years) before these stands meet the needs of fishers. Short-term displacement of prey for fisher would occur under the Proposed Action.

Table WL-6. Acres of Suitable and Future Fisher Habitat altered under the alternatives.

Habitat	No Action	Proposed Action
Suitable	0	0
Potential	0	607

Cumulative Effects to Fisher: Riparian corridors through private land within the resource area may provide movement corridors for fisher, but most of these areas likely do not provide high quality habitat due to the proximity to urban development and high degree of recreational use. Precommercial thinning would result in a short-term decrease in prey populations until canopies are once again closed (10 to 20 years). However, due to restrictions for the lynx, precommercial thinning may not occur within Lynx Habitat Units in the foreseeable future. Some private lands in the Placer Resource Area may provide habitat for fishers. However, since the Forest Service has no control over future management of private lands, they were not analyzed as fisher habitat. Noxious weed control by the county along Placer Creek Road 456 would have no impact on fishers.

The alternative management options presented in this document address the four issues of concern to fisher conservation and management as outlined in *Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Coordinates* (Witmer et al. 1998; PF Doc. WL-R64). The Forest Plan provides guidelines to ensure viability of old growth-dependent species (PF Doc. WL-30). Forest Plan monitoring reports (1998, pp. 31-33 and 38-40; PF Doc. WL-R51; 2004, pp. 66-74, PF Doc. CR-026) indicate that these conditions are being met.

Under either alternative, the current immature forest within the Placer Resource Area would continue to provide less than optimal fisher habitat for the next 50 years, until the stands become mature forest habitat. **There would be no impact to the fisher under the No-Action Alternative. The Proposed Action would impact individuals but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species**. Viability for the fisher would be maintained under the Proposed Action based on the following: movement corridors are available both inside and outside the analysis area, the fisher is not a legally trapped species in Idaho, R1 snag protocol (exceeding IPNF Forest Plan standards) would be implemented, and old growth would be maintained at 10 percent across the IPNF (Witmer et al 1998, PF Doc. WL-R64, WL-41; USDA 2000, PF Doc. WL-R54; and IPNF 1987, PF Doc. WL-30).

3.F. Wolverine (Sensitive Species)

Life History of Wolverines

Wolverines are rare inhabitants of montane forests. They are primarily nocturnal, but will also hunt during the day. Their primary food source is big game carrion, but they also eat small mammals such as marmots, gophers, and mice. Males seem to be territorial (Chapman et al. 1982; PF Doc. WL-R12). Wolverines are solitary animals that have large territories. A male's home range may be up to 790 square miles. Their habitat includes mature or younger forests with natural openings, riparian habitats, and high-elevation subalpine fir areas (USDA-Forest Service R1, 1989; PF Doc. WL-R56). Wolverines are particularly fond of marshy areas, and are most at home in regions with snow on the ground during winter. They are most successful in capturing big game in the winter where the snow is deep (Chapman et al 1982; PF Doc. WL-R12) and are often associated with wilderness (Krott 1960 PF Doc. WL-R34; Van Zyll de Jong 1975 PF Doc. WL-R60; Hornocker and Hash 1981 PF Doc. WL-R27; Whitman et. al. 1986; Banci 1994 PF Doc. WL-R3). Female wolverines in Idaho appear to use subalpine cirque basins for natal denning and kit rearing; home ranges in Idaho vary from 80 to over 700 square kilometers (Copeland 1995 in Idaho Fish and Game 1995, PF Doc. WL-R13).

Figure WL-6. Wolverine.
(Source: www.fs.fed.us/r1/cohesive_strategy.

Reference Condition for Wolverines

When Europeans first arrived in the United States, the wolverine's range extended from Maine to Washington, but by the early 1800's its range was greatly reduced. Although wolverines were widespread in presettlement times, they likely occurred at low densities (Banci 1994; PF Doc. WL-R3). Reports from the mid 1930s and 1940s suggest that the wolverines mostly occurred in the inaccessible mountains in the center of the state (Davis 1939; PF Doc. WL-R72). Records in the late 1940s came from the northern panhandle (Pengelley 1951; PF Doc. WL-R73). Nowak (1973; PF Doc. WL-R40) reported several animals taken from the central mountains, apparently reflecting a comeback.

Management Recommendations for Wolverines

In the *Habitat Conservation Assessment and Conservation Strategies for Forest Carnivores in Idaho*, Idaho Fish and Game states that habitat connectivity with Montana, Canada and northern Washington most likely provide subpopulations of wolverines interspersion throughout the northern region of Idaho (1995; PF Doc. WL-R13). The Habitat Conservation Assessment (HCA) also emphasizes the importance of dispersal corridors for linking subpopulations and the presence of relatively undisturbed "refugia" areas to protect wolverines from human activities (Copeland 1995; PF Doc. WL-R13).

Witmer et al (1998; PF Doc. WL-R64) in the USDA's *Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Correlates* describe three issues of concern to wolverine conservation and management in the Columbia Basin:

Issue 1: Maintenance of large, remote areas of habitat (including denning habitat).

Issue 2: Prey populations

Issue 3: Incidental trapping and predator control mortality

Affected Environment for Wolverines

Present distribution of the wolverine in the western United States includes Alaska, northern Washington, Wyoming, Oregon, northern California, northern Idaho, central Idaho, western Montana, and along the Idaho-Montana border to approximately Fremont County, Idaho (Nowak 1973, PF Doc. WL-R40; Groves 1987, PF Doc. WL-R19). In the western United States and interior Columbia basin, wolverines occur widely at very low densities, but only in northwestern Montana are wolverine populations considered to be healthy and thriving (Butts 1992 in Witmir et. al. 1998; PF Doc. WL-R9).

Figure WL-7. Travel habitat found within the Placer Resource Area.

The wolverine, with its large home range, would most likely use the Placer Resource Area periodically during its long distance movements. Because of the presence of big-game winter range within the resource area it is possible that wolverine would use the area for a carrion source during the winter months. The high recreational use in the basin reduces the value of this carrion source for the wolverine.

The Placer Resource Area provides potential wolverine denning habitat (PF Doc. WL-11), identified through aerial photo interpretation. However, much of this potential habitat has been lost to or is adjacent to snowmobile play areas (PF Doc. WL-11), which may result in loss of habitat to wolverine. Potential habitat for denning and travel for wolverines lies east along the St. Joe Divide (PF Doc. WL-11). Interstate 90 is a barrier to wolverines traveling north from the St. Joe Divide.

Maintaining denning habitat is probably the most important factor affecting wolverine in the Placer Resource Area. There is no designated wilderness within or adjacent to the Placer Resource Area. However, a portion of the Placer Resource Area lies within a portion of a large roadless area that could function as refugia for wolverines. "Refugia" is defined as large, remote areas of habitat (*Draft Habitat Conservation Assessment for Carnivores in Idaho*, Copeland, 1995, page 114; PF Doc. WL-R13). This roadless area totals 81,000 acres. Of this, 2,763 acres are within the Placer Resource Area. The majority of this roadless area lies on the St. Joe Ranger District, south of the St. Joe Divide.

Due to the proximity of the Placer Resource Area to the community of Wallace, there is trapping activity occurring in the area. Although trapping wolverine is illegal in Idaho, a slight potential of incidental trapping of wolverine exists because occasional trapping of other furbearers still occurs.

The Placer Resource Area provides some prey, travel, denning, and roadless habitat for wolverines (Figure WL-7). Wolverines are likely a sporadic traveler through the area, and may occasionally wander into the winter range in the drainage to utilize available carrion. There have been nine wolverine sightings in Shoshone County reported between 1960 and 1987 (PF Doc. WL-R89). A wolverine fatality occurred in 1988 in the Big Creek drainage, just west of the Placer Resource Area and south of I-90 (PF Doc. WL-34). A wolverine was sighted in the Placer Resource Area in 1981 (PF Doc. WL-6). The Big Burn area of the Lolo National Forest and the Cabinet Mountains on the Kootenai National Forest provide additional refugia for wolverine that may occasionally use the portion of the Coeur d'Alene River Ranger District south of I-90.

Environmental Effects to Wolverines

Direct and Indirect Effects to Wolverines: Elevation and other habitat elements were delineated using GIS. Issues of concern for wolverine are evaluated according to Witmer et al (1998; PF Doc. WL-R64) in the USDA's *Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Correlates*.

The most likely use of the Placer Resource Area would be by non-denning wolverines in search of carrion. Since elk populations would be maintained under either alternative, there would be no change in potential carrion sources for wolverine. No denning wolverines have been documented using any part of the Coeur d'Alene River Ranger District.

There would be no increase in open roads under either alternative, and therefore no increase in access by trappers and no increase in the risk of accidental trapping. Potential stand replacing fires under the No-Action Alternative could decrease cover over the long term.

The 2,763-acre portion of the roadless area that is within the boundary of the Placer Resource Area would continue to provide security under either alternative. (Refer to the cumulative effects discussion below for information on effects to the remaining roadless area outside of the Placer Resource Area.)

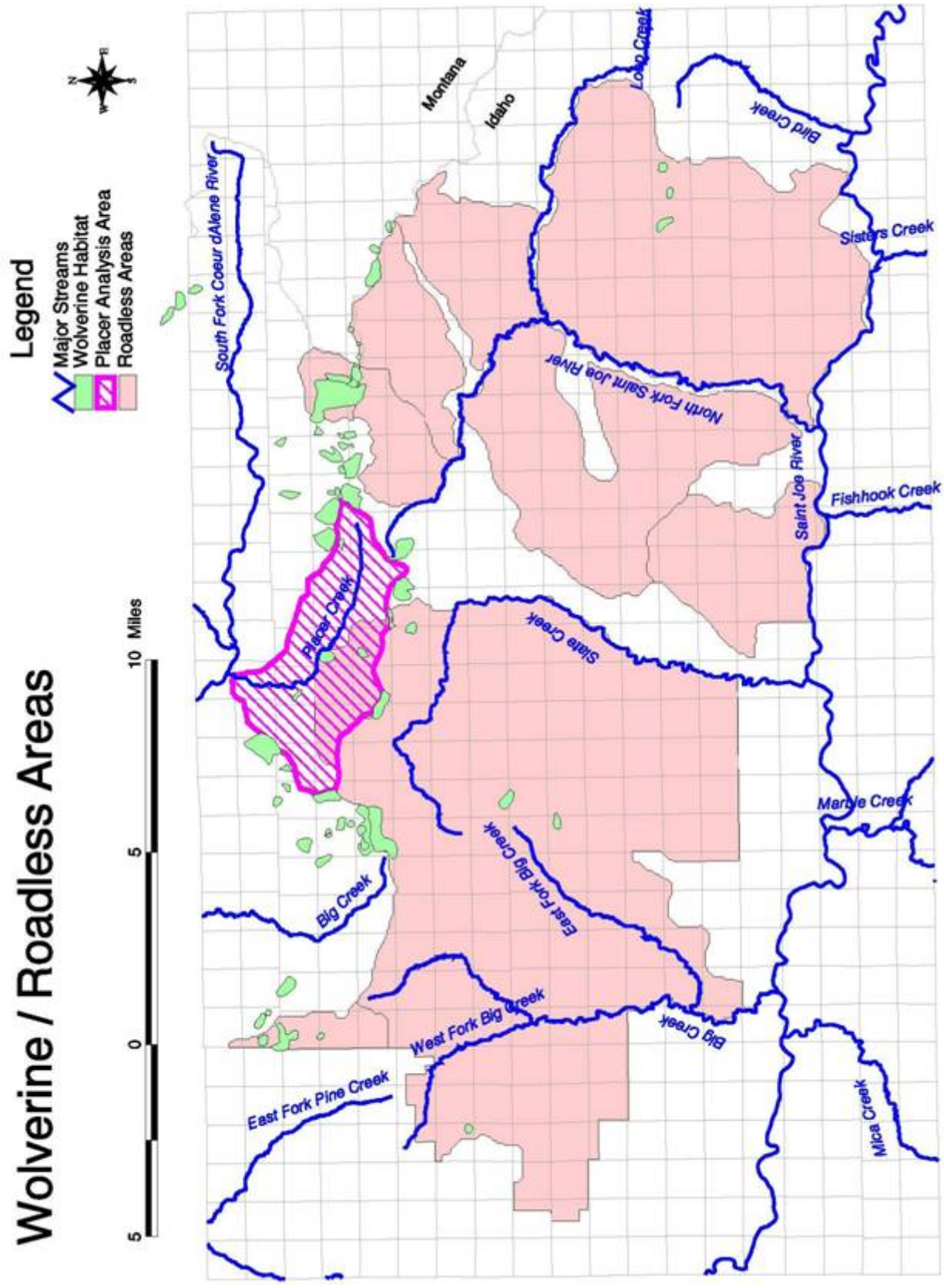
Cumulative Effects to Wolverines: An 81,000-acre roadless area is partially included within the Placer Resource Area (Figure WL-8). In addition, large patches of unroaded habitat east of the project area (in the Big Burn area of the Lolo National Forest and the Cabinet Mountains on the Kootenai National Forest) would continue to provide habitat for wolverines under either alternative. These patches are greater than 2,500 acres in size and all are more than one-quarter mile from a road. There is known denning habitat in the Big Burn Area. Under the Coeur d'Alene Geographical Assessment, patches of habitat that could function as travel habitat or security for wolverines were delineated in the Coeur d'Alene Mountains (Geographic Assessment, pages 42 and 46; PF Doc. WL-R71). However, because these patches lack wilderness quality and are small in area, they do not function as refugia for wolverines. The location of these patches may facilitate dispersal of the wolverine between the Coeur d'Alene Mountains and populations in western Montana (Interagency Unified Lynx Linkage Map, PF Doc. WL-7).

Some of the private lands near Wallace receive a high amount of human use and are probably avoided by the species. To conservatively evaluate wolverine habitat, private lands were not considered to provide habitat for the wolverine. National Forest System and BLM lands provide big-game winter habitat, and therefore a food source for wolverines (PF Doc. WL-27).

Patches of unroaded habitat in the upper Coeur d'Alene River drainage and along the St. Joe and Montana Divides would provide security and travel habitat for the species (Figure WL-8). Other security areas, refugia, and travel habitat for the wolverine and other large-ranging carnivores designated in the Geographic Assessment would maintain some security, refugia, and connectivity for the species. These large patches would also help facilitate movement of wolverine between the Coeur d'Alene River Basin and Montana, where additional refugia is provided. Providing for refugia and movement corridors are consistent with management recommendations by Idaho Fish & Game in the *Habitat Conservation Assessment and Conservation Strategy for Forest Carnivores in Idaho* (Copeland, 1995; PF Doc. WL-R13).

Based on past occurrence of wolverine, presence of potential denning habitat, current recreational use of the area, maintenance of big-game populations, presence of an 81,000-acre roadless area both inside and outside the project area, and disturbance associated with the project, the Proposed Action **may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species**. Viability would be maintained because security patches in the Coeur d'Alene Mountains are provided and large patches of refugia are available on the St. Joe District and nearby Kootenai and Lolo National Forests. Prey base would also be maintained. In addition, there is no trapping season in Idaho for the wolverine (Copeland 1995; PF Doc. WL-13). There would be no impact to wolverines under the No-Action Alternative.

Figure WL-8. Juxtaposition of Roadless Areas, Wolverine habitat, and the Placer Analysis Area.



3.G. Coeur d'Alene Salamander (Sensitive Species)

Life History of Coeur d'Alene Salamanders

Figure WL-9. Coeur d'Alene Salamander. (Source: Montana Natural Heritage Program (http://nhp.nris.state.mt.us).

Coeur d'Alene salamanders are restricted to cool, damp aquatic habitats that have stable temperatures and moisture levels. The species has been found in three main types of habitat in northern Idaho; springs seeps, the spray zones of waterfalls and along stream edges between 1,800 and 3,500 feet in elevation.

Known populations have been located at sites where the presence of fractured bedrock, combined with high substrate moisture, high humidity and moderate air temperatures create favorable habitat conditions (Groves 1989; PF Doc. WL-R74). They are often associated with low elevation areas having dense canopies (USDA-Forest Service R1, 1989; PF Doc. WL-R56).

Reference Conditions for Coeur d'Alene Salamanders

The Coeur d'Alene salamander is a remnant of a once diverse salamander fauna in the northern Rocky Mountains that was likely reduced by climatic changes over the past 10 million years. Surveys have found some known populations extinct due to roads, landslides, heavy metals and extensive logging. Historically, populations were probably higher in the Coeur d'Alene basin and have been reduced by past human activities including logging, mining and road building.

Management Recommendations for Coeur d'Alene Salamanders

Any changes in peak flows could have detrimental effects upon the Coeur d'Alene salamander by either flooding or drying habitat (Cassirer et al 1994; PF Doc. WL-R11). Forest Plan riparian management objectives decrease the potential for effects from management activities in riparian or wet areas.

Affected Environment for Coeur d'Alene Salamanders

Coeur d'Alene salamanders have a patchy distribution below 5,000 feet in northern Idaho. There are no known populations of the species in the Placer Resource Area, although potential habitat exists along streams, seeps, and in wet areas. Surveys were done in portions of Placer Creek in 1995 and 1996 (PF Doc. WL-57); a salamander was found in Big Creek, west of the Placer Resource Area. Since 1996 there have been no activities in the drainage that would alter habitat.

Environmental Consequences to Coeur d'Alene Salamanders

Direct and Indirect Effects to Coeur d'Alene Salamanders: No change to Coeur d'Alene salamander habitat would occur under the No-Action Alternative, although potential stand-replacing fires could reduce habitat by increasing peak flows (refer to the Specialist's Report on Aquatic Resources, PF Doc. SR-07).

Changes in peak flows could have detrimental effects upon Coeur d'Alene salamanders by either flooding or drying the habitat for the salamander (Cassirer et al 1994; PF Doc. WL-R11). Based on the aquatic analysis, the proposed action may result in a slight increase in peak flows (PF Doc. SR-07). However, these increases would be slight and would not alter habitat for Coeur d'Alene salamanders.

Cumulative Effects to Coeur d'Alene Salamanders: Past activities and historic fires on lands under Federal management and private lands within the Resource Area have altered habitat for Coeur d'Alene salamanders. Under either alternative, reasonably foreseeable activities on private and BLM-managed lands

could alter Coeur d'Alene salamander habitat because of potential changes in peak flows (PF Doc. SR-07). Precommercial thinning activities would have no impact on the habitat of the Coeur d'Alene salamander.

Under the Proposed Action, culvert upgrades could alter currently unidentified habitat for the Coeur d'Alene salamander over the short term; however stream restoration would improve habitat for the salamander over the long term. Because of slight changes in peak flows in Placer Creek, risk of currently unidentified populations destroyed during culvert upgrade projects and potential of unidentified habitat in other streams, the implementation of the Proposed Action **may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species**. Since no known populations would be affected and restoration would trend habitat towards an improved condition, the Proposed Action should maintain or enhance viability over the long term for the Coeur d'Alene salamander. Implementing guidelines and buffers under the Inland Native Fish Strategy would ensure viability of the Coeur d'Alene salamander (Cassirer et al 1994; PF Doc. WL-R11). The No-Action Alternative would have no impact on Coeur d'Alene salamanders and their habitat.

3.H. Townsend's Big-eared Bat (Sensitive Species) & Fringed Myotis

Life History of the Townsend's Big-eared Bat & Fringed Myotis

Townsend's big-eared bats use caves and cave-like structures for hiberncula in winter and for summer roosts by nursery colonies. They occasionally use bridges and old buildings for roosting and in some places have been known to use building attics as nursery sites.

Fringed myotis use caves, mines, and buildings as hibernacula and maternity roosts (Montana Animal Field Guide, PF Doc. WL-R100; Schmidt 2003; PF Doc. WL-R101). Snags, especially those sloughing bark, are important day roost habitat for the fringed myotis (Schmidt 2003, PF Doc. WL-R101).

Figure WL-10. Townsend's big-eared bat. (Photo courtesy of Bat Conservation International, www.batcon.org.)

Reference Conditions for Townsend's Big-eared Bat & Fringed Myotis

In northern Idaho, these bats primarily roost in abandoned mines. Loss and disturbance of hibernacula and roosting habitat are the limiting factors for the species.

Management Recommendations for Townsend's Big-eared Bat & Fringed Myotis

Retention of snags in a buffer of one-quarter mile around adits should be implemented to protect day roost habitat adjacent to other habitats of the fringed myotis (Keinath 2004; PF Doc. WL-R104). Managing for large long-term snags, emulating historic fire regimes, and snag retention are recommended management practices (PF Doc. WL-R101). In addition, smoke management protects both species of bats that may be using adits (PF Doc. WL-58).

Affected Environment for Townsend's Big-eared Bat & Fringed Myotis

Surveys have been done on abandoned mine adits within the Coeur d'Alene Mountains (2002, PF Doc. WL-62). The Townsend's big-eared bat has never been documented to occur on the District; however, there is potential habitat in many adits yet to be surveyed.

Fringed myotis were identified in the Varnum Creek and Eagle Creek drainages of the Coeur d'Alene River Ranger District. These are the only sightings on the IPNF. There is potential habitat within the Placer Resource Area; however, the preferred dry site habitat is in short supply.

Environmental Consequences (Direct, Indirect & Cumulative Effects) to Townsend's Big-eared Bat & Fringed Myotis

Mining activities within the Placer Resource Area have created bat habitat. This habitat is important on a broader scale since nation-wide natural (caves) bat habitat has been altered and, in some cases, lost. Some bat friendly closures have been installed at various sites on the Coeur d'Alene River Ranger District. Open adits on BLM and private lands within the Resource Area provide additional habitat. Some of the adits within the Resource Area will likely close naturally over time, as tunnels become unstable and eventually collapse.

Under the No-Action Alternative, potential wildfires could produce smoke at levels that could be fatal for bats occupying mines.

Under the Proposed Action, changes in snag densities could alter habitat for the fringed myotis; however, snags would be retained in accordance with the Region 1 snag protocol. Design features implemented during brush field burning would protect bats from effects of smoke during these operations (PF Doc. WL-58).

Design features would ensure protection of the Townsend's big-eared bat and fringed myotis should either occur within the Placer Resource Area. Therefore, the implementation of the Proposed Action **may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.** Retaining snags at levels recommended in the R1 Snag Protocol and design features implemented to protect bats during burning operations would ensure viability of the Townsend's big-eared bat and fringed myotis.

3.I. Pileated Woodpecker (Old-Growth Management Indicator Species)

Life History of Pileated Woodpeckers

Pileated woodpeckers nest within their home ranges (usually about 1,000 acres) in mature to old-growth stands of about 50 to 100 acres with greater than 65 percent closed canopies and greater than 20-inch diameter trees (Bull 1986, PF Doc. WL-R76; McClelland 1977, PF Doc. R37; McClelland 1979; PF Doc. WL-R38). They prefer stands with snag densities greater than 12 per acre for feeding (Warren 1989; PF Doc. WL-R75). Nest trees are snags averaging 30 inches in diameter and 90 feet in height (Aney and McClelland 1985; PF Doc. WL-R2). However, pileated woodpeckers can excavate a nest in a live ponderosa pine if heart rot is present (Bull 1975 PF Doc. WL-R5). Both larch and ponderosa pine are preferred nest trees (Bull 1975; PF Doc. WL-R5). They feed mostly on carpenter ants (McClelland 1977, PF Doc. WL-R37; Bull 1986, PF Doc. WL-R76), but also eat other insects and fruits and berries. They usually avoid openings for foraging, and prefer dense canopies with many snags and down logs. Large, continuous habitat blocks are more desirable than more fragmented patches.

Figure WL-11. Pileated woodpecker. (Photo Source: www.fs.fed.us/r1/cohesive strategy.)

Reference Conditions for Pileated Woodpeckers

No historic population information is available for pileated woodpeckers. There is some information on historic forest structure in the area from the Geographic Assessment for the Coeur d'Alene River Basin, the Assessment of Ecosystem Components in the Interior Columbia River Basin and in modeling done based on historic records by the IPNFs (PF Doc. WL-R71). These records and models indicate that more old forest habitat existed for pileated woodpeckers historically than exists today. The current amount old forests are believed to be less than under

historical conditions due to the amount of timber harvesting done in older stands and the decreased amount of older stands remaining following stand-replacing wildfires on the District in the early 1900s.

Despite the lack of old forest, a conservation assessment for the pileated woodpecker in Region 1 found that high levels of intermediate-sized trees and increases in post-fire insect outbreaks are providing increased forage for the pileated woodpecker across the region. Because of increases in the extent and connectivity of forested habitat since European settlement, the conservation assessment for the pileated woodpecker in Region 1 found viability will be maintained for the pileated woodpecker for the next 100 years. (PF Doc. WL-67, pages 66-68).

Management Recommendations for Pileated Woodpeckers

Adhering to the Region 1 snag management protocol (USDA 2000; PF Doc. WL-R54), and to the snag guidelines developed in association with the Upper Columbia River Basin (UCRB EIS as described in Bull et. al. 1997, UCRB EIS, Appendix K; PF Doc. WL-30 and WL-R52) help to assure snag availability for this species. Aney and McClelland (1985; PF Doc. WL-R2) recommend that pileated woodpecker habitat be managed to support at least one pair per 2,500 acres. Shelterwood cuts and small group selection cuts are suitable, but not preferred, in feeding areas (McClelland 1979; PF Doc. WL-R38). Often, old growth habitats are found along stream courses in linear patterns. To provide suitable pileated woodpecker habitat, strips should be at least 300 feet in width (McClelland 1979; PF Doc. WL-R38). Habitat components include continuous blocks of 50-100 acres, 65 percent canopy closure and 20-inch diameter or larger trees, high snag density, large down wood, larch and pine preferred, 1,000-acre home ranges.

Affected Environment for Pileated Woodpeckers

Pileated woodpeckers are found in the Pacific Northwest and throughout the Northern Rocky Mountains, including Idaho and Montana. This species occurs throughout the IPNF and there is evidence of pileated use in the Placer Resource Area. Pileated woodpeckers often use ponderosa pine and mixed conifer habitats for nesting and foraging, and this type of habitat is common throughout the resource area. Field reviews by the biologist found forage sign was present but not abundant in the cedar stands in Line Gulch (PF Doc. WL-29). In addition, surveys done by the Audubon Society for the Forest Service detected pileated woodpeckers in the Slate Saddle area in 2004 (PF Doc. WL-56). Ponderosa pine is absent in the resource area, with the exception of some off-site ponderosa pines. Large-diameter snags are also in short supply due to fires at the turn of the century.

Idaho Panhandle National Forests Scale: Old growth management units (OGMUs) are the land area designated by the Forest Plan to manage old growth across the Forest. Forest Plan guidelines state that 10 percent old growth across the Forest ensures viability of old growth dependent species (Forest Plan, page V-3; PF Doc. CR-02). This will be accomplished by maintaining at least 10 percent of the Forest as old growth and retaining up to 5 percent old growth in each old growth unit to assure adequate distribution. To obtain the desired distribution, the IPNF will be managed to maintain approximately 5 percent of each Old Growth Management Unit (OGMU) as old growth where it exists (IPNF Forest Plan II-5, PF Doc. WL-30; Forest Plan Monitoring report; PF Doc. WL-R51). The guidelines require that old growth be well distributed across the Forest. If an OGMU has less than 5 percent existing old growth, more can be allocated in another OGMU to meet the guidelines at the Forest or District scale.

Coeur d'Alene River Basin Scale: The table below (Table WL-7) displays current and historical forest age classes in the Coeur d'Alene River Basin. The table indicates the primary change that has occurred in pileated woodpecker habitat, or mature/old stands. Although the amount of mature age classes are similar to historical conditions, the old component of that age class has been significantly reduced. The old component provides most large diameter, long-lived snags, and down wood that are vital to pileated woodpeckers and many other wildlife species. Fragmentation of old and mature habitats has also occurred over time through urban development, road construction and timber harvest.

Table WL-7. Current and Historic Mature and Old Forests in the Coeur d'Alene River Basin.

	Shrub/Seed/Sapling	Pole	Immature	Mature	Old
Percent Historic Mean	21	13	20	25	21
Percent Existing in the CDA River Basin	17	9	43	25	9
Percent Existing in Placer Resource Area	14	15	71	0	0

Watershed Scale: The Placer Resource Area is within OGMU 119, which currently contains 5.1 percent (737 acres) allocated old growth (all of which is located outside the Placer Resource Area). Existing allocated old growth and potential stands to be added to the allocated old growth in OGMU 119 were evaluated using stand exams in 2003 and 2004. Stand data was re-evaluated and additional information gathered over the past two years to confirm that the best possible stands were allocated towards old growth. Due to the dynamic, changing conditions inherent in forested stands of timber, some stands that had previously been allocated no longer met the criteria for old growth. These stands were dropped from the old growth allocation (PF Doc. SR-02; PF Doc. VEG-32). The old growth allocation in the OGMU was changed to reflect current conditions of the stands in the resource area and across the basin. Many of the stands within the OGMU will quality as old growth over the next 50 to 60 years (refer to the Specialist's Report on Forest Vegetation; PF Doc. SR-02).

An explanation of the methodology used for the allocated old growth analysis is found in PF Doc. VEG-28. Definitions for allocation of old growth are from the Forest Plan (page II-29; PF Doc. VEG-29, VEG-30, VEG-R20), the Regional Task Force Report *Old Growth Forest Types of the Northern Region* (Green et al, 1992; PF Doc. VEG-R20, VEG-30) and Forest Supervisor letters of direction for implementing Forest Plan old growth standards (PF Doc. VEG-29).

Environmental Consequences to Pileated Woodpeckers

Pileated woodpecker habitat was assessed focusing on stands with an average live tree diameter of 14 inches or greater in Douglas-fir, larch, or ponderosa pine. Based on this information and knowledge about the stands, a prediction can be made that adequate snags would be found within these stands (PF Doc. WL-63). Information used also includes forest type, age classes, current and projected canopy closure, current known snags across the resource area (PF Doc. WL-34, WL-28), and presence of recruitment snags where diseases, bark beetles or structural damage to trees is known to occur. It was also based on old growth allocation on the Coeur d'Alene River Ranger District and the absence of old growth within the Placer Resource Area. The delineation of this pileated woodpecker habitat was verified in Dry Gulch by the project wildlife biologist (PF Doc. WL-29). The following table displays the acres of pileated woodpecker habitat found in the Placer Resource Area. The 200 acres of habitat are the result of insects and disease, not age.

Table WL-8. Acres of Affected Pileated Woodpecker Snag Habitat.

Treatment/Effect on Pileated Woodpecker Snag Habitat	No-Action	Proposed Action
Acres of habitat provided before treatments	200	200
Acres of habitat provided after treatments	200	200

Table WL-9. Acres of Treatment Within Pileated Woodpecker Snag Habitat.

Treatment/Effect on Pileated snag habitat	No-Action	Proposed Action
Acres of commercial thinning *(stands continue to provide habitat)*	0	0
Acres of group shelterwood *(stands would no longer provide habitat)*	0	0
Acres of prescribed burning *(snag density could be increased; stands would still provide habitat)*	0	50

Direct and Indirect Effects to Pileated Woodpecker Habitat Under the No-Action Alternative: No short-term effects or changes would result from the implementation of the No-Action Alternative. White pine and larch components in the resource area would continue to be low. Beetle activity and insects and diseases would continue to provide snag recruitment, although the size of snags would not be optimal for pileated woodpeckers. Some stands would trend toward a mature forest component over the next 50 years, improving habitat for the pileated woodpecker. There is potential for stand-replacing fire as stands mature, which would set back the trend towards suitable habitat for the pileated woodpecker. Under the No-Action Alternative, there would be no road construction or reconstruction to decrease habitat quality. If stand-replacing fires were to occur, the trend toward mature/old forest could be set back.

Direct and Indirect Effects to Pileated Woodpecker Habitat Under the Proposed Action: As displayed in Tables WL-8 and WL-9, the Proposed Action Alternative would retain all pileated woodpecker snag habitat in the Placer Resource Area (PF Doc. WL-28). There would likely be additional snags created under this alternative due to prescribed fire even with measures to protect leave trees. Most larger diameter larch would survive the fire. However, Douglas-fir and hemlock may experience some mortality as a result of prescribed fire. Snags and scorched trees resulting from prescribed burns would provide additional nesting and foraging habitat (PF Doc. WL-53). The Placer Resource Area would continue to lack a mature and old forest component for the next 50 years. Prescribed burning often occurs in spring so that burning conditions are most favorable to achieve the desired results. This could directly impact this species if a snag with nesting birds were burned. Field surveys would continue to occur and field personnel would avoid burning near snags with large cavities as specifically described under "Design Features" in this report and briefly discussed in the EA, Part 3.

Cumulative Effects/Determination of Effects to Pileated Woodpeckers: Over time, either alternative would result in a trend toward more suitable habitat for pileated woodpeckers, since some forested stands would move toward providing an old and mature component in the future. The area would never provide optimal habitat since it lacks the preferred ponderosa pine habitat. As stands increase in age and are affected by insects and disease, the snag numbers would increase. Under the no-action alternative potential stand replacing fires could set back the trend towards suitable habitat for the pileated woodpecker. Large fires at the turn of the century in the Placer Resource Area have resulted in large expanses of forested land in the immature age category; therefore, they have reduced quality of habitat for pileated woodpeckers. Across the IPNF, past timber harvest has removed seral species and salvage logging has reduced snag numbers. Private lands adjacent to, and within, the resource area provide some habitat for this species, but the habitat also lacks the preferred ponderosa pine and large-diameter seral species.

The Proposed Action would implement riparian buffers to protect cedar bottoms where pileated woodpeckers forage within the resource area. The Proposed Action is consistent with Forest Plan direction to manage the habitat of sensitive species to prevent further declines in populations which could lead to listing under the Endangered Species Act (USDA 1987, p.II-28 PF Doc. WL-30). In addition, old growth would be maintained at 10 percent across the IPNFs (PF Doc. WL-R51), and Forest Plan standards for snag retention would be exceeded with adherence to the R1 Snag Protocol (USDA Forest Service 2000; PF Doc. WL-R54, WL-53, WL-1). These actions would also be consistent with National Forest Management Act requirements for population viability (36 CFR 219.19). A conservation assessment for the pileated woodpecker in Region 1 found short-term viability (100 years) is not an issue for the pileated woodpecker (PF Doc. WL-67). **Activities under the Proposed Action may impact individual pileated woodpeckers or their habitat, but would not likely contribute towards federal listing or cause a loss of viability to the population or species.** There would be no impact to the pileated woodpecker or its habitat with the implementation of the No-Action Alternative.

3.J. Pine Marten (Old Growth Management Indicator Species)

Life History of Pine Martens

Pine marten inhabit late successional coniferous forests, preferring mature and old-growth fir or spruce-fir stands (Koehler and Hornocker 1977; PF Doc. WL-R90; Spencer 1981, PF Doc. WL-R92). Pine marten are used by the IPNFs as management indicators of these habitats. An important component for marten is dead trees including snags, stumps, and down logs. These are used for regulating temperature in the winter, resting, hiding from predators and reproducing (Simon 1980, Spencer 1981; PF Doc. WL-92).

Figure WL-12. Pine marten.

Marten prefer stands with at least 40 percent canopy closure and are usually within close proximity to cover (Koehler and Hornocker 1977; Wildlife PF doc. WL-R90, Spencer1981; Wildlife PF doc. WL-R92). They prefer spruce-subalpine fir stands with large overstory trees, and many down logs (Witmer et al. 1998; Wildlife PF doc. WL-R93). Marten will also use openings for foraging in the summer and winter (Koehler and Hornocker 1977; Wildlife PF doc. WL-R90, Spencer 1981; Wildlife PF doc. WL-R92). They prey upon small mammals, especially voles, but including squirrels, snowshoe hares, etc. They will also occasionally eat insects, berries, and songbirds (Weckwerth and Hawley 1962; Wildlife PF doc. WL-R92).

Reference Condition for Pine Martens

The marten was selected by many National Forests in the Northern Region as a management indicator species. It is used to represent species using mature and old-growth habitats (Patton and Escano; PF Doc. WL-R94).

The marten ranges throughout most of northern North America's late successional stage forests (Patton and Escano in: Warren 1990; PF doc. WL-R94). Marten are found throughout the forested regions of Idaho. In north Idaho, pine marten habitat usually exists above 4,000 feet in elevation, although they are also found in lower elevations, especially along drainages.

Management Recommendations for Pine Martens

Witmer et al (1998; PF Doc. WL-R93) describe the three major issues of concern to marten conservation and management in the Columbia River Basin in "Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Correlates."

- ***Conservation of late successional forest*** - Over mature stands are found to consistently be preferred habitat for the marten. Martens do not travel far from substantial forest overhead cover. Large-diameter snags, logs, and stumps provide important resting habitat for the marten. Although used as a management indicator species for old growth, in a habitat suitability model developed by Patton and Escano (PF Doc. WL-R94) stands with moist cover types, an average overstory tree size greater than 9 inches in diameter and canopy closure greater than 30 percent provide moderate habitat for the marten (PF Doc. WL-R94). Within the Placer Resource Area Stands stands of this diameter class include small/medium structural stages.

- ***Maintenance of links between populations*** - Martens will not use habitat with minimal canopy cover. Forested travel corridors are essential for maintaining links among individuals and populations. Patton and Escano (1990; PF Doc. WL-R94) recommend that suitable pine marten home ranges be provided every 1 to 2 square miles in order to maintain viable populations. Marten rarely venture greater than 150 feet from forest cover, especially in winter (Patton and Escano; PF Doc. WL-R94). To ensure that a viable population of marten is maintained across its range, suitable habitat for individual martens

should be distributed geographically in a manner that allows interchange of individuals between habitat patches (Patton and Escano, 1990; PF Doc. WL-R94).

- ***Trapping pressure and human disturbance*** - Marten are trapped commercially. Road densities contribute to trapping pressure. Pine marten are very susceptible to trapping; high road densities probably increase vulnerability. They prefer areas with road densities of less than 1 mile per square mile (Patton and Escano, 1990; PF Doc. WL-R94).

Affected Environment for Pine Martens

Pine marten are present in the ecosystem. A marten was sighted in the analysis area, near Moon Pass in 2002 (PF Doc. WL-6) a marten skull was also found near Placer Creek in 2003 (PF Doc. WL-6). Due to stand-replacing fires between 1900 and 1930, low snag and downed log densities have resulted in the current low habitat capability for martens. None of the stands within the Placer Resource Area currently provide mature forest structure or are allocated as old growth. Immature stands (stands with overstory trees greater than 9 inches in diameter) within the Resource Area are abundant and are providing low to moderate habitat for pine marten (PF Doc. WL-46, WL-R94). These stands will continue to trend towards optimal habitat for the marten; as they age, trees increase in diameter and forested stands succumb to insects and disease and increase the amount of down wood on the ground. There are approximately 7,324 acres in the Placer Resource Area on National Forest System and BLM-managed lands that provide low to moderate pine marten habitat, as described above (PF Doc. WL-19).

The St. Joe Divide provides a movement corridor for pine marten to disperse across its range. In addition, an 81,000-acre roadless area that lies partially within Placer Resource Area provides a secure area for marten populations to avoid trapping. This area could serve as source habitat for marten that could disperse into the Placer Resource Area (see Figure WL-8 in the wolverine discussion) and provides an area for marten where they are unlikely to be trapped.

Environmental Consequences to Pine Martens

Direct and Indirect Effects Under Either Alternative

Under either alternative, marten habitat within the Placer Resource Area would continue to be in the low to moderate quality. Immature stands would trend towards mature and in 50 years the basin should provide moderate to high quality habitat for the marten. Both alternatives would continue to provide a large dispersal corridor and secure habitat where marten would avoid trapping within the roadless area that is partially located within the Placer Resource Area.

Direct and Indirect Effects Under the No-Action Alternative

No change in immature stands (low to moderate habitat) would occur under the No-Action Alternative (Table WL-10). The St. Joe Divide would continue to provide a dispersal corridor for pine marten. If disturbance does not occur stands would provide suitable habitat in 50 years. However, potential stand-replacing fires could set back the trend towards suitable habitat.

Direct and Indirect Effects Under the Proposed Action

Due to harvest there would be a slight reduction in current low to moderate quality pine marten habitat (Table WL-10). This change of 310 acres represents a 4 percent change from the current marten habitat within the Placer Resource Area. These acres would provide marten denning and foraging habitat in 90 years. Burning activities along the St. Joe Divide would have minimal impacts on this travel corridor. There could be some loss of cover for the short term, but larger trees and canopies would remain allowing marten to disperse along this corridor. Improvements along Road 2552 could allow for a short-term increase in trapping vulnerability to the marten.

Table WL-10. Changes in low to moderate quality habitat for the marten.

	No-Action	Proposed Action
Acres of Low to Moderate Marten habitat harvested	0	310

Cumulative Effects/Determination of Effects to Pine Martens

Under either alternative, the current immature forest within the Placer Resource Area would continue to provide less than optimal marten habitat for the next 50 years until they provide old forest habitat. **There would be no impact to the marten under the No-Action Alternative. The Proposed Action would not contribute to a trend to a loss of viability to the population or species**. Viability for the marten would be maintained under the Proposed Action because movement corridors are available both inside and outside the analysis area to allow for dispersal, Region 1 snag protocol would be implemented (which exceed the 1987 IPNF Forest Plan standards), the roadless area would continue to provide a potential source of habitat for marten, and old growth would be maintained at 10 percent across the Forest (Witmer et al 1998, PF Doc. WL-R64, WL-30; USDA 2000, PF Doc. WL-R54; and IPNF 1987, PF Doc. WL-30).

3.K. Northern Goshawk (Old Growth Management Indicator Species)

Life History of Northern Goshawks

Goshawks occupy coniferous and mixed forests throughout much of the northern hemisphere (Wattel 1981 in: Warren 1990; PF Doc. WL-R61). Goshawks prefer to nest in mature to over-mature coniferous forests with large trees, and canopy coverages of 60 to 80 percent (Hayward 1983, PF Doc. WL-R24; Saunders 1982, PF Doc. WL-R47). Other characteristics include a stand size greater than 25 acres, gentle to moderate slopes and small, scattered openings (Hayward 1983; PF Doc. WL-R24). North-facing slopes are often preferred for nesting (Hennessey 1978, PF Doc. WL-R25; Reynolds et al 1982, PF Doc. WL-R46), although ridges and benches are often used in the Coeur d'Alene River Basin, probably due to a shortage of gentler slopes.

The species prefers single-storied to multi-storied stands with open understories for hunting (Hayward 1983, PF Doc. WL-R24). Goshawks use snags for hunting and consuming their prey. Prey species include small mammals, songbirds, and game birds such as grouse and waterfowl (Hayward 1990 in Warren 1990; PF Doc. WL-R22). Preferred home ranges are about 5,000 acres of contiguous forest (Warren 1990; PF Doc. WL-R22). Goshawks are sensitive to disturbance, and may leave a nest if prolonged activity occurs nearby.

Figure WL-13. Photo by Mike Lane (www.nature-photography.co.uk)

Reference Conditions for Northern Goshawk

Little historical information is available for goshawks. Urbanization, large fires, road construction and timber harvest have decreased the quality of mature forests and riparian habitat in the resource area and across the IPNFs. Losses of nesting habitat and decreased variety and abundance of prey species often tied to riparian areas indicates that goshawks may have historically been more abundant than they are today. Populations appear to be stable in Idaho (Maj 1996; PF Doc. WL-R36). A conservation assessment for the goshawk in Region 1 found goshawk habitat to be well-distributed and abundant on the current landscape, and that viability for the species will be maintained for the next 100 years (PF Doc. WL-67).

Management Recommendations for Northern Goshawks

Goshawks are listed as a Sensitive species in Region 1 by the Forest Service. However, populations appear to be stable and the species is no longer considered sensitive in Region 1 (USDA Forest Service, Northern

Region, 2004, Sensitive Species changes; PF Doc. WL-65). Region 1 has defined viability for the goshawk as one pair every 10,000 acres (Warren 1990; PF Doc. WL-R22). Recommendations have been established for management of the Northern goshawk in the Southwestern United States (Reynolds et al. 1992; PF Doc. WL-R46). These recommendations suggest goshawk home ranges are about 6,000 acres in size and consist of a nesting area of 20-25 acres, a post-fledgling family area of 400 acres, and a foraging area approximately the size of the home range.

Although goshawk populations are thought to be stable in Idaho, they are low in many western states, increasing the importance of existing habitat in Idaho.

- *Nest Areas - Three suitable and three replacement nest areas (of 30 acres, each for a total of 180 acres) are established for each known pair of nesting goshawks. Nest areas include the stand with an active nest. Other suitable nest stands include alternate or historic nests followed by the best remaining nearby suitable habitat. The three replacement nest areas are established near the stand they are intended to replace and are selected based on the condition of the effective or suitable nest stand and the likely time frame needed to provide for a replacement area.*
- *Post-fledgling Areas – Post-fledgling areas provide cover from predators and sufficient prey to develop hunting skills for newly fledged goshawks (Reynolds et al. 1992; PF Doc. WL-R46). They are described as being about 400 acres in size and correspond to the defended territory of a breeding pair of goshawks (Kennedy 1991; PF Doc. WL-R32).*
- *Foraging Areas – The Southwest Guidelines recommended a vegetative stand structure of 20 percent old forest; 40 percent middle-aged and mature forest; 30 percent seedling, sapling and young forest; and 10 percent grasslands, forbs and shrubs.*

Affected Environment for Northern Goshawks

Northern goshawks occur throughout the western United States and in several northeastern states. Nesting pairs of goshawks have been documented in several areas of the Coeur d'Alene River Basin. Field reviews by wildlife biologists confirmed habitat queries that found the Placer Resource Area to be low in quality goshawk nesting and foraging habitat (PF Doc. WL-9, Wl-29). In general, the overstory is below the optimal 60 to 80 percent canopy required for the goshawk. Habitat prey for goshawks is low. Field review found large snags to be in short supply throughout the Placer Resource Area, reflecting the younger age class found there (Northern Region Snag Management Protocol, 2000, pages 6-7; PF Doc. WL-R54). Large diameter, live overstory trees across the landscape are in very short supply in the drainage.

No goshawks have been sighted in the vicinity of the resource area (PF Doc. WL-6). Calling surveys were conducted in the area in 2003; there was no response by goshawks (PF Doc. WL-9).

The resource area lacks forage habitat for the goshawk (Table WL-12). A portion of the area is comprised of south-facing slopes with brush or open-growing Douglas-fir. The area lacks a mature/old component and, to a lesser extent, the seedling/sapling component. The middle-aged component dominates the forest in the Placer Resource area (Table WL-12). There are no old/mature stands found in the resource area due to fires in the early 1900s (PF Doc. WL-19); as a result, the area provides no nesting habitat for goshawk at this time. Lands managed by BLM are similar to Nation Forest System lands and do not provide nesting habitat for goshawks, but probably provide some forage opportunities.

Habitat queries found no currently **suitable** goshawk nesting habitat within the Placer Resource Area (PF Doc. WL-10, WL-36). Field surveys by the project wildlife biologist verified the lack of suitable habitat identified by queries to the database (PF Doc. WL-9). There are 69 acres of **capable** ("future") nesting habitat in the analysis area (October 28, 2003 model runs for goshawks; PF Doc. WL-36, WL-44). Additional **capable** "future" nesting habitat exists adjacent to the resource area. Capable habitats do not currently provide for the needs of the goshawk, but could over time**.** Capable habitat has been identified in the Resource Area based on forest structure, forest habitat type, and continuity. Foraging habitat of at least 5,000 acres was mapped around future nesting habitat. One future nesting territory was mapped within the resource area (PF Doc. WL-10, WL-36).

Table WL-11. Goshawk Nesting Habitat in the Placer Resource Area.

	Estimated Total Acres	Current/Suitable Nesting Habitat (Acres)	Future/Capable Nesting Habitat (Acres)
National Forest System and BLM lands	8,520	0	69
Private lands	2,887	0	No information

Table WL-12. Vegetative Stand Structure in Goshawk Foraging Areas of the Placer Resource Area.

Vegetative Stand Structure	% Desired Composition	% Existing Composition
Mature/Old	40	0
Middle-aged	20	86
Seedling/Sapling	10	3
Grass/Forb/Shrub	10	11

Environmental Consequences to Northern Goshawks

The following effects analysis for northern goshawks uses two methods of assessment; 1) comparison to the Southwest Guidelines (Reynolds et al 1992; PF Doc. WL-R46) desired condition for goshawk foraging areas, and 2) modeling to determine the abundance, distribution and characteristics of nesting habitat within each foraging area and show the changes that would occur in nesting habitat based on the alternative management actions evaluated. Both alternatives would maintain the immature/middle-aged component above its historic range (Table WL-13) and beyond the range that is optimal for goshawks.

No-Action Alternative: No short-term effects or changes would result from the implementation of the No-Action Alternative. Over the long term, natural mortality would result in snag and downed log recruitment. Some mature stands would move towards old growth; however, many mature stands would never achieve old growth qualities due to insects, disease and fire. The resource area would continue to provide habitat for one nesting pair of goshawks at some point in the next 50 years.

Proposed Action Alternative: With the implementation of the Proposed Action, the area would continue to lack nesting habitat for the goshawk. Brushfield burning would occur in narrow stringers of future/capable nesting habitat adjacent to large brushfields (PF Doc. WL-44). These stands would continue to provide habitat for goshawks at some point in the future. However, the stands would likely be set back successionally by burning activities, and may be too small in area to provide adequate nesting blocks for goshawks. Burning activities could increase snags, which could have a long-term beneficial effect for the goshawk and its forage habitat.

Commercial thinning and shelterwood treatments on 798 acres within the Placer Resource Area could create some stands that could be used by goshawks in the future (25 to 50 years or more). These treatments would trend trees toward a larger diameter over time and result in the necessary large structure component that is currently absent in the Placer Resource Area (PF Doc. WL-19). Burning activities proposed in the resource area could enhance forage habitat for goshawks. Treatment of patches greater than 40 acres in size would provide large patches of interior habitat for nesting in the future (150 years).

Table WL-13. Vegetative stand structure for each goshawk foraging area, by alternative.

Age Class	% Desired Vegetative Stand Structure	% Under the No-Action Alternative	% Under the Proposed Action Alternative
Mature/Old forest	40	0	0
Immature/Middle-aged	20	86	82
Seedling/Sapling	10	3	3
Grass/Forb/Shrub	10	11	15

Cumulative Effects to Northern Goshawk: Managing ATV use along specific corridors and eliminating other pioneered ATV trails could protect post fledgling habitat from disturbance. Private lands within the analysis area were not considered as habitat for the goshawk during the analysis. These private lands probably do not provide nesting habitat, but may provide habitat for the prey of the goshawk.

Proposed commercial thinning in the analysis area would promote a larger diameter tree and, in approximately 25 to 50 years, these areas could provide suitable nesting habitat for the goshawk. Implementation of a fuel break along Road 456 would have little effect upon goshawk habitat, since habitat adjacent to the road is considered to be of low quality. In the event precommercial thinning were to occur in the future, a stand of large-diameter trees would result, which would benefit goshawks. Noxious weed control along Road 456 would not affect goshawks. Under either alternative, habitat would continue to be low in both quantity and quality. The area would provide some forage habitat and nesting habitat in the future (Goshawk Habitat Map, PF Doc. WL-45).

Since there is no suitable habitat, goshawks are not known to nest in the vicinity, activities would not preclude goshawks nesting with the resource area in the future, viability across Region 1 is assured for the short term (PF Doc. WL-67), and there is a small chance an unknown nest could be lost during activities, **the Proposed Action would impact individuals, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or the species.** There would be no impact to goshawks under the No-Action Alternative.

The Region 1 viability criteria of one goshawk nesting pair for each 10,000 acres (Warren 1990, PF Doc. WL-R61) would continue to be met with the implementation of either alternative. Adhering to Region 1 snag protocol (which exceed standards of the IPNF 1987 Forest Plan), maintaining 10 percent old growth across the forest (IPNF 1987, PF Doc. WL-R53 and WL-30; 2004 Forest Plan Monitoring Report, pp. 66-74, PF Doc CR-026), and implementing the design features detailed in this report and highlighted in the EA (Part 3) would ensure the viability of the goshawk within the Placer Resource Area and across the IPNFs.

3.L. Rocky Mountain Elk (Big-Game Management Indicator Species)

Life History of Rocky Mountain Elk

Elk are tolerant of diverse environments and originally had a widespread distribution over much of North America. During the fall elk in Idaho generally can be found in denser cover, in response to hunting pressure. In the spring elk seem to prefer open areas where grasses and forbs provide succulent, nutritious forage.

Reference Conditions for Rocky Mountain Elk

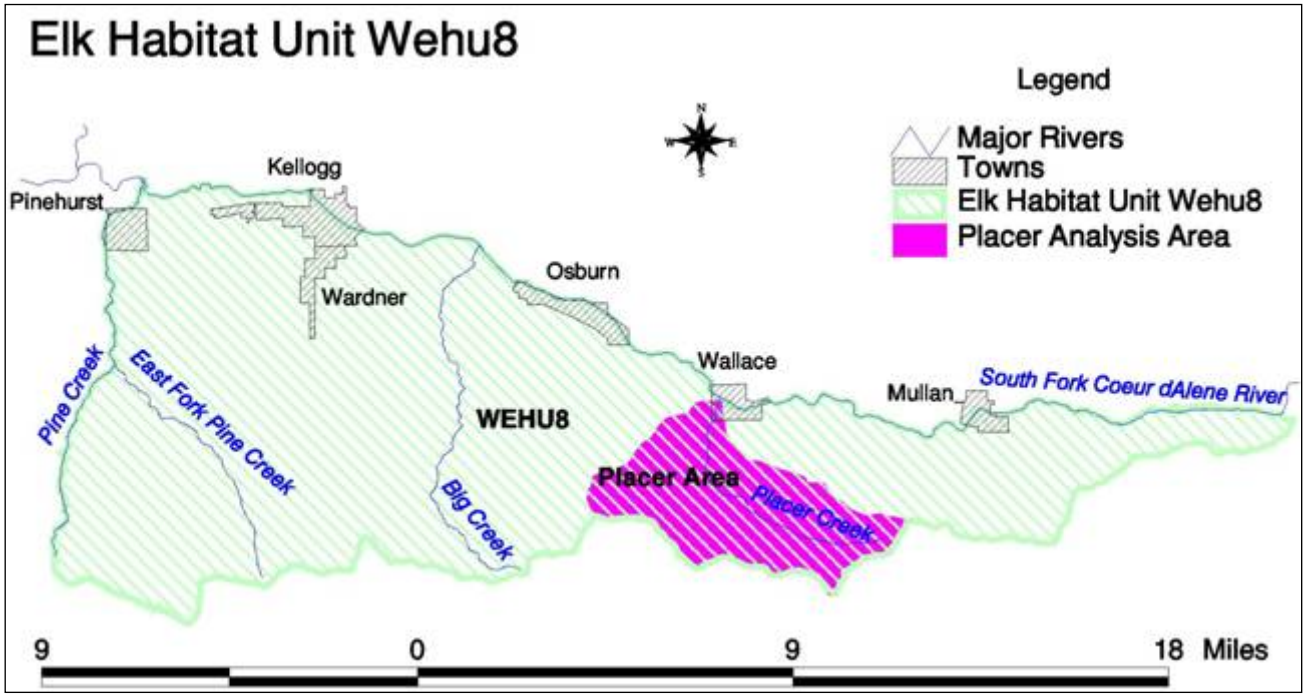
Early records indicate that Rocky Mountain elk occurred throughout most of Idaho; however, large herds were apparently absent from the panhandle. Settlement led to exploitation of the species, causing elk to be reduced to a few isolated herds in the state. A translocation program initiated in 1915 and continuing for the next 30 years restocked elk in northern Idaho. Today, elk exceed their population level of a century ago. However, high road densities in elk habitat in northern Idaho have increased hunter success and have led to changes in hunting regulations. Ages of elk are younger with fewer experienced old cows and bulls. Winter range for the species has been greatly impacted by urban development and agriculture, and noxious weeds can have high impact on forage in some areas.

Figure WL-14*. Rocky Mountain Elk (Photo source: National Image Library; http://images.fsw.gov).*

Management Recommendations for Rocky Mountain Elk

The Forest Plan directs that forest management for elk should be coordinated with the Idaho Department of Fish and Game. The plan recommends using "Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho" (IDFG 1984; PF Doc. WL-R78) to evaluate elk habitat potential. Elk Habitat Units (EHUs) are the land area recommended for tracking elk habitat potential in the Forest Plan. EHUs consist of several compartments used for database management of timber stand information. Compartments are groups of stands topographically delineated and used for tracking current condition and land management activities. Road miles, road status, forage, cover, security areas and other factors that could affect elk habitat are considered in the model. A detailed report on the status of each road within the resource area is available in the wildlife project files and in the Roads Analysis for this project (PF Doc. WL-43). Information includes miles of each road, whether it is open year long, open seasonally or closed, the type and effectiveness of the closure device, and the condition of the road (whether it is brushed in or drivable).

Figure WL-15. Map displaying the boundaries of the Placer Resource Area (shaded) and Elk Habitat Unit 8 (Wehu8).



Affected Environment for Rocky Mountain Elk

White-tailed deer, moose and elk inhabit the Placer Resource Area, which comprises about 15 percent of Wallace Elk Habitat Unit 8. EHU 8 is comprised of six compartments. Major land features in the EHU are the St. Joe Divide, East Fork of Pine Creek, Big Creek and Placer Creek. The EHU is bounded by Pine Creek on the west and Lookout Pass on the east. Within the EHU there is a mix of ownership that includes National Forest System lands, BLM-managed lands, and private lands. Each EHU has a habitat goal developed in the forest planning process. Elk habitat values are also calculated for each compartment. However, the Forest Plan does not identify elk habitat potential goals at the compartment level. It is believed that the model is most accurate at the compartment level of analysis (communication with Idaho Fish and Game; PF Doc. WL-40).

The current elk habitat potential for EHU 8 is 64 percent, which is below the Forest plan goal of 74 percent (Forest Plan Appendix B, Summer Range Elk Management Plan; PF Doc. WL-R53). Compartments 116, 117, 118 119, 120 and 121 all have elk habitat potentials below 74 percent, reducing the overall potential in

EHU 8. The low elk habitat potential reflects the reduction of security areas due to trail use by motorized vehicles (ATVs). The elk population target for EHU 8 is 365. Even though EHU 8 does not currently meet the Forest Plan goal for elk habitat potential, the existing average elk habitat potential for the eastern half of the Coeur d'Alene River Ranger District (formerly the Wallace Ranger District) is currently 54 percent (USDA Forest Service, 1999, Douglas-fir Beetle Environmental Impact Statement; PF Doc. WL-R57). This is above the Forest Plan goal (which is 52 percent) for this area on the eastern half of the District.

Due to high elevations and deep snows, only a small portion of EHU 8 (including a portion of the Placer Resource Area) is managed as winter range. Aerial surveys during the winters of 1982 and 1987 by the Idaho Fish and Game found 91 and 125 wintering elk, respectively, on private lands, National Forest System lands, and BLM-managed lands in the vicinity of the Placer Resource Area. There is no high quality elk summer range (1987 IPNF Forest Plan Management Area 6) within the EHU. Mid-elevation habitat may provide transitional spring range for elk, particularly on BLM-managed lands. Brush fields on south-facing slopes in Placer Creek drainage, resulting from fires in the early 1900s, continue to provide forage habitat for big game (Figure WL-14). There is an opportunity to maintain this brush over time within the Resource Area to improve winter and forage habitat.

Steep terrain across much of the EHU probably limits elk calving habitat. The Resource Area provides 78 percent hiding cover and 22 percent of the land in openings. Roughly two thirds of the hiding cover stands also provide thermal cover. Thermal cover modifies climate extremes and helps animals to regulate body temperature during both the summer heat and winter cold. Snow depths are reduced beneath thermal cover canopies because conifer branches intercept snow. Most of the stands providing cover also provide some forage opportunities.

Figure WL-16. Brush fields in the Placer Resource Area.

Security: Large secure areas are important for big game. These secure areas are used for calving and fawning and rearing of young. In addition, they provide places for elk to escape from hunting pressure. The recommended minimum security is 20% in an area the size of EHU8. EHU8 is below the recommended security with only 9% of the EHU providing security. However, after buffering roads, the Resource Area has 17% of the area in one 2,137-acre block (PF Doc. WL-41). This security area is part of a 81,000 acre roadless block. Roads and motorized use are the biggest impacts to elk security within the Placer Resource Area. Currently there is less than one mile of road per square mile of land that are drivable with standard-sized vehicles.

Cover: Cover is not a limiting factor within the area. Large fires between 1910 and 1930 in the Placer Resource area have resulted in current dense cover throughout the project area. For 20-50 years following the fires the area provided large expanses of browse, but little cover for hiding or thermal regulation. Private lands and where management activities have occurred provide more open stands and browse currently. Cover values are incorporated into the elk habitat effectiveness model.

Environmental Consequences to Rocky Mountain Elk

As discussed, the methodology presented in *Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho* (Leege 1984; PF Doc. WL-R74) was used to evaluate current elk habitat potential. Changes in this potential are used to evaluate potential effects to elk habitat. The elk habitat potential model determines a numerical value for habitat suitability using factors such as the length of road, type of road, whether the road is open or closed and the distribution of forage and cover. When all habitat factors are optimal in abundance and distribution, elk potential is 100 percent. The Idaho Fish and Game recommends a minimum value of 50 percent or greater for general elk summer range (IDFG 1984; PF Doc. WL-R78).

Table WL-14. Percent Elk Habitat Potential During and After Project Activities.

Analysis Area	Goal	Existing/No-Action	Proposed Action	
			During Activities	Post Project
Elk Habitat Unit 8	74%	64%	63%	64%
Compartment 117	NA	52%	47%	51%

Table WL-15. Acres of Elk Security.

Analysis Area	Existing/No-Action	Proposed Action	
		During Activities	Post Project
Compartment 117	1,139 acres	1,139 acres	1,139 acres

Direct and Indirect Effects Under the No-Action Alternative: No short-term vegetative effects or changes would result from the implementation of Alternative 1. There would be a loss of forage habitat over time, as existing immature stands continue to move towards mature forest structure and vigor of brush continues to decline. As mature stands decline, there would be a reduction in thermal cover. Potential catastrophic stand-replacing fires could convert cover to forage.

Direct and Indirect Effects to Elk Under the Proposed Action: The elk habitat potential for the Resource Area would be reduced during activities because of reductions in security during implementation. This security reduction results from both new road construction and reconstruction of currently closed roads. Post sale, after all newly constructed roads and reconstructed roads are closed, Alternative 2 would have an elk habitat potential (EHP) 1% below the existing EHP within compartment 117. The 1% reduction in EHP for compartment 117 is due to a slight reduction in cover (78% reduced to 66%) and a segment of road currently brushed in is changed to a gate closure. The elk habitat model gives a lower value to gated roads than the same road with an earth barrier, brush or partial obliteration. A gated road is considered less secure. The EHP for the EHU would return to the existing value after activities are completed (Refer to Table WL-14).

No changes to security would occur with the implementation of Alternative 2; however, treatment of patches greater than 40 acres in size would provide large security patches in the future (50 years or more). Big-game forage would increase with the implementation of Alternative 2 (Table WL-15).

Cumulative Effects to Rocky Mountain Elk: The District has developed a new Travel Plan that will restrict motorized use (ATVs and motorcycles) to designated trails across the District (Placer EA, Appendix B). This will improve the effectiveness and size of the elk security areas within the Resource Area by reducing ATV access into portions of the analysis area where there currently are no restrictions.

Because the Forest Service has no jurisdiction over management of private lands, for modeling and analysis purposes it is not considered habitat for wildlife. However, the area may provide some values for wildlife.

Implementation of either alternative would result in the same road densities, because the District Travel Plan would be implemented under either alternative. Since the model is primarily sensitive to changes in roads

densities, the implementation of the Travel Plan would result in similar post-sale Elk Habitat Potential values for either alternative. Slight differences in post-sale Elk Habitat Potential values can primarily be attributed to the methods of road closures used under each alternative. For example, the elk model gives a higher security value to an obliterated road and a lower security value to a gated road.

The elk habitat model used is a cumulative effects model that includes past, current and proposed activities. Elk habitat potential was calculated for both EHU 8 and the Placer Resource Area (Compartment 117). Tables WL-14 and WL-15 display the percent elk habitat potential prior to, during, and after post-sale activities (including road closures) are complete, and the acres of elk security prior to, during and after sale activities. The Proposed Action would result in an increase in big-game forage. Forage is generally not considered a limiting factor for elk in the Coeur d'Alene Mountains at this time, however, forage takes on greater importance in the area since part of it is big-game winter range. Idaho Fish and Game, who manage elk as a hunted species and monitor their populations, insure elk viability.

3.M. Nongame and Land Bird Habitat

Affected Environment for Nongame and Land Bird (Neotropical Migrant) Habitat

Vegetation in the Placer Resource Area (and the non-game habitat it provides) has changed considerably over the last 100 years as a result of fires around the turn of the century and increased recreation in the area. The adjacency to Wallace and private lands has resulted in access into the drainage for a variety of recreational uses. No old-growth forest stands are found within the drainage. Currently, only 14 percent of the resource area is in the shrub/seedling/sampling vegetative structure. Small/medium sized tree stands make up 86 percent of the Placer Resource Area, while the mature and old component is absent in the area.

Figure WL-17. Ground Squirrel. (Photo source: National Images Library, http://images.fws.gov).

One of the effects of past fires is the decrease in old trees and the associated lack of snag and down woody habitat they provide. Almost all non-game species use large snags and down wood for some part of their habitat requirements, whether it is for nesting, cover, foraging substrate, or just resting. The loss of down woody has greatly reduced habitat for non-game. Some snag habitat is being provided as a result of insects and disease across the resource area. (PF Doc. SR-02; pages 3-9), but these are still small-diameter trees. Following harvest, stumps left on the ground can promote the occurrence of root rot in Douglas-fir. The mortality from this disease and other agents is currently providing some snags and down wood of smaller sizes.

Riparian areas are another important habitat for non-game species, generally providing large trees in the overstory, and a hardwood component. They are areas of abundant herbaceous vegetation on the forest floor and complex habitat structures including the bed and banks of the stream. Often they are associated with floodplains, ponds, or walls and wetlands. Placer Creek riparian area has been disrupted by roads and mining. Large stumps and snags in the riparian zone along Placer Creek indicate at one time this area probably provided optimal habitat for species such as the fisher and pileated woodpecker (Figure 3-WL-2). The 1910 fire, subsequent salvage, roads, along with their associated disruption of riparian habitat, and the trapping access they provide, have probably led to a reduction in forest non-game species.

Environmental Consequences to Nongame and Land Bird Habitat

There would be some reduction in snags in the resource area as a result of project activities, but snags would be retained at R-1 protocol levels (PF Doc. WL-53). Decreased canopy closure may result in less preferred

overall snag habitat in these areas. Refer to discussions in this section under some of the snag dependent-species such as pileated woodpeckers for more information on snag habitat in the Placer Resource Area.

Road construction or reconstruction may also result in the removal of snag habitat (Figure WL-1). Due to the frequency of harvests and fuelwood cutting near roads, snag availability has been generally shown to be one-third less within 200 meters of a road. If road density is high, there are few areas outside this 200-meter radius having natural snag levels; therefore, higher road density greatly increases the impacts of roads on snag availability.

Prescribed burns proposed in the Placer Resource Area are likely to create some additional snags now and into the future. Insects and diseases are prevalent in the Placer Resource Area and continue to create recruitment snags. The incidence of insects and disease in the resource area currently provides some snag habitat, but the large-diameter snags preferred by many wildlife species are limited. There are many live trees that are currently classified as immature that will provide large snags 50 to 100 years in the future.

Direct and Indirect Effects Under the No-Action Alternative: Taking no action at this time would allow changes in vegetation to continue. These changes may not be within the normal successional pattern due to management activities that have caused loss of seed sources and excluded fire from the system. White pine and western larch forests and the wildlife species associated with them, would remain below historic levels for the long term. Lack of existing seral species and associated seed sources may preclude these species from returning to historic levels. Root diseases would continue to kill the susceptible firs and hemlock, continually adding to snags and downed log recruitment of smaller sizes.

Figure WL-18. Historically, large cedars provided snags and downed logs along Placer Creek.

Some stands would move toward mature and old, but other stands would increase in mortality, as a result of insects and disease, and would experience a high degree of mortality in all age classes. This is likely to be more pronounced in the older trees that are more susceptible to the insects, diseases and fire. Some stands, particularly on the moister northerly slopes, would move towards climax species of hemlock, cedar and grand fir. As some of these moister site stands mature they may start to take on old growth characteristics, and some could eventually be added to the old growth allocation for the Old Growth Management Unit associated with the resource area. This trend towards old forest could benefit old growth dependent non-game species. The fire risk to wildlife habitat within the resource area would remain high due to lack of fuels reduction after decades of fire suppression and could set back the trend towards old forest (refer to the Specialist's Report on Forest Vegetation, PF Doc. SR 02).

Direct and Indirect Effects Under the Proposed Action: Brush field burning proposed would decrease cover and shelter for nongame species for five to ten years. The openings by harvest proposed under this alternative would reduce nongame habitat for those species dependent upon forested habitat. Reserve trees within the shelterwood units would provide some stand structure and diversity in the future and provide for future legacies (old, large trees) as long as these trees are not harvested at a future date. Loss of down wood as a result of harvest and down wood would decrease habitat quality for most nongame species.

This alternative would potentially result in the restoration of stands to have characteristics more similar to historical conditions over the long term (100 to 150 years or more), when the regeneration of healthy long-lived seral species like white pine and larch could benefit nongame species. There is some potential for the

spread of noxious weeds with the re-introduction of fire, which could affect foraging habitat for some non-game species.

Under the Proposed Action, the road construction could have a negative effect on nongame species, contributing to fragmentation and increasing disturbance and the potential for incidental trapping or random shooting. Even though the roads would be closed with a gate during project implementation and closed with barriers following the project, there would still likely be effects from unauthorized motorized use and increased access to those on foot.

Cumulative Effects to Nongame and Land Bird Habitat: Historic fires around the turn of the century have reduced the occurrence of large snags, down wood and old forests. Since that time, fire suppression has cause stands to become more dense, leading to high incidence of insects and disease. Restoration of fire as an ecological process in the Placer Resource Area would result in a trend toward historical conditions, and provide additional biodiversity with maintenance of brush fields on south-facing slopes.

Lands under other ownership in the vicinity of Placer Resource Area also provide habitat for nongame species. These lands provide low-elevation riparian habitats, meadows and the lowest elevation conifer habitats in the resource area. There are some activities planned within these private lands (Placer EA, Appendix B). Depending on their scope, these projects could have effects on nongame species in the resource area. The extent of those effects is difficult to predict as the plans of private landowners do not appear to propose major activities, but that could change over a short period of time.

Noxious weed treatments by the County would improve nongame habitat over the long term. Implementation of a fuel break along Road 456 would have slight impacts (some loss of brush, small trees and lower limbs of larger trees, reducing cover for nongame species).

Although some current habitat may be lost over the short-term as a result of proposed activities, taking no action could have similar effects. Efforts to trend stands in the resource area towards historic species composition and age structure and to maintain the ecological processes which created these conditions would eventually benefit nongame and land bird species.

4. Consistency with Forest Policy and Legal Mandates Related to Wildlife

Both alternatives would be consistent with Forest Plan management direction, goals, objectives, standards and guidelines for the management and protection of wildlife and species, as described below.

A. Elk

1. (a) Coordinate with the Idaho Fish and Game Department to allocate the distribution of habitat potential.

Idaho Fish and Game participated in the allocation of Elk Habitat Units and goals during the Forest Planning process, which is consistent with this standard.

1. (b) Identify and delineate existing and potential winter range for each elk habitat unit and establish goals for forage production suitable to support desired population levels, including such tools as designation of permanent forage areas, scheduling of timber harvest, and habitat movement.

The Forest Plan delineated winter range as a Management Area. Forage goals were identified during the development of the elk habitat suitability model. Permanent forage areas, scheduling of timber harvest and habitat shifts are analyzed with each proposed project.

1. (c) Utilize the "Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho" (Wildlife Bulletin No. 11, 1984, Idaho Department of Fish and Game) for evaluation of effects of proposed activities on elk habitat (Appendix Y, Idaho Panhandle National Forests Plan).

These guidelines have been incorporated into the elk suitability model.

1. (d) Include lands of all cooperators for habitat analysis where mixed ownership is within Elk Habitat Units.

There are no specific cooperators for habitat analysis. Private lands have been qualitatively analyzed, and plans for future management of these lands was requested for this assessment (EA, Part 2 and Appendix B).

B. Threatened and Endangered species

2. (a) Management of habitat and security needs for threatened and endangered (T&E) species will be given priority in identified habitat. Results of research regarding habitat of T & E species will be incorporated into management direction as it becomes available.

Habitat conservation strategies for Threatened and Endangered species address the habitat and security needs for these species. These are identified and analyzed in the Biological Assessment. Current and ongoing research information is used in the Biological Assessment.

2. (b) Biological evaluations will be done on any project likely to have an adverse effect on identified habitats or threatened or endangered animals.

A Biological Assessment and Biological Evaluations have been completed for all Threatened, Endangered and Sensitive species.

2. (c) Current direction for management of T & E species will be amended or revised to ensure conformance with Species Recovery Plans.

All current management direction for Threatened and Endangered species, including recovery plans and strategies, have been incorporated into the Biological Assessment.

C. Bald Eagle

5. (a) Nesting, feeding and roost areas will be protected in accordance with the Pacific States Bald Eagle Recovery Plan (Appendix W, Idaho Panhandle National Forests Plan).

There are no known nest, roost areas, or feeding areas within the resource area. If any such area were identified in the future, it would be and protected from disturbance in compliance with the Pacific States Bald Eagle Recovery Plan.

5. (b) Develop site specific bald eagle nest management plan for each located eagle nest on National Forest land as outlined in the Montana Bald Eagle Management Plan (Appendix II, Idaho Panhandle National Forests Plan).

There are no known nest sites on National Forest Land of the Coeur d'Alene River District. However, measures are implemented to provide protection when forest management activities could impact an active nest on adjacent lands under other ownership. There are no known nest sites near or adjacent to the resource area.

5. (c) Cooperate in research and surveys involving bald eagles on the Forest.

District biologists participate in annual winter surveys for bald eagles.

D. Gray Wolf

6. (a) In areas of reported occurrence, consider maintenance of a high number of prey species (deer, elk) and maintenance of security through road management.

The analysis of the gray wolf was based on maintenance of prey and security. Please refer to the Biological Assessment for further information.

6. (b) Forward information on reported sightings to the Wolf Recovery Team.

All information regarding possible wolf sightings are forwarded immediately to the Wolf Recovery Team.

6. (c) Cooperate in research and data collection involving wolf and wolf habitat.

District biologists cooperate with all wolf relocation efforts and report all possible sightings.

E. Other Wildlife

7. (a) Maintain at least minimum viable populations of management indicator species distributed throughout the Forest.

Viability analysis has been done for these species. Viability thresholds have yet to be developed at the Regional Level. For additional discussion, please refer to the analysis of sensitive and management indicator species in this report.

7. (b) Maintain habitat for cavity nesting species and foraging substrates by implementation of the IPNF Snag and Woody Down Timber Guidelines (Appendix X, Idaho Panhandle National Forests Plan).

Snag requirements for this assessment are described in this report (Features Designed to Protect Wildlife Habitat"). Based on these features, snag management would meet or exceed the requirements identified in the Forest Plan and in the Regional Snag Retention Protocol (USDA 2000; PF Doc. WL-R53, WL-R54). No snags are proposed for removal as a result of this project unless they pose a hazard to forest workers.

F. Sensitive species

9. (a) Manage the habitat of species listed in the Region 1 Sensitive species List to prevent further declines in populations, which could lead to Federal listing under the Endangered species Act.

All alternatives would comply with the Endangered species Act of 1973 as amended (ESA). Forest Plan standards (Forest Plan, Chapter II, pages II-26 through II-29; PF Doc. WL-R53), in compliance with NFMA (219.20 Ecological sustainability), were incorporated into both alternatives. These standards addressed elk and elk goals, threatened and endangered species, sensitive species and old growth management indicator species. Both alternatives are consistent with Forest Plan standards regarding allocated old growth. No harvest is proposed in allocated old growth or recruitment old growth under either alternative.

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WILDLIFE APPENDIX A
TES WILDLIFE SPECIES NOT ANALYZED IN FURTHER DETAIL

The wildlife analysis is commensurate with the importance of the impact (40 CEQ 1502.15), the risk associated with the project, the species affected, and the level of knowledge already on hand (USDA Forest Service, 1992; PF Doc. WL-R65. Some wildlife species or their habitat are present in the analysis area, but would not be measurably affected because they would not be impacted by the proposed activities, the impacts would not be sufficient to influence their use or occurrence, or their needs can be adequately addressed through design of the project. No further discussion or analysis is necessary for those species and/or suitable habitat that are not found within the resource area or for those which would not be measurably affected. These species and the rationale for dismissing them from further consideration are described below and in the Project Files (PF Doc. WL-48).

THREATENED & ENDANGERED SPECIES

Bald eagle: None of the proposed harvest units or helicopter flight paths would affect potential bald eagle habitat. There is no bald eagle habitat within 10 miles of the project area. Based on these features, this project would have no effect on the bald eagle.

Grizzly bear: The project does not lie within a grizzly bear recovery area. No grizzly bears have been sighted in or within 10 miles of the project area in over 10 years. Based on this, the project would have no effect on the grizzly bear.

Woodland Caribou: The only habitat for the woodland caribou is on the Priest Lake District near the Canadian border. There would be no effect upon the woodland caribou.

SENSITIVE SPECIES

Flammulated owl and Pygmy Nuthatch: Placer Resource area lacks dry-site habitat and ponderosa pine habitats preferred by the flammulated owl and pygmy nuthatch. There is no habitat for the flammulated owl and pygmy nuthatch within the resource area. Therefore no further analysis for these species is necessary.

Boreal toad: Boreal toads require shallow water in ponds, lakes or slow-moving streams for breeding sites. This species does not require much aquatic or emergent vegetation in its breeding habitat. After the brief spring breeding season, adult toads leave aquatic habitats and travel to a variety of upland habitats. Radiotelemetry research on boreal toads in southern Idaho found that toads can travel up to 2 kilometers (about 1 mile) from their natal ponds; it also showed that toads avoided crossing openings (Bartelt, 1994). Boreal toads in Colorado have been documented traveling up to 2.5 miles away (Loeffler, 1998).

Boreal toads hibernate in the winter in habitats with a high humidity and above-freezing temperatures. Areas that provide shelter for hibernating toads include rodent burrows, beaver dams and slash piles. It is important that toads be able to move among their seasonal habitats. According to Nussbaum et al., optimal habitat probably has moderate to dense undergrowth in more humid regions. The biggest potential barrier to their movements is roads. Steep roadcuts can be a barrier to toads moving between seasonal habitats. Juvenile toads are vulnerable to being killed by motorized vehicles when they are dispersing from their natal ponds. Preliminary analysis shows that inland Native Fish Strategy guidelines concerning riparian habitat conservation areas within 150 feet of the edge of wetlands would prevent sedimentation of toad breeding habitat. Road removal or improvement would benefit toads by eliminating a potential sediment and mortality source near the wetlands. It was determined that there were adequate design criteria to protect boreal toads and their habitat.

Common loon: Loons are large, heavy-bodied birds with their legs and feet positioned far to the rear. This allows them to propel quickly under water but renders them unable to walk well on land or to take off without a long expanse of water. They require lakes of at least 10 acres in order to gather enough speed to take off.

Lakes suitable for nesting are 10 acres or larger with emerging shoreline vegetation and secluded areas for nesting and brood rearing (USDA Forest Service, 1989). Loons have been sighted on Coeur d'Alene Lake and Fernan Lake. Since loons are located on lakes, the proposed actions would not affect habitat for loons. No further analysis and discussion is necessary for this species.

Harlequin duck: Harlequin ducks were sighted on the Coeur d'Alene River and the North Fork of the Coeur d'Alene in 1991. No harlequin ducks were found on the Coeur d'Alene River District during two years of surveys. Most recently a pair of harlequin ducks were spotted in Fern Creek during the summer of 1999. In 1982, harlequin ducks were seen in Tepee Creek. In 1987, there was a pair seen on the east end of the district, northeast of Cathedral Peak in the Coeur d'Alene River. The Idaho Conservation Data Base Center has no record of harlequin sightings in Placer Creek. A 1989 study of harlequin duck habitat in North Idaho concluded that one missing element in the Coeur d'Alene Mountains may be boulders and log jams providing mid-stream loafing sites (Groves and Wallen 1988). More recent studies have indicated that stone fly populations may be more important than stream structure in indicating suitability for the harlequin. In this case, sedimentation would have a direct impact upon a streams suitability for the harlequin. There would be no activities under any of the alternatives that would affect harlequin duck habitat or cause a change in streamflow. Water quality is expected to be maintained under all action alternatives (please refer to the "Watershed" section for a detailed discussion on water yield). Harvest and watershed restoration activities (i.e. culvert removal/upgrades) may increase sediment in localized areas, but no measurable effect would be expected. Road-related activities associated with the proposal would reduce existing risks to water quality. For these reasons, the risk factors to harlequin ducks have been avoided through design features. Therefore, no further analysis or discussion is warranted.

Northern bog lemming: The northern bog lemming is listed as a sensitive species on the IPNF. There are no known observations of this species on the Coeur d'Alene River Ranger District. The range of the northern bog lemming is not thought to extend south of the Kaniksu Forest on the IPNF (Reichel and Beckstrom, 1993). For these reasons activities in the Placer Resource Area would have no effect on this species. Due to the absence of the species from the District and the resource area, no further analysis of this species is warranted.

Peregrine falcon: Peregrine falcons are seasonal migrants nesting in northern temperate regions and wintering southward. Peregrines typically nest on cliffs higher than 100 feet with overhanging ledges and a vertical surface that provides protection from predation. Foraging areas are associated with nest sites and can include wooded areas, marshes, grasslands, and open water. There are no known historic eyries (nest sites) or potential nesting habitat in the Placer Resource Area. Peregrines have been observed around the Rathdrum Prairie in fall as they are migrating to winter range, and one individual was reported north of I-90 in 1993. Based on lack of suitable or potential habitat, and that there are no known occurrences of the species in the watershed, no further analysis is warranted.

Black swift: The black swift is a long-distance neotropical migratory bird that breeds in western North America in close association with mountain waterfalls or sea-side cliffs (Knorr 1961, Foerster 1987, Dobkin 1994 all in Schultz et al 2001). Known breeding populations are disjunct and are associated with highly specialized habitat characteristics (Schultz 2001). There are five known black swift nests near a waterfall approximately 20 miles north of the Placer Resource Area. This habitat is very specific and no similar habitat is found within the Placer Resource Area. . Based on lack of suitable or potential habitat, and that there are no known occurrences of the species in the watershed, no further analysis is warranted.

Specialist's Report on Recreation Access in the Placer Resource Area

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January 2006

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SPECIALIST'S REPORT ON RECREATION ACCESS IN THE PLACER RESOURCE AREA

1. Regulatory Framework For Recreation Access

Recreation goals and objectives identified in the Forest Plan (Forest Plan, Chapter II) are to provide for the projected use of developed recreation areas with development of new sites as budget becomes available, to provide for a variety of dispersed recreation opportunities (both motorized and non-motorized), to pursue opportunities to increase and improve the recreation trail system, and to continue to increase cooperative trail programs with organizations, clubs and other public agencies.

2. Methodology For Recreation Access

Determination of the existing conditions for recreation activities, facilities and opportunities is derived from facility inventories, facility maintenance work, observation by recreation specialists and technical personnel, and contact with recreation user groups and individuals. Guidance for management of recreation resources is provided in various National Forest manuals and handbooks, as well as professional publications and documents.

Forest Service Recreation Planners also make use of the Recreation Opportunity Spectrum (ROS) as a framework for understanding recreation facilities, opportunities and settings to meet the visitors needs for a desired set of outdoor recreation experiences.

3. Existing Recreation Access Conditions

A. Overview

The Placer Resource area represents a small portion of the Coeur d' Alene River Ranger District. Presently there are no developed campgrounds, picnic areas or other structural developments in the area. The area is important for recreation though for quality summer season and winter season trails. It is also important as a heritage resource that contains artifacts of events of the 1910 fire.

The setting for recreation activities is defined as the Recreation Opportunity Spectrum. The end product of recreation management is the experience people have. The key to providing most experience opportunities is the setting and how it is managed. Setting indicators include access, remoteness, naturalness, facilities, social encounters and visitor impacts. In the Placer area the setting varies from natural appearing from open roads to semi primitive with motorized use permitted, on trails within the Big Creek roadless area.

B. Trails

St. Joe Divide Trail #16 crosses the divide between the St. Joe and Coeur d' Alene River drainages. The total length of the trail is 26.7 miles, of which approximately 9 miles is within the Placer Resource Area. For the most part, the trail follows the divide ridge that forms the southern boundary of the area. This trail is maintained at a fairly primitive and moderately difficult skill level for all uses (hiking, horseback riding, mountain biking, motorcycles and ATVs). Much of the trail was widened to about 10 feet during mineral exploration activities in the past. This activity resulted in trail widths that accommodate ATV's. Since 1999, the Forest Service has worked on portions of the trail in the project area with the goal of improving safety and lessoning the environmental impact of motorized vehicles. The objective of the work was to widen portions of the trail to accommodate all users and eliminate the off trail impacts of people trying to detour around narrow spots on the trail.

Red Oak Trail #16a is another old mineral exploration road. It begins in Red Oak Gulch on the main road and climbs for 7.5 miles to junction with Trail #16. This trail is well suited to ATV use because the old road is sufficiently wide for safe travel.

Cranky Gulch Trail #39 is a single-track trail maintained for motorcycles at a fairly high level of difficulty. It begins at the confluence of Cranky Gulch and Placer Creek. Heavy use has caused substantial degradation to the trail surface to the point that it will need some reconstruction in the near future. This is the route of choice for those users who wish to access the St. Joe Divide Trail on a route that has no ATV use.

West Fork Placer Creek Trail #38 has not been maintained by the Forest Service for many years due to excessively steep grades in the upper one-third of its length. This trail was approximately 4.7 miles long and now is significant to the area as it is the access to the Pulaski Tunnel. The lower 2 miles of the trail is being reconstructed as a historic interpretive trail that focuses on events in August of 1910 when a massive forest fire swept through the area.

Experimental Draw Trail #6 is just 1.7 miles in length. The trail parallels the creek for the short distance and dead-ends. The trail was built to allow forestry researchers to access experimental tree growing sites within the areas burned in 1910. Today there are only limited recreation visitors to the trail.

Striped Peak Trail #107 borders about one-half mile of the western boundary of the Placer Resource Area. The 1.3-mile trail runs from a junction with Trail #16 to the summit of Striped Peak. Like many others in this area, the trail is an old mineral exploration road that is maintained for ATV use.

C. Snowmobile Trails

Road 456 is not plowed in the winter and once snowbound it is groomed for use by over snow vehicles. The road accesses the upper St. Joe country that draws snowmobilers from Idaho and Washington as well as other States. The City of Wallace has allowed snowmobiles to legally use city streets. The easy accessibility of the Placer Creek road to the City and the winter play ground to the south that the road leads too is of high importance to the community and visitors. The groomed route also facilitates access to off trail riding of snowmobiles along the St. Joe Divide. While such riding presents a high degree of difficulty, technological improvement of snowmobiles has made off trail high country more accessible.

D. Inventoried Roadless

About 2,763 acres of the Placer Resource Area are within the Big Creek Roadless Area #1143 (which is 81,000 acres in total size). Recreation management within the area presently allows motorized trail vehicle access on designated routes. All the trails in the Placer portion of the roadless area are managed for motorized use as described above. There are few encounters with other people on trails in the Placer portion of the roadless area (20 people or less per day). Most of the trails in the Big Creek portion of the roadless area are also managed for motorized use, although ATV use is more restricted. Overall the area offers a visitor the opportunity for a sense of solitude, challenge and self-reliance with no developments other than trails. Forest Service managers are challenged to limit motorized vehicles to designated routes within the area. Regulation, signing, and improvement of trails is being used to encourage better compliance with use limitations.

E. Other Existing Recreation Activity

Camping in the Placer area is done in undeveloped places and is mostly related to hunting in the fall season. Most summer season campers continue on to the St Joe River country where there is greater opportunity for solitude and water based recreation such as fishing or floating. Big game hunting is popular due to convenience of access to the area.

Berry picking along the good huckleberry growing high ridges is a popular activity in the late summer. Many people enjoy driving along the Placer Creek road. The experience of being in a wild-land setting is readily available from the boundary of the City of Wallace.

4. Environmental Consequences to Recreation

A. Effects Under the No-Action Alternative

Existing recreation developments and opportunities would not be affected under the No-Action Alternative. However, wildfire poses some risk to the quality of recreation in the area. If fuels continue to build up there is a remote potential for a recreation visitor to be the source of ignition that kindles a major fire. Burned trees and possible erosion caused by vegetation burnout could damage trails.

B. Effects Under the Proposed Action Alternative

Other than continued trail maintenance, no recreation projects are proposed under the Proposed Action. Existing recreation developments and opportunities would not be affected. There would be less risk to the quality of recreation in the area as a result of wildfire, since the intensity of potential wildfires would be reduced following treatment.

A brushfield burn proposed within the Placer Creek portion of the Big Creek Roadless Area is consistent with the management of semi-primitive, roadless locations. Moderately sized burn areas are considered a natural feature of wild lands. The burn operation would not involve use of ground disturbing vehicles or fire line excavation.

Six helicopter-landing pads are proposed within the roadless area. The purpose of the helicopter landing sites would be to drop off or pick up small groups of firefighters in the event of wildfire in the area. Installation and maintenance of these sites is consistent with roadless area management if vegetation removal is of small scale and inconspicuous; there is no painting of numbers or pad delineation done on the ground and that there is no excavation involved. It is recommended that the sites be mapped with a GPS system. Marking on the ground must be avoided.

The management activities proposed in the Placer project within the roadless area are not considered to be an irreversible or irretrievable commitment of resources that could have serious environmental consequences. Effects of burning are temporary. Smoke produced by the burn affects the area for only a few hours. The burned landscape is blackened but vegetative re-growth begins soon after. One to two years following the burn the effects are barely noticeable and indeed the site may be enhanced by vigorous growth of brush and wildflowers. The position of the burn unit on a steep slope far from roads and trails would not invite off highway vehicles or snowmobiles to the site.

The integrity and manageability of the roadless boundaries would be unchanged.

Noise from operations in and near the roadless area would be temporary. Helicopter motor and rotor noise might be expected to varying degrees, but decibel levels generated would fall well short of the uncomfortable range. The Big Creek Roadless Area allows motor vehicle on trails, so a certain amount of motor noise is already a feature of the area.

The effects of other vegetative treatment on recreation vary, but all can be rated as temporary events that mainly impact season of use on some of the trails in the Placer Resource Area. The Red Oak Trail would be most affected, since the trail-road would be used as a timber haul route for units located to the south of the main ridge on which the trail is located.

Road 456 is vital to winter snowmobile recreation in the Silver Valley, therefore winter log haul or road based operations must be avoided between early December and late March.

Some of the proposed burning may close roads and trails for short periods (at most a few days).

Smoke, dust and noise are short-term effects of the proposed operations. These may cause delay and disturbance for visitors to the Placer area.

5. Consistency With Forest Plan and Other Legal Mandates for Recreation

The Forest Plan identifies specific goals and objectives related to providing a variety of recreation opportunities and settings (Forest Plan, pages II-1 and II-3; PF Doc. CR-002). The following standards apply to recreation management:

1. The Forest will continue to provide a share of recreation opportunities and diversity in relation to other public and private entities; recreation planning and operations will be coordinated with other federal, state, local and private recreational managers.

All alternatives would continue to provide a diversity of recreation opportunities. Coordination with other recreation managers is done on an ongoing basis throughout the Coeur d'Alene River Ranger District. Based on this information, all alternatives would meet this standard.

2. Forest Service recreational programs will be complementary with other public and private programs where possible.

Recreational programs on the Coeur d'Alene River Ranger District are complementary with other recreational programs provided by county, state, and private facilities. The Pulaski Trail development directly responds to this direction in that it is a public-private partnership.

3. Consult with recreational users and other recreational suppliers to coordinate public needs.

Consultation occurs with recreational organizations on an ongoing basis, and with the recreating public at large through project scoping. Recreation needs in the Placer area have been considered and would be provided under either alternative. Based on this information, both alternatives would meet this standard.

4. Evaluate and authorize service by the private sector on National Forest lands that complement National Forest objectives.

There are currently no recreation service permits authorized in the area. There are no applications on file for such services at the time of this writing. This standard does not apply to the project.

5. Continue existing private recreation uses of National Forest lands only on lands that are not suitable or not needed for public use, providing that long-term public interest is protected.

There are no existing private recreation uses (such as a leased cabin or resort) provided in the Placer Resource Area, therefore this standard does not apply.

6. Additional recreational sites will not be permitted.

There would be no additional recreation sites permitted under either alternative; therefore both alternatives would meet this standard.

7. Provide a broad spectrum of dispersed and developed recreation opportunities in accord with identified needs and demands. Enhance user experience by on and off-site interpretation.

A broad spectrum of dispersed and developed recreation opportunities are provided in the Placer Resource Area in response to public needs and demands. The Recreation Opportunity Spectrum (ROS) classification system has identified the area as having a "roaded natural and a semi-primitive motorized" setting. Geography of the Placer drainage limits developments to trails and limited dispersed recreation sites. The development of the Pulaski historic interpretation trail directly addresses this guideline in the Forest Plan.

8. On proposed developed sites treat and maintain timber stands in a manner compatible with recreation objectives prior to development.

Current recreation objectives would be maintained under both alternatives, and potential for future recreation developments would be unaffected. Based on this information, both alternatives would meet this standard.

9. Trailhead facilities in dispersed areas will be minor and limited to resource protection. Off-site interpretation is encouraged.

At this time, none of the existing trailheads in the area warrant expansion, although there will be some clean up of loose rock around the existing trailhead, and parking stops installed. Due to the trend of increasing recreation visitation, expansion may be needed in the future. At that time, trailheads would be improved to protect natural resources. Such improvements would occur under either alternative; both alternatives would be consistent with this standard.

10. Trails will be managed in accordance with management area requirements as identified in a more site-specific analysis of needs.

The No-Action Alternative would not have any affect on area trails. Under the Proposed Action, standards for trails would be met.

11. Cooperate with the State of Idaho in developing a joint management agreement on the Lower Priest River.

The Lower Priest River is not located in the Coeur d'Alene River Ranger District; therefore this standard is not applicable to the Placer Resource Area.

12. Maintain the free flowing characteristics of rivers identified as eligible for consideration as part of the National Wild and Scenic Rivers System pending suitability. Identified rivers will not be modified to the degree that eligibility or classification would be affected.

There are no eligible rivers within the resource area; therefore this standard does not apply.

13. Maintain free flowing and related characteristics of the Lower Priest River and Moyie River until prescribed guidelines in cooperative agreements or ordinances have been approved per River Study recommendations.

The Lower Priest and Moyie Rivers are not located in the Coeur d'Alene River Ranger District; therefore this standard is not applicable to the Placer Resource Area.

Specialist's Report on Scenic Resources in the Placer Resource Area

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January 2006

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SPECIALIST'S REPORT ON SCENIC RESOURCES IN THE PLACER RESOURCE AREA

1. Regulatory Framework and Methodology for the Scenic Resources Analysis

Scenery management direction is provided by the Forest Plan and is described in terms of Visual Quality Objectives. The objectives are based on the area seen from sensitive travel corridors and on other features that result in a high visual sensitivity level. The visual management system was revised in 1995, and is now known as the Scenery Management System. The revised guidelines are provided in "Landscape Aesthetics: A Handbook for Scenery Management," (USDA Forest Service, 1995).

2. Existing Scenic Resource Conditions

The Placer Creek drainage is steep and highly incised with swift flowing steams. The ridges are heavily timbered but there are numerous brushy openings where trees are sparse. The high country along the St. Joe Divide features very scenic rocky prominences and open grassy ridges. The exposed rock adds a great deal of color and diversity to the scenery. The trees in the drainage are primarily conifers and are uniformly forest green in color. Western larch trees add more color variation in the fall season as they change from green to bright yellow. The brush fields on many of the south slopes also add color to the scenery.

A conflagration forest fire swept the Placer area in 1910. Evidence of this event is not readily identifiable to the casual visitor to the area. The trained eye will notice that the many brushy sparsely timbered slopes are evidence of soil scorching fire conditions. A charred snag may be noticed along some of the trails and roads. Like a dark ghost these snags are reminders of the mighty old growth forest that stood in the area prior to August 1910.

The Idaho Panhandle National Forest Plan identifies the City of Wallace and Interstate Highway 90 as having high sensitivity and concern for the scenic condition of adjacent forest and terrain. Do to the steeply walled canyon at the mouth of Placer Creek very little of the area is observable from the above locations.

The next location for concern with scenic quality is along the route of the Placer Creek Road, number 456. Another point of interest for scenery lies along the trails in the area that are described in the Recreation Existing Condition section of this document.

Views of the surrounding terrain are limited on the lower portions of the 456 road due to the steepness of the canyon. Views from the road open up as it climbs to the St. Joe Divide. Views from the trails are generally wide and sweeping as many of the trails traverse open ridge tops.

Views from the road and the trails are lessoned in sensitivity and concern as compared to habitations as in a community. Observations from travel routes are transitory and constantly changing as a traveler moves along. The steep slopes next to the road and the rough nature of the trails also tend to keep a travelers attention focused on staying on the route rather than viewing scenery. Identified travel corridors are assigned a visual sensitivity level rating of two in the IPNF Forest Plan.

Forest Plan Visual quality objectives vary from *partial retention* of the scenic integrity to *modification* of landscape vegetation. Partial Retention of scenic conditions means that management activities may be evident to the observer but borrow from natural occurring forms. For instance, a logged area may be evident to a viewer as a human management activity but the boundary lines, unit shape and remaining vegetation should mimic openings that might occur naturally such as following a wildfire or openings related to thin soil or rocky patches of ground. Modification visual quality objectives allows for a bit more aggressive approach than the former prescription but still should attempt to borrow, as much as possible from natural forms.

3. Environmental Consequences to Scenic Resources

A. No-Action Alternative

With no proposed activities, there would be no direct or short-term effects to the scenic condition of the area. Over the long term, increasing vulnerability to wildfire in the area may bring detrimental changes to the scenic conditions (such as blackened landscape, loss of vegetation, etc.).

B. Proposed Action Alternative

Under the Proposed Action, none of the proposed vegetative management units could be observed from high sensitivity locations in Silver Valley communities or along the Interstate corridor. Of next concern is the route along Road 456. The road parallels Placer Creek through the project area. All of the proposed burn units except that one in Experimental Draw and one in West Fork Placer Creek would be visible from the road. Burns of the brush fields and thin timber areas are activities that borrow from natural occurrences. Most fire effects are temporary. Immediately following a burn the blackened landscape is obvious to most observers. In a seasons time the same ground will be supporting vigorous growth of grasses and new brush germination. In some instances the release of the fresh growth is an improvement over the existing condition. Consequently, all burn units would meet partial retention visual quality objectives from all viewpoints.

There are a number of proposed harvest units that would be visible from Road 456. Units 6 and 13 would be readily observable from the road. These units are considered foreground in nature and fall into the partial retention visual quality objective. The units would be harvested as shelterwood cuts, which would leave 15 to 20 trees per acre standing. The remaining trees mitigate the effects of the opening and as they are in a foreground view the remaining trees help to create the appearance of an open stand that mimics the same stands that often occur in unaltered settings. It is critical that burning under the remaining stand of trees be done carefully so the remaining trees remain alive to serve as the mitigating effect to the harvest unit's impact on the scenic condition in the area.

Units that are proposed for thinning that can be observed from the road are the group that is located south of Placer Creek between Line Gulch and Moon Pass. Thinned logging units are not visually dominate and are very often overlooked by observers. The group of units individually and as a whole will meet partial retention visual quality objectives.

Also proposed is a thinning and pruning of trees and brush along the length of Road 456. The VQO directive for this linear zone is partial retention of foreground views. This action should meet visual goals fairly easily with good cleanup of logging and brushing debris.

Many of the management activities in the Placer area are observable from segments of all trails in the area. The trail most affected would be the Red Oak Trail, where the trail on the ridge top would temporarily serve as a log haul route as well forming the top boundary of several logging units. As with the road, burning is not considered a long- term impact to visual quality.

The units that string along the Red Oak Trail all are proposed for shelterwood or thinning and are all foreground views from the trail. Foreground views are the most easily mitigated by leaving a reserve of trees in the units. All the units would easily meet the partial retention VQO as observed from this trail. Shelterwood units will appear much more open but being that the units are oriented down slope from the trail the effects will be mitigated. Tree stumps are often the most invasive element of close foreground views so the fact the units drop steeply away from the viewer will hide the visual impact of stumps. With careful underburning all units along the Red Oak Trail would meet the VQO.

Trail 16 adjoins the Placer area along the south boundary but most of this trail is screened from views of the area by topography being that the trail lies mainly on the south slope of the St. Joe Divide Ridge. The trail swings over to the northern slope opposite Cranky Gulch but no harvest units are visible from this point.

A cluster of regeneration units in the upper West Fork of Placer Creek may be visible from the Striped Peak Trail 107 for a brief exposure. The units are middle ground and rate as modification as seen from this trail

and would meet visual quality objectives. The proposed Pulaski Trail is adjacent to a burn unit in the West Fork but as explained, the temporary effects would meet the partial retention VQO. The Pulaksi Trail construction will have no effect on VQO ratings.

The Specialist's Report on Recreation (PF Doc. SR-08) describes in detail the activities proposed in the Placer portion of the Big Creek Roadless Area. These would have no effect on the natural appearing landscape and scenic quality of the IRA. Some of the proposed logging and burn units outside of the roadless area could be seen from trails within the roadless area. The effects are measured using the Forest Plan visual analysis guidelines discussed above. Under the Proposed Action, natural appearing landscapes with high scenic quality would be maintained.

4. Consistency with the Forest Plan and Other Legal Mandates for Scenic Resources

The Forest Plan identifies specific goals and objectives related to protection of visual (scenic) quality (Forest Plan, pages II-1 and II-4). The following standards (Forest Plan, pages II-25 and II-26) apply to visual management:

1. Meet adopted visual quality objectives (VQO's). Exceptions may occur in unusual situations; these will be identified through the project planning process involving an interdisciplinary team…Mitigation measures should be developed for areas when VQO's are not met.

All alternatives would be consistent with this standard. The No-Action Alternative would have no short-term visual effects because no openings would be created by timber harvest. The Proposed Action would affect the scenic condition in the area as observed from Sensitivity Level 2 locations. VQO's would be met if harvest areas that are under burned maintain a living stand of trees at about 15 trees per acre.

2. The visual resource has been evaluated based on visual sensitivity levels assigned to travel routes, use areas, and water bodies in and adjacent to the IPNF. Adjustments in VQO boundaries based on project level analysis will conform to principles in FSM 2380.

There would be no adjustments to VQO boundaries under either alternative; therefore both alternatives would be consistent with this standard.

Specialist's Report on Finances Related to the Placer Resource Area Proposal

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January 2006

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None

SPECIALIST'S REPORT ON FINANCES
RELATED TO THE PLACER RESOURCE AREA PROPOSAL

1. Regulatory Framework for Finances

Forest Service policy sets a minimum level of financial analysis for timber sale planning (Forest Service Handbook 2409.18 section 32; PF Doc. FIN-R3). The level of timber harvest is important not only in providing jobs in the timber industry, but also through indirect and induced impacts on other business sectors as well (Forest Plan, page IV-47). One of the seven major issues for the Forest Plan was community stability (Forest Plan, pages 1-8; PF Doc. CR-002).

2. Methodology for Analysis of Finances

This analysis deals with the project-level financial attributes of the action alternative and a qualitative discussion of the loss of timber resource value if no timber is harvested, which helps display the effects of the No Action Alternative. The financial analysis was used to determine the economic feasibility of accomplishing the project using a timber sale. This analysis will essentially determine whether selling the trees to be removed is a cost effective tool to achieve objectives of the purpose and need, considering the value of timber sold versus the cost of road work, fuel treatment, regeneration and other mitigation measures described in the Placer Resource Area EA, Part 3.

To arrive at the expected predicted high bid, a Transaction Evidence (TE) appraisal was used to determine the potential value (referred to as "stumpage") of trees removed (PF Doc. FIN-9). The TE appraisal method predicts the value of timber through the use of several independent variables developed from recent similar sales within Region 1 of the Forest Service (northern Idaho and western Montana). Since the information used is from actual bidding, current local market conditions and production costs for logging and milling are reflected in the predicted rate. There is currently a rollback factor incorporated into the appraisal program to account for the existing market condition.

Actual District costs were used for fuel reduction, site preparation and planting (including overhead), road reconstruction, road maintenance and erosion control. These direct costs are deducted from the expected stumpage value. All unit information, logging systems, and costs can be found in the Project Files (PF Doc. FIN-1, FIN-3 through FIN-7, and FIN-12.

Non-commodity values were not included in this analysis because these resources are evaluated under each specific resource section. Title 40, Code of Federal Regulations for NEPA (40 CFR 1502.23) states, "For the purposes of complying with the Act, the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost benefit analysis and should not be when there are qualitative considerations." Qualitative effects on resources are documented in individual resource sections.

This analysis focuses on the direct and indirect effects of proposed activities. Past, present and reasonably foreseeable activities on National Forest, Bureau of Land Management and other lands within the project area would not have an effect on the economics issues for this alternative. Therefore, there would be no cumulative effects.

3. Existing Condition of Finances

Within northern Idaho, the Forest Service has been offering for sale 11 to 12 percent of the timber that was on the market the last few years. This figure is down from approximately 33 percent of the timber harvested during the late 1980's to early 1990s, which matched a trend throughout the western U.S. (Keegan III, et al, p.9; PF doc. FIN-R4, p. 25). Keegan co-authored *Idaho's Forest Products Industry: A descriptive Analysis 1979-1996* that provides a detailed look at the causes of the timber market fluctuations, and the effects on both the local and national economy, over the past 20 years. The report also notes that the net growth of timber on national forests "exceeds harvest by several fold…"

For the past several years (prior to 2003) sales of timber from National Forest System lands in the Idaho Panhandle have been flat, matching the lumber/stumpage prices, and the number of jobs in the lumber and wood products industry has fallen locally. During 2003-2004, stumpage prices began to rise, as attested by the bid-up amounts in timber sales (PF Doc. FIN-R1). Besides the ongoing rate of growth for the local and regional area, several factors affect the timber market throughout a year and from year to year. These factors include interest rate adjustments, trade negotiations with Canada, tax cuts (or increases), and the mix of species and yarding systems in a sale contract. Stumpage prices are noticeably down across the United States at present, largely due to imports of inexpensive timber from other countries, but they are expected to be on the rise again.

4. Financial Consequences

A. No-Action Alternative

Under the No-Action Alternative, there would be no timber harvest, road reconstruction, site preparation or planting. There would be no monetary costs or revenues associated with this alternative. Not managing the forest vegetation in this area would result in a loss of productivity over the long-term in the lodgepole pine stands, due to insect and disease mortality. There is significant beetle activity occurring on the Idaho Montana divide leading to thousands of acres of mortality and a serious increase in fire hazard. The same situation will occur in Placer due to the age of the lodgepole pine stands in this area. There will also be a loss of larch (a desired seral species more resistant to insect, disease and more capable of surviving wildfire) due to competition if we do not harvest the adjacent trees. This alternative would forego the opportunity to provide usable wood products to the local economy from merchantable-sized trees.

B. Proposed Action Alternative

Implementing stand-management treatments would depend on having financially viable timber sales that the local forest products industry is willing to purchase, or the availability of appropriated/other funding.

Table FIN-1 provides a summary of the financial appraisal from the proposed action. The predicted high bid uses the stumpage value of timber removed (based on size, species and volume, planned yarding methods such as helicopter, skyline, tractor, and hauling distance), then deducts the contractual costs (fuel treatment, road costs, erosion control) from the value of the timber. The minimum bid is then determined by adding the cost of stand regeneration as well as the roll-back factor used to adjust the TE equation to better reflect current bid prices.

The appraisal for the proposed action was run using two different time frames; one with the current indices which are at a low point, and one with indices from October of 2004 to reflect the variability of the predicted high bid based on market conditions. The current indices are rising, but it takes several months for the appraisal system to catch up with the market.

Table FIN-1. Predicted high bids, value and timber volume.

	No Action Alternative	Proposed Action (Current Indices)	Proposed Action (October 2004 Indices)
Total estimated CCF/MBF	0	8,356 / 4,178	8,356 / 4,178
Predicted High Bid	0	$12.33/ccf	$49.85/ccf
Minimum Bid		$13.82/ccf	$22.88/ccf
Minimum advertised value	0	$115,478.00	$191,144.72

As shown in the above table, under the current indices, the minimum bid must be raised to cover the costs of regeneration and the roll-back factor. Under better market conditions, the predicted high bid will far exceed the minimum bid.

Costs associated with burning the 1,183 acres of brushfields are estimated at $75/acre using a helicopter and torch. These dollars are not tied to the timber sale, but will use appropriated hazardous fuels reduction dollars that are available to the District every year. The cost of reconstructing Road 330 is fairly high because of the

existing narrow base as well as the blasting and end-haul required along the upper portion of the road. This cost was discussed with the Resource Advisory Committee (Secure Rural Schools and Community Self-Determination Act of 2000), which provides increased funding to counties, a portion of which is designated for projects on National Forest System lands. Once a decision is made on this project, a proposal will be made to the RAC for funding this reconstruction.

5. Financial Consistency with the Forest Plan

Forest-wide goals, objectives and standards for finances are not specifically addressed in the Forest Plan. This issue was addressed indirectly in the discussion of community stability. Chapter II of the Forest Plan states, "management activities will continue to contribute to local employment, income, and lifestyles. The Forest will be managed to contribute to the increasing demand for recreation and resource protection while at the same time continuing to provide traditional employment opportunities in the wood products industry." (Forest Plan, p. II-11; PF Doc. CR-002.) The proposed action would meet this direction.

6. List of References Cited in the Financial Analysis

Keegan III, et al. Idaho's Forest Products Industry: A descriptive analysis 1979-1996. *PF DOC. FIN-R4*

USDA Forest Service, 1987. Forest Plan for the Idaho Panhandle National Forests. *PF DOC. CR-002*

USDA Forest Service, 1999. Timber Sale Preparation Workbook, FSH 2409.18, WO Amendment 2409.18-99-6. 20 pp. *PF DOC. FIN-R3*