

Summary

■ S.0 Introduction

The wildfires of 2000 were historic in their extent and effects. Across the Lolo National Forest, approximately 74,000 acres burned.

The wildfires left a mosaic of burn patterns in some areas and large expanses of charred land in others. Due to the effects of past harvesting and fire suppression, some areas of the forest that historically would have burned with frequent, low intensity fires were, consumed by high intensity fires.

In many locations, the fires degraded watershed conditions. They revealed roads that were previously vegetated, destabilized soils and drainage ways, and increased sediment delivery to fisheries habitat. In some areas, due to the loss of tree canopy, peak watershed flows may also have been increased to levels above the capacity of existing structures. In other areas, the fires killed or weakened trees, increasing their susceptibility to insect attack, or created the potential for fuel accumulations that could lead to the recurrence of uncharacteristic wildfires in the future.

Although “natural” in occurrence, the fires left many resources in an unacceptable condition (relative to Forest Plan goals or other resource protection laws) and susceptible to further degradation without management intervention.

The fires also provided a situation where the commercial value of forest products could be recovered from areas designated as suitable for

resource management, and jobs and economic opportunities could be gained through a variety of forest restoration projects.

This document is a summary of the Post Burn Final Environmental Impact Statement (FEIS). It provides a brief overview of the: (1) proposed action, (2) purpose and need for the project, (3) process used to formulate alternatives, (4) alternatives developed to respond to public issues and comment, and (5) effects that the proposed alternatives may have on the human environment. As a conclusion to this summary, the environmentally preferred, and agency preferred alternatives are identified.

More detailed information is presented in the Final Environmental Impact Statement and Appendices, and in the Post Burn EIS Project File.

■ S.1 Proposed Action

To respond to the resource conditions and opportunities created by the fires of 2000, the Lolo National Forest is proposing to conduct a variety of management activities that address: (1) the short-term effects of the wildfires and wildfire suppression activities, (2) the long-term needs for restoration and recovery of watersheds and land (including vegetation and wildlife), and (3) the need to work with local communities and people affected by the fires.

The Forest’s proposed management activities are limited to four of the larger fires on the Forest

including: the Upper Ninemile Complex (19,900 acres), the Alpine Divide Fire (3,600 acres), the Thompson-Flat Complex (9,500 acres) and the Landowner Fire (5,700 acres) that burned near the communities of Superior, Alberton, and Huson, Montana. In this document, these fires are referred to as the “Ninemile”, “Alpine”, “Flat”, and “Landowner” fires. Other fires that burned across the Forest were not considered within this project because they: (1) were very small in size, (2) burned in geographically isolated areas, (3) have lower restoration needs and fewer concerns associated with restoring ecosystem resilience, (4) burned within areas allocated as unsuitable within the Lolo Forest Plan, or (5) burned in small diameter timber uneconomic to recover.

The proposed management activities are summarized in Figure S1.1.1 under the headings of: **“Restoration and Recovery of Watersheds”**, **“Restoration and Recovery of the Land,”** and **“Working with People and Communities”**. These headings relate to information described in the Northern Region Assessment, *Toward Restoration and Recovery* (USDA Forest Service 2001) and are used throughout this document to highlight efforts to restore both aquatic and terrestrial conditions. These headings also highlight the concept of multiple use management and provide a clear distinction between activities associated with water and land restoration, and activities intended to protect land uses or provide economic support to local communities.

Proposed Action
<p>Restoration and Recovery of Watersheds</p> <p>Remove or replace up to 350 undersized or improperly positioned culverts (priority on structures that are fish passage barriers or that pose greatest potential for causing stream sedimentation).</p> <p>Evaluate needs and implement stabilization and rehabilitation activities on approximately 30 miles of stream.</p> <p>Evaluate needs and conduct soil erosion control measures on approximately 14,000 acres of area burned by moderately high to high fire severities.</p> <p>Conduct fire line stabilization activities on approximately 14 miles of fire line near streams.</p> <p>Close approximately 140 miles of unneeded road.</p> <p>Reconstruct and install Best Management Practice (BMP) measures on approximately 180 miles of road.</p>

Restoration and Recovery of the Land
Plant approximately 12,000 acres of areas burned by moderately high and high fire severities where natural regeneration is absent or insufficient.
Conduct fuels reduction projects and ecosystem-management prescribed burns on approximately 1,300 acres.
Conduct prescribed burns (following salvage and commercial thinning activities) on approximately 1,600 acres.
Commercially thin approximately 10,000 acres of unburned timber and timber burned by low severity fires (including old growth forests).
Working with People and Communities
Provide interpretive information for three historical sites.
Salvage approximately 5,000 acres of fire damaged, dead, and dying timber in areas that burned with moderate to high fire severities.
Salvage approximately 100 acres of insect killed timber adjacent to the fire perimeters.
Construct approximately 3 miles of temporary road to access proposed treatment areas.

Figure S.1.1. Proposed Action. *The project proposal includes a variety of activities.*

Most vegetation management and associated activities would occur within the fire perimeters. To address broader scale needs associated with cumulative effects, watershed restoration and recovery activities would occur over a larger area both inside and outside of the fire perimeters.

■ S.2 Purpose and Need for the Proposed Action

The Forest has identified several reasons for proposing management activities in and near the areas that burned in the summer of 2000. These are based on a combination of factors including: (1) existing resource conditions, (2) Forest Plan direction, (3) National Fire Plan direction, and (4) public input regarding the need to manage the burned areas. Many reasons are founded on long-term ecological needs to return the land to a more healthy and resilient condition; others are based on social and economic values (Figure S.2.1).

Purposes and Objectives

Restoration and Recovery of Watersheds

Improve hydrologic, riparian, and stream channel conditions including channel stability, drainage patterns, and runoff timing in order to: (a) ensure that streams would be resilient to future natural and human-caused disturbances, and (b) that they would function properly from a hydrologic perspective. *(Lolo National Forest Plan Standards #14-20)*

Improve in-stream aquatic habitat including condition and connectivity in order to facilitate recovery of local native salmonid populations with emphasis on bull trout and cutthroat trout populations. *(Lolo National Forest Plan Standards #27 and #28)*

Protect soil properties and stability including risk to erosion, vegetative cover, soil organic content, and damaged soil surface layers in order to provide for long-term soil quality and site productivity. *(Lolo National Forest Plan Standards #13 and #18, Forest Service Manual 2500)*

Provide for a transportation system that better reflects current access needs and resource concerns, and reduces economic burdens associated with maintaining unneeded roads. *(Lolo National Forest Plan Standards #48-52, National Forest Roads Policy, 36 CFR, Part 212, et al.)*

Restoration and Recovery of the Land

Improve vegetation structure in order to: (a) reduce future fire intensity, (b) reduce the potential for epidemic bark beetle infestations in "at-risk" stands, (c) improve habitat for flammulated owls, and (d) enhance the potential for old growth forest conditions in low elevation, drier, forest habitats. *(Lolo National Forest Plan Standards #43-47, #56-58, #23, #24, Northern Region Overview, 1988)*

Minimize establishment and spread of non-native weed species to areas impacted by fire and fire suppression activities. *(Lolo National Forest Plan, Noxious Weed Management Amendment, Forest Service Manual 2080)*

Reestablish or promote "at risk" ponderosa pine, western larch and whitebark pine tree species and other sensitive plant species. *(Northern Region Overview, 1988)*

Working with People and Communities

Protect and interpret cultural and historical resources in order to: (a) reduce risk to damage or loss by human disturbance, and (b) enhance awareness of unique local historic features. *(Lolo National Forest Plan Standards #54 and #55, Forest Service Manual 2360)*

Provide forest products to support local communities that continue to be associated with commodity outputs from the National Forest. *(Lolo National Forest Plan Goal #1, Lolo National Forest Plan Standard #13)*

Provide for healthy stands and optimize timber growing potential in areas allocated for timber management

within the Forest Plan. *(Lolo National Forest Plan Goal #1, Lolo National Forest Plan Standard #13)*

Figure S.2.1. Purposes and Objectives. *The Forest has identified several reasons for proposing management activities in and near areas that burned in the summer of 2000.*

S.3 Process Used to Formulate Alternatives

S.3.1 Burned Area Assessment

Following the fires, the Forest completed a Burned Area Assessment (BAA) to determine scientific needs for conducting long-term land and watershed restoration activities in and near to the fire perimeters. The results of this assessment helped determine a Proposed Action for the Post Burn project.

S.3.2 Public Involvement

During and immediately following the 2000 fire season (July-December), the local public remained heavily involved and well informed of fire fighting efforts and post fire emergency rehabilitation activities. In many instances, local residents were directly involved with fire suppression, emergency restoration work, and associated support services.

Pre-Scoping

Following the fires, and prior to beginning the Post Burn project, the Forest initiated public involvement by conducting four "Pre-Scoping" meetings in communities near and most directly influenced by the fires (Figure S.3.1).

Community Pre-Scoping Meetings

Ninemile Community Meeting – meeting held at Ninemile Community Center on March 22, 2001.

Alberton Community Meeting – meeting held at Alberton Public Library and Community Center on April 9, 2001.

Frenchtown Community Meeting – meeting held at Frenchtown High School on April 10, 2001.

Superior Community Meeting – meeting held at Superior Ranger District on April 23, 2001.

Figure S.3.1. Pre-Scoping Meetings. *The Forest conducted four "Pre-Scoping" meetings in communities near and most directly influenced by the fires.*

Information, comments, and concerns expressed in these meetings, along with the scientific findings of the Burned Area Assessment, led to a formal proposal to manage lands affected by the fires of 2000.

■ **Project Scoping**

On June 15, 2001, the Lolo National Forest began the formal public involvement or “scoping” process by mailing general information packets containing a summary of the Proposed Action to 1361 individuals and organizations on the Forest’s established mailing list

The Lolo National Forest also published a “Notice of Intent” within the Federal Register on Thursday, July 5, 2001.

Figure S.3.2 summarizes public involvement used to solicit comments on the Forest’s Proposed Action.

Public Involvement
General Information Packets – mailed on June 15, 2001 to 1361 individuals and organizations on Forest’s established mailing list.
Introduction to Post Burn EIS – on June 15 th this document was published on the Forest’s web page, posted at local libraries and Forest Offices, and provided hard copy upon request.
Newspaper Headlines – on June 27 th a widely distributed newspaper (the <u>Missoulian</u>) runs a front-page article on the Forest’s Proposed Action. A second front-page article was run on August 17 th in a local newspaper (the Clark Fork Wagon Wheel).
Legal Notices and Announcements – on July 6 th articles were placed in local newspapers requesting comments to the Proposed Action.
Open Houses – public open houses were held on July 23 rd and 24 th to meet one-on-one with the public and solicit comments.
Field Tours – on September 25 th and 27 th field tours were held with the public and Environmental Advocacy Groups.
Student Education - on September 25 th educational field trips were held with students from the Superior Elementary School system.
Mill Tour – on November 26 th a mill tour was attended with local timber industry representatives.

Figure S.3.2. Public Involvement. *Several means of public involvement helped to solicit comments on the Forest’s Proposed Action.*

■ **Public Comments on Draft EIS**

Approximately nine months after beginning the Post Burn project, the Lolo National Forest released the Draft of the Post Burn Environmental Impact Statement. Six alternatives were presented in the Draft EIS, of which four were fully analyzed.

The Lolo National Forest published a “Notice of Availability” within the Federal Register on Friday, March 29, 2002.

Figure S.3.3 summarizes public involvement used to solicit comments on the Draft EIS.

DEIS Comment Period
Legal Notices and Announcements – on March 20, 2002 and 21, 2002 articles were placed in local newspapers announcing release of the Draft EIS and requesting comments to the Proposed Action. A “Press Release” including a “Fact Sheet” describing the project and alternatives was released to the local press.
Newspaper Headlines – on March 27, 2002 a widely distributed newspaper (the <u>Missoulian</u>) runs a front-page article on the Forest’s release of the Draft EIS and project alternatives.
Post Burn DEIS Publication and Distribution – on March 29, 2002, this document was published on the Forest’s web page, posted at local libraries and Forest Offices, and provided as a CD, Hardcopy, or Summary to over 100 individuals, groups and organizations.
Open Houses – public open houses were held on March 14 th , 25 th , 27 th , April 24 th and May 7 th at Ninemile, Frenchtown, Alberton, Superior, Missoula, and Plains to meet one-on-one with the public and solicit comments on the DEIS.
Professional Associations – on April 16, 2002, presentation of the DEIS was made to Missoula Chapter of Society of American Foresters to solicit public comments.
Student Education - on May 7, 2002 a presentation of the DEIS was made to the U of M Forest Policy Class to discuss analysis and alternatives, and to solicit public comments. Between May 18, 2001 and June 5, 2002, educational field trips were held with students from elementary school systems.
Field Tours – on June 10 and 11 th field tours were held with the Environmental Protection Agency (EPA) and Montana Department of Environmental Quality (MDEQ) to review watershed conditions and project effects.

Figure S.3.3. DEIS Comment Period. *Several means of public involvement helped to solicit comments on the draft of the EIS.*

Approximately 170 letters, comment cards, telephone calls, and e-mails were received during

the 45-day comment period on the Draft EIS.

Additional analysis, explanations, clarifications, and other responses to public concerns were completed and included within the Final EIS.

The Lolo National Forest and Regional Office also conducted an internal professional peer review of the Draft EIS. Responses to peer comments were also included in the Final EIS.

■ **Involvement of other Agencies**

In addition to involving the public, the Forest consulted with several other agencies for resource data and issue identification. The input from these agencies was also used to develop alternatives.

Following issuance of the Draft EIS, the Environmental Protection Agency and Montana Department of Environmental Quality expressed general support of the project and alternatives. The United States Fish Wildlife Service provided concurrence with the effects of the preferred alternative on Threatened, Endangered, and Sensitive species.

■ **Literature Citations, References and Attachments used in Issue Identification**

Several letters received from the public during the scoping process included literature attachments or references to previously submitted comments. The information in these attachments was considered during the coding of comments that were specific to the project.

Because of heightened concerns for issues discussed by the scientific commentary of Beschta et al., the principles outlined in this report were used in the development of Design Criteria and Alternatives. Many of the Design Criteria specifically iterate resource protection concerns displayed in the Bestcha et al. commentary. Mitigation measures were also used to offset resource management effects as outlined by Bestcha et al.

□ **S.3.3 Issue Development**

Potential issues (defined as actual and perceived effects, risks, and hazards of the Proposed Action) were developed from the results of both “internal scoping” and “external scoping” (public involvement). These issues were grouped and

consolidated into Consolidated Issue Statements.

Fifty-six Consolidated Issue Statements were identified as relevant to driving the development of alternatives (Figure S.3.4).

<p>Driving Issues</p> <p>Consolidated Public Issues</p> <p>BESCO 7 – Road System Environmental Impacts, Costs and Analysis - There is a concern that the degraded condition of most non-wilderness watersheds on the Lolo National Forest warrants the implementation of rehabilitation and restoration projects that propose no further commercial logging or road building.</p> <p>ECO 2 – Restoration of Ecosystem Processes - There is a concern that the proposed activities do not emulate natural ecosystem processes and are designed solely for the gain of economic benefits from the burned area, therefore disregarding the principles of ecosystem management. There is further concern that these actions disrupt, rather than restore natural ecosystem process to the landscape</p> <p>ECO 3 – Insect Infestations – There is a concern that the large numbers of stressed and dying trees impacted by the fires of 2000 will lead to the spread of and damage by insect populations known to be present within the area. There is also concern that the failure to remove both stressed and dying burned trees, and susceptible overstocked unburned trees, will lead to additional insect infestation and loss.</p> <p>ECO 6 – Noxious Weed Spread and Non-Native Species Introduction – There is a concern that the removal of fire killed stands of dead and dying trees and the commercial thinning of unburned trees may increase the spread and establishment of noxious weeds. There is further concern that noxious weeds, or exotic grass species used to prevent weed spread, may compete with native forbs and grasses, especially sensitive plants that potentially occupy very small habitats.</p> <p>ECON 3 – Contributions to Local Jobs, Counties, and Economies – There is a concern that local jobs and support to local economies will be lost if timber salvage, commercial thinning, and other proposed forest management activities are not conducted. There is also concern that federal funding provided to local counties from timber sale proceeds would not be available unless forest management activities were conducted and therefore schools and roads would deteriorate.</p> <p>ECON 5- Product Deterioration and Value Loss – There is a concern that standing dead and dying timber is quickly deteriorating and value will be lost before burned trees can be salvaged.</p> <p>FIRE 1 – Fuel Levels and Effect on Fire Behavior and Reburn – There is a concern that existing and future fuel loads created by past fire suppression, burned vegetation, and unburned vegetation killed by disease, insects or competition, could lead to higher fire severities, fires less resistant to control, and increased rate of spread. There is also concern that fuels created by the fires of 2000 increase the potential for reburn.</p>

FIRE 2 - Fuels Vary by Fire Regime and Elevation - There is concern that prescribed fire, fuels reduction, and other vegetation treatments are being proposed within areas historically dominated by moderate to severe fire regimes. Prescribed burning and vegetation treatments to return fire are unnecessary in these areas and should be focused within the low elevation, low-severity fire regimes or areas adjacent to important structures.

FISH 1 - Effects on Fish and Aquatic Habitat - There is a concern that the removal of fire-killed stands of dead and dying trees and the commercial thinning of unburned trees could adversely affect fish populations and aquatic habitat necessary to support fish and riparian fauna. Furthermore, there is a concern that previous logging, road development, mining, and other land uses have impacted fish populations and aquatic habitat to levels that preclude any further detrimental impacts.

MINER 1 - Historic Mining Impacts on Water Quality - There is a concern that historic and abandoned mine sites may adversely affect water quality and aquatic health. Reclamation would be effective at reducing the impacts of these sites and could be completed along with adjacent stream and riparian rehabilitation projects.

PLAN 8 – Proposed Alternatives - There is a concern that an adequate range of alternatives may not be evaluated. There is a request for the consideration of specific alternatives and alternative designs.

ROADS 1 – Closure Affects Long Term Land Management and Public Access - There is a concern that road closures and road decommissioning will limit access for future land management and public access. There is additional concern that road closures are an unnecessary expense and remove an existing or established infrastructure. There is also a concern that the decommissioning of roads that are already heavily vegetated may produce additional and unnecessary sedimentation and resource impacts. Roads are observed as an asset. Temporary (vs. permanent) closures can be used to protect resources without jeopardizing future access. Roads can be designed to produce little impact and be of low maintenance and should be considered for areas that are presently not roaded.

ROADS 2 – Effects of Roads on Ecological Values - There are concerns that the existing road system is adversely affecting water quality, aquatic habitat, wildlife, and other resources. There is also a concern that existing road densities exceed Forest Plan Standards for protecting resource health and that there is no "room for additional roads". There is concern that poor maintenance has caused unnecessarily high levels of sedimentation to stream systems and that many unclassified roads have not been monitored and have not received maintenance. If these roads are not to be closed, they should be placed on the system and maintained.

ROADS 3 – Maintenance Practices and Best Management Practice Standards - There is a concern that present maintenance and management practices are not effectively reducing road sediment delivery and may further degrade water quality and aquatic habitat. There is also a concern that many roads do not receive any maintenance because they are presently unclassified or unaccounted for in the Forest Service Inventory of roads.

RDLES 1 – Unroaded and Inventoried Roadless Areas - There is a concern that removal of fire created stands of dead

and dying trees, the commercial thinning of unburned trees, and the removal of understory fuels could alter the undeveloped character of large unroaded areas. Roadless areas within or adjacent to the analysis area that have contiguous unroaded parcels adjacent to them include Reservation Divide (1205), Stark Mountain (01800), North Siegel (01796), South Siegel (01795), Hoodoo/Great Burn (01301), and Meadow Creek – Upper North Fork (01302).

SOILS 1 – Fires Impacts on the Chemical, Physical, and Biological Components of Soil - There is a concern that the fires and fire suppression activities may have adversely affected soil stability, structure and erosion potential. There is concern that soils within the area are now highly prone to mass wasting and increased erosion due to the loss of vegetation. Furthermore, there is a concern that the fires caused soil structure damage that could lead to increased overland flow and extensive erosion.

TIMBE 1 – Harvesting Needed to Improve Forest Health - There is a concern that without harvesting, forest health may decline. There is concern that without vegetation management, disease, insects, and decadence will increase, resulting in a loss of forest products and economic values. There is additional concern that without harvesting, increases in course woody debris could divert stream courses and adversely affect riparian stability. There is a desire to harvest merchantable trees in an environmentally sound manner, leaving non-merchantable trees and adequate snags to protect other resource values.

TIMBE 2 – Harvesting Not Ecological, and Unnecessary for Fire Recovery - Refer to Issue ECO 2 that addresses ecological impacts of vegetation management and road management.

TIMBE 3 – Harvesting Leads to Fuel Problems - Refer to Issue FIRE 4 that address fuel increases following vegetation management.

TIMBE 4 – Past Logging Has Caused Resource Damage - Refer to ECO 2 that addresses ecological impacts of vegetation management and road management.

TIMBE 6 – Harvesting Increases Weed Spread - Refer to Issue ECO 6 that addresses land management as a cause of weed spread.

TIMBE 7 – Planting Un-Ecological and Unnecessary - There is a concern that planting will introduce non-native species of trees and atypical (offsite) tree genotypes. There is further concern that planting accelerates the natural regeneration cycle and does not represent the ecological cycle that occurs following fire. There is a desire that all planting be delayed for 5 years to allow natural regeneration to occur. In areas where natural regeneration does not occur, planting of on-site genotypes could be conducted.

TIMBE 8 – Small Sales Opportunities Needed - There is a concern that opportunities for small sales, roundwood (including post and poles and small sawtimber), and commercial firewood are not being provided to meet a diversity of jobs and economic needs. There is a desire that these opportunities be provided for local employment and utilization of lower value wood products.

WATER 1 – Reburn in Riparian Areas - There is a concern that reburns (that could occur because fuels reduction projects are not being conducted with RHCAs) may consume

nearly all vegetation and organic matter and adversely affect riparian areas, riparian area stability, and water quality.

WATER 2 – Wetlands and Riparian Areas - There is a concern that removal of fire created stands of dead and dying trees, the commercial thinning of unburned trees, and the removal of understory fuels could adversely affect wetlands and riparian areas.

WATER 5 – Water Quality and Degradation of WQ Limited Stream Segments - There is a concern that the removal of fire created stands of dead and dying trees and the commercial thinning of unburned trees could exceed non-degradation criteria established by State Water Quality Standards and lead to further degradation of water quality and adverse effects on beneficial uses. Two drainages, Ninemile and Trout Creek have been listed as "Water Quality Limited" within the Montana 303(d) report. Although not listed as impaired, several other drainages, including Flat Creek, Johnson Creek, and First Creek have been impacted by previous land uses.

WATER 6 – Restoration and Redisturbance of Disturbed Areas - There is a concern that vegetative treatments and access needed for proposed land management activities may redisturb areas previously restored, or restored recently following the fires of 2000. There is also a concern that previous land management activities have left many areas in need of land restoration. Restoration activities identified are for damage caused by roads, logging, livestock grazing, and other sediment sources.

WLF 1 – Burned Stands (Snag Associated bird Species) - There is a concern that the removal of fire created stands of dead and dying trees could adversely affect habitat for several bird species that utilize snags and burned trees created by wildfires. Approximately 74,000 acres burned on the Lolo National Forest during 2000. Of this acreage, approximately 12,500 acres of lethal and mixed lethal burn intensities within mature stands of VRUs 2 and 3 is considered ideal habitat for species such as the Black Backed Woodpecker.

WLF 2 – Green Stands (Closed Canopy Associated Bird species) - There is a concern that the reduction of canopy closure and stand density caused by fuels reduction activities and commercial thinning may adversely affect habitat for several bird species that are dependent upon late-successional dry forests with closed canopies and high basal area.

WLF 3 – Forest Fragmentation Effects on Bird Species - There is a concern that fragmentation of the forested area by harvesting and road construction may adversely affect interior songbirds and other birds associated with large parcels of unaltered forest habitat.

WLF 5 – Big Game and Non-Game Habitat - There is a concern that the removal of fire created stands of dead and dying trees and the commercial thinning of unburned trees could adversely affect habitat for several big game species and other smaller non-game species that utilize forested conditions for hiding and thermal cover.

WLF 6 – Lynx and other Fur Bearer Habitat - There is a concern that the removal of fire created stands of dead and dying trees and the commercial thinning of unburned trees could adversely affect habitat for Canada Lynx, pine marten, fisher, and other wildlife species dependent upon snags, burned stands and mature forest conditions.

WLF 7 – Potential and Listed Sensitive, Threatened, and Endangered Species - There is a concern that the removal of fire created stands of dead and dying trees, the commercial thinning of unburned trees, and the removal of understory fuels could adversely affect Proposed, Threatened or Endangered Species and listed Sensitive, Threatened or Endangered Species (ST&E) known to be present within or to be potential to the analysis area.

WLF 8 – Linkages, Corridors, and Habitat Fragmentation - There is a concern that the removal of fire created stands of dead and dying trees, the commercial thinning of unburned trees, and the removal of understory fuels could fragment habitat and adversely affect established wildlife movement corridors within the project analysis area. There is also a concern that these same activities may be detrimental to linkages between ecosystems within western Montana and Idaho, and thus lead to further island-ization of core habitat. Roadless and unroaded parcels along the FIR Divide, Ninemile Divide, and Lightening Peak - Bitterroot Crestline provide wildlife movement corridors within the project analysis area and between local habitats. The Ninemile Valley, including relatively undeveloped areas along the FIR and Ninemile Divides, is identified as one of the linkages between the Cabinet-Yaak and Bitterroot Selway Ecosystems. The FIR Divide may also provide a connection between the large core areas such as the Mission Mountains, Bob Marshall, and Glacier and the Cabinet-Yaak and Bitterroot Selway ecosystems. All of these core areas are identified as essential to long-term recovery of large carnivores such as the grizzly bear.

WLF 9 – Old Growth Dependent Species - There is a concern that the reduction of canopy closure and stand density caused by fuels reduction activities and commercial thinning may both beneficially and adversely affect habitat for old growth dependent species.

Consolidated Internal Issues

VEG 1 – Fire Weakened Trees Susceptible to Insect Predation - Fire weakened trees are more susceptible to insect predation, especially Douglas-fir from the Douglas-fir beetle, and in large wildfire events, these conditions can trigger a local epidemic which spreads into unburned stands resulting in high levels of tree mortality.

VEG 2 – Continued Insect Predation - Mountain pine beetle, western pine beetle, and Douglas-fir beetle were causing elevated levels of tree mortality prior to the wildfires in response to the large areas of moderate and high risk stands of lodgepole pine, ponderosa pine, and Douglas-fir. Risk of continued epidemic predation will continue without the added effects of the year 2000 wildfires.

VEG 3 – Reburn Effects on Soils and Regeneration - The potential for another wildfire increases as fire killed trees fall to the ground and greatly increases fuel loadings. Another high intensity burn in VRU2 within approximately 3 to 35 years could cause soil damage beyond the range of natural variation. Wildfires could also cause mortality of saplings that regenerate after the year 2000 wildfire.

VEG 4 – Old Growth Protection and Enhancement - Old growth stands in burned and unburned portions of VRU2 are at risk to insects and disease, and wildfires by the overly dense understory conditions that are beyond the range of natural variation. A significant amount of old growth forests has been harvested since settlement and mining began in the

late 1800's. Protecting, enhancing, and recruiting old growth forests in burned and unburned portions of VRU2 is important to the ecological integrity of these landscapes.

VEG 5 – Protecting, Enhancing and Establishing “Species at Risk” - Several seral conifer species occurring in these landscapes have been identified as “species at risk” in the Northern Region Overview primarily as a result of wildfire suppression. Natural regeneration of these species may be deficient in some burned areas for lack of adequate seed fall. Protecting, enhancing, and establishing western larch, ponderosa pine, and whitebark pine is important to the ecological integrity of these landscapes and conifer species.

FISH 1 – Roads Impair Stream Function - Roads impair stream function, produce fine sediment that may be delivered to stream channels, alter watershed hydrology by more efficiently delivering upslope runoff to channels, and may affect instream flows where they cross channel (See HYDRO 4). An increase in fine sediment delivered to stream channels may reduce available pool quantity and quality (fish rearing) and intergravel quality, thereby reducing early life history survival and further impair viability of important fish populations such as bull and westslope cutthroat trout.

FISH 2 – Vegetation Management Affects Fisheries Habitat - Timber harvest (salvage and green) in areas that burned with moderate, moderate-high, and high severity may increase fine sediment inputs to instream habitats. An increase in fine sediment delivered to stream channels may reduce available pool quantity and quality (fish rearing) and intergravel quality, thereby reducing early life history survival and further impair viability of important fish populations such as bull and westslope cutthroat trout.

FISH 4 – Culverts Impede Fisheries Connectivity - Stream crossings and undersized culverts may impair function and recovery of fish populations, as well as increase the risk for sediment production and delivery to instream habitats. Inappropriately sized or placed culverts at stream crossings can prevent upstream fish passage; this reduces the ability of fish populations to persist in a healthy state or to recover from landscape disturbances such as wildfire. Stream crossings and undersized culverts increase the potential for sediment inputs to instream habitats through failure or long-term sediment recruitment from fill areas.

HYDRO 3 – Accelerated Soil Loss - Harvest activities and fire suppression may lead to accelerated soil loss due to ground disturbance; past activities may also contribute. Road rehabilitation may also cause short-term impacts until disturbed sites are stabilized. Soils may be especially vulnerable in areas of high-severity burn. Accelerated erosion in upland areas may lead to increased sediment delivery to stream channels, which may cause a decline in water quality downstream. Ninemile Creek and Trout Creek are on the Montana list of streams not meeting water quality standards under Section 303(d) of the federal Clean Water Act. Management activities related to timber harvest and roads have the potential to further degrade water quality in these streams.

HYDRO 4 – Road Sediment and Hydrologic Effects - Roads that are open to use produce sediment that may be delivered to stream channels, alter watershed hydrology by more efficiently delivering upslope runoff to channels, and may affect instream flows where they cross channels. Changes in runoff timing, peak discharge, sediment loads, and channel stability may result.

HYDRO 5 – Increased Water Yields and Flood Peaks - Removal of vegetative cover may alter evapotranspiration and interception of incoming precipitation; this may lead to an increase in annual water yields and flood peaks. Such changes in runoff patterns have the potential to destabilize channels. Culvert sizing may also need to take account of this potential impact.

FIRE 4 – Fuels in Intermix Communities - High fuels in intermix zones may increase fire risk to local communities and reduce suppression abilities for future wildfire events.

WILDLIFE 2 – Lynx - Management activities may change denning habitat, foraging habitat, travel cover and suitable habitat.

WILDLIFE 6 – Northern goshawk – The fires have greatly reduced potential goshawk habitat within the fire perimeter. Goshawks are not likely to occupy stands where the tree canopy has been lost. Goshawks may utilize under burned stands adjacent to unburned stands. Thinning in green stands may reduce canopy closure in foraging areas or impact nest trees.

WILDLIFE 7 – Black Backed Woodpecker - Removing burned trees may reduce suitable habitat for black-backed woodpeckers.

WILDLIFE 15 – Pileated Woodpecker - Management activities may reduce suitable pileated woodpecker habitat by removing large snags and smaller foraging trees.

TIMBER 3 – Logging System Feasibility – In addition to feasibility concerns created by loss of timber value and merchantability specification, limitations imposed by available transportation facilities will determine which from of logging system can be used.

ECONOMIC 4 – Funding for Resource Rehabilitation Activities – Without timber harvest funding may not be available to complete watershed and land restoration and rehabilitation activities. Even if timber harvesting is performed, rehabilitation activities outside of the sale boundaries will need funding from appropriated sources.

ROADS 1 – Access needs for Land Management and Public Use - Road closures may reduce access for future land management and public recreational use. The amount of roads needed to manage a given area could be reduced with changes in logging systems. Decommissioning some of these roads would improve the hydrologic function of the watershed, but may increase logging costs. Road systems provide for faster and less expensive access to the forest for management activities. The wildfires of 2000 have changed the type and frequency of access for land management.

REC 3 – Noxious Weed Spread - Off-road and off-trail human, stock, and snowmobile travel could spread noxious weeds into relatively weed-free areas.

Figure S.3.4. Driving Issues. *Fifty-six of the Consolidated Issue Statements were identified as relevant to driving the development of alternatives.*

In order to avoid developing alternatives that were not environmentally, technically or economically feasible, “Design Criteria” were developed to limit the scope of alternatives

within known resource constraints, Forest Plan Standards, and laws and regulations. These constraints served as a basis for resource protection or enhancement when developing all of the action alternatives.

Design Criteria were developed from resource information and issues displayed in the Burned Area Assessment, field reconnaissance, and from review of current Forest Plan direction, and pertinent laws and regulations governing management of Federal lands.

The Design Criteria served as a “Coarse Filter” for developing alternatives. The Design Criteria helped avoid or rectify resource impacts by directing management toward or away from areas. The Design Criteria thus helped to focus the location of activities and to minimize the time and energy spent developing alternatives that could not be implemented.

■ S.4 Description of Proposed Alternatives

Six alternatives were designed to reflect the range of issues and resource conditions and the purpose and need of the project (Figure S.4.1). Two of these alternatives (Alternatives #3 and #6) were eliminated from detailed analysis.

Proposed Alternatives
Alternative #1 – No Action
Alternative #2 – Restoration and Recovery with No Vegetation Treatments
Alternative #3 – Restoration and Recovery with Non-Commercial Vegetation Treatments (<i>eliminated</i>)
Alternative #4 – Restoration and Recovery with Vegetation and Fuels Treatments and Salvage in drier-low elevation habitats. Emphasis on Protecting Linkages and Corridors and Wildlife Habitat
Alternative #5 – Restoration and Recovery with Vegetation, Fuels Treatments and Salvage
Alternative #6 – Proposed Action (<i>eliminated</i>)

Figure S.4.1. Proposed Alternatives. Six alternatives were designed to reflect the range of issues and resource conditions, and to meet the purpose and objectives of the project.

□ S.4.1 Alternative #1 – No Action

Alternative #1 serves as a baseline for the project and displays existing resource conditions. Under

the “No Action” Alternative, ongoing Forest Management would continue. Resources identified for restoration, rehabilitation, or recovery, would remain untreated under this alternative. Natural restoration processes would recover areas impacted by the fires and previous land uses. Roads open for motorized vehicle use would remain open.

□ S.4.2 Alternative #2 - Restoration and Recovery with No Vegetation Treatments

Alternative #2 responds to the public’s request for an alternative that focuses on rehabilitating soil, water and fisheries resources impacted by the fires of 2000 and previous land uses. It highlights the grouping of both internal and public issues that address concerns relating to water quality and effects associated with proposed timber harvest. This alternative focuses primarily on the first portion of the Purpose and Need: **“Restoration and Recovery of Watersheds”**. It also features the second and third portion of the Purpose and Need: **“Restoration and Recovery of the Land”** and **“Working with People and Communities”**. No timber salvage, harvesting, or fuels treatments would occur within this alternative.

Alternative #2 highlights Lolo National Forest Plan Goals Nos. 4, 7, and 8 and specifically addresses hydrologic improvements needed for Water Quality Limited streams by proposing no harvest or salvage activities that could have short term detrimental impacts to water quality. No management activities would occur in Inventoried Roadless Areas in this Alternative. Only road closures and watershed restoration related activities would occur in areas qualifying as “unroaded”.

This alternative does not address long term vegetation restoration needs associated with past fire suppression and stand manipulation. This alternative does not address salvage of burned timber. In order to respond to the public concern regarding the introduction (planting) of non-native tree genotypes, this alternative does not address needs for reestablishing “at-risk” tree species in areas where regeneration does not occur. This alternative does address travel management, spraying for noxious weeds, and the need for protection of heritage resources exposed by the fires of 2000.

□ S.4.3 Alternative #4 - Restoration and Recovery with Vegetation and Fuels Treatments and Salvage in Dry – Low Elevation Habitats. Emphasis On Protecting Linkages, Corridors and Wildlife Habitat

Alternative #4 responds to the public's request for an alternative that focuses on the "ecological" restoration and rehabilitation of Forest resources. This alternative also responds to the public's request for an alternative that emphasizes the protection of unroaded and roadless areas, and linkages and corridors essential to big game populations and the recovery of Sensitive, Threatened and Endangered species. This alternative highlights the grouping of issues that address concerns relating to water quality, ecosystem processes, and forest fragmentation. This alternative focuses on the first two portions of the Purpose and Need: **"Restoration and Recovery of Watersheds"** and **"Restoration and Recovery of the Land"**. It features **"Working with People and Communities"**.

Within this alternative the treatments described in Alternative #2 would carry forward. Additional land restoration activities would also occur. Vegetation management, including commercial thinning and salvage, and fuels treatments would occur on the lower elevation, drier habitats referred to as Vegetation Response Unit #2 (VRU 2). No vegetation management would occur within the higher elevation, cooler, moister habitats (VRUs 3-5) considered to be "within their ecologically historic range" for fuels and wildfire. No management activities would occur in Inventoried Roadless Areas in this Alternative. Only road closures, watershed restoration, and limited vegetation management activities would occur within areas that qualify as "unroaded". No temporary roads would be developed for vegetation management activities. The effectiveness of linkages and corridors would be maximized through closure of well-established road systems.

Alternative #4 highlights Forest Plan Goals Nos. 4, 7, and 8, and more specifically addresses ecosystem processes. This alternative addresses long term restoration needs associated with past fire suppression and stand manipulation within the lower elevation-drier habitats. This alternative does not address salvage of burned

timber except where it coincides with vegetation restoration needs. This alternative does address regeneration of "at-risk" species, travel management, weed spread, and heritage site protection.

□ S.4.4 Alternative #5 - Restoration and Recovery with Vegetation, Fuels Treatments and Salvage

This alternative is a modification of the Proposed Action with adjustments made to the scale and location of proposed activities based on site-specific knowledge derived from resource condition evaluations. This alternative responds to the public's request for an alternative that focuses both on the restoration and rehabilitation of Forest resources and the provision of jobs and commodities. This alternative highlights Forest Plan Goals #1, 4, 7, and 8. This alternative strives to reach a balance among all of the issues by focusing on all three portions of the Purpose and Need: "Restoration and Recovery of Watersheds", "Restoration and Recovery of the Land", and "Working with People and Communities".

Within Alternative #5, most of the treatments (e.g. watershed and land restoration related activities) described within Alternatives #2 and #4 would carry forward; however, additional vegetation management including timber salvage would occur in order to help fund water and land restoration activities and meet local communities' needs for forest products. Several of the travel restrictions (gated roads) described in Alternative #4 would not occur in this Alternative.

In this alternative, vegetation management, including commercial thinning and salvage, would occur on the lower elevation, drier habitats referred to as Vegetation Response Unit #2 (VRU 2). Salvage would also occur within limited areas of the higher elevation, cooler, moister habitats (VRUs 3-5) where other resource concerns (e.g. soils, water quality, and wildlife habitat) would not be severely impacted. No management activities would occur in Inventoried Roadless Areas in this Alternative. Road closures, watershed restoration, and vegetation management activities, however, would occur within areas that qualify as "unroaded". Temporary roads would be developed in some areas outside of the

Inventoried Roadless Area boundaries to implement vegetation management activities.

Although subject to variation at the time of contract preparation and offering (market dependent), timber harvest activities, would be implemented through various timber sale contracts.

Watershed and land restoration activities associated with timber sale areas would be incorporated into the sale contract where practical. In Alternative #4, approximately six sale contracts would be used to implement timber harvest and associated activities (Figure S.4.2). In Alternative #5, approximately eight sale contracts would be used (Figure S.4.2). To ensure that vegetation management and watershed restoration activities that are funded by the timber sales were economically feasible, some variations of these sales could occur. Variations to the sales could include combining sales, creating optional harvest units, or creating multiple sales out of any one larger sale.

Watershed and land restoration activities not coinciding with timber sales would be completed under various service contracts. Restoration activities would be prioritized by watershed and completed as funding permitted.

Timber Sales			
Alternative #4			
Sale Name	Sale Size	Acres Treated	Approximate Volume
9-Mile	Large	596	3.7 mmbf
Alpine	Small	91	0.8 mmbf
St. Louis	Small	41	0.3 mmbf
Siegel	Small	34	1.4 mmbf
Landowner	Large	341	1.7 mmbf
Flat Creek	Large	830	4.9 mmbf
Alternative #5			
Sale Name	Sale Size	Acres Treated	Approximate Volume
9-Mile	Large	1127	8.3 mmbf
Alpine	Large	972	9.2 mmbf
St. Louis	Small	79	0.5 mmbf
Siegel	Large	278	1.7 mmbf
Pine Creek	Small	50	0.2 mmbf
Sunrise	Small	19	0.2 mmbf
Landowner	Large	654	4.2 mmbf
Flat Creek	Large	1666	12.6 mmbf

Figure S.4.2. Timber Sales. Timber harvest activities, including commercial thinning, salvage of insect killed timber, and salvage of burned timber, would be implemented through various timber sale contracts.

□ S.4.5 Mitigation and Monitoring Measures

Where potential impacts to resources were predicted, environmental protection measures would be employed to mitigate the effects of conducting activities.

Monitoring would be used to: (1) determine whether the original objectives of the activities were met, (2) determine the need for additional action, and (3) educate and assist in designing future projects.

■ S.5 Summary Comparison of the Activities, the Predicted Achievement of the Project Objectives and the Predicted Environmental Effects of All Alternatives

□ S.5.1 Introduction

The effects of the alternatives on the human environment vary according to the location and quantity of activities proposed in each alternative. The alternatives can be compared quantitatively and qualitatively by: (1) their activities, (2) how they meet the Purpose and Need, and (3) their response to the driving issues and individual resources.

□ S.5.2 Comparison of Alternative Activities

Table S.5.1 provides a comparison of the activities that would occur under each alternative.

Table S.5.1. Comparison of Alternative Activities. *The activities provide a baseline for the ability of each alternative to meet the purpose and need of the project, the ability for the alternatives to respond to issues, and the effects of the alternatives on individual resources.*

Comparison of Alternative Activities				
<u>Restoration and Recovery of Watersheds</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Soil Stabilization	0 acres	1262 acres	1262 acres	1262 acres
Riparian Planting	0 acres	38 acres	38 acres	38 acres
Dam Rehabilitation with Stream Restoration	0 dam 0 acres 0 mile stream	1 dam 10 acres ½ mile stream	1 dam 10 acres ½ mile stream	1 dam 10 acres ½ mile stream
Mine Reclamation with Stream Restoration (includes potential CERCLA qualified sites)	0 mines 0 acres 0 miles stream	4 mines 127 acres 2 ¼ miles stream	4 mines 127 acres 2 ¼ miles stream	4 mines 127 acres 2 ¼ miles stream
Trail Stabilization	0 miles 0 stream crossing	½ mile 1 stream crossing	½ mile 1 stream crossing	½ mile 1 stream crossing
Road Reconstruction and BMPs with Allocated \$\$	0 miles	279 miles	191 miles	163 miles
Road Reconstruction and BMPs with Timber Sale \$\$	0 miles	0 miles	107 miles	123 miles
Culvert Removals and Replacements with Stream Restoration (approximately 100 feet per culvert)	0 culverts 0 miles stream	108 culverts 2 miles stream	108 culverts 2 miles stream	108 culverts 2 miles stream
Road Closures and Decommissioning	0 miles (total)	228 miles (total)	225 miles (total)	225 miles (total)
Open to Scarified / Culverts Removed	0 miles	72 miles	70 miles	70 miles
Open to Recontoured	0 miles	26 miles	26 miles	26 miles
Gated to Scarified / Culverts Removed	0 miles	80 miles	80 miles	80 miles
Gated to Partially Recontoured / Culverts Removed	0 miles	2 miles	2 miles	2 miles
Gated to Recontoured	0 miles	13 miles	13 miles	13 miles
Partially Vegetated to Scarified / Culverts Removed	0 miles	21 miles	21 miles	21 miles
Partially Vegetated to Recontoured	0 miles	14 miles	14 miles	14 miles
Gravel Source Development and Reclamation	0 sites	1 site	1 site	1 site
<u>Restoration and Recovery of the Land</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Commercial Thinning and Salvage in Burned and Unburned VRU 2, 3 and 4	0 acres	0 acres	1892 acres (only VRU 2)	2470 acres
Regeneration Monitoring & Planting "at-risk" Species	0 acres	0 acres	12916 acres	12916 acres
Road Travel Management Restrictions (Gated Roads)	0 miles (total)	11 miles (total)	34 miles (total)	14 miles (total)
Open to Yearlong A Restriction	0 miles	0 miles	13 miles	0 miles
Open to Yearlong B Restriction	0 miles	0 miles	7 miles	0 miles
Open to Seasonal E Restriction	0 miles	3 miles	11 miles	6 miles
Open to Seasonal J Restriction	0 miles	8 miles	3 miles	8 miles
Prescribed Burning and Post Harvest Fuels Treatment	0 acres	0 acres	934 acres	1686 acres
Weed Treatments Along Roads and Disturbed Areas	0 miles (0 acres)	503 miles (1829 acres)	521 miles (1895 acres)	509 miles (1851 acres)
<u>Working with People and Communities</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Timber Salvage in Burned VRU 2, 3 and 4	0 acres	0 acres	0 acres	2322 acres
Timber Salvage of Insect-killed Timber Adjacent to	0 acres	0 acres	41 acres	79 acres

Comparison of Alternative Activities				
Fire Perimeters				(only VRU 2)
Temporary Road Construction	0 miles	0 miles	0 miles	1.7 miles
Heritage Site Interpretation and Interpretation Routes	0 sites 0 miles	3 sites 39 miles	3 sites 39 miles	3 sites 39 miles

□ S.5.3 Achieving the Purpose and Need

The following table displays the levels that each alternative meets the objectives of the purpose and need.

Table S.5.2. Comparison of Achieving the Purpose and Need. *Because each alternative was designed to address various driving issues, the types and quantity of activities in each alternative provide different levels of meeting the purpose and need.*

Comparison of Achieving the Purpose and Need				
<u>Objectives for Restoration and Recovery of Watersheds</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Improve hydrologic, riparian, and stream channel conditions including channel stability, drainage patterns, and runoff timing.	No – Watershed restoration, culvert removals and replacements, road reconstruction, and road closures would not occur. Ongoing BAER restoration would improve hydrologic, riparian, and stream channel conditions.	Yes – Riparian planting, dam rehabilitation, mine reclamation, trail crossing stabilization, culvert removals and replacements, road reconstruction, and road closures would be conducted to improve hydrologic, riparian, and stream channel conditions. These activities would be supplemented by ongoing BAER restoration and road maintenance activities.	Yes – Riparian planting, dam rehabilitation, mine reclamation, trail crossing stabilization, culvert removals and replacements, road reconstruction, and road closures would be conducted to improve hydrologic, riparian, and stream channel conditions. These activities would be supplemented by ongoing BAER restoration and road maintenance activities.	Yes – Riparian planting, dam rehabilitation, mine reclamation, trail crossing stabilization, culvert removals and replacements, road reconstruction, and road closures would be conducted to improve hydrologic, riparian, and stream channel conditions. These activities would be supplemented by ongoing BAER restoration and road maintenance activities.
Improve in-stream aquatic habitat including condition and connectivity in order to facilitate recovery of local native salmonids populations.	No – Watershed restoration, culvert removals and replacements, road reconstruction, and road closures would not be conducted. Ongoing BAER restoration and road maintenance would be used to improve in-stream habitat conditions and connectivity.	Yes – Riparian planting, dam rehabilitation, mine reclamation, trail crossing stabilization, culvert removals and replacements, road reconstruction, and road closures would be conducted to improve in-stream habitat and connectivity. These activities would be supplemented by ongoing BAER restoration and road maintenance activities.	Yes – Riparian planting, dam rehabilitation, mine reclamation, trail crossing stabilization, culvert removals and replacements, road reconstruction, and road closures would be conducted to improve in-stream habitat and connectivity. These activities would be supplemented by ongoing BAER restoration and road maintenance activities.	Yes – Riparian planting, dam rehabilitation, mine reclamation, trail crossing stabilization, culvert removals and replacements, road reconstruction, and road closures would be conducted to improve in-stream habitat and connectivity. These activities would be supplemented by ongoing BAER restoration and road maintenance activities.

<p>Protect soil properties and stability including risk to erosion, vegetative cover, soil organic content, and damaged soil surface layers in order to provide for long-term soil quality and site productivity.</p>	<p>No – Soil stabilization measures would not be conducted. Completed fire suppression restoration activities and ongoing BAER restoration and road maintenance would protect soil properties.</p>	<p>Yes – Soil stabilization measures would be conducted in areas of high burn severity. Road reconstruction, BMPs, road closures, and travel management restriction would be conducted to reduce erosion. These activities would be supplemented by completed fire suppression restoration activities and ongoing BAER restoration and road maintenance activities.</p>	<p>Yes – Soil stabilization measures would be conducted in areas of high burn severity. Road reconstruction, BMPs, road closures, and travel management restriction would be conducted to reduce erosion. Design Criteria, Mitigation Measures, and Monitoring Methods would be used to protect soil properties during timber harvest. These activities would be supplemented by completed fire suppression restoration activities and ongoing BAER restoration.</p>	<p>Yes – Soil stabilization measures would be conducted in areas of high burn severity. Road reconstruction, BMPs, road closures, and travel management restriction would be conducted to reduce erosion. Design Criteria, Mitigation Measures, and Monitoring Methods would be used to protect soil properties during timber harvest. These activities would be supplemented by completed fire suppression restoration activities and ongoing BAER restoration.</p>
<p>Provide for a transportation system that better reflects current access needs and resource concerns, and reduces economic burdens associated with maintaining unneeded roads.</p>	<p>No – Road reconstruction, BMPs, road closures, and travel management restrictions would not occur. Ongoing road maintenance and BAER restoration projects would be used to manage the transportation system.</p>	<p>Yes – Road reconstruction, BMPs, road closures, and travel management restrictions would be conducted to improve the existing transportation system and reduce the effects of the system on other resources. These activities would be supplemented by ongoing road maintenance and BAER restoration projects.</p>	<p>Yes – Road reconstruction, BMPs, road closures, and travel management restrictions would be conducted to improve the existing transportation system and reduce the effects of the system on other resources. These activities would be supplemented by ongoing road maintenance and BAER restoration projects.</p>	<p>Yes – Road reconstruction, BMPs, road closures, and travel management restrictions would be conducted to improve the existing transportation system and reduce the effects of the system on other resources. These activities would be supplemented by ongoing road maintenance and BAER restoration projects.</p>
<p><u>Objectives for Restoration and Recovery of the Land</u></p>	<p><u>Alternative 1</u></p>	<p><u>Alternative 2</u></p>	<p><u>Alternative 4</u></p>	<p><u>Alternative 5</u></p>
<p>Improve vegetation structure in order to reduce future fire intensity, reduce the potential for epidemic bark beetle infestations in “at-risk stands, improve habitat for flammulated owls, and enhance the potential for old growth forest conditions in low elevation drier forest habitats.</p>	<p>No – Commercial thinning, prescribed burning and other vegetation management activities would not be conducted to enhance stand density, structure, or composition.</p>	<p>No – Commercial thinning, prescribed burning, and other vegetation management activities would not be conducted to enhance stand density, structure, or composition.</p>	<p>Yes – Commercial thinning, prescribed burning, and salvage activities would be used to reduce stand densities, reduce fuels, and change composition in VRU 2 stands only.</p>	<p>Yes – Commercial thinning, prescribed burning, and salvage activities would be used to reduce stand densities, reduce fuels, and change composition in VRUs 2, 3 and 4 stands.</p>
<p>Minimize establishment and spread of non-native weed species to areas impacted by fire and fire suppression activities.</p>	<p>No – Weed control and management measures would not be implemented. Other Forest, County, State, and private weed control projects are relied</p>	<p>Yes – Roadside spraying, road closures, and travel management restrictions would be used to control and manage weed species. These</p>	<p>Yes – Roadside spraying, road closures, and travel management restrictions would be used to control and manage weed species. These</p>	<p>Yes – Roadside spraying, road closures, and travel management restrictions would be used to control and manage weed species. These</p>

<p>Reestablish or promote "at-risk" ponderosa pine, western larch and whitebark pine tree species and other sensitive plant species.</p>	<p>upon to implement weed control and management.</p> <p>No – Planting and forest restoration activities would be conducted to reestablish or promote "at-risk" species.</p>	<p>measures would be supplemented by other Forest, County, State, and private weed control projects.</p> <p>No – Planting and forest restoration activities would be conducted to reestablish or promote "at-risk" species. Only natural regeneration would be used. Commercial thinning would not be conducted to promote "at-risk" or sensitive species in established stands.</p>	<p>measures would be supplemented by other Forest, County, State, and private weed control projects.</p> <p>Yes – Regeneration monitoring, and planting would be conducted in order to reestablish "at-risk" species where natural regeneration is unsuccessful. Commercial thinning and salvage would also be conducted to promote "at-risk" or sensitive species only in established VRU 2 stands.</p>	<p>measures would be supplemented by other Forest, County, State, and private weed control projects.</p> <p>Yes – Regeneration monitoring, and planting would be conducted in order to reestablish "at-risk" species where natural regeneration is unsuccessful. Commercial thinning and salvage in VRUs 2, 3, and 4, would be conducted to promote "at-risk" or sensitive species in established stands.</p>
<p>Objectives for Working with People and Communities</p>	<p>Alternative 1</p>	<p>Alternative 2</p>	<p>Alternative 4</p>	<p>Alternative 5</p>
<p>Protect and interpret cultural and historical resources in order to (a) reduce risk to, damage, or loss by human disturbance, (b) enhance awareness of unique local historic features.</p>	<p>No – Protection and interpretation would not be provided at known sites or along local historic routes. Brochures would not be written to interpret lost resources.</p>	<p>Yes –Protection and interpretation would be provided at identified sites and along routes. Brochures would be written to interpret lost resources.</p>	<p>Yes –Protection and interpretation would be provided at identified sites and along routes. Brochures would be written to interpret lost resources.</p>	<p>Yes –Protection and interpretation would be provided at identified sites and along routes. Brochures would be written to interpret lost resources.</p>
<p>Provide forest products to support local communities that continue to be associated with commodity outputs from the National Forest.</p>	<p>No – Forest products or jobs would not be created.</p>	<p>Yes – Although no forest products would be provided, forest jobs would be provided for conducting watershed restoration activities.</p>	<p>Yes – Forest products and jobs would be provided through timber harvest. Forest jobs would also be provided for conducting watershed and land restoration activities.</p>	<p>Yes – Forest products and jobs would be provided through timber harvest. Forest jobs would also be provided for conducting watershed and land restoration activities.</p>

□ S.5.4 Response to Driving Issues and Resource Concerns

Each alternative was designed to respond to particular groupings of the Driving Issues. Because the effects of the alternatives are resource associated, they are described by resource.

■ Range of Alternatives

Six alternatives were developed to respond to: (1) public and internal issues, (2) resource conditions, and (3) purpose and need for conducting post burn activities. Three alternatives were specifically designed to reflect

public requests for alternative designs. They included: Alternatives #2, #3, and #4.

Alternative #1 would respond to the public’s request for conducting no post burn management actions.

Alternative #2 would respond to the public’s request for an alternative that: (1) focused on the “remediation of the effects of past human development”, (2) is “completely focused on restoration” and (3) “proposes no commercial vegetation management activities” or “removal of forest materials from the project area.”

Alternative #3 would respond to the public’s

request for an alternative that “would propose no commercial vegetation management activities, and where vegetation management activities were needed they would be conducted through non-commercial means”.

Alternative #4 would respond to the public’s request for an alternative that would “maximize biodiversity and wildlife habitat” and have “no harvest in actual/potential grizzly bear connectivity areas.”

Alternative #5 would respond to general public comments for the development of alternatives that provided forest products and jobs to local communities.

Alternative #6, the proposed action would respond to all opportunities identified by the Burned Area Assessment.

Alternatives #3 and #6 were not analyzed in detail because they failed to meet established design criteria and existing resource conditions. These two alternatives were also predicted to have effects that did not meet Forest Plan standards or other resource protection laws.

■ Minerals and Mining

Alternative #1 would not respond to the need for reclamation of historic and abandoned mine sites that are adversely affecting water quality and aquatic health.

Alternatives #2, #4, and #5, equally respond to the issue for mine reclamation by proposing reclamation of four mine sites. Reclamation activities on sites determined to qualify under the CERCLA would be implemented following additional toxicity analysis.

Table S.5.3. Comparison of Mine Reclamation Activities. *Alternatives #2, #4, and #5, equally respond to the issue for mine reclamation by proposing reclamation of four mine sites.*

Comparison of Mine Reclamation Activities				
	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Joe Waylett Mine (St. Louis Creek)	Not Conducted	83 acres ¾ mile stream	83 acres ¾ mile stream	83 acres ¾ mile stream
Eustache Creek Placer Mine	Not Conducted	2 acres ½ mile stream	2 acres ½ mile stream	2 acres ½ mile stream
Mattie V Creek Placer Mine	Not Conducted	2 acres ½ mile stream	2 acres ½ mile stream	2 acres ½ mile stream
Windfall Creek Placer Mine	Not Conducted	40 acres ½ mile stream	40 acres ½ miles stream	40 acres ½ mile stream

■ Soils

All alternatives, would maintain long-term soil productivity. Under Alternative #1, the recovery of the soil resource from the effects of the 2000 wildfires would take longer because no restoration activities would occur.

Under Alternative #1, surface coarse woody debris could increase in the short term. The intensity of future wildfire could be greater in VRU 2 stands where fuel treatment was not conducted. Future intense wildfires could potentially volatilize several soil nutrients and decrease long-term soil productivity in these stands.

Alternatives #2, #4, and #5 would improve soil quality by decreasing the detrimental impacts to the physical, chemical and biological characteristics of the soil through proposed restoration activities. Short-term impacts to soil quality, including compaction, displacement and rutting in areas disturbed by restoration activities would be reduced by mitigation measures.

Alternatives #4 and #5 could have short-term detrimental impacts to soils associated with tractor and skyline yarding in harvest units. Soil compaction, displacement, and rutting would be reduced by implementation of mitigation measures that prohibit equipment operation on

wet soils and requirements for post harvest restoration on sites disturbed during harvest activities. Temporary roads constructed under Alternative #5 would be fully rehabilitated following use.

Prescribed burning treatment activities associated with Alternatives #4 and #5 could also have short-term detrimental impacts to soil mycorrhizae. These impacts would be reduced

by burning during the spring or fall when wind speed, air temperature, and soil and fuel moisture conditions were within prescription for maximum protection of the soil resource.

With the implementation of mitigation measures, none of the short-term or long-term effects of Alternatives #2, #4, and #5 would exceed soil quality standards.

Table S.5.4. Comparison of Effects on Soils. *With the implementation of mitigation measures, none of the short-term or long-term effects would exceed soil quality standards.*

Comparison of Effects on Soils				
	Alternative 1	Alternative 2	Alternative 4	Alternative 5
Maintain Short-Term Soil Productivity	No	Yes	Yes	Yes
Maintain Long-Term Soil Productivity	Yes	Yes	Yes	Yes
Percent Detrimental Soil Criteria (measured as average percent of activity areas)	12 % (total)	< 5 % (total)	< 5 % (total)	< 5 % (total)
Range of Coarse Woody Debris Remaining	3 to greater than 33 tons/acre	5 to 33 tons/acre	5 to 33 tons/acre	5 to 33 tons/acre
Harvest Activities on High Burn Severity Soils	0 acres	0 acres	20 acres	72 acres
Ground Based Yarding on Soils Susceptible to Compaction, Displacement, and Rutting	0 acres	0 acres	66 acres	410 acres

■ Visual Resources

Under Alternative #1, the natural patterns created by the fires would continue to evolve. Where soil erosion and stream sedimentation continued, exposed ground surfaces would take a long time to vegetate. These areas would appear as obvious patches of lightly covered soils with weeds and other vegetation growing on them. Soil sedimentation problems and poor road drainage would also create negative visual effects.

Under Alternative #2, the visual effects of the forested and burned areas would be the same as for Alternative #1 except where watershed and land restoration activities occurred.

Under Alternatives #2, #4, and #5, watershed restoration activities would be visible from local forest roads but not from communities or State and Federal highways.

Under Alternatives #4 and #5, harvest units would be visible from forest roads. In some areas, skid trails, landings, and stumps would be

very obvious during and immediately following harvest treatments. Views from communities, and State and Federal highways would be limited, and salvage prescriptions would not significantly change the appearance of the burned stands. Mitigation methods would reduce visual effects on areas viewed from well traveled routes.

All alternatives would meet the visual quality objectives (VQOs) allocated within the Lolo National Forest Plan.

■ Heritage Resources

Alternative #1 would have no direct effects on the heritage resource. However, because no interpretive activities would occur under this alternative, there would be an increased potential for site disturbance or vandalism.

Alternatives #2, #4, and #5 would include watershed restoration activities that have the potential for direct, adverse effects to sites that may be eligible for listing on the National Register of Historic Places. Appropriate

mitigation measures, including interpretation and development of brochures would be used to mitigate the adverse effects on these resources.

Alternatives #4 and #5 would include one and two harvest units, respectively, that contain heritage sites. Adverse effects to these sites would be prevented through mitigation measures including “no-activity” buffer zones, and silvicultural prescriptions that would not significantly change the visual setting of the forested environment.

Interpretive actions included in Alternatives #2, #4, and #5 would increase public access to the history of the area and improve awareness of the area’s cultural importance. Interpretation may result in less vandalism of known heritage sites.

■ Inventoried Roadless Areas and Unroaded Areas

No activities are proposed in Inventoried Roadless Areas under any of the alternatives.

In Alternatives #2, #4, and #5, noise from watershed restoration activities, or helicopter yarding, felling and skidding, and log trucks could have short-term effects on the apparent remoteness of nearby Inventoried Roadless Areas. Openings created by harvest units in Alternatives #4 and #5 could also be visible from vistas within roadless areas.

Alternatives #2, #4, and #5 would have some beneficial effects on the remoteness of Inventoried Roadless Areas by closing or removing roads near the boundaries of the six roadless areas that lie within the project area.

Alternatives #2, #4, and #5 would add approximately 1860 of unroaded land by fully recontouring roads in roaded areas. Other road closures, including scarifying and removing culverts, were not considered to fully remove traces of the road profile, and thus were not considered to add acreage to the unroaded base.

Alternatives #4 and #5 would have some effects on unroaded areas by implementing vegetation management activities, including salvage of burned timber and thinning of green timber in areas that have suitable Management Area allocations under the Forest Plan. Openings created by harvest units and landings, skid trails, and stumps could have an effect on the apparent naturalness and natural integrity of these areas thus reducing their potential for being reallocated to Inventoried Roadless or Wilderness Areas under the Forest Plan revision process.

Proposed harvest units under Alternatives #5 would require the construction of approximately 1.5 miles of temporary roads in unroaded areas. These roads would be fully rehabilitated after one season of use. Under Alternative #4, approximately 83 percent of the harvesting in unroaded areas would be completed by helicopter yarding methods. Under Alternative #5, approximately 60 percent of the harvesting in unroaded areas would be completed with helicopter yarding methods. All harvest activities and temporary road construction would occur in suitable Management Areas, or unsuitable MAs that provide for timber salvage under the Forest Plan.

Table S.5.5. Comparison of Activities in Inventoried Roadless Areas and Unroaded Areas. Alternatives #2, #4, and #5 have various effects on the roadless and unroaded resource.

Comparison of Activities in Inventoried Roadless Areas and Unroaded Areas				
	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
<u>Inventoried Roadless Areas (IRAs)</u>				
Temporary Road Construction in IRAs	0 miles	0 miles	0 miles	0 miles
Permanent Road Construction in IRAs	0 miles	0 miles	0 miles	0 miles
Harvest and Salvage Units in IRAs	0 acres	0 acres	0 acres	0 acres
<u>Unroaded Areas of Any Size</u>				
Acres Added to Unroaded by Recontouring Existing Roads	0 miles	1860 acres	1860 acres	1860 acres
Temporary Road Construction in Unroaded Areas	0 miles	0 miles	0 miles	1.5 miles

Permanent Road Construction in Unroaded Areas	0 miles	0 miles	0 miles	0 miles
Harvest and Salvage Units in Unroaded Areas	0 acres	0 acres	1357 acres	2797 acres

■ Water and Hydrologic Resources and Fish and Aquatic Resources

Under all alternatives, riparian areas and wetlands would be protected. No timber harvest would occur within Inland Native Fish Strategy (INFISH) Riparian Habitat Conservation Areas (RHCAs).

Under Alternative #1, sediment would continue to be delivered to water bodies from burned areas. Sediment yields from roads and abandoned mines would continue. Improvements to fish habitat and connectivity between stream reaches would not occur, and therefore existing development would continue to exert stress on native fish populations. This alternative would have the potential for delivering the most sediment to channels of all alternatives.

Under Alternatives #2, #4, and #5, the restoration activities that would occur within RHCAs would cause short-term effects on water quality (primarily sedimentation) but would result in long-term improvements that would outweigh the short-term effects. Short-term impacts to water quality and aquatic habitat would be reduced by mitigation measures.

Under Alternatives #2, #4, and #5, road closures and reconstruction (BMPs) would reduce runoff and sediment production from existing roads. Removal and replacement of culverts would improve hydrologic connectivity for fish and aquatic life. Riparian planting would improve recovery of burned riparian areas. Restoration of dams and mines would reduce sediment delivery and improve stream function and aquatic habitat.

Under Alternatives #4 and #5, proposed timber harvest activities would produce a higher short-term increase in sediment yield than Alternatives #1 and #2. The increased pulse of sediment, over that already occurring, could increase the negative effects of sediment delivery on fish populations. The use of helicopter and skyline yarding systems, as well as design criteria and mitigation measures would minimize sediment yield from timber harvest activities.

Although no harvest activities in Alternatives #4 or #5 are proposed within RHCAs, the RHCA buffer width may be less than 300 feet on some channels types. Timber harvest and prescribed burning within 300 feet of stream channels may produce sediment that could be delivered to channels. Mitigation measures and use of helicopter yarding in some areas would decrease the amount of sediment mobilized and delivered to stream channels.

Under Alternative #5, temporary roads would be constructed near ridges. No RHCAs would be crossed, and they would be recontoured after use. Their effects on water quality would be negligible.

Sediment delivery from restoration and harvest activities in Alternatives #2, #4, and #5 would coincide with elevated flows and sediment delivery resulting from the fires of 2000. This would result in a sharply rising sediment curve, followed by a relatively sharp decrease in sediment over a five-year period following restoration and harvest activities. Over another five to ten years, sediment delivery would decline to levels below those displayed under Alternative #1, where no activities would occur. Although the actions of Alternatives #2, #4, and #5 would display a “pulse” of sediment in the short-term, the long-term benefits of reducing the “press” of sediment delivery from roads and other past development, would outweigh the short-term negative effects. Fisheries would be expected to benefit substantially in the long-term from watershed restoration related improvements.

Under Alternatives #2, #4, and #5, recovery of stream temperatures would be similar to Alternative #1. Riparian planting would lead to improved stream shading in some areas. This would lead to an increased rate of improvement of temperatures in some watersheds. Restoration activities under Alternatives #2, #4, and #5 would require removal of streamside vegetation, and thus may lead to short-term increases in water temperatures in some stream reaches. Channel restoration, however, would improve water temperatures in the long-term.

The effects on runoff timing and quantities would be similar for all four alternatives. There would only be a slight change in ECA where green canopy would be removed during commercial thinning. Harvest under Alternatives #4 and #5 would not appreciably increase the risk of changing runoff timing or magnitude in most watersheds. However, the effects on ECAs are greatest in Alternative #5, where a larger percentage of commercial thinning is performed.

Alternative #1 would not meet Forest Plan or State water quality standards. It would not be consistent with Forest Plan standards as amended by INFISH. For westslope cutthroat trout, this alternative would be likely to adversely impact individuals or habitat with a consequence that may contribute toward a federal listing or reduced viability for the population or species. It would result in a continued trend in degradation of bull trout habitat from the existing situation. This alternative may affect and would likely adversely affect bull trout.

Alternatives #2, #4, and #5 would meet Forest Plan and State water quality standards. Proposed restoration activities would accelerate watershed recovery in all three of these alternatives.

Alternative #2 would have a long-term positive effect on fisheries and fish population dynamics and persistence. This alternative may impact individual westslope cutthroat trout or habitat, but would not likely result in a trend toward federal listing or reduce viability for the population or species. It may affect and would likely adversely affect bull trout. Restoration activities would cause short-term disturbance and degradation of some bull trout habitat features. These short-term effects are not anticipated to further threaten or jeopardize bull trout populations over the long-term and the net effect would be positive.

Alternatives #4 and #5 may impact individual westslope cutthroat trout or habitat, but would not likely result in a trend toward federal listing or reduce viability for the population or species. They may affect and would likely adversely affect bull trout.

Table S.5.6. Comparison of Effects on Hydrologic, Fisheries, and Aquatic Resources. *Although Alternatives #2, #4, and #5 would contribute to short-term detrimental conditions to hydrologic, fisheries, and aquatic resources, they would provide long-term improvements to these resources.*

Comparison of Effects on Hydrologic, Fisheries, and Aquatic Resources				
<u>Water Quality Standards (303d Impaired)</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Short -Term Improvement Trend	No	No	No	No
Long -Term Improvement Trend	No	Yes	Yes	Yes
<u>Biological Evaluations of Sensitive, Threatened, and Endangered Fish Populations</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Westslope Cutthroat Trout (Sensitive)	LIFV*	MIH**	MIH**	MIH**
Bull Trout (Endangered)	LAA***	LAA***	LAA***	LAA***
<u>Road Related Effects</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Average Road Densities in Miles/Square Mile (% reduction in density)				
Ninemile Creek Drainage	3.0 miles (0%)	1.4 miles (56%)	1.4 miles (56%)	1.4 miles (56%)
Siegel Creek Drainage	1.2 miles (0%)	1.0 miles (19%)	1.0 miles (19%)	1.0 miles (19%)
First Creek Drainage	4.3 miles (0%)	3.5 miles (18%)	3.5 miles (18%)	3.5 miles (18%)
Flat Creek Drainage	2.6 miles (0%)	2.3 miles (14%)	2.3 miles (14%)	2.3 miles (14%)
Johnson Creek Drainage	4.1 miles (0%)	3.4 miles (18%)	3.4 miles (18%)	3.4 miles (18%)
Idaho Gulch Drainage	2.6 miles (0%)	2.3 miles (14%)	2.3 miles (14%)	2.3 miles (14%)
Trout Creek Drainage	2.1 miles (0%)	1.2 miles (45%)	1.2 miles (45%)	1.2 miles (45%)
Near Channel Road Densities in Miles/Square Mile (% reduction in density)				
Ninemile Creek Drainage	0.7 (0%)	0.4 (50%)	0.4 (50%)	0.4 (50%)
Siegel Creek Drainage	0.6 (0%)	0.5 (4%)	0.5 (4%)	0.5 (4%)

Comparison of Effects on Hydrologic, Fisheries, and Aquatic Resources				
First Creek Drainage	0.9 (0%)	0.8 (16%)	0.8 (16%)	0.8 (16%)
Flat Creek Drainage	0.8 (0%)	0.7 (12%)	0.7 (12%)	0.7 (12%)
Johnson Creek Drainage	0.9 (0%)	0.8 (10%)	0.8 (10%)	0.8 (10%)
Idaho Gulch Drainage	1.7 (0%)	1.5 (10%)	1.5 (10%)	1.5 (10%)
Trout Creek Drainage	0.6 (0%)	0.4 (31%)	0.4 (31%)	0.4 (31%)
Stream Crossing Densities in Numbers/Square Mile (% reduction in density)				
Ninemile Creek Drainage	2.4 (0%)	1.3 (47%)	1.3 (47%)	1.3 (47%)
Siegel Creek Drainage	1.9 (0%)	1.5 (25%)	1.5 (25%)	1.5 (25%)
First Creek Drainage	4.7 (0%)	3.7 (21%)	3.7 (21%)	3.7 (21%)
Flat Creek Drainage	2.4 (0%)	2.4 (0%)	2.4 (0%)	2.4 (0%)
Johnson Creek Drainage	4.2 (0%)	3.9 (9%)	3.9 (9%)	3.9 (9%)
Idaho Gulch Drainage	2.8 (0%)	2.5 (10%)	2.5 (10%)	2.5 (10%)
Trout Creek Drainage	2.3 (0%)	1.3 (43%)	1.3 (43%)	1.3 (43%)
Miles of Road within 300 Feet of Stream Channels				
	143.4 miles (total)	97.4 miles (total)	97.4 miles (total)	97.4 miles (total)
Ninemile Creek Drainage	52.8 miles	26.5 miles	26.5 miles	26.5 miles
Siegel Creek Drainage	8.1 miles	7.7 miles	7.7 miles	7.7 miles
First Creek Drainage	7.3 miles	6.1 miles	6.1 miles	6.1 miles
Flat Creek Drainage	12.9 miles	11.4 miles	11.4 miles	11.4 miles
Johnson Creek Drainage	12.8 miles	11.5 miles	11.5 miles	11.5 miles
Idaho Gulch Drainage	5.9 miles	5.3 miles	5.3 miles	5.3 miles
Trout Creek Drainage	44.8 miles	30.1 miles	30.1 miles	30.1 miles
Fish Passage Barriers				
	28 (total)	1 (total)	1 (total)	1 (total)
Ninemile Creek Drainage	22	0	0	0
Siegel Creek Drainage	0	0	0	0
First Creek Drainage	1	0	0	0
Flat Creek Drainage	1	0	0	0
Johnson Creek Drainage	1	0	0	0
Idaho Gulch Drainage	0	0	0	0
Trout Creek Drainage	3	1	1	1
Miles of Stream Habitat Made Available to Fish				
	0 miles (total)	27.5 miles (total)	27.5 miles (total)	27.5 miles (total)
Ninemile Creek Drainage	0 miles	16.9 miles	16.9 miles	16.9 miles
Siegel Creek Drainage	0 miles	0 miles	0 miles	0 miles
First Creek Drainage	0 miles	5.2 miles	5.2 miles	5.2 miles
Flat Creek Drainage	0 miles	2.7 miles	2.7 miles	2.7 miles
Johnson Creek Drainage	0 miles	1.6 miles	1.6 miles	1.6 miles
Idaho Gulch Drainage	0 miles	0 miles	0 miles	0 miles
Trout Creek Drainage	0 miles	1.1 miles	1.1 miles	1.1 miles
Percent Reduction of Road Sediment Delivery to Streams after 15 Years (based on LOLOSED Computer Model)				
Ninemile Creek Drainage	0%	15%	12%	15%
Siegel Creek Drainage	0%	21%	21%	21%
First Creek Drainage	0%	14%	11%	11%
Flat Creek Drainage	0%	9%	3%	5%
Johnson Creek Drainage	0%	11%	11%	7%
Idaho Gulch Drainage	0%	2%	2%	3%
Trout Creek Drainage	0%	13%	8%	8%
Harvest Related Effects				
	Alternative 1	Alternative 2	Alternative 4	Alternative 5
Acres of Harvest within 300 Feet of Stream Channels (outside of established RHCAs)				
	0 acres (total)	0 acres (total)	92.5 acres (total)	250.9 acres (total)
Ninemile Creek Drainage	0 acres	0 acres	15.9 acres	57.3 acres
Siegel Creek Drainage	0 acres	0 acres	0.0 acres	3.9 acres
First Creek Drainage	0 acres	0 acres	10.4 acres	29.3 acres
Flat Creek Drainage	0 acres	0 acres	36.2 acres	36.2 acres
Johnson Creek Drainage	0 acres	0 acres	19.2 acres	90.1 acres
Idaho Gulch Drainage	0 acres	0 acres	0 acres	4.8 acres
Trout Creek Drainage	0 acres	0 acres	10.8 acres	29.3 acres

Comparison of Effects on Hydrologic, Fisheries, and Aquatic Resources				
Acres of Prescribed Burning within 300 Feet of Stream Channels (no ignition in RHCAs)	0 acres (total)	0 acres (total)	50.3 acres (total)	79.6 acres (total)
Ninemile Creek Drainage	0 acres	0 acres	14.1 acres	42.4 acres
Siegel Creek Drainage	0 acres	0 acres	0 acres	0 acres
First Creek Drainage	0 acres	0 acres	0.0 acres	0 acres
Flat Creek Drainage	0 acres	0 acres	36.2 acres	36.2 acres
Johnson Creek Drainage	0 acres	0 acres	0 acres	0 acres
Idaho Gulch Drainage	0 acres	0 acres	0 acres	0 acres
Trout Creek Drainage	0 acres	0 acres	0 acres	1 acres
Average Equivalent Clearcut Acres (including non-Forest Service ownerships)				
Ninemile Creek Drainage	26%	26%	27%	28%
Siegel Creek Drainage	8%	8%	8%	8%
First Creek Drainage	30%	30%	30%	30%
Flat Creek Drainage	8%	8%	8%	8%
Johnson Creek Drainage	33%	33%	33%	34%
Idaho Gulch Drainage	44%	44%	44-45%	45%
Trout Creek Drainage	17%	17%	17%	17%
Percent Reduction of Total Sediment Delivery to Streams after 15 Years (based on LOLOSED Computer Model)				
Ninemile Creek Drainage	0%	32%	28%	30%
Siegel Creek Drainage	0%	31%	29%	29%
First Creek Drainage	0%	23%	13%	13%
Flat Creek Drainage	0%	24%	11%	11%
Johnson Creek Drainage	0%	23%	19%	15%
Idaho Gulch Drainage	0%	9%	8%	7%
Trout Creek Drainage	0%	30%	21%	21%

* LIFV – Likely to impact individuals or habitat with a consequence that the action may contribute toward federal listing or result in reduced viability for the population or species.

** MIIH – May impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population species.

*** LAA – May Affect – Likely to Adversely Affect

■ Fire, Fuels and Air Quality

No burning activities are proposed in Alternatives #1 and #2. Without any burning treatments, there would be no impact on air quality or human health in the short term. However, without fuel treatments on some acres, there would be an increase in the potential for future wildfire and smoke.

Alternatives #4 and #5 could cause temporary degradation of air quality resulting from prescribed burns, pile burning, and road dust. Because only 500 acres or less would be burned in any one day, both alternatives would be equal in terms of meeting regulations.

Under Alternatives #1 and #2, fire would not be returned to stands or used to restore or maintain species composition and stand structure.

Without fire, individual stands would continue to change as species less adapted to fire (such as Douglas-fir) increased. In the unburned VRU 2 areas, ladder fuels would increase in understories. Standing fuels would continue to present a fire hazard in the short- and long-term. Fuel conditions could cause an increase in rate of spread, resistance to control and severe fires similar to stand replacement burns that occurred in 2000. Fuels would increase and change the fire behavior and intensity, which would also affect the cost of fire suppression. A lack of fire hazard reduction could make extreme fire behavior more common, with added risk of property loss, and difficulty of suppression.

Under Alternatives #1 and #2, the acres that burned at moderate-high and high severity would have an increase in fuels as trees fall. This increase in fire hazard would put regeneration that has since established at risk of loss in future

wildfires. Because the increase in fuels and subsequent fire intensity and severity in VRU 2 would be beyond what occurred historically, the potential for soil damage would be high. The increase in fuels in lower elevation VRU 2 stands would also increase risk to adjacent private properties. Chances for reburn would be high .

Under Alternatives #4 and #5, harvest and fuels treatments would affect stand structure and composition by reducing the amount of fire sensitive species and increasing fire resistant species. The number of trees per acre, fine fuel recruitment, and ladder fuels would be reduced. This would reduce the potential for a ground fire to increase in intensity and become a crown fire. Long-term fire hazard, fire risk, and resistance to control would be lower following treatments. Fuel reduction in VRU 2 would restore open canopy and restore systems to a state that would allow implementation of disturbance regimes. Although none of the alternatives would exactly duplicate historic process in terms of scale and intensity, Alternatives #4 and #5 would have some immediate benefits in VRU 2 stands.

Under Alternatives #4 and #5, thinning would reduce the number of trees contributing fine fuels to the load and continuity of fuels in low elevation, dry habitats (VRU 2).

Salvage is not expected to reduce short-term fire risk or hazard in the moderate to severely burned areas because the fine fuels have already been reduced. In the short term, salvage would not decrease risk of fire starts and spread. Salvage could decrease the future intensity of fire (especially under drought conditions) and resulting mortality by reducing the number of large, dead trees that would fall and increase fuels.

Harvest and fuels treatments under Alternative #4 and #5 would coincide with some areas adjacent to private property and structures in the

“intermix” area. Although the greatest protection of structures is afforded by treatments of fuels within 100 feet of structures, treating the fuels in the general area would reduce intensity and ember spotting, especially during extreme fire weather conditions.

“Activity fuels” created under Alternatives #4 and #5 would pose a fire risk in the short term before being piled or prescribed burned. These fuels would be reduced in two to four years. Once the fuels were treated, the risk would drop dramatically. Harvest units in moderate to high severity burns would not be scheduled for fuels treatment due to an absence of risk from fine fuels. Harvest in these units would not produce many fine fuels and would not pose a short-term fire risk. Severely burned areas not harvested would pose a hazard once fine fuels develop in 20 to 30 years.

Prescribed fire would mimic wildfires in that it would reduce fuel buildup and would reduce litter. The fires would be controlled and burn less intensively. Using prescribed fire to reduce fuel loads would decrease the potential for wildfires to burn at severe, damaging temperatures under extreme weather conditions.

Even under controlled spring and fall conditions, prescribed burns would have a chance of escape. This risk would be minimized in both alternatives with the selection of weather and fuel moisture parameters. Contingency plans would be developed as part of the burn plan and would be activated if a burn escaped control.

Fuel treatments would provide a break in continuous fuel patterns, and would reduce the potential for large, high-intensity, stand replacement fires. These mosaics would also allow more effective initial attack. The reduction of fuel loads would reduce the fire hazard and resistance to control in the long term in all harvest units.

Table 2.7.7. Comparison of Effects on Fire, Fuels and Air Quality. *Fuel treatments would provide a break in continuous fuel patterns, and would reduce the potential for large, high-intensity, stand replacement fires.*

Comparison of Effects on Fire, Fuels and Air Quality				
Air Quality	Alternative 1	Alternative 2	Alternative 4	Alternative 5

Comparison of Effects on Fire, Fuels and Air Quality				
Estimated Smoke Emissions PM-10 From Prescribed Burning (assumes a maximum of 500 acres of fuel treatment per day)	0 tons	0 tons	83 tons	150 tons
Estimated Smoke Emissions PMS-10 From Burning Landing Piles	0 tons	0 tons	30-122 tons	123-492 tons
Estimated Smoke Emissions PM-10 From Wildfires (occurring on same 500 acre area)	0 tons	0 tons	233 tons	420 tons
<u>Fuel Loads</u>				
Average Fuel Loads in Individual Stands Treated with Prescribed Fire	26-43 tons	26-43 tons	8-24 tons	8-24 tons
<u>Average Fire Management Costs</u>				
Projected Cost Per Acre in Individual Stands (displays comparison between potential suppression needs and prescribed burning treatments)	\$500 to \$5000	\$500 to \$5000	\$150 to \$300	\$150 to \$300
<u>Suppression Ability</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Suppression Difficulty at a Stand Level	Higher	Higher	Lower	Lower
<u>Risk of Escape</u>				
Acres of Prescribed Burning with Risk of Escape	0 acres	0 acres	934 acres	1686 acres
<u>Fire Risk Due to Commercial Harvest</u>				
Total Activity Fuels Created by Harvesting	0 acres	0 acres	1933 acres	4845 acres

■ Infrastructure and Improvements

Under Alternative #1, current public access would not change. The road system would continue to affect water quality, wildlife security, and other resource values where high road densities occur and roads were not up to BMP standards. The cost to maintain the road network would remain higher than the availability of maintenance funds. No changes would occur where current road densities exceed Forest Plan Management Area estimated averages for MAs 18 and 25.

Alternatives #2, #4, and #5 would all make significant changes to the road system, including reconstruction of road to meet BMP standards, and closure of road unnecessary for land management in the near or distant future. Some permanent road closures would affect popular driving routes. All three alternatives would place seasonal travel restrictions on approximately 15 miles of road. Alternative #4 would place an additional 20 miles of yearlong travel restrictions on popular driving routes.

Road closures and seasonal restrictions proposed under Alternative #2, #4, and #5 would affect approximately 30 percent of the Forest roads currently open to public travel. Off-road snowmobile travel would be restricted for five years within the fire perimeters. Additional road closures, including scarification and recontouring would occur on roads already restricted to public travel. Road reconstruction would bring all roads that were not closed up to Best Management Practice standards. Road closures, restrictions, and reconstruction activities would provide significant improvements to water quality, and wildlife habitat security, and bring the current road system in line with available maintenance funds.

Under Alternatives #2, #4, and #5, the road density for MAs 18 and 25 would be reduced to reflect Forest Plan estimated average road densities. Winter-open road densities would still not meet the Forest Plan estimated average because of the need to maintain primary access routes that fall within this Management Area.

Under Alternatives #2, #4, and #5, two popular driving routes currently open to travel would be closed or restricted seasonally. The lower portion of the Eustache Creek Road (FR #97) would be decommissioned. The upper segment would be restricted to travel seasonally. A portion of the Ninemile-Siegel Road (FR #412) between Siegel Pass and Eustache Creek would also be gated and restricted seasonally. This combination of restrictions and closures would modify established traffic patterns. Forest Road #9920, between Siegel Pass and upper Eustache, would be opened seasonally to provide an alternative driving route and maintain access between the upper portion of the Ninemile and Flat Creek drainages. This combination of travel changes would improve water quality in Eustache and Ninemile Creeks by removing or restricting travel on road segments that parallel stream channels.

Under Alternative #4, road treatments would be similar to Alternative #2 except that road reconstruction would be necessary to access timber harvest units and additional road restrictions would be implemented to protect wildlife linkages and corridors. As with Alternative #2, off-road snowmobile travel would be restricted for five years within the fire perimeters

In addition to the travel restrictions proposed in Alternative #2, Alternative #4 would restrict travel on Forest Road #388, over Freezeout Pass,

on Forest Road #450, between Windfall Creek and Sunrise Creek, and on Forest Roads #5475 and #536 that cross the Alpine Divide between First Creek and Sawpit Creek. The yearlong restrictions on these roads would benefit wildlife resources by improving habitat security, reducing fragmentation, protecting wildlife linkages and corridors, and improving forage by reducing weed spread. Travel restrictions would also be placed on several local roads, including the Soldier Creek Road (FR #18102) under this alternative.

Although these restrictions would be a major step toward minimizing motorized access in potential wildlife linkages and corridors, they would be considerable changes to established traffic patterns.

Road closures proposed under Alternative #5 would be similar to those under Alternative #2. Temporary road would be constructed to provide access to proposed timber harvest units.

The difference in the proposed road closures and restrictions in Alternative #5 reflects a response to public access desires, yet blends resource needs with watershed restoration and recovery treatments. Forest Roads #412, #97, and #9920 would have similar management treatments as proposed in Alternatives #2 and #4. Proposed restrictions and closures would help reduce soil erosion, especially during the wet seasons, and reduce disturbance to wildlife.

Table S.5.7. Comparison of Road Development, Closures, and Access and Travel Management. Alternatives #2, #4, and #5 would all make significant changes to the road system, including reconstruction of approximately 300 miles of road to meet BMP standards, and closure of approximately 225 miles of road unnecessary for land management in the near or distant future.

Alternative Comparison of Road Development, Decommissioning, and Access and Travel Management				
<u>Road Reconstruction</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Road Reconstruction and BMPs without Timber Haul	0 miles	279 miles (total)	298 miles (total)	286 miles (total)
Road Reconstruction and BMPs with Timber Haul	0 miles	279 miles	191 miles	163 miles
		0 miles	107 miles	123 miles
<u>Road Decommissioning</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
	0 miles (total)	228 miles (total)	225 miles (total)	225 miles (total)
Open to Scarified / Culverts Removed	0 miles	72 miles	70 miles	70 miles
Open to Recontoured	0 miles	26 miles	26 miles	26 miles
Gated to Scarified / Culverts Removed	0 miles	80 miles	80 miles	80 miles

Alternative Comparison of Road Development, Decommissioning, and Access and Travel Management				
Gated to Partially Recontoured / Culverts Removed	0 miles	2 miles	2 miles	2 miles
Gated to Recontoured	0 miles	13 miles	13 miles	13 miles
Partially Vegetated to Scarified / Culverts Removed	0 miles	21 miles	21 miles	21 miles
Partially Vegetated to Recontoured	0 miles	14 miles	14 miles	14 miles
<u>Travel Management Restrictions</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Road Travel Management Restrictions (Gated Roads)	0 miles (total)	11 miles (total)	34 miles (total)	14 miles (total)
Open to Yearlong A Restriction	0 miles	0 miles	13 miles	0 miles
Open to Yearlong B Restriction	0 miles	0 miles	7 miles	0 miles
Open to Seasonal E Restriction	0 miles	3 miles	11 miles	6 miles
Open to Seasonal J Restriction	0 miles	8 miles	3 miles	8 miles
<u>Road Construction</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Temporary Road Construction	0 miles	0 miles	0 miles	1.7 miles

■ **Vegetation and Forest Resources**

Alternatives #1 and #2 would provide no reduction of bark beetle infestation or risk of future infestation. There could be a considerable loss of old growth trees from bark beetle predation. Continued unaltered high-risk conditions would predispose stands containing sawtimber-size host trees to significant mortality from bark beetles. A beneficial effect of these alternatives would be the continued role that bark beetle plays in forest succession.

Alternative #4 would provide direct reduction of bark beetle infestation or risk of future infestation on treated VRU 2 stands. This alternative would reduce the potential loss of old growth trees from bark beetle predation in treated stands. However, risk reduction would not provide absolute bark beetle prevention. Approximately 18 percent of the high-risk stands within the fire perimeters would be treated.

Alternative #5 would be similar to Alternative #4 except that it would treat more acres of high-risk stands in VRUs 2, 3, and 4. This alternative would provide direct reduction of bark beetle infestation or risk of future infestation of trees on a larger area. Approximately 31 percent of the high-risk stands within the fire perimeters would be treated.

Harvest treatments in Alternatives #4 and #5 would replicate the beneficial effects of the role that bark beetles play in forest succession. These alternatives would provide for healthy stands,

and would optimize the timber growing potential on treated acres. They would improve vegetative structure to reduce the potential for epidemic bark beetle infestation in “at-risk” stands.

Alternatives #1 and #2 would provide no direct reduction of large fuels that pose a risk of potential soil damage beyond the natural range of variation on VRU 2 sites. Beneficial and adverse effects of these alternatives would be the role these atypically high levels of large woody debris would play in the forest environment. High levels of large woody debris on severely burned sites could favor regeneration on south aspects by providing shade. Adversely, this same woody debris loading could increase the degree of tree mortality in the event of a future wildfire.

Alternative #4 would provide direct reduction of large fuels on VRU 2 sites. This alternative would directly reduce uncharacteristic risk conditions on treated VRU 2 sites. The potential for uncharacteristic soil damage to in the event of a reburn would be reduced.

The effects of Alternative #5 would be similar to those of Alternative #4. Alternative #5 would provide the greatest reduction of large fuels in VRU 2.

Alternatives #1 and #2 would provide no direct enhancement or recruitment of old growth on VRU 2 sites. The old growth forests in VRU 2 would continue to decline.

Alternative #4 would provide direct enhancement or recruitment of old growth forests in VRU 2 through harvest and prescribed burning activities. Approximately 14 percent of the VRU 2 sites within the fire perimeters would be treated. All existing old growth would be protected. Commercial thinning and prescribed burning would partially replicate the effects and conditions of natural disturbance processes and therefore partially restore characteristic stand structure, composition and function.

The effects of Alternative #5 would similar to those of Alternative #4. Alternative #5 would provide the greatest amount of direct enhancement or recruitment of old growth forest in VRU 2. Approximately 16 percent of the VRU 2 sites within the fire perimeters would be treated.

Alternatives #1 and #2 would rely solely on natural regeneration to reestablish ponderosa pine, western larch, and whitebark pine. Regeneration of areas denuded by the fires would be variable with the possibility that some sites would not have these “species at risk” present. In the short-term, bark beetle predation

could continue to reduce the occurrences of “species at risk”.

Alternatives #4 and #5 would provide for planting of “species at risk” where natural regeneration failed. The determination of failure would take approximately two to five years of monitoring. Planting would provide the opportunity to increase the occurrence of the seral “species at risk”.

Under Alternative #4, commercial thinning and shelterwood cutting on VRU 2 sites would provide direct enhancement or recruitment of “species at risk”. Because these treatments would favor these species over others, they would improve the presence, health, vigor, and reproductive capability of existing “species at risk”.

Alternative #5 would have similar effects of Alternative #4, except this alternative would treat more acres. Under Alternative #5, VRUs 2, 3, and 4 would be treated to enhance or recruit “species at risk”. In the short term, this alternative would provide for greater establishment of “species at risk” conifers than all other alternatives.

Table S.5.8. Comparison of Effects on Vegetation. Alternatives #1 and #2 would provide no reduction of bark beetle infestation or risk of future infestation. There could be a considerable loss of old growth trees from bark beetle predation.

Alternative Comparison of Effects on Vegetation				
<u>Harvest Treatment Prescriptions</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
Salvage	0 acres (total)	0 acres (total)	1933 acres total	4845 acres (total)
Commercial Thinning	0 acres	0 acres	479 acres	2213 acres
Shelterwood Preparation	0 acres	0 acres	1360 acres	2246 acres
Improvement Cutting	0 acres	0 acres	94 acres	183 acres
			0 acres	203 acres
<u>Harvest Activities By Vegetation Response Unit (VRU)</u>	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
VRU 1	0 acres (total)	0 acres (total)	0 acres (total)	14 acres (total)
Salvage	0 acres	0 acres	0 acres	11 acres
Commercial Thinning	0 acres	0 acres	0 acres	3 acres
Shelterwood Preparation	0 acres	0 acres	0 acres	0 acres
Improvement Cutting	0 acres	0 acres	0 acres	0 acres
VRU 2	0 acres (total)	0 acres (total)	1933 acres (total)	2230 acres (total)
Salvage	0 acres	0 acres	479 acres	531 acres
Commercial Thinning	0 acres	0 acres	1360 acres	1548 acres
Shelterwood Preparation	0 acres	0 acres	94 acres	135 acres
Improvement Cutting	0 acres	0 acres	0 acres	16 acres
VRU 3	0 acres (total)	0 acres (total)	0 acres (total)	1207 acres (total)
Salvage	0 acres	0 acres	0 acres	742 acres
Commercial Thinning	0 acres	0 acres	0 acres	400 acres
Shelterwood Preparation	0 acres	0 acres	0 acres	10 acres

Improvement Cutting	0 acres	0 acres	0 acres	54 acres
VRU 4	0 acres (total)	0 acres (total)	0 acres (total)	1394 acres (total)
Salvage	0 acres	0 acres	0 acres	929 acres
Commercial Thinning	0 acres	0 acres	0 acres	295 acres
Shelterwood Preparation	0 acres	0 acres	0 acres	38 acres
Improvement Cutting	0 acres	0 acres	0 acres	133 acres
<u>Reduction of Insect Predation and Risk in "at-risk" Stands</u>				
	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
	0 acres (total)	0 acres (total)	1454 acres (total)	2632 acres (total)
Commercial Thinning	0 acres	0 acres	1360 acres	2246 acres
Shelterwood Preparation	0 acres	0 acres	94 acres	183 acres
Improvement Cutting	0 acres	0 acres	0 acres	203 acres
<u>Treatments in VRU 2 to Reduce Fuel Loads</u>				
	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
	0 acres (total)	0 acres (total)	2686 acres (total)	2983 acres (total)
Prescribed Burning	0 acres	0 acres	753 acres	753 acres
Salvage Harvest	0 acres	0 acres	479 acres	531 acres
Commercial Thinning, Shelterwood Preparation, and Improvement Cutting	0 acres	0 acres	1454 acres	1699 acres
<u>Vegetative Treatments in VRU 2 for Old Growth Enhancement and Recruitment</u>				
	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
	0 acres (total)	0 acres (total)	2207 acres (total)	2452 acres (total)
Prescribed Burning	0 acres	0 acres	753 acres	753 acres
Commercial Thinning, Shelterwood Preparation, and Improvement Cutting	0 acres	0 acres	1454 acres	1699 acres

■ Threatened, Endangered and Sensitive Plants

Under all alternatives, ongoing weed treatments would reduce existing weed populations in the project area. These activities would reduce competition between invasive species and native plant populations.

Alternatives #1 would meet the goal of the Lolo National Forest Plan to maintain viable populations of indigenous plants. It would, however, not address recommendations for Invasive Species and Rare Plants from the Assessment of the 2000 Fire Season, *Toward Restoration and Recovery*. Potential habitats as related to fire exclusion and fuel accumulations would not be improved under this alternative.

Alternative #2 would meet the Lolo National Forest Plan goal to maintain viable populations of all indigenous plants. This alternative would address recommendations for Invasive Species and Rare Plants from the assessment of the 2000 fire season, *Toward Restoration and Recovery* because roadside weed treatments, road closures, and restoration activities would improve habitat for Threatened, Endangered, and Sensitive Plants. Potential habitats as related to fire exclusion and fuel accumulations would not be improved under this alternative.

Alternatives #4 and #5 may benefit species such as clustered ladyslipper. The indirect effects of prescribed fire and fuel treatments may benefit those species that grow in dry, fire-adapted habitats. Thinning and individual tree salvage could also result in reduction of closed canopy, and may benefit common clarkia and clustered ladyslipper, and possible taper-root orogenia and tapertip onion.

■ Noxious and Invasive Plant Species

Alternative #1 would have no direct effect on noxious weed species. However weeds could increase in areas currently infested that are not proposed to be treated under ongoing weed management actions. Under this alternative there would be less weed control than with other alternatives, which means that the overall cumulative effects to native vegetation and ecosystem function would be less beneficial than other alternatives.

Alternative #1 would not meet Forest Plan standards for noxious weed management. It also would not address recommendations for Invasive Species and Rare Plants from the assessment of the 2000 fire season, *Toward Restoration and Recovery*.

Under Alternatives #2, #4, and #5, all weed management measures tier directly to the Big Game Winter Range and Burned Area Weed Management EIS and Record of Decision. Under Alternatives #2, #4, and #5, herbicide treatment of noxious weeds would occur on roads. Road closures and travel management measures would also reduce the potential for establishment and spread of noxious weeds. However, the ground disturbing activities proposed in these alternatives would have a risk of increasing weed spread. A comprehensive plan of weed control and prevention would be integrated into project design for all of the action alternatives. Mitigation measures would reduce the potential for spread where harvest activities occurred.

Alternatives #2, #4, and #5 would follow Lolo National Forest Plan management direction for noxious weed control. They would also address the recommendations for invasive species, and indirectly, for rare plants, from the assessment of the 2000 fire season, *Toward Restoration and Recovery*.

■ **Wildlife**

The effects of the alternatives on Threatened, Endangered, Sensitive and Management

Indicator species are summarized in Table S.5.11.

All alternatives would likely have no impact on forest land birds considering the small extent of the habitat treatments compared with the effects of the 2000 wildfires.

All alternatives would have no impact on fragmentation, linkages and corridors. Alternatives #2, #4 and #5 would increase elk security and decrease open road density. Alternative #4 is designed to have the greatest increase in elk security and the largest decrease in open road density. This alternative would produce the most area with hiding cover and the lowest miles of open roads.

Overall, the biodiversity of the project area is generally within the natural range of variation. None of the alternatives proposes forest type conversion or introduction of exotic species. None of the forest would be permanently changed to another vegetation type. A large percentage of the burned forest would not be harvested. Considering these factors, no alternatives would reduce biodiversity within the project area.

Table S.5.9. Comparison of Effects on Wildlife. Alternatives #2, #4 and #5 would increase elk security and decrease open road density, which would slightly improve elk habitat. Alternative 4 would have a slightly greater increase in elk security and a slightly greater reduction in open road density within all the elk herd units located in the project area than the other alternatives.

Comparison of Effects on Wildlife				
	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
<u>Threatened and Endangered Species</u>				
Bald Eagle	No Effect	No Effect	No Effect	No Effect
Gray Wolf	No Effect	No Effect – Slight improvement to habitat	No Effect – Slight improvement to habitat	No Effect – Slight improvement to habitat
Grizzly Bear	May Affect, But Not Likely to Adversely Affect	May Affect, But Not Likely to Adversely Affect – Slight improvement to habitat	May Affect, But Not Likely to Adversely Affect – Slight improvement to habitat	May Affect, But Not Likely to Adversely Affect – Slight improvement to habitat
Lynx	No Effect	No Effect	May Affect, But Not Likely to Adversely Affect – Slight improvement to habitat	May Affect, But Not Likely to Adversely Affect – Slight improvement to habitat

Summary

<u>Sensitive Species</u>				
Coeur d'Alene Salamander	No Impact	No Impact	No Impact	No Impact
Harlequin Duck	No Impact	No Impact	No Impact	No Impact
Northern Goshawk	No Impact	No Impact	No Impact	No Impact
Black Backed Woodpecker	No Impact	No Impact	No Impact	No Impact
Flammulated Owl	No Impact	No Impact	No Impact	No Impact
Townsend's Big – Eared Bat	No Impact	No Impact	No Impact	No Impact
Fisher	No Impact	No Impact	No Impact	No Impact
Wolverine	No Impact	No Impact	No Impact	No Impact
Boreal Toad	No Impact	No Impact	No Impact	No Impact
Northern Leopard Frog	No Impact	No Impact	No Impact	No Impact
<u>Management Indicator Species</u>				
Pileated Woodpecker	No Impact	No Impact	No Impact	No Impact
Elk	No Impact	No Impact	No Impact	No Impact
<u>Big Game Habitat</u>				
<u>Elk Security (By Herd Unit)</u>				
Sunrise Herd Unit	44%	44%	49%	44%
Van Ness Herd Unit	47%	49%	49%	49%
Johnson Herd Unit	20%	22%	23%	21%
Upper Ninemile Herd Unit (FS Portion)	28%	32%	32%	31%
<u>Open Road Density within the Elk Herd Units</u>				
Sunrise Herd Unit	1.3 mi / sq mi	1.3 mi / sq mi	1.1 mi / sq mi	1.3 mi / sq mi
Van Ness Herd Unit	1.1 mi / sq mi	1.0 mi / sq mi	1.0 mi / sq mi	1.0 mi / sq mi
Johnson Herd Unit	1.2 mi / sq mi	1.2 mi / sq mi	1.1 mi / sq mi	1.2 mi / sq mi
Upper Ninemile Herd Unit (FS Portion)	0.9 mi / sq mi	0.7 mi / sq mi	0.7 mi / sq mi	0.7 mi / sq mi
<u>Pileated Woodpecker Habitat</u>				
Existing Habitat	30,140 acres	30,140 acres	30,140 acres	30,140 acres
Habitat Harvested (Potential Snag Loss)	0 acres	0 acres	575 acres (<1%)	1040 acres (3%)
Habitat Underburned (Potential Snag Gain)	0 acres	0 acres	750 acres (2%)	750 acres (2%)
<u>Black-backed Woodpecker Habitat</u>				
Existing Habitat	9870 acres	9870 acres	9870 acres	9870 acres
Habitat Harvested (acres and percent)	0 acres (0%)	0 acres (0%)	478 acres (5%)	1020 acres (10%)
<u>Lynx Habitat</u>				
<u>Open Road Density (By Lynx Analysis Unit)</u>				
Upper Ninemile – Siegel LAU	1.0 mi / sq mi	0.8mi / sq mi	0.7mi / sq mi	0.8mi / sq mi
Ninemile Divide LAU	0.4 mi / sq mi	0.3mi / sq mi	0.2mi / sq mi	0.3mi / sq mi
Trout LAU	0.8 mi / sq mi	0.8mi / sq mi	0.6mi / sq mi	0.8 mi / sq mi
McCormick LAU	0.2 mi / sq mi	0.01mi / sq mi	0.01 mi / sq mi	0.01mi / sq mi
<u>Lynx Denning Habitat</u>				
Upper Ninemile – Siegel LAU	10,940 acres (33%)	10,940 acres (33%)	10,810 acres (33%)	10,330 acres (31%)
Ninemile Divide LAU	6130 acres (18%)	6130 acres (18%)	6108 acres (18%)	5520 acres (16%)
Trout LAU	17,280 acres 46%	17,280 acres 46%	17,130 acres (45%)	16, 880 acres (45%)
McCormick LAU	5600 acres (20%)	5600 acres (20%)	5600 acres (20%)	5562 acres (20%)

■ **Recreation**

The broader scale patterns and types of recreation uses would not change appreciably under any of the alternatives. Low density

recreation uses would continue to occur across most of the fire areas. There would be no change to the designated Recreation Opportunity Spectrum (ROS).

The Ninemile, Flat, and Landowner Fire Areas would continue to offer mostly roaded natural recreation opportunities, while the Alpine Fire area would provide mostly semi-primitive, motorized opportunities.

Firewood gathering would be expected to increase under all of the alternatives. Firewood gathering near riparian areas may pose a problem in some areas where desirable species of larger size are readily available. “No-Cutting” signs and law enforcement would help reduce the impacts of these activities. Firewood gathering would diminish after several years, when the supply was depleted near roads.

Increased forage production may increase deer and elk numbers in the burned areas increasing hunter success. However, additional road closures under Alternatives #2, #4, and #5 would reduce motorized hunting opportunities but improve non-motorized, walk-in opportunities.

Under Alternative #1, the current system of open, closed, and seasonally restricted roads would remain in place. Snowmobile use would continue on existing, established routes, on and off-road.

Under Alternatives #2, #4, and #5, motorized vehicle travel on established Forest Roads would be reduced. Some popular driving routes would be closed or restricted seasonally or yearlong to motorized vehicles. Most of the road closures would occur in the Ninemile and Trout Creek drainages.

Under Alternatives #2, #4, and #5, off-road snowmobile use would be restricted within the fire perimeters for five years. Patterns of snowmobile use on established roads would still be permitted under these alternatives.

Alternative #4 would have the greatest impact on motorized vehicle access. In addition to road closures under Alternatives #2 and #5, this alternative would restrict yearlong travel on additional road. Additional restrictions would occur on popular loop and thru-roads including Forest Road #450 over Windfall Creek, Forest Road #388, over Freezeout Pass, and Forest Roads #5475 and #536, between First Creek and Sawpit Creek.

Alternative #5 would compare closely to Alternative #2, with fewer road closures than

Alternative #4. The overall access patterns on established routes would be left intact. Local road access would, however, be reduced.

■ Economics

Alternative #1 would produce no economic outputs. There would be no return on the \$1,000,000 cost of planning and analysis. The \$19,200 cost for mushroom permitting and monitoring would be incurred regardless of alternative. Present net value of Alternative #1 would be -\$1,000,000. Economic impacts of this alternative would be minimal when compared to other alternatives.

Alternative #2 would accomplish the same management activities of Alternatives #4, and #5 with the exception of timber harvest and a small difference in road restoration work. The total PNV for this alternative would be -\$7,575,000. This alternative would generate approximately 184 jobs and \$2,526,000 in employee compensation.

Alternative #4 would include the restoration activities proposed in Alternative #2 plus reforestation activities and timber harvest. If all of the offered timber volume were sold, the total PNV for this alternative would be -\$10,182,000. This alternative would generate approximately 515 jobs and \$7,540,000 in employee compensation. Although this alternative displays a 180 percent increase in employment over Alternative #2, the employee compensation would be 198 percent more than Alternative #2 because of the higher paying jobs associated with timber harvesting and processing. Current market conditions display a negative stumpage value, indicating that some sales under this Alternative may not have bids when offered. This is primarily due to the high percentage (64 percent) of helicopter yarding required under this alternative. Approximately \$69,300 of timber revenue would be available to pay for a portion of the \$1,391,200 road stabilization costs.

Alternative #5 would include the restoration activities proposed in Alternative #2 plus reforestation activities and timber harvest. Additional timber salvage would occur over that performed in Alternative #4. If all of the offered timber volume were sold, the total PNV for this alternative would be -\$9,229,000. This alternative would generate approximately 927 jobs and \$16,992,000 in employee

compensation. This alternative displays an 80 percent increase in employment over Alternative #4. Employee compensation would be 125 percent more than Alternative #4 because of the increased number of higher paying jobs associated with added timber harvesting and processing. Current market conditions also display a negative stumpage value, indicating

that some of the sales in this Alternative may not have bids when offered. This is primarily due to the percentage (43 percent) of helicopter yarding required under this alternative. Approximately \$1,579,000 of timber revenue would be available to pay for a portion of the \$1,693,000 road stabilization costs.

Table S.5.10. Comparison of Economic Effects. Each alternative would vary in total PNVs, job creation, and employee compensation. Variations are often based on proposed activities, including restoration and timber harvest.

Comparison of Economic Effects				
	Alternative 1	Alternative 2	Alternative 4	Alternative 5
Logging Systems Average for Project				
Tractor Yarding (% of Area)	0 acres (total)	0 acres (total)	1933 acres (total)	4845 acres (total)
Skyline Yarding (% of Area)	0 acres	0 acres	197 acres (10%)	1353 acres (28%)
Helicopter Yarding (% of Area)	0 acres	0 acres	354 acres (18%)	1415 acres (29%)
			1382 acres (72%)	2077 acres (43%)
Logging Systems By Sale				
9 Mile Timber Sale				
Tractor Yarding (% of Area)	0 acres (total)	0 acres (total)	597 acres (total)	1127 acres (total)
Skyline Yarding (% of Area)	0 acres	0 acres	73 acres (12%)	500 acres (44%)
Helicopter Yarding (% of Area)	0 acres	0 acres	50 acres (8%)	57 acres (5%)
			473 acres (79%)	570 acres (51%)
Alpine Timber Sale				
Tractor Yarding (% of Area)	0 acres (total)	0 acres (total)	91 acres (total)	972 (total)
Skyline Yarding (% of Area)	0 acres	0 acres	4 acres (4%)	302 acres (31%)
Helicopter Yarding (% of Area)	0 acres	0 acres	87 acres (968%)	87 acres (52%)
			0 acres (0%)	168 acres (17%)
St. Louis Timber Sale				
Tractor Yarding (% of Area)	0 acres (total)	0 acres (total)	41 acres (total)	79 acres (total)
Skyline Yarding (% of Area)	0 acres	0 acres	23 acres (56%)	43 acres (54%)
Helicopter Yarding (% of Area)	0 acres	0 acres	18 acres (44%)	36 acres (46%)
			0 acres (0%)	0 acres (0%)
Siegel Timber Sale				
Tractor Yarding (% of Area)	0 acres (total)	0 acres (total)	34 acres (total)	278 acres (total)
Skyline Yarding (% of Area)	0 acres	0 acres	34 acres (100%)	221 acres (79%)
Helicopter Yarding (% of Area)	0 acres	0 acres	0 acres (0%)	57 acres (21%)
			0 acres (0%)	0 acres (0%)
Pine Creek Timber Sale				
Tractor Yarding (% of Area)	0 acres (total)	0 acres (total)	0 acres (total)	50 acres (total)
Skyline Yarding (% of Area)	0 acres	0 acres	0 acres	50 acres (100%)
Helicopter Yarding (% of Area)	0 acres	0 acres	0 acres	0 acres
			0 acres	0 acres
Sunrise Timber Sale				
Tractor Yarding (% of Area)	0 acres (total)	0 acres (total)	0 acres (total)	19 acres (total)
Skyline Yarding (% of Area)	0 acres	0 acres	0 acres	19 acres (100%)
Helicopter Yarding (% of Area)	0 acres	0 acres	0 acres	0 acres
			0 acres	0 acres
Landowner Timber Sale				
Tractor Yarding (% of Area)	0 acres (total)	0 acres (total)	341 acres (total)	654 acres (total)
Skyline Yarding (% of Area)	0 acres	0 acres	28 acres (8%)	28 acres (4%)
Helicopter Yarding (% of Area)	0 acres	0 acres	82 acres (24%)	160 acres (25%)
			231 acres (68%)	466 acres (71%)
Flat Creek Timber Sale				
Tractor Yarding (% of Area)	0 acres (total)	0 acres (total)	830 acres (total)	1666 acres (total)
Skyline Yarding (% of Area)	0 acres	0 acres	35 acres (4%)	190 acres (11%)
Helicopter Yarding (% of Area)	0 acres	0 acres	117 acres (14%)	603 acres (36%)
			678 acres (82%)	873 acres (53%)
Timber Sale Volume				
9 Mile Timber Sale	0 mmbf (total)	0 mmbf (total)	12.8 mmbf (total)	36.9 mmbf (total)
Alpine Timber Sale	0 mmbf	0 mmbf	3.7 mmbf	8.3 mmbf
			0.8 mmbf	9.2 mmbf

Comparison of Economic Effects				
	<u>Alternative 1</u>	<u>Alternative 2</u>	<u>Alternative 4</u>	<u>Alternative 5</u>
St. Louis Timber Sale	0 mmbf	0 mmbf	0.3 mmbf	0.5 mmbf
Siegel Timber Sale	0 mmbf	0 mmbf	1.4 mmbf	1.7 mmbf
Pine Creek Timber Sale	0 mmbf	0 mmbf	0 mmbf	0.2 mmbf
Sunrise Timber Sale	0 mmbf	0 mmbf	0 mmbf	0.2 mmbf
Landowner Timber Sale	0 mmbf	0 mmbf	1.7 mmbf	4.2 mmbf
Flat Creek Timber Sale	0 mmbf	0 mmbf	4.9 mmbf	12.6 mmbf
<u>Sale Size</u>	0 (total)	0 (total)	7 (total)	9 (total)
Small Sales Offered Under 2.0 mmbf	0	0	4	4
Large Sales Offered (Over 2.0 mmbf)	0	0	3	5
<u>Employment Created</u>	15 (total)	184 (total)	515 (total)	927 (total)
Private Sector Jobs	0	152	466	855
Federal Sector (Forest Service) Jobs	15	33	48	72
<u>Employment Compensation</u>	\$242,000 (total)	\$2,526,000 (total)	\$7,540,000 (total)	\$16,992,000 (total)
Private Sector Compensation	\$0	\$2,002,000	\$6,763,000	\$15,827,000
Federal Sector (Forest Service) Compensation	\$242,000	\$525,000	\$778,000	\$1,165,000
<u>Jobs and Income (\$1000) by Activity</u>				
Forest Products	0	0	185	594
	\$0	\$0	\$4,203	\$13,619
Road Restoration and BMPs	0	73	72	73
	\$0	\$1,308	\$1,281	\$1,316
Reforestation	0	0	148	148
	\$0	\$0	\$842	\$842
Watershed Restoration	0	67	67	67
	\$0	\$529	\$529	\$529
Noxious Weed Treatment	0	7	7	7
	\$0	\$45	\$45	\$45
Mine Restoration	0	21	21	21
	\$0	\$376	\$376	\$376
Heritage Site Protection	0	2	2	2
	\$0	\$24	\$24	\$24
Planning and Analysis	15	15	15	15
	\$242	\$247	\$247	\$247
<u>Sale Net Value (PNVs)</u>				
Upper Ninemile	\$0	\$0	-\$593.3	-\$587.8
Alpine	\$0	\$0	\$33.5	\$440.7
St. Louis	\$0	\$0	-\$4.1	-\$11.3
Siegel	\$0	\$0	-\$3.8	\$71.9
Pine	\$0	\$0	\$0	-\$12.0
Sunrise	\$0	\$0	\$0	-\$0.3
Landowner	\$0	\$0	-\$109.5	-\$262.1
Flat	\$0	\$0	-\$446.5	\$13.3
<u>Present Net Value (PNVs)</u>	-\$1000.0 (total)	-\$7,575.0 (total)	-\$10,182.0 (total)	-\$9,229.0 (total)
Total Timber Sale Revenue (\$1000)	\$0	\$0	-\$500.1	\$1,809.0
Total Sale PNVs (\$1000)	\$0	\$0	-\$1,189.6	-\$2432.0
Reforestation Cost PNVs (\$1000)	\$0	\$0	-\$2,003.0	-\$2,003.0
Watershed Restoration PNVs (\$1000)	\$0	-\$1,510.0	-\$1,510.0	-\$1,510.0
Heritage Protection PNVs (\$1000)	\$0	-\$50.2	-\$50.2	-\$50.2
Road Rehabilitation PNVs (\$1000)	\$0	-\$4,088.9	-\$3,868.2	-\$3,888.1
Noxious Weed Management PNVs (\$1000)	\$0	-\$123.7	-\$123.7	\$123.7
Mushroom Permitting PNVs (\$1000)	-\$19.2	-\$19.2	-\$19.2	-\$19.2
Planning (NEPA) Costs PNVs (\$1000)	-\$1000.0	-\$1000.0	-\$1000.0	-\$1000.0

■ S.6 Identification of the Environmentally Preferred Alternative

“**Alternative #4**” has been identified as the environmentally preferred alternative (40 CFR 1502.14(e)).

Alternative #4 would cause the fewest adverse effects to water quality, aquatic habitat, and fisheries resources while meeting all of the objectives of the Post Burn Project as stated within the Purpose and Need. This alternative would restore water quality, fisheries habitat, and stabilize soils impacted by the fires of 2000. This alternative would also restore vegetation structure and reduce fuels in individual VRU 2 stands where fire return intervals are most disharmonious with natural regimes. This alternative would maximize protection of potential wildlife linkages and corridors by implementing road closures and travel restrictions on well-established Forest Roads.

This alternative meets the statutory mission and responsibilities of the Lolo National Forest, as stated within the Goals, Objectives, and Standards of the Lolo National Forest Plan. Furthermore, it implements the majority of objectives identified within the National Fire Plan, Region 1 Assessment “*Toward Restoration and Recovery*”, and the USDA, Forest Service Strategy.

Given consideration of the environmental, technical, and economic factors identified through both internal and external scoping, this alternative most clearly represents the issues, concerns and opportunities associated with environmental protection and restoration.

■ S.7 Identification of the Agency’s Preferred Alternative

The Lolo National Forest Supervisor has identified “**Alternative #5**” as the agency’s preferred alternative (40 CFR 1502.14(e)).

Alternative #5 more closely fulfills the objectives of the Post Burn Project as stated within the Purpose and Need than the other proposed alternatives. It also more closely meets the statutory mission and responsibilities of the Lolo National Forest, as stated within the Goals, Objectives, and Standards of the Lolo National Forest Plan. Furthermore, it implements the majority of objectives identified within the National Fire Plan, Region 1 Assessment “*Toward Restoration and Recovery*”, and the USDA, Forest Service Strategy.

Given consideration of the environmental, technical, and economic factors identified through both internal and external scoping, this alternative more closely balances the issues, concerns and opportunities associated with restoring and recovering watersheds and the land, and working with communities and people. By combining timber generated revenue with allocated National Fire Plan funds, Alternative #5 allows for the expedient implementation of resource restoration and recovery projects including soil stabilization, mine and stream reclamation, road decommissioning, culvert replacements and removals, weed spraying, and road reconstruction with Best Management Practices (BMPs).