

Wildfire Existing Conditions

Natural wildfire has played a major part in the vegetative dynamics of the northern Rocky Mountains ecosystems. Prior to effective fire suppression, natural fire played a major role in shaping and developing the vegetation and ecosystems within the analysis area. “Pre-1900 fires were characterized by less stand replacement burning and more mixed severity fire and non-lethal understory burning. Much of the pre-1900 burned area was in ponderosa pine and pine-mixed conifer types that burned frequently but primarily in non-lethal understory burns”(Barrett, et. al., 1997). Natural fire history records for the Clearwater National Forest indicate frequent large fires, often well over 1,000 acres, burned within and adjacent to the analysis area (see fire occurrence map at the end of this section). These fires contributed to a mosaic of vegetative conditions, reduced ground and ladder fuels, thinned stands, and favored large, fire resistant tree species. Much of the Lochsa River Basin was burned between 1910 and 1934. The 1910, 1919, 1924, and 1934 fires burned a total of 77,100 acres (61%) of the NLF analysis area at various intensity levels. Several of the major drainages burned 2 to 3 times between 1910 and 1934. Most of these double/triple burns retarded natural forest succession, creating extensive seral shrub fields still present today.

There are a wide range of natural fire regimes present in the North Lochsa Face area, from low- to mixed-severity events with mean fire return intervals of 26-50 years, to lethal (stand-replacing) severity on some of the old surfaces with mean fire return intervals of 300+ years. Natural fire affected landtype associations with varying intervals and intensities. On steep, dry landtypes within the NLF, natural fires typically occurred frequently and were characterized by low-severity (smoldering and creeping on the forest floor) that favored survival of large, fire resistant trees (such as ponderosa pine and Douglas fir). On steep terrain and terrain with deeper soils, natural fires typically burned in the forest understory, occasionally killing patches of overstory trees. Resulting forest conditions following a mixed-severity burn was mosaic containing of relatively unburned moist habitats (such as riparian areas), partially burned stands typically dominated larger, by fire resistant trees (such as Douglas fir, western larch and ponderosa pine). On gentle terrain, such as wide stream bottoms and areas of abundant moisture, infrequent (300+ years) high-severity events. In high-severity fire events, most trees are killed; isolated small patches of relatively undisturbed forest “missed” by the fire, however, continue to survive. Within these general descriptors of mixed- and high- severity natural fire events, isolated fires of lesser intensity and scale (such as single-tree fires and other fires ranging 1 to 10 acres) occurred at intervals less than the typical fire regime intervals, described above. Specific descriptions of Clearwater Forest LTA's and fire regime characteristics are available in the project file.

The role of natural fire has been reduced due to effective fire suppression. There were approximately 450 natural fires suppressed in the North Lochsa Face analysis area between 1955 and 1994. It is likely that one or more of these natural fires would have

altered forest vegetative patterns to more historic conditions. Forest character on much of the NLF landscape has changed to dense stands of small diameter, fire susceptible tree species insects and disease patterns, partly as the result of increased competition between trees and partly as the result of non-native pathogens (i.e., whitepine blister rust and balsam wooly adelgid). Subalpine fir in the NLF is infested with balsam wooly adelgid and there has been notable mortality in fir of all ages, which has increased tree mortality above natural conditions. Until biological controls are found for this insect, it is not likely that subalpine fir can be maintained as a major stand component. Where there is a subalpine fir component, higher fire risk and more intense fire behavior can be expected. These changes in forest fuel conditions have altered fire regimes within the NLF, from events of low or mixed-severity to disproportionately large, high-severity fires.

Fire suppression has interrupted the role of natural wildfire in much of the NLF, particularly on breakland and colluvial midslope landscapes. This exclusion of natural fire regimes has been a major factor in the increased severity and number of wildland fires. An assessment of the current potential for large wildfire occurring by landtypes was conducted for the NLF using factored topography, woody fuels, weather, fire history, fire severity factors (spread, intensity, torching, spotting, crown fire), and landscape connectivity, to arrive at an overall fire potential rating. That report (Clearwater National Forest, 8/11/95) indicated that breakland LTA's (21/23A and 21/23B) colluvial midslope (LTA's 61/63) were consistently characterized as currently having high potential for large wildfires. Fire severity factors of steep terrain, unnatural accumulation of dense forest stands and dead wood, and the likelihood that many of these sites currently containing mature forest stands would have had understory burns or mixed-severity fire, combine to indicate a current (and increasing risk) of large wildfire(s).

Stand densities in the North Lochsa Face analysis area are generally increasing, largely due to successful suppression of fire over the last 60 years. The density of vegetation influences the type and severity of fire that will occur in a stand. Competition for nutrients, sunlight, growing space, and moisture increases as density increases, causing stress to the trees and eventually reducing vigor. Density affects tree vigor and, therefore, susceptibility and spread of insects and disease through timber stands. Reduced vigor in turn makes trees increasingly susceptible to the lethal effects of insects and disease. Many of these dense stands now support active root disease centers with associated bark beetle mortality. When compared to historic conditions, an estimated 28,000 acres within the NLF Analysis Area have a high density of trees.

Areas that have not burned, or only under story burned, and which have not been harvested, have higher levels of dead wood on site. The breaklands, in particular have a higher component of standing dead because there have been increased levels of root rot and bark beetles due to increased stem density. Areas particularly at risk are mature forest stands in Apgar and Rye Patch Creeks, and 'face' drainages. These areas are comprised of at least 75% breakland and colluvial midslope landtypes. Additional areas at risk (where of at least 35% of the watershed is breakland and colluvial midslope landtypes) include the lower elevations of Canyon, Deadman and Glade Creek and portions of Pete King Creek (particularly in Walde Creek). In the Canyon, Apgar, and Glade Creek drainages, many stands have high levels of dead standing wood, due to extensive insect

and disease activity. Dead wood is lacking where multiple fires burned in the early 1900s (Lower Pete King Creek, the east half of the Deadman drainage, the face of the Lochsa in much of the area from Deadman to Fish Creek, and the lower Fish and Hungry Creek watersheds). It is likely, because of the effective interruption of the natural fire cycles in these areas, that resulting large wildfires would be severe (i.e., larger, more intense, greater large-tree mortality and higher risk of soil damage) than occurred historically on these landtypes.

Because of the effects of random events (i.e. weather, ignitions source/timing, and fuel moisture), it is impractical to predict wildfire locations or severity. It is reasonable, however, to predict that continued fire suppression in many of these areas would only delay inevitable large, more intense wildfires causing unwanted resource impacts. The current risk of uncontrolled fire supported by unnatural accumulations of fuels is undesired. While disturbances, which mimic historic wildfire regimes, are considered desirable, completely restoring more natural fire regimes to the ecosystem is not feasible. The re-introduction, therefore, of prescribed fire should be done on a limited and controlled basis.

Programmatic Forest Plan Amendment

The Forest Plan, Appendix D, Table D-1, designated maximum acreages, by management area, that a wildfire is not to exceed. Current Forest Service Manual directs that initial suppression action be taken to provide for the most reasonable probability of minimizing fire suppression cost and limit resource damage, (consistent with expected fire behavior, environmental impacts, firefighter and public safety, and smoke management considerations). Forest Plan acreage limits often conflict with Forest Service Manual direction to suppress wildfires at minimal costs, while providing for firefighter safety and resource protection.

Based on the NLF analysis and direction provided in the *Wildland and Prescribed Fire Management Policy - Implementation Procedures and Reference Guide (1995)*, an amendment to the Forest Plan was identified to reconcile conflicts in fire suppression direction. Forest Service policy permits Forest Plan amendments resulting from analyses conducted during Forest Plan implementation [36 CFR 219.10(f) and FSM 1922.5]. The amendment will change the Clearwater Forest Plan, Table D-1, Column 7, “maximum burn acres for wildfire” to “unscheduled” (i.e., to be determined using site-specific conditions present at the time of the event).

The amendment will apply to management areas A4, A6, A7, C3, C4, C6, C8S, within the North Lochsa Face analysis area (including lands to be managed as B2, as per the Forest Plan lawsuit settlement stipulation of dismissal).

Wildfire Environmental Consequences

The following section discusses the environmental consequences of each alternative on wildfire risk. Direct impacts are presented in terms of acres treated, scale, intensity and costs of treatment. Indirect impacts are associated with risks to healthy forest stands and commercial timber. Cumulative impacts address fire regimes (intensity, scale and vegetative expression) at the landscape level.

Mixed severity fire causes selective mortality in dominant vegetation, depending on different species' susceptibility to fire, or varies between understory and stand replacement. Mixed severity fire ranges from low-intensity understory fires to high-intensity stand-replacing fires that produce a mosaic of vegetative patches. This fire disturbance produces both even age-aged stands as well as two-aged or multi-aged stands across the landscape, similar to what would be expected under historical conditions, prior to fire suppression. Understory burning is considered a low severity fire that is generally not lethal to the dominant vegetation. Approximately 80 percent or more of aboveground dominant vegetation survives the fire.

When understory burning or mixed severity fire occur, fuels both upright and on the forest floor are consumed by the fire. This results in improved forest health, reduced risk of severe wildfire, and maintenance and restoration of ecological process, function, structure and composition. Ponderosa pine and western larch are the most fire resistant species occurring in the analysis area. Burning in areas with these species would increase their proportions in the stands since the burning would likely kill less fire-tolerant species. Fewer live trees will occupy the site increasing growing space. More moisture, nutrients and sunlight will be available for the remaining trees. Shrubs and young understory trees, known as ladder fuels, provide continuous fine material from the forest floor into the crowns of dominant trees allowing fire to spread more easily into the overstory trees. Understory burning kills many of these ladder fuels since they typically are not fire resistant. Reducing the number of ladder fuels should lessen the risk for future, stand-replacing crown fires.

Treating overstocked stands using commercial timber harvest (commercial thinning) to reduce tree densities would favor retention of fire-tolerant leave tree species. Reducing stand densities reduces competition for sunlight and soil moisture, improving forest health conditions that allow trees to be more resilient to insect and disease pathogens. Improved forest health in treated stands would favor re-establishment of more historic disturbance regimes, particularly mixed severity fire.

Areas proposed for mixed severity burns and understory burns were chosen based on the likelihood of: 1) Achieving resource objectives, including retaining riparian vegetation; 2) Improving elk foraging habitats; 3) Improving vegetation composition, structure and function; and 4) Ability to confine the prescribed fires. As noted by Jerry Williams, USFS Washington Office Director of Fire and Aviation Management, "The objective

isn't to put fire back into the woods; the objective is to put the right kind of fire back into the woods within an acceptable level of risk". Mixed-severity burns are expected to typically kill 20 to 30% of the trees within a given stand (though tree mortality could locally range between 10 and 60% of the stand).

All action alternatives improve forest resiliency by reducing stand densities, and shifting species composition towards early seral species that have adapted to fire. Technology (where, when and how severe) is not available to provide accurate, comprehensive, numerically-based assessment of cumulative effects of wildfire risk. The combination of timber harvest and prescribed fire, however, are expected to reduce the risk of a large-scale fire in the planning area. Alternatives 2, 3, 5 and 6, would be the most effective alternatives to reduce the risk of large, severe wildfire; Alternative 4, the least effective; and Alternative 3a, intermediate to all other action alternatives. However, given the unnatural high accumulation of fuels attributed to aggressive wildfire suppression practices, a large-scale fire may still occur.

Direct Effects

Alternative 1, assumes ongoing salvage program and fire suppression would not use prescribed fire or allow for wildland fire use. The rate of tree mortality from competition, insects and disease, would increase at an increasing rate. In the long term, a dead fuel accumulation and development of green canopy layers that reach from the ground up into the dominant canopies will raise the risk for crown fire. The more time that passes before a wildfire, the fewer early seral species will remain. The likelihood rises that there will be a limited seed source after a wildfire. Dead wood would continue to accumulate at a rate faster than rot and decay could return it to the soil. The risk of large (1,000 acres or greater in size), high-intensity, stand-replacing fires would continue to increase. High wildfire risk areas in mature forest stands on breakland and colluvial midslope landtypes would continue at risk of high-severity, stand-replacing fires. Progression toward restoring desired fire regimes would not occur. The risk of high-severity wildfires occurring on landtypes where low- to mixed-severity fires naturally occurred would increase. Desired tree species composition, size and density would be compromised by the increased risk of high-severity, large wildfires. The current 5-year small sale program (primarily planned in the Pete King Creek drainage) would have no measurable impact on large wildfire risks on breakland and colluvial midslope landtypes across the NLF analysis area.

Mature forest stands on high-risk landtypes would go untreated by planned management actions. Fire intensities would increase over time as fuels continue to build up. Increased fuel loading and fire hazard are expected. The risk of a large, stand-replacing fire would continue to increase, with one or more large fires being inevitable, even with current fire suppression efforts. Wildfires burn where they want, when they want and may not result in the desired conditions. Costs to suppress in the NLF over a 5-year period are not quantifiable, as it is difficult to predict episode occurrence, scale and duration. The possibility of at least a 500 to 1000+ acre fire occurring somewhere in the NLF increases each year with the accumulation of woody fuels. Current local (Nez Perce/Clearwater Forests Fire Zone) fire suppression costs alone, typically exceed \$1500 per acre (Harbert,

2001). This does not include fire line or burned area rehabilitation costs needed to limit soil erosion and reforest the site. Estimated costs to suppress the fire and rehabilitate soil, watershed and vegetation for one 1000-acre fire, would likely exceed \$1,500,000 (for comparison with Alternatives 2 and 6, \$300,000 per year for 5 years, where an estimated 12,500 acres of the NLF landscape would be treated at an average cost of \$100-130/ac, or less).

Table 3-119: Prescribed Fire Effects by Alternative

Alternative	Proposed Treatment	Area (ac)	Estimated Prescribed Fire Implementation Cost/Yr for 5 years (\$K)	Changes in Wildfire Risk
1	Mixed-severity Fire Low-severity Fire Burning Logging Slash ^{1/}	0 0 0	\$0	Expected to increase at an increasing rate
2	Mixed-severity Fire Low-severity Fire Burning Logging Slash	5485 7045 5080	\$250,000 to \$325,000	Reduced 17-18,000 ac
3	Mixed-severity Fire Low-severity Fire Burning Logging Slash	5485 7045 4675	\$250,000 to \$325,000	Reduced 17-17,500 ac
3a	Mixed-severity Fire Low-severity Fire Burning Logging Slash	925 6635 4920	\$150,000 to \$200,000	Reduced 12-13,000 ac
4	Mixed-severity Fire Low-severity Fire Burning Logging Slash	0 705 2105	\$14,000 to \$18,000	Reduced 2800 ac
5	Mixed-severity Fire Low-severity Fire Burning Logging Slash	5485 7045 2015	\$250,000 to \$325,000	Reduced 14-15,000 ac
6	Mixed-severity Fire Low-severity Fire Burning Logging Slash	5655 7180 4920	\$250,000 to \$325,000	Reduced 17.5 -18,000 ac

^{1/} Logging slash would only be treated in 'regeneration' and 'off-site harvest' units.

Alternative 2, 3 and 6, would reduce the potential for large fires (spread and intensities) on approximately 14% of the NLF analysis area; Alternative 3a, 10%; Alternative 4, 2%; and Alternative 5, 10%. The risk of wildfires would continue to occur within the NLF, but the opportunity and ability to suppress the risk of large wildfires, due to decreased spread and intensities in high-risk areas, would be enhanced by the treatment over time. A higher percentage of early seral species, and fewer small understory trees will also make thinned stands less susceptible to damage from fire. Understory burns will have similar effects to the commercial thinning in that tree density will be decreased. However, fuels created by commercial thinning would not be burned, while dead fuels on the forest floor would be consumed by low-severity fire. Mixed severity prescribed fires, which are partially stand-replacing, will provide the environmental conditions that will

favor early seral species by leaving fire-resistant early seral species, creating openings that favor early seral tree regeneration and reducing woody fuels on the forest floor.

Proposed vegetation management, to some degree, would reduce stand densities across the NLF landscape. Prescribed burns designed to mimic stand-replacing fire (either lethal or mixed severity) will reduce stand densities. Salvage and stocking control will also reduce stand densities so that trees can be more vigorous and resist insects or diseases. Not all of these burns are planned in areas that have high densities. Some of stands were not proposed for treatment because of poor access for management. Insect and disease activity and increased fire risk is expected to continue to increase in those stands. Fire will be returned as a low-intensity function on appropriate LTAs, and as a mixed-severity fire or lethal fire on some LTAs, in Fish Creek and the face watersheds

Alternatives 3a and 4 restrict ecosystem burning in the Fish Creek drainage, and the risk of large wildfires would continue to increase in this area. Prescribed understory burns in Alternative 4, particularly on the breakland and colluvial midslope landtypes, would be inconsequential to restoring fire or reducing the risk of large, severe wildfires. Alternative 4 would result in an ecosystem less resilient to disturbance processes. Allowing natural fire to burn when it wants and where it wants may result in a large stand-replacing wildfire, especially as time continues and the stands increase biomass and species composition changes to species less adapted to fire. A large wildfire may result in delaying watershed recovery and affecting aquatic conditions, as well as other resources.

The cost of wildfire suppression would be mitigated with implementation of Alternatives 2, 3, 3a, 5 and 6. Current cost for wildfire suppression, including resource loss, range from \$1000 to \$1,800 per acre. Prescribed burning cost range from \$100 to \$130 per acre to reduce wildland fuels, and \$200 to \$250 per acre to treat logging slash (Harbert, pers. comm.) The prevention or size limitation of even one large wildfire would be an economic benefit.

Public access would likely be restricted (case-by-case) to provide for public safety while burning projects are being implemented. Hunters, particularly during the fall big game seasons, could be affected.

Indirect Effects

An indirect effect of burning would be the need (on a site-by-site, episode-by-episode basis) to manage the risks of large, severe wildfires affecting healthy forest stands and commercial timber values. Alternative 1 would maintain or increase the risk of fire in healthy stands adjoining high risk stands. Alternatives 2, 3, 5 and 6, would reduce the risk of large-severe wildfires affecting healthy stands. Alternative 4, though reducing the some risk to adjoining healthy stands, would also maintain or increase the risk of fire in healthy stands adjoining high-risk stands. Risks to commercial timber from large or severe wildfires in the Apgar and Canyon Creek watersheds, would be maintained or increased with Alternative 1; and would be substantially reduced with Alternatives 2, 3, 3a, 5 and 6. Alternative 4 would largely maintain current fire risks to commercial timber in the Apgar and Canyon Creek watersheds.

Cumulative Effects

Geographic Boundary: Lochsa River Basin

Time Frame: Year 2012 - (the expected completion date for project implementation).

Past, present and foreseeable actions include wildfire occurrence, fire suppression, prescribed fire practices, timber harvest with associated woody fuel treatments; and changes in federal wildland fire policy. Both wildfires and prescribed burning for ecosystem benefits are expected to increase in the future in the geographic area. Prescribed burning will involve the treatment of activity generated fuels (logging slash) and ecosystem burning (the reintroduction of fire for resource benefit). The acres of slash burning will change as logging activity changes across the National Forest system.

Alternative 1 will favor more tolerant species (grand fir and cedar) to dominate stands as the early seral species die and disturbances (windthrow, root rot pockets, etc.) continue. Windthrow, root rots, etc., occur on such a small scale that they do not provide the open conditions needed to allow early seral species to establish. These small-scale disturbances do not remove competing shrubs, which also inhibits early seral conifer regeneration. Insect and disease activity levels will continue to change with changes in tree densities, stand structures, and moisture conditions. Salvage timber harvest treatments will have little effect on infestation and infection levels for most of the insects and diseases currently present in the NLF. Overall, the NLF is expected to experience a shift towards late seral species. The risk of wildfire will increase through time and wildfires, similar to the 1910, 1919 or 1934 fires, could occur. Wildfire risk will continue to increase because of the restrictions (social/political, fiscal and environmental) limiting the scale, intensity and timing of applying vegetative management practices involving prescribed fire to the Lochsa River basin. Wildfires will continue even with treatment, as will fire suppression. Wildfire risks are expected to increase, regardless of management activities applied in the NLF.

Changes in federal wildland fire policy would allow a wide range of suppression responses to wildland fires. The new policy directs federal agencies to achieve a balance between suppression (to protect life, property, and resources) and fire use (to regulate fuels and maintain healthy ecosystems). Aggressive fire suppression will remain an essential cornerstone of the Forest Service mission. However, the appropriate suppression response to some wildland fires will only be monitoring fire activity to insure that pre-stated resource benefit objectives are being met. Implementation of this policy will be incremental; with the development of fire management plans. The acres of prescribed burning for resource benefit will dramatically increase with the completion of new fire management plans for Federal lands. The result may be an additional increase in wildland fire acreages.

Programmatic Forest Plan Amendment

The following section discusses the environmental consequences of amending the Forest Plan to reconcile conflicts in fire suppression direction. Direct impacts are presented in

terms of suppression costs, ecosystem management principles, firefighter safety, and forest goods and services. Indirect impacts are associated with risks to healthy forest stands and commercial timber. Cumulative impacts address fire regimes (intensity, scale and vegetative expression) at the landscape level.

Direct Effects

Alternative 1 would not amend to the Forest Plan. Fire suppression strategy and tactics in MAs A4, A6, A7, (B2), C3, C4, C6, C8S, would continue to be focused on quick and decisive initial attack as currently practiced. Wildfires in the last several decades in these MAs have been relatively small, with only two exceeding 100 acres since 1950. Suppression costs per acre would continue at current rates (typically exceeding \$1500 for even the smallest fires). Accumulation of forest fuels would continue unchecked. Continued fire suppression would maintain fire-created openings to typically less than 10 acres. These small openings in habitats where natural wildfires typically exceeded 100 acres, would likely be inconsistent with the desired forest conditions identified for the NLF. Suppression of small, often very remote fires would continue to expose firefighters to high-risk conditions (steep terrain, heavy loads, helicopter access to remote landings, hazardous snags and limited safety zones). The goods and services provided to forest users from these MAs would be unchanged in the next 5 to 10 years.

Alternatives 2 through 6, would amend to the Forest Plan. Fire suppression strategy and tactics in MAs A4, A6, A7, (B2), C3, C4, C6, C8S, would be guided by “the most reasonable probability of minimizing fire suppression cost and resource damage, consistent with probable fire behavior, probable resource and environmental impacts, safety, and smoke management considerations.” A cost-plus-loss analysis would be used to select the suppression strategy and tactics most appropriate for the resources-at-risk.

The amount of land burned by wildfires in these MAs is expected to increase, but would be dependent upon ignitions, weather conditions and forest fuel conditions in and around any given ignition point. Fire suppression costs per acre are expected to decline as fewer fires are aggressively suppressed (because they pose little risk), or are allowed to burn larger areas (because they would benefit forest health, reduce forest fuels, and/or contribute to other resource benefits). The upward trend in accumulations of forest fuels in the affected MAs would begin to level off. Larger openings created by these fires would be consistent with the desired forest conditions identified for the NLF. Suppression of some small fires would continue to expose firefighters to high-risk conditions. Overall risks to firefighters, however, from unnecessary exposure to suppression hazards would decline. The goods and services provided to forest users from these MAs would be unchanged from current conditions. Aggressive fire suppression would still occur where resource values-at-risk are high, such as stands of mature timber and/or sensitive portions of some watersheds or landscapes.

Indirect Effects

An indirect effect of burning would be the need (on a site-by-site, episode-by-episode basis) to manage the risks of large, severe wildfires affecting healthy forest stands and

commercial timber values. Public access would likely be restricted to provide for public safety while burning projects are being implemented. Hunters, particularly during the fall big game seasons, could be affected.

Cumulative Effects

Geographic Boundary: North Lochsa Face

Time Frame: Year 2012 - (The expected project completion)

Past, present and foreseeable actions (in and adjacent to MAs A4, A6, A7, (B2), C3, C4, C6, C8S, within the North Lochsa Face analysis area) include wildfire occurrence, fire suppression and prescribed fire, Lewis and Clark Bi-centennial, dispersed recreation activities; and changes in federal wildland fire policy.

Alternative 1 would continue to require aggressive fire suppression strategies and tactics to limit wildfires to acreages established in the Forest Plan. Annual suppression costs, however, are expected increase as forest fuels accumulate and fire risks (increase). Continuing to suppress fires within the limits designated by the Forest Plan is inconsistent with the disturbance regimes on many of the areas LTA's. Wildfire risk to firefighters and the public would continue to increase. Alternative 1, would be inconsistent with current and projected changes to the current *Wildland and Prescribed Fire Management Policy - Implementation Procedures and Reference Guide*.

Alternatives 2 through 6, would temper fire suppression strategies and tactics to minimize costs, achieve resource ecosystem management objectives, and reduce exposure of firefighters to unnecessary risks. Annual suppression costs are expected decline as forest fuels and fire risks ultimately decrease. Implementing a Forest Plan revision to eliminate acreage limits in the affected MAs, is consistent with the disturbance regimes on many of the LTA's. The amendment would be consistent with current and project changes to the current *Wildland and Prescribed Fire Management Policy - Implementation Procedures and Reference Guide*. The acres of prescribed burning for resource benefit will dramatically increase with the completion of new fire management plans for Federal lands. The result may be an additional increase in allowable wildland fire acreages.

Irreversible and Irretrievable Commitment of Resources: This amendment would neither significantly change the forest-wide environmental impacts disclosed in the Clearwater National Forest Plan EIS, nor change the management prescription or anticipated goods and services to be produced. The proposed changes are minor adjustments resulting from site-specific analyses and will not alter the multiple-use goals and objectives for long-term land and resource management. The amendment will be effective concurrently with vegetation management practices needed to implement NLF projects.

Adverse Effects Which Cannot Be Avoided: Exposure to hazardous fire suppression conditions in the affected MAs would continue. The incidence of exposure, however, would be primarily focused on fire suppression activities practices consistent associated with high values-at-risk fires.

Air Quality Existing Conditions

The North Idaho Airshed 13 includes the Selway-Bitterroot Wilderness Class 1 Airshed, and Montana Airshed 3A. The analysis area falls within North Idaho Airshed 13, which encompasses the area from Cottonwood Butte, east to the Montana State line, south to the Nez Perce/Payette Forest Boundary and west to the Oregon State line. This is an area averaging 120 miles wide (east to west) and 55 miles (north to south). Restrictions on prescribed burning on the Clearwater National Forest have been imposed within Airshed 13, in the past because of adverse effects on air quality in parts of western Montana and Northern Idaho. Locally, all major river canyons are subject to temperature inversions which pool smoke in the drainage bottoms. Temperature inversions can occur at any time during the year, but they are common in the fall. Prescribed fire on the Clearwater National Forest has been typically done during the late summer/early fall. Recently the Forest has been accomplishing more of this type of burning during the spring and early summer months when smoke dispersion is more favorable.

Smoke from natural fires, prescribed burning, and dust from native-surfaced roads are the principal factors affecting air quality. To mitigate for air quality concerns, wildland fires have been typically suppressed by the fastest, safest, most cost-effective means. Smoke from prescribed fires would be mitigated by igniting when atmospheric conditions are conducive to smoke dispersal, while complying with the North Idaho Airshed Group guidelines. Road dust during drier times of the year would be mitigated by using standard, industrial dust abatement practices (typically magnesium chloride application).

The annual amount of smoke generated from forest fires, including wildland and prescribed fires, has generally decreased since the early 1900s. Prior the mid-1930's, there were 1500 to 2000 fires burning annually within the northern Rocky Mountains. Those fires generated smoke for as short as a few hours to as long as 90 to 120 days. Smoke emission estimates before 1935, however, are 1.3 to 10 times greater than the recent period (1979-90). The effect of settlement and subsequent fire protection has been to reduce the amount of area burned and to reduce the duration of smoke emissions from wildland fires. Since the mid-1930's, smoke generated annually from forest fires, including natural fires and prescribed fires, has generally decreased, due to the advent of successful fire suppression efforts. There is no known historical air quality data for natural ecosystems in central Idaho. The following table shows sensitive areas located within and adjacent to the analysis area, with the potential to be affected by smoke emissions from natural and prescribed fire:

Table 3-120: Sensitive Airsheds Sites Within, or in Close Proximity to, NLF Analysis Area

Airshed	Distance (airmiles) and Direction from NLF Analysis Area	Major Human Occupation Period
Missoula, MT	65 NE	Yearlong
Selway-Bitterroot Wilderness	3 E	May-November
Middle Fork Clearwater River	10 SW	Yearlong
Lochsa Historical Station	6 NE	June -- Oct.
Wilderness Gateway Campground	10 SE	April-October
Apgar Campground	3 SW	June-October
Knife Edge River Access	1 S	April-October

Air Quality Environmental Consequences

The following section discusses the environmental consequences of each alternative on wood smoke production. Direct impacts are presented in terms of acres treated, scale and intensity of treatment, and wood smoke produced. Indirect impacts are associated with activity costs, changes in availability of dead wood and wood smoke. Cumulative impacts address fire regime (intensity, scale and vegetative expression) and wood smoke production at the landscape level.

The principal factor affecting air quality in the NLF is wood smoke. Smoke particulate emissions are calculated using guidelines of the U.S. Environmental Protection Agency. Effects of the alternatives on air quality are measured by the acres treated and emission produced. Predicted fuel loadings were estimated using planned treatments, downed woody fuel photo guides and 20+ years of local wildfire and prescribed fire experience by the NLF IDT Fire and Fuels Specialist. Accurate estimates of smoke particulate production for prescribed fires however are difficult to calculate. Prescribed fires could require ignitions in two or more burning seasons to control the risk of undesired high fire intensities. With multiple prescribed fires necessary to treat a given patch, the efficiency of combustion, coupled with the amount of fuel consumed, would vary with each burn. Estimated smoke volumes (using generalized forest and woody fuel features and the First Order Fire Effects Model) likely to occur in the NLF are depicted in Table 3-121.

Table 3-121: Estimated Smoke Volume (tons/ac) by Fire Type and Landscape Characteristics

Landscape Description	Fire Type	Forest & Fuel Conditions	Estimated Woody Fuel Consumption - Tons/acre	Estimated Total Smoke Volume (pounds/ac)	Discussion
Southerly Aspects, Breaklands & Colluvial Midslope	Understory burn	Douglas fir - Typical Fuel Loads	13	600	
	Wildfire	Douglas fir - Typical Fuel Loads	22	1000	Would consume 70+% more fuels and produce 60% more smoke than understory burn on similar site
	Wildfire	Douglas fir w/ Dense Understory Regeneration and Heavy Dead Fuels	35	1500	Would consume 170% more fuels and produce 150% more smoke than understory burn on similar site
Northerly Aspects, Breaklands & Colluvial Midslope	Mixed Severity	Grand Fir, Larch, Douglas Fir - Typical Fuel Loads	27	1200	
	Wildfire	Grand Fir, Larch, Douglas Fir - Typical Fuel Loads	64	2900	Would consume 135% more fuels and produce 140% more smoke than mixed severity burn on similar site
Upland Ridges & Old Surfaces	Mixed Severity	Englemann spruce & subalpine fir - Typical Fuel Loads	35	1500	
	Wildfire	Englemann spruce & subalpine fir - Typical Fuel Loads	47	2150	Would consume 30% more fuels and produce 40% more smoke than mixed severity burn on similar site
Breaklands, Colluvial Midslope & Old Surfaces	Logging Slash	Mixed Conifer - Average Fuels Loads	32	1150	

Direct Effects

Alternative 1: Air quality would be adversely affected by an increase in the frequency and size of wildfires over time. Estimated smoke production (PM-10 and PM-2.5,

combined) from a severe wildfire would range between 1500 and 2900 pounds per acre. Alternative 1 would not reduce this risk or treat high-risk stands to restore fire to the ecosystem. Air quality could affect the Selway-Bitterroot Wilderness due to unpredictable nature of winds directing wildfire smoke into the airshed. Wood smoke production from any given wildfire episode is expected to increase as more area becomes heavily fueled accumulating dead wood. Due to the uncontrolled nature of large, high-severity wildfires, particulate emissions would be greater than those expected from prescribed fires in the same area.

Prescribed burning activities in the analysis area would have an effect on air quality. Alternatives 2, 3, 3a, 5 and 6, would produce an estimated smoke (PM-10 and PM-2.5, combined) would range between 600 and 1500 pounds per acre (including burning of logging slash); Alternative 4, approximately 600 pounds per acre for the understory burns and 1150 pounds per acres for logging slash. The combination of prescribed burning forest landscapes and treating logging slash applied in Alternative 4, would produce the least amount of management-generated smoke of all action alternatives; Alternatives 2, 3, 5 and 6, the most.

Due to the controlled nature of both understory burns and mixed severity prescribed fires, particulate emissions are estimated to be 1/3 to 1/2 of a wildfire on similar terrain and fuels. Use of prescribed burning for fuel reductions would limit the duration and amount of smoke produced from future natural fires. Potential impacts would be limited by following smoke management procedures identified in the North Idaho Smoke Management Agreement. Smoke effects on the Selway-Bitterroot Wilderness Class 1 Airshed, due to the distance from the burn areas and typical weather patterns that direct smoke away from the Wilderness, are unlikely.

Alternative 1, because of inability to manage intensity and direction of smoke drift, would maintain or increase the risk of smoke affecting the Selway-Bitterroot Wilderness airshed. Alternatives 2, 3, 5 and 6, would produce the greatest potential for smoke associated with the planned management practices to affect the Bitterroot Valley; Alternative 4, the least potential; and Alternative 3a, intermediate with all other action alternatives. The anticipated duration (years to implement planned actions; seasons of ignition; and length of time smoke would be generated from a single ignition) is expected to be greatest with Alternatives 2, 3, 5 and 6; least with Alternative 4 and intermediate with Alternative 3.

Indirect Effects

An indirect effect of burning would be the effectiveness (on a site-by-site, episode-by-episode basis) to control wildfires and prescribed burns and their associated smoke. Smoke produced by active projects could drift in unpredicted directions and/or reduce visibility for recreational users several miles or more from active project sites. Ignition of a given prescribed burn could be extended for several days to control the burning intensity and rate of spread. Resulting smoke from any given active burn may linger during, and several days after, ignition.

Cumulative Effects

Geographic Boundary: North Idaho Airshed 12B and 13 and Montana Airshed 3A

Time Frame: Year 2012- (The expected project completion)

Past, present and foreseeable actions include wildfire occurrence, fire suppression, prescribed fire practices, timber harvest with associated woody fuel treatments (in and adjacent to these airsheds); and changes in federal wildland fire policy;

Compliance with the North Idaho Airshed Group guidelines will limit cumulative smoke effects within air quality standards. The North Idaho Airshed Group may impose restrictions on airshed cooperators on any given day, based analyses of weather conditions and projected smoke/particulate generation.

Air quality will be negatively impacted by the increase in both wildland and prescribed fire smoke. The air quality in the Class 1 Airshed over the Selway-Bitterroot Wilderness should not be significantly impacted, due to the prevailing winds and the controlled manner and timing of ignition, by prescribed fires in the NLF. Federal air quality standards have never been exceeded in this geographic area from prescribed or wildland fire smoke. Particulate emission regulations are under review and may be tightened, significantly affecting prescribed burning. There may be times when prescribed burning will approach these standards due to unforeseeable conditions, but monitoring will take place to prevent such occurrences. Smoke impacts are expected to not exceed the Environmental Protection Agency's federal ambient air quality standards, except possibly in very isolated incidences under the most severe circumstances. Regulatory changes may include strategies to protect air quality by trading increased prescribed burning for uncontrolled wildland fire emissions.

The north end of North Idaho Airshed 13, the majority of North Idaho Airshed 12B, and occasionally Montana Airshed 3A, all will have some long term negative impacts from the increasing number and severity of wildland fires. The suppression response to a wildland fire will take into consideration the potential smoke to be generated by a given fire, along with consideration of the cumulative effects of smoke from other fires burning in the geographic area. In the long term, prescribed burning is expected to reduce overall smoke impacts when comparing smoke produced from large, severe wildland fire episodes and prescribed fire management practices.

Irreversible and Irretrievable Commitment of Resources: None known or suspected.

Adverse Effects Which Cannot Be Avoided: Prescribed burning, due to the increasing acreages across the geographic area, will have some short-term impacts on these airsheds. The prescribed burns will be ignited when weather and fuel conditions minimize emission impacts on populated areas. Smoke from prescribed fire would temporarily reduce air quality, which could have short-term effects on recreation, visual quality and Wilderness characteristics.

Recreation Existing Conditions

Major features or attributes attracting recreation users to the NLF are the Lochsa River (white-water kayaking, trout fishing, developed campgrounds); Lolo Motorway, Rd 500 (Lewis and Clark historic route); hunting (spring bear; fall big game; winter mountain lion); and off highway vehicle (OHV) driving (4-wheelers and snowmobiles). There is one, small (seven camping units) developed campground (Apgar Creek); three Lochsa River access sites (Fish Creek, Split Creek and Knife Edge); and one picnic area (Major Fenn) within the NLF. These sites are all located along the Lochsa River between the river and the US Highway 12. Other typical recreation activities in the NLF and surrounding forest landscapes include dispersed camping, firewood gathering, hiking and huckleberry picking.

The primary visual attractant for Forest recreation users is a landscape dominated by trees and other native vegetation. Most of the Lochsa River canyon and Lolo Motorway contain these scenic attributes. The NLF maintains this visual quality but lacks outstanding site-features such as scenic overlooks, trail or road destinations, or lakes that attract or accommodate additional forest recreation use.

Lochsa River and Lolo Motorway use occurs on the perimeter of the NLF from late spring through late summer. Hunting occurs throughout most of the roaded areas (including upper and lower Fish Creek) year around. Recreation access is via US Highway 12, Forest Roads 101 (Smith Creek Rd) and 500 (Eldorado Rd), or Lolo Creek Rd 103 (the west portal to Lolo Motorway). OHV travel occurs mostly on roads constructed for timber harvest activities. OHV travel in the NLF occurs both on roads open to all motorized vehicles, as well as road restricted from having highway vehicles.

Hunting: Hunting is one of the most widespread, yearlong recreational activities in the North Lochsa Face area. Access to both roaded and unroaded areas offers a diversity of experiences to hunters. The mosaic of habitat conditions in the NLF supports healthy populations of elk, deer, moose, bear, and mountain lion. Openings in the forest canopy typically provide foraging areas while more heavily treed areas provide hiding, cover, and denning habitats. Hunters often concentrate their efforts near the borders of these areas. Currently habitat conditions for the big game species are declining due to the decline in timber harvest, lack of prescribed burning, and wildfire suppression. The maintenance of a mosaic of habitats will be necessary to maintain the species, their populations, and subsequent hunting opportunities.

Major motorized access for big game hunting between October and December 1 is restricted to major roads in the upper Pete King, Canyon and Deadman Creek watersheds; and motorized access in the Fish Creek watershed is restricted to the Middle Butte Road (# 485), Boundary Peak Road (#484) and Lolo Motorway (#500). Motorized opportunities for disabled hunters exist on the West Deadman Road (#5541 system) and upper west Pete King (#455).

While motorized recreation is associated with roads, hunting in the NLF is associated with a mosaic of habitat conditions supporting healthy populations of hunted species. Forest disturbances that open the forest canopy (i.e., timber harvest, prescribed fires and wildfires) to create preferred forage and cover conditions preferred by elk, deer, moose and bear, are essential in the NLF to maintaining their populations. Likewise, mountain lion populations, which prey largely on deer and elk, also (indirectly) require these forest habitat conditions to support their prey base. Hunters in the NLF select these mixed habitat conditions, wherever they occur in the NLF, for locating big game. As a result, hunting big game, including bear and mountain lion, is the most widespread, yearlong recreation activity in the NLF. Habitat conditions for the big game species are currently declining due to the decline in timber harvest, lack of prescribed burning, and wildfire suppression. If big game populations continue to decline, hunting use would likewise decline.

Trails and OHV Use: The majority of trails located on the North Lochsa Face are poorly located and many are on unstable landforms. Trail reconstruction and/or relocation for many of them has been approved with the *North Lochsa Face Recreation and Access Management Record of Decision* (April 2000). Approximately 44 miles of trail will be reconstructed or relocated and 50% of all trails will be managed for motorized use. The steep topography of the area has resulted in trails with tread widths of 24" or less. This is highly challenging, limits most motorized trail use to trail bikes only, and requires experienced riders.

The Pete King, Canyon and Deadman drainages support nearly 60% of the road and 40% of the trail miles open to motorized use. The Van Camp, Fish Butte/lower Fish Creek trails, and other short sections of trails provide 60% of the motorized trail access. Motorized recreation in Hungery and Willow Creek drainages is limited to existing roads on the perimeter of these watersheds. Some snowmobiling ("play areas") occurs in the extreme headwaters of the Obia Creek watershed. Trail reconstruction in the Pete King and Canyon Creek drainages, where the trail system network has been unusable for 15+ years, is expected to re-distribute and increase use in the NLF area.

Recreation Environmental Consequences

Direct Effects

All Alternatives: White-water kayaking, trout fishing, and developed campground use would likely remain at current levels. Motorized recreation use (both highway vehicles and OHV), trail reconstruction/relocation would continue as depicted in the North Lochsa Face Recreation and Access Management Record of Decision (April 2000). Dispersed camping, firewood gathering, hiking and huckleberry picking would continue at current levels.

Recreational use of the Lolo Motorway is expected to increase as the Lewis and Clark Bicentennial approaches. During the bicentennial years (2003-2007) Motorway, public

access would be restricted (by permit), to limit resource impacts and user conflict (Lolo Resource Protection Project; decision pending).

All Action Alternatives: Some loss of motorized recreation would occur as the result of approximately 66 miles of road obliteration (decommissioning). Vegetative management practices in the Lochsa River canyon (commercial timbering and prescribed fire) may displace some users. However, activities would be timed to avoid disturbing high-use recreation periods.

Alternative 1- No Action: Spring bear, fall big game, and winter mountain lion hunting are expected to continue, but would depend on big game population trends.

Alternatives 2, 3, 3a, 5 and 6: Fall big game hunting is expected to experience an upward trend, due to improved habitat conditions.

Alternative 4: Fall big game hunting is expected to experience a stable or declining trend, due to generally declining big game habitat conditions. This alternative does not provide significant maintenance in big game habitat conditions in the NLF.

Indirect Effects

Vegetative treatments associated with all action alternatives are expected to attract additional hunters the NLF. This could increase the risk of conflicts between hunters for dispersed hunting camp sites. The greatest potential for attracting hunters would be associated with those alternatives treating the most big game habitat (Alternatives 2, 3, 3a, 5 and 6.). The No Action alternative is not expected to attract more hunters due to a lack of treatment. Alternative 4, offers much less potential for attracting hunters, as only 2800 acres of habitat would benefit from the planned actions.

The opportunity to gather firewood would be reduced where timber harvest removes dead trees from along roadsides. Temporary displacement of recreation users to different areas could occur as the result of timbering and/or prescribed burning projects.

Cumulative Effects

Geographic Boundary: The Lolo Trail Corridor (Kamiah to Lolo Pass); the Lochsa Wild and Scenic River Corridor; and Hunting Unit 12 (Smith Creek road on west end, to Lolo Pass on east end and includes the entire Lochsa River basin).

Time Frame: Year 2005 (5 years from implementation for the public to experience and understand the access strategy).

Foreseeable Future Actions: Lewis and Clark Bicentennial celebration, 2002 through 2007; Lolo Resource Protection Project; US Highway 12 Trailhead Access Improvement NLF Trail reconstruction; Jerry Johnson Campground Reconstruction, Wendover Staging Area and Trail Construction, and Johnson Fuels.

Recreation visitor use to the area during the Lewis and Clark Bicentennial celebration (2003 through 2007) is expected to dramatically increase. The Lolo Motorway and Highway 12 recreation improvement projects will assist in meeting the needs of these additional visitors. Reconstruction of Pete King and Canyon Creek trails may redistribute both motorized and non-motorized use. Implementation of the NLF project may increase hunter use.

The cumulative effects to recreation would include increases in potential conflicts between users (boaters, motorized and non-motorized, stock users, etc...). The recreation-related projects may also not be sufficient to handle all users. Timber harvest and burning projects may distract from users enjoyment of the area. Any impacts however would be short term in nature.

Potential accommodations to meet the needs of these additional visitors to the area include facility improvements along the Lolo Motorway and Highway 12 Corridors, increased visitor services; additional interpretive opportunities; and improved parking and access to existing trails within the Lochsa River corridor (Van Camp Trailhead and Deadman Creek River Access). Impacts resulting from visitor use associated with the Lewis and Clark Bicentennial Observance are being addressed in the Lolo Trail and Portals Resource Protection and Highway 12 Trailheads environmental analyses.

Trail reconstruction in the Pete King and Canyon Creek drainages where the trail system network has been unusable for recreation for the past 10 to 15 years. Reconstruction of Pete King and Canyon Creek trails may redistribute both motorized and non-motorized use.

Vegetative treatments (i.e. timber harvest or prescribed burning) could attract additional hunters to the NLF to different forest areas.

Adverse Effects Which Cannot Be Avoided: The designation of non-motorized use areas can have an adverse effect on recreation users desiring a motorized opportunity, and the same is true for those desiring a non-motorized experience in areas designated for motorized use.

American Indian Treaty Rights Existing Conditions

Tribal governments have an increasing influence on the formulation of public land policy through agency recognition of their legally established rights as well as their unique trust relationship with the U.S. Government. A series of Indian trade and intercourse acts, initiated in 1790 and permanently adopted in 1834, became the cornerstone of Federal Indian policy. The Marshall Trilogy (three Supreme Court decisions made between 1823 and 1831) established that: (a) only the Federal Government has the pre-emptive right to procure Indian land; (b) the Federal Government has trust responsibilities toward American Indian tribes; and (c) treaties take precedence over state laws.

Treaty Rights: For the purposes of western expansion, keeping the peace, and adding new states to the union, the United States Government negotiated treaties with Indian tribal governments and obtained the vast majority of public domain land in the lower 48 States. Approximately sixty of these tribes negotiated and reserved their treaty rights to off-reservation lands and resources. Off-reservation treaty rights on National Forest System lands are very important to Indian tribes and may include grazing rights, hunting and fishing rights, gathering rights and interests, water rights, and subsistence rights. In some treaties in the Pacific Northwest, the U.S. Government is obligated to protect the tribes' right to access usual and accustomed fishing places and open and unclaimed lands and must assure that Forest Service actions protect treaty resources and do not prevent tribes or their members from accessing such locations to exercise tribal rights.

Trust Responsibilities: The trust responsibility is the U.S. Government's permanent legal obligation to exercise statutory and other legal authorities to protect tribal lands, assets, resources, and treaty rights, as well as a duty to carry out the mandates of Federal law with respect to American Indian and Alaska Native Tribes. For the Forest Service, trust responsibilities are those duties that relate to the reserved rights and privileges of Federally Recognized Indian Tribes as found in treaties, executive orders, laws, and court decisions that apply to the national forests and grasslands. Currently Forest Service policy, as outlined in FSM 1563.03, is to: (a) maintain a governmental relationship with Federally recognized Tribal Governments; (b) implement our programs and activities honoring Indian treaty rights and fulfill legally mandated trust responsibilities to the extent they are determined applicable to National Forest System lands; (c) administer programs and activities to address and be sensitive to traditional Native religious beliefs and practices; and (d) provide research, transfer of technology, and technical assistance to Tribal Governments.

Nez Perce Tribe: Since time immemorial the valleys, prairies, and plateaus of north central Idaho, northeastern Oregon, and southeastern Washington, encompassing 13 million acres, were home to the Nez Perce people. Living primarily in the valleys of the Clearwater and Snake Rivers and their tributaries, they fished the streams, hunted in the woodlands, and dug the bulbs of the edible camas lily on the high plateaus.

In 1855, Isaac Stevens, the governor of the newly formed Washington Territory, called the Nez Perce leaders to a council at Walla Walla to create a reservation. An agreement was reached that reserved most of their traditional homeland (7.7 million acres) as their exclusive domain. Article 3 of this treaty states: "The exclusive right of taking fish in all the streams where running through or bordering said reservation is further secured to said Indians; as also the right of taking fish at all usual and accustomed places in common with citizens of the Territory; and of erecting temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land."

After the discovery of gold on the reservation, a new treaty was signed in 1863 that reduced the size of the original reservation to 780,000 acres. Not all of the Nez Perce bands were in agreement with the new treaty, which gave rise to the "treaty" and "non-treaty" factions. Four years later the U.S. Government launched a campaign to move all

of the Nez Perce onto the new, smaller reservation. After several skirmishes with the U.S. Army, about 750 Nez Perce men, women, and children attempted to escape to Canada on the Lolo Trail. They travelled 1,170 miles from the Wallowa valley in eastern Oregon to the plains of north-central Montana. Their leaders included Chief Joseph, White Bird, Hahtalekin, Too-hool-hool-zote, Chief Looking Glass, and Lean Elk (Poker Joe). They were forced to surrender just 40 miles from the Canadian boundary, near Bear Paw, Montana.

In 1893, the Nez Perce Tribe ceded and sold to the U.S. Government all unallotted lands on the reservation with exception of certain lands held for the benefit of the entire Tribe, including "the boom"¹. The current reservation consists of 750,000 acres, of which the Tribe owns approximately 90,000 acres. However, the Nez Perce Tribe still retains the treaty rights reserved in the 1855 Treaty. These rights apply to most of the Clearwater National Forest, including all of the North Lochsa Face area.

American Indian Treaty Rights Environmental Consequences

Tribal Treaty Rights: The Nez Perce Tribe has "the right of taking fish at all usual and accustomed places...together with the privilege of hunting, gathering roots and berries..." The following estimates the effects of proposed treatments on these tribal activities:

Fishing

Alternative 1: Current recovery trends would continue in the area's streams. However, some sediment would continue to enter the streams due to the lesser amount of restoration projects (road obliterations and riparian planting), as compared to the action alternatives. The risk of a catastrophic wildfire would continue to increase which could have an impact on water quality and fish habitat.

Alternatives 2-5: Proposed activities are not likely to have an effect upon the ability of Nez Perce Tribal members to exercise their right to fish within and near the North Lochsa Face area. Any negative effects upon fish habitat are expected to be minimal, not likely to affect fish populations. There are restoration projects common to all alternatives that have the potential to benefit fish habitat. Prescribed burning, although a potential short-term sediment producer, may benefit aquatic and riparian habitat over the long term by reducing the risk of catastrophic wildfires.

Hunting

Alternative 1: There would be no impact on Tribal hunting. However, the lack of activities that would improve elk habitat (prescribed fire and timber harvest) would contribute to the continued decline in elk populations over the long-term. Forage

¹ This consists of traditional fishing places and spiritual grounds downriver from the Spalding railroad trestle bridge to the Spalding Historical Park.

production would continue to decline as current browse vegetation ages and is overtopped by competing conifers. It is anticipated that areas of browse forage on winter range would decline by 1/3 to 1/2 by the year 2003.

Alternatives 2-5: Treatments proposed for North Lochsa Face improve elk habitat, with Alternatives 2, 3, and 5 treating the largest percentage of elk winter range for browse improvement. This would in the long-term benefit tribal hunting. Access Options 2-4 would limit motorized access, with Access Option 4 being the most restrictive during the fall hunting season.

Gathering Activities

Alternative 1: Common gathering sites for camas are located outside of the analysis area, although camas may exist in and around some of the area's meadows. The gathering of whitebark pine seeds occurs along the Lolo Trail corridor, and berries, such as huckleberries and elderberries, are common throughout the analysis area. All of these sites would remain in their current condition.

Alternatives 2-5: No activities, burning or timber harvest would occur in the meadow areas. These activities could have a short-term impact on berry bushes, although in the long-term, studies show enhanced growth of berries after burning. Also, mushrooms flourish after a fire. Only Alternatives 2, 3, and 5 have prescribed fire proposed along the Lolo Trail Corridor, which would stimulate the regeneration of whitebark pine. Overall, the impact on Tribal gathering activities from proposed vegetative management activities should be minimal.

Cumulative Effects on Treaty Rights

Geographic Boundary: As agreed to in the 1855 Treaty, the Nez Perce Tribe still retains the treaty rights throughout areas of Oregon, Idaho, Washington, and Montana, including most of the Clearwater National Forest and all of the North Lochsa Face area.

Time Frame: Proposed actions are planned for completion in approximately ten years, with final site preparation adding an additional two years. Given this time frame, these sights should be fully revegetated by the year 2025.

Past, Present, and Foreseeable Future Actions: District salvage sales, other Forest sales, special forest products program, access restrictions, and the Lewis and Clark bicentennial.

District salvage sales and similar ones on the rest of the Forest are primarily targeting deteriorating stands along open road systems in areas having few, if any, resource issues. This should result in no additional effects on Tribal treaty rights. Impacts could result from larger Forest sales, such as those proposed in close proximity to the Lolo Trail corridor or popular Tribal use sites. However, consultation with the Tribe would be initiated with each sale proposal, and appropriate design or mitigation measures would be implemented to minimize or eliminate any adverse effects.

Implementation of access options that limit motorized access could affect access of tribal members for fishing, hunting, and gathering. However, access options include opportunities for disabled person access, and the more traditional means of accessing areas by walking or riding stock are not limited in any of the access options.

Impacts resulting from visitor use associated with the Lewis and Clark Bicentennial Observance have the potential to result in resource damage to important tribal sites, such as historic trail corridors, cairns, and traditional gathering, hunting and fishing areas. Currently, the Forest is working with the tribe on a strategic plan for the bicentennial period which includes protection and monitoring of these sites.

Irreversible and Irretrievable Commitment of Resources: None known or suspected.

Adverse Effects Which Cannot Be Avoided: None known or suspected.

Community Economics Existing Conditions

Although amenity and commodity resource values are both important, trade-offs between them are difficult to measure in monetary terms. This economic analysis focused on those values that could be quantified, thus it has a timber management emphasis.

Local counties and communities are closely aligned to the North Lochsa Face area because of geographic location, historic reasons for settlement, economic dependency, and traditional land use patterns. Some areas were first settled because of mining activities. Agriculture and cattle ranching occurred in the early 1900s, when farmers and ranchers settled the Middle, South Fork, and main Clearwater River valleys, and the Weippe and Camas prairies. Logging came shortly thereafter and became the primary industry for most communities of the area.

Local Zone of Influence

The area that would primarily be affected by the North Lochsa Face project includes Idaho, Clearwater, and Lewis counties and the communities of Lowell, Syringa, Kooskia, Kamiah, Grangeville, Stites, Orofino, Pierce, and Weippe. Although Lewis County is for the most part separate from the analysis area, it lies partly within the town of Kamiah, which is located on Highway 12 within the local zone of influence. The Nez Perce Reservation is also within the zone of influence.

These counties and communities are closely associated with the North Lochsa Face analysis area because of geographic location, historic reasons for settlement, economic dependency, and traditional land use patterns. Some areas were first settled because of mining activities. Agriculture and cattle ranching developed in the early 1900's when farmers and ranchers settled the Middle Fork, South Fork, and main Clearwater River valleys and the Weippe and Camas prairies. The forest industry developed shortly

thereafter and became the primary industry for most communities in the local zone of influence.

Community Stability

Idaho has always been a natural resource-based state, economically, although as dependency on natural resources becomes less stable, there is some movement towards diversification. Many communities have made impressive strides in achieving GEM Community status and working to diversify their economies. (The GEM Community Program was established by the Idaho Department of Commerce to encourage communities to plan their own future). As reported by the Idaho Department of Labor, the timber products industry went through some hard times in the early '80s, but those firms which survived were streamlined and modernized. The result is reduced dependence on hired labor.

Logging has been the primary means of support and a way of life for many residents of these small communities throughout their existence. Assuming a wood supply was available, and the economy was favorable, the tradition would likely continue for many more generations with children following in their fathers' footsteps. Although some former loggers have ventured out into a new line of work, such as a business or auto mechanics, the majority of workers in the timber industry are opposed to a change in lifestyle, particularly if they have spent many years in this work.

Preliminary findings from a study recently done by University of Idaho sociologists working on the Columbia River Basin Assessment reveal some new information about rural communities. The study shows that many timber-dependent communities tend to be more resilient and able to tolerate change than is commonly assumed. While mill closures have impacts in some communities, the shutdowns have little impact in others.

Generally, the attitude of community leaders in Kooskia and Kamiah is to try to be flexible enough to meet the challenges brought about by a change in economic structure and to accommodate the influx of new people to the area. Both towns are looking for ways to diversify their economies to counter the dwindling employment from timber production. Community leaders in these towns recognize the importance of recreation and tourism. They see the timber-related jobs disappearing and young people leaving because of lack of work. Comments they made were: "One way to help our economy is to promote tourism," and "Unemployment is high; the mills are not employing as many people as they use to. We need to diversify."

The Interior Columbia Basin Ecosystem Management Project notes that a large amount of primitive and semi-primitive recreation opportunity in the Basin, like provided in the northern portion of North Lochsa Face, is noteworthy and provides substantial economic value. From a national perspective, these areas are valued for both their exceptional scenery and solitude that draw visitors from both a national and international base. This type of attraction also draws visitor use into surrounding local communities.

Outfitting operations also have played a role in the economic stability of these communities, primarily supported by the fall hunting season and the influx of out-of-state hunters. Recently, this industry has experienced growth associated with recreational opportunities such as horseback riding, photography and viewing of scenery, mountain bike riding along the historic Lolo Motorway, and winter sports. It is anticipated that this growth will continue as the local communities promote more recreation and tourism.

Land Ownership: The Clearwater National Forest comprises 44 percent of Clearwater County and 48 percent of Idaho County. Idaho County encompasses 5,430,528 acres. Of those acres, 4,523,518 are in National Forest ownership, 78,798 acres are in state ownership, and 822,978 acres are in private and tribal ownership. The Lochsa Ranger District encompasses 292,844 acres, or 5 percent of Idaho County, and the North Lochsa Face analysis area at 130,000 acres encompasses 2 percent of Idaho County.

Population: The population of all three counties decreased significantly from 1980 to 1990, according to census counts. However, since then, population levels have begun to rise again in all three counties. By 1994, populations in Clearwater and Lewis counties had nearly reached 1980 levels, and Idaho County surpassed the 1980 level. As of 1994, the population of Idaho County was nearly 15,000, Clearwater County was 9,300, and Lewis County was almost 4,000.

In Idaho and Clearwater counties, 2 percent of the population is Native American; in Lewis County, 5 percent is Native American. Several hundred Nez Perce people reside in the towns of Kamiah, Kooskia, and Stites. These three towns, along with Orofino, lie within the Nez Perce Indian Reservation. The Nez Perce Tribe has approximately 3,000 enrolled tribal members, and about 1,700 of them reside within the reservation.

Communities: Idaho County includes the towns of Cottonwood, Ferdinand, Grangeville, Lowell, Syringa, Kooskia, Riggins, and Stites. Clearwater County includes Elk River, Orofino, Pierce, and Weippe. Lewis County includes Kamiah, Craigmont, Nez Perce, Reubens, and Winchester.

Lowell, Syringa, Kooskia, Stites, Kamiah, Grangeville, Pierce, Weippe, and Orofino are considered to be within the local zone of influence for the North Lochsa Face project. Other than Lowell and Syringa, whose few businesses depend on highway travelers and recreationists, these communities are primarily dependent on timber harvest for economic survival. Grangeville and Weippe have some cattle grazing, but are still primarily timber-dependent. Although Pierce began as a gold-mining town, logging is its primary means of support now.

Lowell and Syringa are closest to the analysis area; both are very small communities. They lie well within the National Forest boundaries, and have limited room for growth in size or population. Each community probably has less than 50 people.

Located on Highway 12 at the confluence of the Selway and Lochsa rivers, Lowell is a stopping place for travelers, fishermen, hunters, and river recreationists. For highway travelers headed east, Lowell represents the last opportunity for 64 miles to buy gas and

groceries or to rent a motel room. Syringa is also on Highway 12, six miles west of Lowell. It lies about two miles south of the North Lochsa Face analysis area. Highway travelers and recreationists are the main support for businesses at Lowell and Syringa.

The populations in most communities in the local zone of influence have remained relatively stable, and the impact from newcomers is minimal. Kamiah and Kooskia, however, are exceptions. Both of these towns are experiencing an influx of retirees and other people, many of whom are without work. Schools are filled to capacity, and employment is a concern. Many of the newcomers are moving into subdivisions or parcels of land outside city limits, but their children attend local schools. Generally, community leaders in both towns try to be flexible in meeting the challenges that result from changes in the economic structure and in accommodating the influx of new people to the area. Both towns are looking for ways to diversify their economies in response to dwindling employment in timber production.

Economics

Employment: In North Central Idaho, the largest number of unemployment claims filed in 1993 (23%) were filed by workers in the lumber and wood products industry. In 1994, the Idaho Department of Employment projected an unemployment rate of 11.4% for Idaho County, 13.5% for Clearwater County, and 6.1% for Lewis County. As of December 2000, unemployment rates in all three counties exceeded the national unemployment rate of 4.0% (*Idaho Employment*, February 2001, Page 1).

Employment and income within the market area are directly affected by four timber-related sectors of the economy. These four sectors are the timber industry, Forest Service timber program investments, Forest Service timber program-related salaries, and county roads and schools that received funds from the “25% Fund” payments to counties. In the timber industry sector, each million board feet that is harvested would directly employ loggers, truck drivers, mill owners and mill workers, as well as Forest Service employees who prepare and administer timber sales. Roads built to access timber require heavy equipment operators and construction engineers. In the county road and school sector, the 25% Fund payment would be sent to the counties for county roads and school programs. Therefore, a number of teaching and road jobs are also tied to timber harvest.

Timber-related economic factors have indirect and induced economic effects as well. Examples include business such as grocery stores, gas stations, and equipment suppliers for those individuals who work in the timber industry.

Idaho County: When the Ida Pine mill closed in Grangeville in 1994, Idaho County received a significant setback in the number of people employed in lumber manufacturing. Of the 113 people laid off, about 40 were still unemployed as of July 1995. Unemployment in Idaho County was 10.4% in 1996, and had risen slightly to 10.6% by December 2000.

Clearwater County: Clearwater County’s major industry, lumber manufacturing, faces several problems. They include a tightening of the timber supply on public lands and

increased competition. Smaller sawmills in Clearwater have been slow to modernize, hampering their ability to compete. Unemployment in Clearwater County was 13.4% in 1994.

According to Idaho Department of Labor statistics, five Idaho counties had double-digit unemployment rates in December 2000. Clearwater County's unemployment rate was the highest in the state, at 18.2%. Idaho County's December 2000 unemployment rate was 10.6%. Clearwater and Idaho counties rely heavily on logging and wood products manufacturing. While seasonality plays some role, economic downturns in these natural resource-based industries is the main contributor to high unemployment rates (*Idaho Employment*, February 2001, page 2). The closure of the Jaype mill in Pierce in the fall of 2000 probably contributed to the increase in unemployment for Clearwater County.

Lewis County: In Lewis County, farms and sawmills have survived lean times in the past, and some diversification through recreational opportunities is occurring. Unemployment in Lewis county was 6.1% in 1994 and 6.6% in 1996; it had dropped to 5.5% by December 2000. Employment is expected to remain at current levels.

Interest Groups

The Forest Service Workforce: Shifts in the Forest Service workforce can result from many Forest management activities. Potential changes in government employment can result from increases or decreases in project outputs. Employment in the timber program historically has varied by about 2.5 Full Time Equivalent (FTE) employees for every 1.0 million board feet (mmbf) of timber sell volume. Employment in the engineering program has varied by .8 FTE's for every 1.0 mmbf of sell volume.

The Nez Perce Tribe: The Nez Perce Tribe has religious, cultural, subsistence, and commercial ties to the study area. The Lolo Trail was heavily used by their ancestors as a travel route, as were trails that led south from there to Hungery Creek and Fish Creek. The interior of this area was used for hunting, and salmon from the Lochsa River at the southern boundary of the study area were a primary food source. Permanent Indian villages were located along the Lochsa River at Lowell and Syringa. The protection of cultural and religious sites is of primary concern to the Tribe, as well as the enhancement of anadromous fisheries and big game herds. Any dramatic change in current wildlife or fisheries levels could impact traditional Tribal lifestyles and violate treaty rights.

The study area is within the area defined by the Treaty of 1855 between the U.S. Government and the Nez Perce Tribe. The Forest Service has a responsibility to protect these treaty rights, including hunting, fishing, grazing, gathering, cutting teepee poles, and the freedom to believe, express, and exercise traditional religions within the Forest. This responsibility was reemphasized in the National Forest Management Act of 1976 and the American Indian Religious Freedom Act of 1978.

Today, a large number of Nez Perce live in Kamiah, Kooskia, and Stites, many on land that has been passed down from one generation to the next. Tribal members continue to utilize the study area for hunting, fishing, gathering, and religious purposes. Tribal

members work in the local timber industry as well. Tribal members, particularly those who live near the analysis area, are very interested in the North Lochsa Face project.

Timber Industry/Loggers: Since most communities near the study area rely heavily on timber production for survival, there are many people living in the local and regional zones of influence who work in mills and wood products-related industries who are very interested in this project. Many would benefit if timber were harvested, particularly if the trees went to local mills.

Historians: The Lewis and Clark and Nez Perce National Historic Trails draw researchers, college students, members of foundations that were developed to oversee these historic trails, and many others who are interested in prehistoric and early American history. The portions of the historic trails that cross the Clearwater National Forest are of particular interest to researchers because they have been left relatively undisturbed, and still contain traces of the early travelers.

Environmentalists: There is likely to be significant interest in the study area by people who are concerned about protecting water quality and retaining diversity in the ecosystem. Interest will be especially high in areas that are still primarily unroaded, and where large areas have not been logged. Environmental interests are generally focused in the larger communities of Missoula, Lewiston, and Moscow, and are represented at the national level as well. Most people who represent this interest group are members of organized groups.

Hunters: Hunters comprise another strong interest group. The North Lochsa Face area contains prime elk habitat, and hunters will want to retain that value whether they have hunted in this area traditionally or not.

Local Homeowners: Homeowners in Kamiah, Kooskia, Lowell, and Syringa, as well as private property owners adjacent to the southern boundary of the analysis area, are interested in this project because of their close proximity.

Table 3-122: Local Communities Summary Data

Community/ County	Total Persons	Persons Below Poverty Level	Total Households	Households On Public Assistance	Percent Minority	Population Density (Persons/mi ²)
Kooskia	1,248	250	490	54	6.3	44.4
Kamiah	1,411	204	563	62	13.0	24.7
Grangeville	1,973	154	793	68	1.0	1,300.6
Stites	1,248	250	490	54	6.3	44.4
Orofino	3,479	351	1,243	75	6.0	78.1
Pierce	*	*	*	*	*	*
Weippe	*	*	*	*	*	*

Source: United States Environmental Protection Agency, EnviroJustice Query Mapper, 1990 Census Data; <http://es.epa.gov/oeca/main/ei/ejmapper>, 10/5/01 Queries.

* Data not available.

Table 3-123: Kooskia Race and Age Breakdown

Race Breakdown	Persons (%)	Income Breakdown	Persons (%)
White	1,194 (95.7)	Less than \$15,000	236 (48.2)
African-American	0 (0.0)	\$15,000 - \$25,000	101 (20.6)
Hispanic Origin	24 (1.9)	\$25,000 - \$50,000	117 (23.9)
Asian/Pacific Islander	11 (0.5)	\$50,000 - \$75,000	31 (6.3)
American Indian	43 (3.4)	Greater than \$75,000	5 (1.0)
Other Race	0 (0.5)		

Source: United States Environmental Protection Agency, EnviroJustice Query Mapper, 1990 Census Data;
<http://es.epa.gov/oeca/main/ej/ejmapper>, 10/5/01 Queries.

Table 3-124: Kamiah Race and Age Breakdown

Race Breakdown	Persons (%)	Income Breakdown	Persons (%)
White	1,246 (88.3)	Less than \$15,000	196 (34.8)
African-American	0 (0.0)	\$15,000 - \$25,000	161 (28.6)
Hispanic Origin	19 (1.3)	\$25,000 - \$50,000	160 (28.4)
Asian/Pacific Islander	7 (0.5)	\$50,000 - \$75,000	33 (5.9)
American Indian	158 (11.2)	Greater than \$75,000	13 (2.3)
Other Race	0 (0.0)		

Source: United States Environmental Protection Agency, EnviroJustice Query Mapper, 1990 Census Data;
<http://es.epa.gov/oeca/main/ej/ejmapper>, 10/5/01 Queries.

Table 3-125: Grangeville Race and Age Breakdown

Race Breakdown	Persons (%)	Income Breakdown	Persons (%)
White	1,961 (99.4)	Less than \$15,000	204 (25.7)
African-American	0 (0.0)	\$15,000 - \$25,000	228 (28.8)
Hispanic Origin	8 (0.4)	\$25,000 - \$50,000	283 (35.7)
Asian/Pacific Islander	0 (0.0)	\$50,000 - \$75,000	38 (4.8)
American Indian	12 (0.6)	Greater than \$75,000	40 (5.0)
Other Race	0 (0.0)		

Source: United States Environmental Protection Agency, EnviroJustice Query Mapper, 1990 Census Data;
<http://es.epa.gov/oeca/main/ej/ejmapper>, 10/5/01 Queries.

Table 3-126: Stites Race and Age Breakdown

Race Breakdown	Persons (%)	Income Breakdown	Persons (%)
White	1,194 (95.7)	Less than \$15,000	236 (48.2)
African-American	0 (0.0)	\$15,000 - \$25,000	101 (20.6)
Hispanic Origin	24 (1.9)	\$25,000 - \$50,000	117 (23.9)
Asian/Pacific Islander	11 (0.9)	\$50,000 - \$75,000	31 (6.3)
American Indian	43 (3.4)	Greater than \$75,000	5 (1.0)
Other Race	0 (0.0)		

Source: United States Environmental Protection Agency, EnviroJustice Query Mapper, 1990 Census Data; <http://es.epa.gov/oeca/main/ej/ejmapper>, 10/5/01 Queries.

Table 3-127: Orofino Race and Age Breakdown

Race Breakdown	Persons (%)	Income Breakdown	Persons (%)
White	3,314 (95.3)	Less than \$15,000	338 (27.2)
African-American	0 (0.0)	\$15,000 - \$25,000	283 (22.8)
Hispanic Origin	71 (2.0)	\$25,000 - \$50,000	457 (36.8)
Asian/Pacific Islander	7 (0.2)	\$50,000 - \$75,000	106 (8.5)
American Indian	136 (3.9)	Greater than \$75,000	59 (4.7)
Other Race	22 (0.6)		

Source: United States Environmental Protection Agency, EnviroJustice Query Mapper, 1990 Census Data; <http://es.epa.gov/oeca/main/ej/ejmapper>, 10/5/01 Queries.

Community Economics Environmental Consequences

Although amenity and commodity resource values are both important, trade-offs between them are difficult to measure in monetary terms. This economic analysis focused on those which could be quantified, thus it has a timber management emphasis.

Direct Economic Effects

National Forest timber harvest affects employment and income within the market area based on two timber-related sectors of the economy. These sectors are the timber industry and county roads and schools that receive funds from the 25% Fund payments to counties. In the timber industry sector, each million board feet that is harvested would require the direct employment of loggers, truck drivers, mill owners, and mill workers. Roads built to access timber require heavy equipment operators. In the past, the county road and school sector was directly related to the 25% Fund where payment is sent to the counties from where the timber was harvested to fund county road and school programs. Thus, a portion of teaching and road jobs were tied to timber harvest on this project. The Craig/Wyden Bill (P.L. 106-393) now allows the counties to select whether they will

continue with the 25% fund as in the past or to select "full payment" which consists of 80% of the average of the three highest payments from the state since 1986. This provides stability to the funds received by the counties. However, if timber receipts do not reach the payment level, then the remainder is paid from unobligated finds in the Treasury.

Indirect and Induced Economic Effects

In addition there are indirect and induced economic effects that are considered in assessing the proposed alternatives. Example are businesses such as grocery stores, gas stations and equipment suppliers to those individuals directly tied to timber harvest. Each dollar of income paid to a mill worker, for example, travels through the local economy as it moves from one business to another until it finally leaves the market area.

Estimated Economic Impacts

The following table on Jobs & Income displays the economic consequences of implementing the alternatives of timber harvest activities that are relative to local employment and income. Basic information utilizes the Forest Service MirocIMPLAN model, which tracks employment and income of the counties identified as the market area. The coefficients used were developed from the 1997 Clearwater National Forest Timber Sale Program Information Reporting System (TSPIRS). TSPIRS is a reporting system developed jointly with the General Accounting Office (GAO) and the Forest Service which has been reviewed and approved by congress.

The coefficients used from TSPIRS were:

Related Jobs Generated	26.9 per 1.0 mmbf
Income to Communities	\$1,091,190 per 1.0 mmbf
Payments to Counties	\$ 50,194 per 1.0 mmbf
Federal Income Tax Generated	\$ 163,690 per 1.0 mmbf
Total Gross Receipts	\$ 239,930 per 1.0 mmbf

Table 3-128: Jobs and Income

Alternative	Alt. Volume (mmbf)	Related Jobs Generated	Income to Communities	Payments to Counties	Federal Income Tax Generated	Total Gross Receipts
2	73	1963	\$ 79,656,870	\$ 3,664,162	\$ 11,949,370	\$ 17,514,890
3	67	1802	\$ 73,109,730	\$ 3,362,998	\$ 10,967,230	\$ 16,075,310
3A	70	1883	\$ 76,383,300	\$ 3,513,580	\$ 11,458,300	\$ 16,795,100
4	48	1291	\$ 52,377,120	\$ 2,409,312	\$ 7,857,120	\$ 11,516,640
5	49	1318	\$ 53,468,310	\$ 2,459,506	\$ 8,020,810	\$ 11,756,570
6	66	1775	\$ 72,018,540	\$ 3,312,804	\$ 10,803,540	\$ 15,835,380

The effect of implementing the North Lochsa Face provides economic benefit across the spectrum of local residents. Some will be directly employed in extraction and manufacturing of products generated by the project. Some residents will have indirect

benefits by providing service to the people directly affected, and some people will benefit from money brought into the community through payments to counties and federal income tax generated as well as from the general income that is spent in the community. Thus this project does not effect minorities or low income groups disproportionately.

Predicted Stumpage and Present Net Value

Each Alternative produces a different level of benefits and costs associated with timber harvest, road work, fuel treatment, reforestation, and other related timber harvest activities. This part of the economic analysis focuses on the relative differences in these benefits and costs between alternatives by displaying advertised rates, Predicted High Bid, Present Net Value (PNV). The Advertised Rate is the minimum dollar amount for which a timber offering can be sold. Predicted High Bid is the amount the winning bidder is predicted to offer for a timber sale based on Transaction Evidence appraisal model. The Present Net Value is the benefits (market prices and nonmarket values) discounted to a specific point in time, minus costs discounted to that same time.

Present net value is a technique to compress values into an equivalent single time period which allows comparison of alternatives. Present net value is used because in timber sales there is a flow of cost and benefits over time. An alternative with a positive PNV is expected to be above costs, i.e. not a below cost proposal.

HELIPACE

Since a significant amount of each alternative would require helicopter yarding to met the vegetative objectives, all proposed helicopter units were analyzed with the HELIPACE model to assess economic feasibility and provide cost estimates for stumpage appraisal purposes.

Table 3-129: Helicopter Volume (MMBF)

Alternative	Pete King Cr.	Face	Canyon/Deadman	Fish Cr.	Total
2	7.1	3.2	3.6	---	13.9
3	7.1	3.2	3.6	---	13.9
3A	7.1	3.2	3.6	---	13.9
4	5.4	---	2.8	---	8.2
5	5.4	---	2.8	---	8.2
6	7.1	3.2	5.7		16.0

HELIPACE is a Helicopter Production and Cost Estimation program developed to meet the need for greater accuracy in estimating helicopter logging production rates and costs. HELIPACE was the result of cooperative project between the Helicopter Logging Association, the USDA Forest Service Pacific Northwest region, and the Pacific Northwest Research Station.

HELIPACE program looks at several factors of which three significant variables have the greatest affect on helicopter stump-to-truck cost of \$250/mbf or less is considered economically viable. However costs that exceed \$250/mbf are considered high risk and are considered economically infeasible. Below is a brief description of these significant variables.

Load Factor: Measure of efficiency for achieving turns at or near optimal target weight (payload). As this load factor decreases, yarding cost per thousand board feet increases.

Flight Distances: The distance from landing to center of the unit. This is know as the mean yarding distance. As expected, cost per thousand board feet increases at a linear rate as flight distance increases. Region One guidelines consider the mean yarding distance of approximately 5/8 mile or 3035 feet to be economic feasible.

Canopy closure: An estimate of the percentage of area occupied by the crowns (canopy) of the residual trees over the logs to be yarded. Canopy closure influences the number of turns that are obstructed during the hooking and lifting operation and also effects the number of turns which can not meet the designed turn load weight because of the hookers inability to gather an adequate number of logs at a given location. As remaining canopy closure over the logs increases, turn weights decrease and turn times increase. For safety and standard industry practice assessment of canopy closure over logs in excess of 75% are considered operationally feasible.

TSPS

The TSPS computer model was used to appraise the alternatives and assess the Present Net Value of each. TSPS (Timber Sale Planning and Analysis System) was developed by the Economics Research Unit of the Intermountain research Station to help planners design and evaluate timber sale alternatives and to simultaneously accomplish the economic requirements of project-level analysis.

TSPS Sale Program (TSPS_SP) allows development of several timber sale alternatives, differing in terms of cutting units harvested and for management of those units subsequent to harvest. TSPS_SP can be initially used several years before a timber sale is offered and used later to update sale information as plans and data become more refined and specific. TSPS_SP has several features, including provisions for two methods of stumpage appraisal, multiple timber and nontimber products, multiple entries in cutting units to approximate uneven-aged management in addition to even-aged management, and reports that provide a wide variety of information on stumpage appraisals and overall management summaries reflecting present net value calculations.

Information provided by the Economic Models is used as a tool to understand the relative difference between alternatives rather than predict actual "values" for each Alternative.

Road construction/reconstruction, erosion control, fuel treatment associated with harvest, and reforestation costs anticipated to be needed to implement the alternatives would be financed from stumpage fees collected from the timber sales and therefore have been included in the stumpage calculations.

Cost associated with road rehabilitation have not been included in the stumpage equation. The rehabilitation activities are not a direct cost against the stumpage of these action alternatives, because the proposed timber harvesting did not create the need to do this rehabilitation work. A limited amount of this type of activity for sediment reduction may be funded under the Knutson-Vandenburg Act (KV) which derives funds from excess timber stumpage revenues above base rates from the harvesting of timber within the immediate vicinity of a rehabilitation site.

All Alternatives have a positive PNV, therefore they are not considered a below cost proposal.

Alternative 2 has the highest PNV of \$15.9 million and alternative 5 has the lowest with \$9.6 million.

Alternative 2 would generate the highest total revenue because of the largest associated volume to be harvested and would generate the greatest revenue to the government.

The following table displays the predicted stumpage and present net value by drainage for each alternative.

Table 3-130: Estimated Economic Effects, Appraisal Comparison, Predicted Stumpage, and Present Net Value

Alt	Drainage	Volume (CCF)	Advertised Rate (\$/CCF)	Predicted High Bid (\$/CCF)	PNV (\$1000)
2	Pete King	36,272	138.52	153.94	2,388.3
	Canyon/Deadman	55,008	246.14	261.56	9,745.0
	Fish	8,460	121.14	136.56	487.1
	Face	45,576	159.66	175.08	3,257.5
	Ave/Total	145,316	184.88	200.30	15,877.9
3	Pete King	34,332	129.32	144.74	1,959.2
	Canyon/Deadman	49,708	198.93	214.35	4,714.2
	Fish	8,460	121.14	136.56	487.1
	Face	41,616	157.55	172.97	2,853.2
	Ave/Total	134,116	163.36	178.78	10,013.7
3a	Pete King	36,272	137.96	153.38	2,360.5
	Canyon/Deadman	54,396	240.07	255.49	7,877.4
	Fish	8,460	121.14	136.56	487.1
	Face	41,616	157.55	172.97	2,853.2
	Ave/Total	140,744	182.21	191.67	13,578.2
4	Pete King	34,664	160.14	175.56	2,795.8
	Canyon/Deadman	53,092	237.21	252.63	7,734.1
	Fish	8,460	121.14	136.56	487.1
	Face	164	88.55	103.97	-1,218.4
	Ave/Total	96,380	199.05	214.47	9,798.6
5	Pete King	34,664	143.65	159.07	2,304.6
	Canyon/Deadman	53,312	241.48	256.90	7,913.2
	Fish	8,460	121.14	136.56	487.1

Alt	Drainage	Volume (CCF)	Advertised Rate (\$/CCF)	Predicted High Bid (\$/CCF)	PNV (\$1000)
	Face	752	65.20	80.62	-1,095.6
	Ave/Total	97,188	194.75	210.17	9,609.3
6	Pete King	35,624	135.66	151.08	2,173.6
	Canyon/Deadman	47,140	206.34	221.76	5,326.6
	Fish	8,460	121.14	136.56	487.1
	Face	41,448	157.10	172.52	3,369.1
	Ave/Total	132,672	166.55	181.97	11,356.4

The following table displays the Overall Management Comparison by alternative. This comparison displays the net PNV for stumpage for each alternative along with cost for the non-timber outputs. Non-harvest activities are underburning, prescribed burning and precommercial thinning which would need Congressionally appropriated funds to implement the activity, and are not directly associated with a timber sale.

Table 3-131: Overall Management Comparison by Alternatives

Alternative	Stumpage, PNV (\$1000)	Non-Timber Output Cost (\$1000)	Non-Timber Acres Treated
2	15,877.9	-2,640	13,656
3	10,013.7	-2,644	13,627
3A	13,578.2	-2,104	8,647
4	9,798.6	-877	1,999
5	9,609.3	-2,640	13,607
6	11,356.4	-2,685	13,917

Table 3-132: Source of Cost and Revenues

Activity	Cost Calculations
Essential Regeneration and Environmental Protection:	The costs were obtained by using a three average (FY 95-97) costs from the TPIR 01 report. A weight average cost per acre was obtained by multiplying the cost times the acres harvested in the respective fiscal year. An overhead factor was applied to the direct costs. The procedure is the same as used in the annual TSPIRS report.
Road Maintenance:	Costs per mile to complete maintenance requirements were based on 2/97 Base Rates for Road Mtnce. Obtained from Clearwater Engineering section.
Forest Service Cost: Harvest Administration, Sale Preparation, Stand Exam and Transportation Planning:	The procedure was the same as with Essential Regeneration and Environmental Protection except the costs were multiplied times the MBF harvested in the fiscal year.

Activity	Cost Calculations
Engineering COR:	The costs were obtained from the Clearwater SO Engineering section based on FS administration costs experienced with reconstruction and construction of system roads.
Jobs, Income to Communities and Federal Income Tax Estimations	The Intermountain Research Center updates the Input-Output model used in completing the employment and income values for Table 3 in TSPIRS. The number of jobs which can be anticipated by the timber harvested are classified as direct (9.26 jobs/mmbf) and indirect and induced (17.62 jobs/mmbf) for FY 97
Payment to State	Mike Niccolucci, Intermountain Research Station, Missoula suggested a 3 year average bid value be determined and 25 percent of the average be used to anticipate the payment to state. A weighted average of bid values (FY 95-97 and the first half of FY98) was computed at \$265 per MBF.
Gross Receipts	Revenue based on 1996 Clearwater National Forest harvest of 42 mmbf that generated \$ 10,077,100 gross receipts.