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Summary

Introduction

The following summary is a brief overview of the Tower Fire Recovery Projects Final Environmental Impact Statement (FEIS). For complete information, please review the entire document. This summary is not meant to present all the information contained in the complete FEIS.

The Tower Fire burned from August 13 to September 9, 1996, about 8 air miles southeast of the town of Ukiah, Oregon, in Umatilla and Grant counties. Heavy fuel conditions, steep terrain, and strong gusting winds resulted in unusually severe fire behavior. About 50,800 acres were burned, 46,300 of which occur on the Umatilla National Forest. The fire burned within the headwaters of the North Fork John Day River across large portions of eleven subwatersheds. Major streams within the fire area include North Fork Cable, South Fork Cable, Hidaway, Texas Bar, Oriental, Winom, and Big creeks. The fire's perimeter included all of the South Fork-Tower Roadless Area (16,280 acres), as well as portions of the North Fork John Day Wilderness. Four predominant forest cover type groups characterize the burned area: dry forests (23% of the area burned), moist forests (44%), lodgepole pine forests (27%), and cold forests (6%).

An ecosystem analysis at the watershed scale was completed for the area in January 1997 entitled "*Tower Fire Ecosystem Analysis*". The ecosystem analysis characterized the physical and biological condition of the area, considered issues and key questions, compared current resource conditions to reference conditions, and identified resource protection and restoration measures. Based on the Tower Fire Ecosystem Analysis and the existing condition of the analysis area, the North Fork John Day District initiated four projects (Hairy Hazard Tree CE, Big Tower Salvage and Revegetation Project EA, South Tower Fire Recovery Projects EA, and Cable Fire Recovery Project EA) to improve public safety within the area, salvage value from fire-killed timber, reduce existing and future fuel levels, and accelerate recovery of forest vegetation.

In January 1998, the Big Tower Fire Recovery Projects Decision Notice and Environmental Assessment was challenged in court. The Federal District Court upheld the project decision and the three salvage sales associated with the Big Tower Salvage and Revegetation Projects were sold and awarded (as was the Hairy Hazard Tree Sale) in the spring of 1998. The court was petitioned for a stay of implementation during appeal, but the stay was denied and activities associated with the Big Tower Salvage and Revegetation Projects began. The District Court's decision was appealed and the Ninth Circuit Court of Appeals overturned the decision on November 5, 1998. The Ninth Circuit judge enjoined "*any logging, road construction and reconstruction, and other ground-disturbing activities within the Tower Fire area of the Umatilla National Forest, until such time as the Forest Service has prepared, circulated, and considered an environmental impact statement, to analyze proposed actions within the Tower Fire Area...*" All activities on the three timber sales associated with the Big Tower Salvage and Revegetation Projects EA, as well as the Hairy Hazard Tree Sale (which was to remove hazard trees along open roads), were stopped. At the time of the halt order, 19 million board feet of the 26 million board feet of timber sold had been cut and removed from three of the four timber sales. The Tower Fire Recovery Projects Environmental Impact Statement responds to that direction.

Purpose & Need For Action

This section lays the framework for why action is needed to recover the area burned by the Tower Fire. It is divided into subsections due to the complexity caused by the size of the fire and inter-relatedness of resources affected. The current condition of resources is briefly described, followed by the actions the District is proposing to address undesired conditions. In some cases, a proposed action is discussed in more than one subsection (e.g. reforestation would accelerate reestablishment of trees and recovery of wildlife habitat).

Soil and Water

Before the Tower Fire, riparian communities within the area were considered to be in poor to fair condition due to previous management (Tower Fire Ecosystem Analysis 1997). Cable, Hidaway, and Big creeks and the North Fork John Day River (from the Middle Fork to Granite) appeared on Oregon State's List of Water Quality Limited Water Bodies (ODEQ 1996) for not meeting state standards for stream temperatures and fish habitat modification. The Tower Fire has further degraded water conditions and exposed many acres of soil to erosion, which is causing slope instability in some areas. In some areas, soil compaction caused by past tractor-based harvest has exacerbated overland flows and erosion. Roads are also contributing to erosion by restricting drainage and concentrating overland flows. In addition, ash and debris from the fire clog culverts, causing drainage problems and deterioration of the roadbed. In particular, a storm in 1998 plugged culverts on Forest roads 5506 and 5507 and stream crossings were washed out. As a result, Forest Road 5510 (which traverses the headwaters of Oriental Basin across areas of unstable soil) now serves as the primary route through the basin and is too narrow for the volume of traffic. Loss of vegetative cover has also increased erosion adjacent to recreational trails. All of these situations are contributing to reduced water quality through sedimentation.

To address these conditions, the North Fork John Day District proposes to implement the following actions:

-  Plant riparian shrubs, hardwoods, and conifers along intensely burned portions of the South and North forks of Cable Creek, Winom Creek, and Hidaway Creek
-  Plant 10,285 acres of burned upland forest with coniferous tree seedlings
-  Seed approximately 30 acres of highly erodible slope with native grass
-  Transplant approximately 10 acres of highly erodible cutbank along Forest Road 5510 with native shrubs
-  Plant approximately 10 acres of conifers and hardwoods on a landslide along Hidaway Creek and 5 acres on a landslide along Texas Bar Creek
-  Subsoil up to 25 acres of existing landings, major skid trails, and temporary roads associated with past timber harvest
-  Improve drainage on 13.1 miles of Forest roads 5445, 5500-070, 5500-080, 5506-100, 5507-270 (which are closed but needed administratively)
-  Improve condition of 47.1 miles of Forest roads 5200-440, 5212, 5448, 5500-070, 5506, 5506-130, 5507, 5507-300 and -305, and 5510 (which are open to public travel) to reduce erosion
-  Replace the 3 adjacent culverts on Forest Road 5448 with an OHV bridge to improve stream flow patterns
-  Replace culvert at Forest Road 5506 crossing of Sheep Creek and milepost 10.2 on Forest Road 5507

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-  Construct a short-term hardened ford at the Forest Road 5506 crossing of Oriental Creek, then when the stream channel has stabilized, install a rip rap structure and culvert that allows fish passage
-  Repair washouts and culverts on the closed portion of Forest Road 5507 from milepost 10.2 to the 100 spur junction (River Trail); install barricades with turn-arounds at the 100 spur and 130 spur junctions
-  Improve drivability and safety on Forest Road 5510 so that it may function as the primary access to Oriental Basin
-  Obliterate¹ 6.4 miles of closed Forest roads 5500-136, 5507-266, 5507-274, 5507-276, 5507-282, 5507-283, 5507-284, 5507-285, and 5507-400
-  Seed slopes adjacent to recreational trails that traverse steep, moderate to intensely burned areas with native grasses and forbs
-  Install signs at Round Meadows Trailhead, Three Culverts Camp, and Winom Campground to gain users' assistance in protecting fragile burned areas

Fish Habitat

The North Fork John Day River contains important spawning and rearing habitat for the “Threatened” mid-Columbia summer steelhead (which have been found throughout the burned area streams below natural barriers). “Threatened” bull trout are presumed to use the North Fork John Day River as a migratory corridor. Native, wild spring chinook salmon use the North Fork John Day River, Oriental Creek, lower Big Creek, and lower Hidaway Creek for spawning and rearing habitat. Past management coupled with the Tower Fire has degraded habitat for these species. Fish access to upstream habitat has been restricted in some areas due to improperly designed road crossings of streams. High total road densities contribute sediment in the Lower Cable, Lower North Fork Cable, Texas Bar, North Fork John Day/Otter, North Fork John Day/Turner, North Fork John Day/Oriental and Lower Hidaway subwatersheds. Before the fire, trees along parts of Texas Bar and North Fork Cable creeks were harvested, reducing shading. Livestock grazing in riparian areas (such as Round Meadow) also reduced shading and destabilized streambanks in some areas. The fire degraded stream conditions by killing much of the riparian vegetation where it burned at moderate and high intensities (141 miles of stream habitat, see Map 2). Sediment loads have increased since the fire, fish hiding cover and food sources have been reduced, and shade (which keeps water cool) is almost non-existent in the most severely burned areas. As a result, the Tower Fire Ecosystem Analysis identified Texas Bar Creek, upper North Fork Cable Creek, and a couple tributaries of Hidaway Creek as being at extremely high risk of further habitat degradation. This was underscored by a flood in 1997 which scoured the upper headwaters of North Fork Cable and Hidaway creeks to bedrock, and another in 1998 which scoured Oriental Creek and added fill from road crossings to the sediment load.

To address these conditions, the North Fork John Day District proposes to implement the following actions:

-  Plant riparian vegetation and conifers along intensely burned portions of the South and North forks of Cable Creek, Winom Creek, and Hidaway Creek²
-  Obliterate Forest roads 5500-136; 5507-266, -274, -276, -282, -283, -284, -285, and – 400 (which are closed and not needed administratively)

¹ Obliteration would loosen soil compaction, restore the original landform as much as possible, and seed native grasses.

² Burned portions of Texas Bar and Oriental creeks have already been planted.

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-  Remove fish barriers at four culverts where Forest roads 55 and 5506 cross Texas Bar Creek and one culvert on Forest Road 5448 near the 550 junction on a tributary to North Fork Cable Creek
-  Construct step weirs down slope of the two culverts where Forest Road 52 crosses Winom Creek and South Fork Cable Creek
-  Construct a permanent fence around the eroding portion of streambank (approximately one mile) within Round Meadow
-  Place large instream wood in portions of Big, North Fork Cable, and Hidaway creeks

Forests

The Tower Fire burned approximately 42% of the area at high and moderate intensities, resulting in near total mortality of trees. In many areas there are no longer any seed sources to reforest the dead stands (Tower Fire Ecosystem Analysis 1997) and natural reforestation could take several hundred years in areas which are beyond the reach of existing seed sources. The fire extirpated 60-70% of the native white pine populations on the District, which served as a major source of seed for this species. In the northeast portion of the fire, mortality in *Armillaria* root rot pockets has increased due to the added stress from the fire and there is a risk that those stands could now be lost due to this disease (Scott and Schmidt 1996). In addition, tree survival and growth surveys conducted since 1998 indicate that grasses, ferns, and shrubs have become well established in a number of areas. While this is desirable in many ways (e.g. soil cover, wildlife habitat, etc.), vigorous competition from established plants coupled with low precipitation has killed many of the trees planted after 1997.

Where tree mortality was high, uncharacteristically high fuel loads will occur in the future (20+ years). Large-sized fuels would not contribute to the rate of fire spread, but would increase fire intensity (and associated plant mortality) and make suppression of wildfires or the use of controlled fire more difficult³. In the North Fork John Day Wilderness, the District would like to return fire to its historic role in the ecosystem by allowing lightning-ignited fires to burn, however, future fuel loads coupled with a predicted continuous cover of young trees would make containment of such fires nearly impossible.

In areas where the fire resulted in little tree mortality, many stands are densely stocked with an uncharacteristic abundance of species that require lots of moisture. This is resulting in increased competition between trees for nutrients, water, and space. Overstocked stands are highly stressed, which results in slower growth and increased susceptibility to insects and disease. There is a risk that the remnant, old ponderosa pine will weaken and die because of the crowded conditions, further depleting an already scarce stand type. As a result, overstocked stands are highly stressed, which results in slower growth and increased susceptibility to insects and disease. The desired future conditions for forest species composition, structure, stocking, and big game thermal cover described in the Forest Plan will not be achieved in the near future.

To address these conditions, the North Fork John Day District proposes to implement the following actions:

-  Plant 10,085 acres with conifer seedlings of mixed species, and another 200 acres with white pine
-  Spot apply herbicide in tree planting areas (including areas planted in 1998 and 1999⁴) to improve seedling survival and growth
-  Harvest *Armillaria* root rot-infected green or dead trees from 271 acres and replant with resistant species

³ The unstable nature of standing dead trees would also pose increased safety risks to firefighters working around them.

⁴ Areas planted in 1997 do not need treatment because these trees were planted before competition became a problem.

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-  Salvage harvest approximately 3,028 acres to reduce future fuel loads to desired levels (8-12 tons/acre) using all logging system options, including construction then decommissioning of an estimated 4 miles of temporary roads and reopening (grading and drainage improvement) of 1.2 miles of abandoned road
-  Construct a 6.25 mile long, 300-foot wide shaded fuel break⁵ using manual and mechanical methods along the ridge bounding but outside the northern edge of the North Fork John Day Wilderness
-  Commercially thin 843 acres of trees ranging from 7-21 inches in diameter to restore healthy stand densities using all logging system options, including construction then decommissioning of 0.5 miles of temporary road and reopening (grading and drainage improvement) of 0.6 miles of abandoned road
-  Non-commercially thin 180 acres of trees ranging from 1-7 inches in diameter to restore healthy stand densities

Wildlife Habitat

The fire has reduced the diversity of wildlife habitats to a predominantly homogenous landscape of early successional stage forest with isolated microhabitats of green tree patches and scattered individual live trees (Tower Fire Ecosystem Analysis 1997). A number of tree stands designated in the Forest Plan as C1-Dedicated Old Growth were burned, with 13,000 acres experiencing moderate to heavy mortality. A large amount of inventoried old growth was killed as well. Riparian areas appear to be recovering from the fire, however, there is potential in the future for ungulate use to affect the rate of recovery of riparian wildlife habitat. Snag densities will be high for the next few years, but most snags will fall within the next 10 years (especially in areas exposed to prevailing winds) so there will be a deficiency of snag habitat⁶ throughout much of the area in the long-term (20+ years). Deer and elk migrate through the burned area from the north and west in the spring. These animals should benefit from the large increase in forage, but the extensive loss in tree cover will make deer and elk more susceptible to human disturbance and associated stress. Dead trees provide some level of protection as hiding cover, but are not as effective as live vegetation. Big game browsing in the spring (when forage is still scarce) could damage proposed riparian plantings and slow vegetative recovery in areas that burned at high intensities.

To address these conditions, the North Fork John Day District proposes to implement the following actions:

-  Plant 10,285 acres with conifers to acceleration of development of forest cover
-  Designate new areas as C1-Dedicated Old Growth
-  Construct permanent fence around 45 acres of Round Meadow, 2 acres of Donut Meadow, 9 acres of Long Meadow, and 4 additional acres of Pearson Meadow
-  Fence 1 acre around a spring at T.6S., R.33E., Section 35, 3 acres around a spring at T.6S., R.33E., Section 34, and fence and repair three ponds within T.6S., R.33E., sections 27 and 35
-  Delay future shortages of snags by removing one-third to three-quarters of the crown from scattered, large, dead trees to reduce wind resistance using the most economical and safe method (chainsaw, explosives, or mechanical)

⁵ A shaded fuel break retains tree cover. Trees are thinned so that crowns do not touch and standing dead or downed fuels (beyond what is needed to meet Forest Plan standards) are removed.

⁶ Primary cavity excavators expected to use snags in the burned area include black-backed, northern three-toed, hairy, and Lewis' woodpeckers, northern flickers, and to a lesser degree downy and white-headed woodpeckers.

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-  Reduce grazing pressure by aerially seeding 2,800 acres and fertilizing 1,500 acres along the north and west edges of the fire perimeter where spring migration occurs, and prescribe burning 900 acres near the North Fork John Day River to stimulate herbaceous vegetation

Recreation

The fire not only affected the natural resources in the area, it also affected various recreational resources. At least 20 dispersed campsites could contribute to increased erosion and sediment due to the fire's reduction in vegetation and ground cover. At Pearson Guard Station, the fire burned the outhouse, damaged the water system, and removed vegetation surrounding a high use dispersed campsite. Visual quality was reduced along a portion of the Blue Mountain Scenic Byway where the fire burned at high intensity. Trees along many roads and within the Pearson Recreational Residence tract, the Winom-Frazier OHV Complex, and Winom Campground have died since the fire and now pose hazards to recreationists and travelers. In addition, the 1998 flood in Oriental Creek destroyed some of the campsites and facilities at Oriental Campground.

Some repairs were made to trails immediately after the fire, however, longer-term effects are now appearing: lost definition and visibility of road crossings on the Round Meadows and Cut Across OHV trails, increased drainage problems on the River Trail, and increased safety concerns on the Roundaway OHV Trail. The safety concerns on the Roundaway Trail are particularly difficult to resolve. The Roundaway Trail is an important connection from the Frazier Campground to both the Winom and Wallowa-Whitman National Forest trail systems. The existing trail crosses above a landslide along Hidaway Creek, and is rated "most difficult" for motorcycles and "not recommended" for 4-wheelers. Even so, 4-wheelers have been using this trail. The fire consumed vegetation that previously served as a natural barrier to 4-wheelers, and as a result, the established trailbed has widened from the 16-inch width needed for motorcycles to 50 inches or more. Use of this trail by 4-wheelers is unsafe and is resulting in trail degradation. An alternative route that accesses the Frazier portion of the complex is available to 4-wheelers (Forest Road 5226), but this road is narrow and very busy.

To address these conditions, the North Fork John Day District proposes to implement the following actions:

-  On 20 dispersed campsites, remove hazard trees and large charred logs, define site boundaries using boulders, and level and surface site with gravel
-  Reconstruct the Pearson Guard Station outhouse and water system and harden the existing dispersed campsite to reduce erosion
-  Install interpretive sign along the Blue Mountain Scenic Byway (Forest Road 52) to provide information regarding wildfire and post-fire management
-  Harvest dead trees from 346 acres in the foreground of the Blue Mountain Scenic Byway
-  Plant approximately 10 acres of trees and shrubs on a landslide along Hidaway Creek
-  Remove hazardous trees from 663 acres, including the Winom Creek OHV area (South Winom and North Winom trailheads, trail crossings, dispersed campsites, and the Winom Campground) and the Pearson Recreational Residence tract (Forest roads 5200-528, 5200-529, 5200-530, and 5200-340). Hazard trees would also be removed along Forest roads 5507, 5510, 5226, and 5226-090. Hazard trees that occur within PACFISH Riparian Habitat Conservation Areas would be felled and left on site.
-  Remove debris, recontour, and place gravel on two campsites and the trailhead parking at Oriental Campground, and replace the damaged toilet with a seamless vault toilet
-  Fence, sign, and harden trailbeds where the Round Meadows and Cut Across OHV trails cross roads
-  Install drainage structures and harden or raise the tread of up to ½ mile of the River Trail to alleviate excess wetness of the trailbed
-  Construct a 6 ½-mile-long trail on gentler terrain west of the Roundaway Trail to provide a safe connection for 4-wheeler traffic and maintain slope stability on the Roundaway Trail (a size constriction device would be placed on the existing trail to eliminate 4-wheeler use)

Public Involvement

The North Fork John Day Ranger District sought information, comments, and assistance from federal, state, and local agencies, local Tribes, and other groups and individuals interested in or affected by the proposed actions. The Notice of Intent to prepare an environmental impact statement was published in the Federal Register on January 12, 1999. On February 19, 1999, a letter and maps (explaining the need for an EIS and delineating proposed projects) were mailed to 159 groups and individuals who had previously shown interest in District projects. This project was also included in every quarterly issue of the Umatilla National Forest Schedule of Proposed Activities (SOPA) since the 1999 Winter issue and was displayed on the Forest's website. Ten letters were received from the public and other agencies in response to the District letter.

On February 12, 1999, several interdisciplinary team members met with a wildlife biologist from the Oregon Department of Fish and Wildlife. The group reviewed the proposed actions, specifically with regard to big game (potential forage enhancement options, alternatives to proposed road treatments, the density of open roads within Oriental Basin, and additional disturbance of big game that could result from the proposed construction of the 4-wheeler trail). That same week, District fish biologists also reviewed the 48 proposed projects with a fish biologist from the Oregon Department of Fish and Wildlife. On April 8, 1999, the District Ranger and interdisciplinary team co-leaders met with the Department of Natural Resources Director for the Confederated Tribes of the Umatilla Indian Reservation. The group specifically discussed salvage of fire-killed timber and protection of the water and fisheries resources. The Tribes are particularly concerned with construction of temporary roads because soils in the area are light and erodible. However, they agreed that short-term increases in sediment due to implementation of restoration projects would be acceptable as long as fish were benefited in the long-term. The Tribes supported the shaded fuel break and requested that harvester/forwarder logging systems be used to minimize damage to soils. The District Ranger and several interdisciplinary team members met with Confederated Tribes of the Umatilla Indian Reservation representatives again on December 8, 1999, to tour the Tower Fire. In particular, the group visited the Texas Bar Creek area to view proposed fish passage improvement, riparian planting, road obliteration, one of the landslides, commercial thinning, reforestation and the need for control of competing vegetation, and salvage. On October 5, 2000, the interdisciplinary team leader, District silviculturist, and District fire management officer toured the Cable Creek portion of the Tower Fire area with Asante' Riverwind of Blue Mountains Biodiversity Project to further discuss concerns raised in his comments on the DEIS. The group discussed the long-term fuels situation, alternative ways to address future fuel concerns, treatment of Armillaria root rot, and the proposed commercial thinning.

The Draft Environmental Impact Statement was mailed on December 17, 1999, to 244 individuals, organizations, and agencies. The 45-day review period began on December 30, 1999, when the Notice of Availability was published in the Federal Register, and ended February 16, 2000. Written responses were received from 18 individuals, government agencies, and groups. Substantive comments quoted from the letters are displayed in Appendix E along with corresponding Forest Service's responses. Several of the substantive comments resulted in changes to the EIS, which are discussed in chapters 2 and 4.

Key Issues

The interdisciplinary team reviewed comments received in response to the EIS proposed action as well as comments regarding previous projects within the fire area (Big Tower EA, South Tower EA, Cable EA Tower Salvage EA, and Hairy Hazard Tree Removal CE). Using these comments and the concerns identified in the Tower Fire Ecosystem Analysis, the interdisciplinary team identified issues⁷ related to the proposed actions. Key issues drive the development of the alternatives to the proposed action and must at least partially satisfy the purpose and need.

Key Issue 1: Removal of Trees & Reforestation

Some members of the public believe the best way to restore the burned area is to salvage dead and badly injured trees, treat overstocked or unhealthy stands of green trees, plant appropriate species where natural regeneration is not expected to be successful in the near future, and use herbicides to control vegetative competition so that planted seedlings survive. They are concerned about excessive fuel loads and an increased risk of an insect epidemic. Some do not like to see so many dead trees rot in the woods when local communities and mills need the income these trees would generate.

Other members of the public are concerned that the burned area has already been stressed from the effects of the fire. They believe that the optimum outcome for the fire area would be achieved by allowing natural disturbance processes to restore ecosystem integrity. Of particular concern are the effects that salvage harvesting would have on soils exposed by the fire. They disagree with the proposed harvest and thinning of green trees because it could change soil characteristics and reduce wildlife cover. Some are anxious that tree planting could rely on trees that are not genetically adapted to the specific locale and are adamantly opposed to the use of herbicides to control competing vegetation.

Key Issue 2: Soil Erosion and Water Quality

Comments from some members of the public indicate a great concern that harvest would further disturb soils already exposed by the effects of the Tower Fire and cause additional instability, which would degrade watershed values. Several respondents proposed that the District should consider riparian buffers larger than the recommended PACFISH Riparian Habitat Conservation Areas since so much vegetation was lost. Many respondents commented that temporary roads, even if later obliterated, do not belong in an area already taxed by such a large fire. They point out the already high road densities in the Oriental Basin and contend that some of the roads proposed for repair from the 1998 flood should actually be closed due to unstable slopes. Even restoration activities such as placement of large instream wood raised concerns due to the possible use of heavy equipment, which could increase soil disturbance and compaction. Furthermore, a number of people are concerned that the use of herbicides (particularly glyphosate) could contaminate local waters.

Proponents of salvage and restoration activities argue that any sedimentation caused by logging activities would be negligible when compared with sediment increases resulting from the fire, and that the use of sensitive logging systems and mitigation would negate any harvest-related increases. They feel the benefits from reestablishing forest cover, improving roads, and other restoration projects outweigh the risks. They also argue that a very small portion of the fire would actually be harvested and this, coupled with implementation of measures such as Best Management Practices, would largely limit site disturbance.

Key Issue 3: Changes in Fish & Aquatic Habitat

The analysis area lies within the traditional lands of the Confederated Tribes of the Umatilla and the Confederated Tribes of the Warm Springs in Oregon. In their respective treaties, both Confederated Tribes retained certain rights to fish, hunt, gather roots and berries, and pasture stock on unclaimed federal lands. The courts have determined that the right to have associated resources (habitat) protected

⁷ The National Environmental Policy Act section 102(2)(E) defines issues as “unresolved conflicts regarding alternative uses of available resources.”

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from degradation is implied in these treaties. Both Tribes have clearly stated that the fisheries resource of the John Day River system is invaluable and critical to the pursuit of traditional life ways and that recovery projects must not result in any decreases in habitat quality.

Publics that oppose the proposed actions are particularly concerned that salvage harvest could potentially increase sediment and water temperatures. They feel only projects that would reduce erosion and sedimentation resulting from existing human-caused disturbances should be implemented. Other commenters fear that when added to sediment resulting from the fire and other existing sources, restoration activities could cause irreparable damage to the salmon, steelhead, and bull trout populations in the North Fork John Day River system.

Many supporters of salvage harvest argue that the risks involved with harvest are minimal and that restoration projects and road improvements associated with harvest would make up for any undesired effects. They also point out that tree planting, which would occur as a result of harvest, would speed recovery of soil and forest cover which would reduce sediment and improve slope stability. They point out that many factors are responsible for the decline of anadromous fish runs and that unless downstream factors are corrected, runs will continue to decline regardless of what occurs upstream. Consequently, they believe that deferring salvage harvest activities would have no effect on the overall health of the fish populations.

Key Issue 4: 4-wheeler Access to Winom-Frazier Complex

The Winom-Frazier OHV Complex is very popular for motorcyclers and 4-wheelers alike. While the North Fork John Day District received only six letters commenting on the proposed construction of the Roundaway 4-wheeler trail, the interdisciplinary team believe that current trail's popularity and instability warrant consideration as a key issue. Objectives for the selected alternative in the 1995 Camas OHV Complex EA emphasized a connection between Frazier Campground and the existing Winom and Wallowa-Whitman National Forest trail systems, and riding opportunities for all experience levels and OHV types. Since this trail is one of the most challenging in the complex for motorcyclists, the District believes it should be maintained to provide the desired variety of riding experiences. The trail cannot be widened to allow safe 4-wheeler use because the loss of vegetation coupled with the amount of excavation required for a safe 4-wheeler trailbed would likely increase slope instability, as well as remove some of the challenge this trail provides for motorcyclists.

Opponents of the proposed 4-wheeler trail construction are concerned that the new location extends into an area not currently affected by motorized trails. They argue that this will increase disturbance of big game animals and other wildlife, which were already stressed by the adjacent fire (the new trail would mostly occur outside the burned area). They also believe that OHVs cause a great deal of disturbance to soils and vegetation. Others point out that OHV use is disruptive and in conflict with other recreational uses of the area.

Tracking Issues

Issues that did not drive the formulation of alternatives, but were determined to be important or required to disclose, were considered as issues to be tracked throughout the document. These tracking issues are generally of high interest to the public or are necessary to understand the full extent of the alternatives.

- ❖ Reductions or increases in recreational access
- ❖ Changes to the character of the South Fork-Tower Roadless Area
- ❖ Changes to the character of the North Fork John Day Wild & Scenic River corridor
- ❖ Reductions in big game hiding cover and snag habitat in the short-term
- ❖ Harvest of dead old growth
- ❖ Changes in management indicator species populations and habitat

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- ❖ Changes in Threatened, Endangered, or Sensitive wildlife, fish, and plant species populations and habitat
- ❖ Recovery of the economic value of dead timber and associated economic support to local communities
- ❖ Spread of noxious weeds
- ❖ Methods used to change the scale of future stand replacement fires
- ❖ Particulate emissions, timing, and duration of prescribed burning
- ❖ Accessibility and maintenance of the transportation system
- ❖ Changes in the integrity of existing cultural properties

Scientific Controversy

A concern was identified during the Big Tower lawsuit and again in scoping for this EIS that a scientific controversy exists regarding harvest and other management activities following wildfire. In March 1995, the Pacific Rivers Council released an unpublished report by a group of scientists (Dr. Robert Beschta et. al.) whom the organization had invited to discuss and consider the ramifications of fire in western landscapes. The paper, entitled *Recommendations for Ecologically Sound Post-Fire Salvage Logging and Other Post-Fire Treatments On Federal Lands In the West*, has become known as the 'Beschta Report'. In general, the report recommends that "*human intervention should not be permitted unless and until it is determined that natural processes are not occurring,*" and strongly advises against salvage logging in most instances.

The Forest Service asked its Research Branch to review the report and comment on the issues it raised. Richard Everett, Science Team Leader at the Wenatchee Forest Sciences Laboratory, reviewed the report and, while commending the report's comprehensive consideration of potential hazards to natural resources following fire, he cautioned that the report's bias towards a hands-off approach is not appropriate in all situations and supported his concerns with citations from scientific research. Eight other agency scientists who specialize in fire ecology and fuels, ecosystem processes, root diseases and soil microbiology, aquatic/land interactions, vegetation management, and watershed and fisheries reviewed the report. Their review, although supporting a number of the principles expressed in the report, expressed reservations about the tone, specificity, and general application of many of the report's recommendations. They were concerned that while the report emphasizes the complexity and diversity of ecosystems, its recommendations tend to present a one-size-fits-all approach to management. In January 2000, the Forest Service Pacific Northwest Research Station published General Technical Report PNW-GTR-486 entitled *Environmental Effects of Postfire Logging: Literature Review and Annotated Bibliography*. The review includes 129 documents through August 1998 (commentary and scientific study) specific to the question of what happens when logs are salvaged after fire. The editors found only 21 studies worldwide that examined the environmental effects of post-fire logging. In general, there are studies both in support and in opposition to post-fire harvest. Unfortunately, no studies were found which specifically looked at how post-fire logging alters the size distribution of fuel and the accompanying changes in future fire risk.

The interdisciplinary team considered all of these reports and used them to design the proposed action and its alternatives based on conditions specific to the Tower Fire area.

Changes in Alternatives from the DEIS

The interdisciplinary team made several minor changes to alternatives since the publication of the Draft Environmental Impact Statement. These alterations resulted primarily from changed conditions on the ground, public comments, and the listing of Canada lynx as "Threatened" under the Endangered Species Act. Also the wording of alternative themes was refined to make the rationale behind the associated mix of activities more clear.

Summary

Field reconnaissance in the spring of 2000 by the Forest botanist, Forest wildlife biologist, and District wildlife biologist revealed that there is no longer a need for seeding or fertilization. There are still areas where ground vegetation is sparse, however, a biotic crust covers these soils and would prevent penetration of seed and rootlets. In the majority of the burn, native vegetation is largely recovering and little benefit would be gained by fertilization or seeding, while these activities could alter the diversity of native plants. As a result, seeding and fertilizing for forage enhancement were dropped from alternatives 4, 5, and 6, but maintained in the proposed action and Alternative 3 for tracking purposes.

Large instream wood placement is also no longer needed. The District fish biologist visited sections of Big, Hidaway, and North Fork Cable creeks that had been proposed for large, instream wood placement. Existing conditions indicate that although large instream wood frequency was low before the fire in some reaches, it has increased since the fire and will continue to increase as fire-killed trees fall into these streams. The expense that would be required to add instream wood and additional risk that would be incurred by operating machinery in and near the stream channel is not justified when compared to the small benefit. Again, this proposal was removed from alternatives 4, 5, and 6.

The fuelbreak, which was proposed in the DEIS, has been dropped from alternatives 4, 5, and 6 for several reasons. A number of letters received during the DEIS comment period expressed concern regarding the ability of the proposed fuelbreak to function as planned. Also, a 300-foot-wide shaded fuelbreak on a ridge would not be consistent with guidelines in the Lynx Conservation Assessment and Strategy (USDA et al 2000). Establishment and long-term maintenance of the fuelbreak would be difficult and expensive due to limited access and rough terrain. Finally, the proposal to create a fuelbreak between the North Fork John Day Wilderness and the South Fork Tower Roadless Area could limit future options related to the Forest Service's recently established, agency-wide policy on roadless area conservation.

Most fire-killed trees in the Cable Creek area have deteriorated to a point that a viable timber sale at this location no longer exists. However, there is still a need to reduce long-term fuels in the Cable Creek drainage. The interdisciplinary team considered alternative fuel treatments (felling and burning, chipping with a slash buster, decking dead material into piles, etc.), and these are displayed in the preferred alternative (Alternative 6). Areas to be treated remain the same as the harvest units displayed in the DEIS, only the tool for reducing fuels has changed. These other fuel treatments were not added to Alternative 4 or 5 because they were not consistent with those alternatives' themes. The change in fuel treatment methods would reduce environmental consequences due to fewer acres of ground disturbance; however, economic consequences would become more severe because income from harvest would decrease, while adding the cost of implementing fuel treatments.

Many comments were received from the public with regard to high road densities within the Tower Fire and insufficient actions that would address existing roads. During the past year, the Forest Service has been developing a national Roads Management Policy, which emphasizes maintenance of needed roads and decommissioning of unneeded roads. The proposed rule would require science-based analysis of the value and consequences of each road in the transportation system. In response to public comments and the shift in national policy, the interdisciplinary team reviewed each system road within the fire perimeter through a simplified road analysis based on Miscellaneous Report FS-643 "*Roads Analysis: Informing Decisions About Managing the National Forest Transportation System*" (USDA 1999). The team identified whether there was a continued need for each road and balanced that with the condition of the road and resource impacts. This resulted in identification of 18.2 additional miles of road that could be obliterated, 6.4 miles that could be decommissioned, and 5.6 miles of open road that could be closed. After reviewing each alternative's theme, the interdisciplinary team decided to add these actions to alternatives 4 and 6. The additional road treatments were not included in Alternative 5, because road obliteration and decommissioning of this amount would be inconsistent with the theme to reduce short-term sediment.

Alternatives Considered in Detail

Alternative 1 (No Action) Theme: Allow the fire area to recover naturally; no restoration activities would occur to address conditions caused by the fire or past management activities, however, other management activities such as recreational use, road and trail maintenance, and grazing would continue

Summary

as addressed in the post-fire BAER report and existing direction documents (District Motorized Access and Travel Management Plan, Camas OHV Trail Complex EA, etc.)

Alternative 2 (Proposed Action) Theme: Salvage wood fiber and intensively accelerate recovery of the fire area using all available management techniques, including chemicals and heavy equipment

Alternative 3 Theme: Salvage wood fiber and intensively accelerate recovery of the fire area using management techniques that do not require chemicals

Alternative 4 Theme: Accelerate recovery of the fire area by focusing on repair of soil and water resources

Alternative 5 Theme: Accelerate recovery of the fire area by reducing future fuel loads and using management options that are more active than those proposed under Alternative 4, while limiting short-term sediment potential as much as possible

Alternative 6 Theme: Accelerate recovery of the fire area using the full range of management options with a focus on cost-effectiveness, decrease of long-term sediment potential, safe trail access for all OHV users, and reduction of future fuel loads

Proposed Non-significant Forest Plan Amendments

Five dedicated old growth areas occur partly or wholly within the Tower Fire area (#0991, #1001, #1021, #1043, and #1053). The fire burned 94 percent of these stands, of which 47 percent burned with moderate and high severities killing most trees. Field reconnaissance of stands that burned with a low severity has also revealed that a large portion experienced delayed mortality from the fire. As per Forest Plan requirements, this EIS proposes a non-significant Forest Plan amendment to designate replacement stands outside the fire as C1-Dedicated Old Growth (see Map 1). The existing C1 areas would revert to the adjacent management allocation (C7- Special Fish Emphasis) once the new designations have been made. Activities proposed in existing C1 areas⁸ include: planting of riparian vegetation, rehabilitation of dispersed campsites, planting of conifer trees with herbicide control of competing vegetation, and the creation of a shaded fuelbreak.

In addition, the Big Tower Environmental Assessment had proposed a minor, non-significant Forest Plan amendment to assign management area allocations to lands that were acquired by the Umatilla National Forest in 1988 through a land exchange with Louisiana Pacific Corporation. Since the Ninth Circuit Court overturned the Big Tower decision, the non-significant Forest Plan amendment was negated as well. Management area allocations for these lands were reconsidered during analysis for the Tower Fire Recovery Projects EIS. The interdisciplinary team's analysis is discussed in Chapter 4 under the Forest Plan Consistency section.

Preferred Alternative

Alternative 6 has been selected as the preferred alternative. Alternative 6 would reduce future large-diameter fuel loads, restore forests to historic species compositions and stocking densities over almost a quarter of the fire area, reduce impacts from past management activities (particularly roads), and respond to the need for safe trail access for 4-wheelers between the Winom and Frazier portions of the OHV complex. Refer to Map 7 for orientation to the various project locations associated with Alternative 6. The primary features of this alternative include:

- ✦ Obliteration or decommissioning of 39.5 miles of unneeded closed roads
- ✦ Closure of 12.7 miles of road currently open to the public

⁸ These activities would be compatible with the adjacent management allocation as well.

Summary

- ✦ Repair of 10.0 miles of administrative use roads and 42.4 miles of roads open to the public
- ✦ Construction of an open bottom arch or bridge at Forest Road 5506 crossing of Oriental Creek
- ✦ Construction of a bridge or open bottom arch at Forest Road 5507 crossing of Oriental Creek to serve as the primary access to Oriental Basin; Forest Road 5510 would be closed and partially obliterated
- ✦ Restoration of a variety of wildlife habitat, fish habitat, and soil conditions using the most feasible methods (manual, mechanical, or chemical) Use of native or non-persistent exotic species to rapidly revegetate soil disturbed through restoration activities
- ✦ Reduction of large-diameter fuels on 2,106 acres and commercial thinning on 599 acres while minimizing soil disturbance through full suspension of logs during yarding, limiting the length of temporary roads to less than 1,000 feet, and avoiding temporary road crossings of streams where possible
- ✦ Improvement of safety and stability on the Roundaway OHV Trail, while providing the only north-south access route for 4-Wheelers
- ✦ Acceleration of recovery of forest habitat and historic tree species compositions by planting 10,285 acres with conifers and using herbicides to control vegetation that would compete with seedlings

Alternative 6 would address Key Issue 1 by recovering what economic value remains in the dead trees, reducing future fuel loads, restoring health of forests that are densely stocked, and planting areas (together with control of competing grasses and shrubs) where natural regeneration is not expected to be successful in the near future or where increased species diversity is desired. About 58% of the entire burn would be allowed to recover without any human intervention (tree planting, harvest, thinning, etc.). To deal with concerns under Key Issue 2 regarding harvest and restoration projects, helicopter or harvester/forwarder logging systems and mitigation would be used to offset increases in erosion or sedimentation. The restoration activities would reduce chronic sediment 3.6 percent in the long-term (year 2006 and beyond). Detailed mitigation found in Appendix C would limit the risk of herbicide contamination to streams to accidental spills and this mitigation includes measures to minimize the potential for spills. Alternative 6 would address Key Issue 3 by minimizing sediment through the use of sensitive logging systems and mitigation, while implementing restoration projects that would benefit fish (i.e. removal of fish barriers, planting of riparian vegetation, road obliteration). Key Issue 4 would be addressed by providing a safe route for 4-wheelers that accesses the entire Winom-Frazier Complex. The trail would be constructed on existing areas of soil compaction to limit the amount of new soil disturbance.

Summary

Table S.1: List of projects by alternative.

Alternatives					
1 (No Action)	2 (Proposed Action)	3	4	5	6 (Preferred Alternative)
no treatment	Repair 11.1 miles of closed roads needed for administrative use	Same as 2	Obliterate closed roads identified for repair under Alternative 2	Obliterate closed roads identified for repair under Alternative 2	Repair 10 miles of closed roads identified under Alternative 2 (but not Forest Road 5507-270)
no treatment	Improve drainage on 2.1 miles of Forest Road 5445 behind the gated closure	Same as 2	Move barricade on Forest Road 5445 to the junction with Forest Road 54; repair the open portion and obliterate closed portion (3.1 miles) leaving a 50" wide OHV trail	same as 4	Repair open portion of Forest Road 5445 (2.4 miles); move gate 200 yards to access popular dispersed camp; obliterate from gate to end (2.1 miles) leaving a 50" wide OHV trail
no treatment	Repair 47.1 miles of open roads	Same as 2	Repair 36.6 miles of open roads and 6.4 miles of road closed to public travel by this alternative, but needed administratively	Repair 31.4 miles of open roads and 4.8 miles of road closed to public travel by this alternative, but needed administratively	Repair 40 miles of open roads
no treatment	Reconstruct Forest Road 5448 and replace the Three Culverts with an OHV bridge	Same as 2	Close Forest Road 5448 at 550 junction and obliterate to the end (1.1 miles); reroute OHV trail; replace Three Culverts with an OHV bridge	same as 4	Close Forest Road 5448 at north entry to meadow and obliterate to end (1.1 miles); reroute OHV trail out of meadow; replace Three Culverts with an OHV bridge
no treatment	Replace culvert where Forest Road 5506 crosses Sheep Creek.	Same as 2	Install a pipe arch or larger culvert where Forest Road 5506 crosses Sheep Creek; build step weirs for fish access; excavate sediment immediately upstream	same as 4	same as 4

Summary

Alternatives					
1 (No Action)	2 (Proposed Action)	3	4	5	6 (Preferred Alternative)
no treatment	Construct low water ford at Forest Road 5506 crossing of Oriental Creek; later replace with riprap and a culvert that allows fish passage	Same as 2	Close all of Forest Road 5506-130 (1.7 miles) and close Forest Road 5506 at Oriental Creek crossing (3.1 miles); construct new parking area/trailhead west of 5506 closure; install footbridge to access Oriental and Big Creek trailheads	Construct open-bottomed arch or bridge at Forest Road 5506 crossing of Oriental Creek to access Oriental Creek Trailhead; close Forest Road 5506-130 and 5506 east of Oriental Creek Trailhead (no vehicle access to Big Creek Trailhead)	Construct open-bottomed arch or bridge at Forest Road 5506 crossing of Oriental Creek (both this road and its 130 spur would remain open)
no treatment	Repair drainage on Forest Road 5507, but do not repair crossing of Oriental Creek; install barricades and turn-arounds at the junctions of Forest roads 5507-100 and 5506-130	same as 2	Repair Forest Road 5507 and install open bottomed arch or bridge at Oriental Creek crossing (this road would be primary access to Oriental Basin)	same as 4	same as 4
no treatment	Reconstruct Forest Road 5510 (this road would be primary access to Oriental Basin)	same as 2	Close Forest Road 5510 at Forest Road 5510-030 junction and at eastern junction with Forest Road 5507 (6 miles); obliterate road from eastern crossing of Oriental Creek to Forest Road 5510-030 (2.7 miles); maintain remaining closed portion for administrative use	same as 4	same as 4
no treatment	Replace culvert at mile post 10.2 on Forest Road 5507	same as 2	same as 2	same as 2	same as 2

Summary

Alternatives					
1 (No Action)	2 (Proposed Action)	3	4	5	6 (Preferred Alternative)
no treatment	Obliterate 6.4 miles of closed system roads	same as 2	Close 18.5 miles of road open to the public (portions of 5445, 5448, 5506, 5506-130, 5507-030, and 5510); obliterate 28.4 miles and decommission 6.4 miles of closed system roads	Close 12.9 miles of road open to the public (portions of 5445, 5448, 5506, 5506-130, and 5510); obliterate 10.2 miles of closed system roads and mulch using weed-free mulch	Close 12.7 miles of road open to the public (portions of 5448, 5507-030, and 5510); obliterate 33.1 miles and decommission 6.4 miles of closed system roads
no treatment	Remove barriers to fish passage where Forest roads 55 and 5506 cross Texas Bar Creek and on Forest Road 5448 near the 550 junction	same as 2	same as 2	same as 2	same as 2
no treatment	Construct step weirs at the Forest Road 52 crossing of Winom Creek and at the same road's crossing of South Fork Cable Creek	same as 2	same as 2	same as 2	same as 2
no treatment	Construct a permanent fence around 1 mile of degraded creek in Round Meadow (adjacent to the fencing of 45 acres described below)	same as 2	Construct fence same as Alternative 2; manually place large wood instream	same as 4	same as 2
no treatment	Place large wood in 0.4 miles of Big Creek below Forest Road 52, 3 miles of North Fork Cable Creek, and 3 miles of Hidaway Creek using manual or mechanical methods	same as 2	no treatment	no treatment	no treatment

Summary

Alternatives					
1 (No Action)	2 (Proposed Action)	3	4	5	6 (Preferred Alternative)
no treatment	Plant woody riparian vegetation (1,309 ac.) along South and North forks Cable Creek, Winom Creek, and Hidaway Creek.	same as 2	same as 2	same as 2	same as 2
no treatment	Seed 30-acre erodible slope with native grass	same as 2	same as 2	same as 2	same as 2
no treatment	Transplant 10-acre erodible cutbank along Forest Road 5510 with native shrubs	same as 2	same as 2	Hydroseed and mulch 10-acre erodible cutbank (in addition to planting shrubs) using native and/or non-persistent exotic grasses and a tachifier (to bind mulch and soil).	same as 2
no treatment	Plant 10-acre landslide along Hidaway Creek with native trees	same as 2	Plant 10-acre landslide with native trees; seed with native grasses	Plant 10-acre landslide with native trees; seed with native or non-persistent exotic grasses	same as 2
no treatment	Plant 5-acre landslide along Texas Bar Creek with native trees	same as 2	Plant 5-acre landslide with native trees; seed with native grasses	Plant 5-acre landslide with native trees, seed with native or non-persistent exotic grasses; use an excavator to reroute stream channel where landslide caused constriction	Plant 5 acre landslide along Texas Bar Creek with native trees; use an excavator to reroute stream channel where landslide caused constriction
no treatment	Subsoil 25 acres of existing landings, major skid trails, and temporary roads associated with past harvest	same as 2	Subsoil same acres, then seed with native grass and plant trees	Subsoil same acres, then seed with native or non-persistent exotic grasses, plant trees, and fertilize	same as 5

Summary

Alternatives					
1 (No Action)	2 (Proposed Action)	3	4	5	6 (Preferred Alternative)
no treatment	Seed 1,100 acres along Pearson Ridge, 500 acres on the ridge south of Cable Creek, and 700 acres on the ridge north of Hidaway Creek, and 500 acres of additional small, scattered patches with native and non-persistent annual grasses and shrubs to enhance big game forage	same as 2	no treatment	no treatment	no treatment
no treatment	Broadcast fertilize 1,500 acres of ridges burned at low intensities along north and west fire perimeter	same as 2	no treatment	no treatment	no treatment
no treatment	Prescribe burn 900 acres near the North Fork John Day River to enhance big game forage	same as 2	Prescribed burn same area during the fall	no treatment	same as 2
no treatment	Replace 1,300 acres of C1-Designated Old Growth stands killed by the fire	same as 2	same as 2	same as 2	same as 2
no treatment	Construct permanent fence around 45 acres in Round Meadow	same as 2	same as 2	same as 2	same as 2
no treatment	Construct permanent fence around 2 acres in Donut Meadow	same as 2	same as 2	same as 2	same as 2
no treatment	Repair ½ mile of existing fence in Pearson Meadow and extend to include 4 more acres	same as 2	same as 2	same as 2	same as 2

Summary

Alternatives					
1 (No Action)	2 (Proposed Action)	3	4	5	6 (Preferred Alternative)
no treatment	Install temporary electric fence around 9 acres within Long Meadow	same as 2	same as 2	same as 2	same as 2
no treatment	Fence two springs	same as 2	same as 2	same as 2	same as 2
no treatment	Fence and repair three ponds	same as 2	same as 2	same as 2	same as 2
no treatment	Remove tops of snags scattered across 1,910 acres using manual or mechanical methods	same as 2	Remove snag tops using manual methods only	same as 4	same as 2
no treatment	Seed eroding slopes adjacent to trails with native grasses	same as 2	same as 2	same as 2	same as 2
no treatment	Install signs at Round Meadows Trailhead, 3-Culverts Camp, and Winom Campground to encourage users to stay on trails	same as 2	Install signs at Round Meadows Trailhead and Winom Campground to encourage users to stay on trails	same as 4	same as 2
no treatment	Rehabilitate 20 dispersed campsites	same as 2	same as 2	same as 2	same as 2
no treatment	Install 1 interpretive sign along the Blue Mountain Scenic Byway	same as 2	same as 2	same as 2	same as 2
no treatment	Reconstruct Pearson Guard Station facilities; surface existing dispersed campsite with gravel	same as 2	same as 2	same as 2	same as 2

Summary

Alternatives					
1 (No Action)	2 (Proposed Action)	3	4	5	6 (Preferred Alternative)
no treatment	Improve road crossings on the Round Meadows and Cut Across OHV trails	same as 2	same as 2	same as 2	same as 2
no treatment	Improve approximately ½ mile of the River Trail	same as 2	same as 2	same as 2	same as 2
no treatment	Rehabilitate two campsites and the trailhead at Oriental Campground/ Trailhead	same as 2	Rehabilitate only the two campsites at Oriental Campground	same as 2	same as 2
no treatment	no treatment	no treatment	Place gravel in parking area at Big Creek Meadows Trailhead; relocate 2 developed campsites into a lodgepole pine stand away from the creek (clear trees from new sites and level); block motorized access to the old sites and a nearby wet meadow using boulders; confine dispersed campsites with boulders and surface with gravel	same as 4	same as 4
no treatment	Install a barrier to 4-wheelers on the existing Roundaway Trail; construct 6.5 miles of new trail to relocate the displaced 4-wheeler traffic	same as 2	Install a barrier to 4-wheelers on the existing Roundaway Trail; do not provide trail access for 4-wheelers between Winom and Frazier portions of the OHV complex	same as 4	same as 2

Summary

Alternatives					
1 (No Action)	2 (Proposed Action)	3	4	5	6 (Preferred Alternative)
no treatment	Harvest hazard trees from 741 acres (1.5 MMbf)	same as 2	Fell hazardous trees on 756 acres and leave in place; fell hazardous trees surrounding Pearson Recreational Residence tract then pile and burn	same as 4	same as 2
no treatment	Salvage harvest approximately 17 MMbf of standing dead and down trees from 3,028 acres using all logging systems; harvest 1.5 MMbf of green and dead trees from 271 acres of <i>Armillaria</i> -infected stands; construct 4 miles of temp road and reopen 1.2 miles of abandoned road to access landings	same as 2	no harvest	Salvage approximately 2.2 MMbf from 399 acres using a helicopter logging system only; do not harvest <i>Armillaria</i> -infected stands	Salvage harvest approximately 8.6 MMbf from 1,528 acres only where full suspension of logs could be achieved during yarding; construct 1.1 miles of temp road (each 1,000-foot-long or less) and reopen 1.2 miles of abandoned road to access landings; do not harvest <i>Armillaria</i> -infected stands; on 371 acres, fell dead trees up to 15" dbh, then treat small logs with a slashbuster and skid larger logs into piles; on 207 acres, fell dead trees up to 15" dbh and burn
no treatment	Commercially thin 846 acres (2.1 MMbf) of green (live) stands using all logging systems; construct 0.5 miles of temp road and reopen 0.6 miles of abandoned road to access landings	same as 2	Girdle or fell trees on 598 acres and leave in place	Commercially thin 598 acres (1.5 MMbf) using a helicopter logging system only; add 150 feet to the width of all Class III stream Riparian Habitat Conservation Areas; if helicopter harvest is not feasible, thin by girdling or felling trees and leaving them on site	Commercially thin only in those proposed units where full suspension of logs could be achieved during yarding (598 acres, 1.5 MMbf); construct 0.4 miles of temp road (each 1,000-foot-long or less) and reopen 0.6 miles of abandoned road to access landings; girdle or fell trees in any units that cannot be harvested in this manner
no treatment	Pre-commercially thin 180 acres	same as 2	same as 2	same as 2	same as 2

Summary

Alternatives					
1 (No Action)	2 (Proposed Action)	3	4	5	6 (Preferred Alternative)
no treatment	Plant 10,285 acres with conifers	same as 2	same as 2	same as 2	same as 2
no treatment	Spot apply herbicides on 11,029 acres	no treatment	no treatment	same as 2	same as 2
no treatment	Create a 6¼-mile long, 300-foot wide shaded fuel break along the northern edge of the North Fork John Day Wilderness	same as 2	no treatment	no treatment	no treatment

Summary

Table S.2: Response to the Key Issues.

Indicator of Response	Unit	Alternative					
		1	2	3	4	5	6
Significant Issue 1: Removal of Trees & Reforestation							
Area restored to healthy stand density	acres	0	1,023	1,023	779	779	779
Trend toward historic range of species mix	Short-term	decreasing, not enhanced	increasing, 8,494	increasing, 4,894	increasing, 4,379	increasing, 7,979	increasing, 7,979
	Long-term	decreasing, not enhanced	increasing, 9,402	increasing, 6,862	increasing, 4,379	increasing, 8,098	increasing, 8,668
Area with fuel levels that will allow prescribed fire into regenerated stands within 20 years	%	16	26	26	18	18	23
Wood fiber harvested	Mbf	0	22,065	16,864	0	3,732	11,548
Area left to recover without intervention	%	84	52	53	64	63	58
Predicted seedling survival in planted areas	%	N/A	70	35	35	70	70
Predicted net area sprayed with herbicide	acres	0	1,544	0	0	1,544	1,544
Significant Issue 2: Soil Erosion & Water Quality							
Predicted sediment yield (estimated by modified WATSED model) after implementation (2001)	% above back-ground	38.8	48.1	48.2	45.5	43.5	49.4
Predicted sediment yield by 2006	% above back-ground	26.4	25.6	25.6	20.0	23.4	22.8
Change in total road densities	miles/mile ²	0	-.44	-.44	-0.70	-0.57	-0.60
Significant Issue 3: Fish and Aquatic Habitat							
Streams treated to reduce water temperature in the long-term	miles	0	22.8	22.8	22.8	22.8	22.8
Increase in accessible fish habitat	miles	0	11.2	11.2	11.2	11.2	11.2
Short-term risk to fish from project-related sediment (year of implementation) ¹	-	6	3	2	4	5	1

Summary

Indicator of Response	Unit	Alternative					
		1	2	3	4	5	6
Long-term risk to fish from chronic sediment ¹	-	3	2	2	6	4	5
Risk of water contamination ²	-	Very low	Low	Very low	Very low	Low	Low
Significant Issue 4: 4-Wheeler Access to Winom-Frazier Complex							
Safety for 4-wheeler users	-	Low ³	High ⁴	High	High	Low	High
<p>¹ Highest risk =1, lowest risk = 6.</p> <p>² The use of herbicides carries a risk of contaminating streams. Very low = Risk only from ongoing treatment of noxious weeds which is very site specific and restricted. Low = Risk increases to include proposed control of competing vegetation. Location of planting units and mitigation would keep herbicides out of riparian areas and make leaching of herbicide into streams unlikely, so risk would only involve the possibility of an accidental spill.</p> <p>³ Low - Will not provide an “easy” 4-wheeler trail that connects the Winom and Frazier trails. ATV riders will continue to use Forest Road 5226 for a suitable access route, which has potential for OHV-vehicle</p> <p>⁴ High - Construction of an “easy” 4-wheeler trail will provide access between the Winom and Frazier trails for all skill levels. Would eliminate the need for using Forest Road 5226.</p>							

Table S.3: Road treatments by alternative.

Alternative		Admin Rd. – Repair	Admin Rd. – Oblit	Open Rd. – Repair	Open Rd. – Close	Unneeded Rd. - Oblit	Unneeded Rd. - Decom
2 & 3	DEIS	13.1	0	47.1	0	6.4	0
	FEIS	13.1	0	47.1	0	6.4	0
	% change between DEIS & FEIS	0	0	0	0	0	0
4	DEIS	4.8	14.1	31.4	12.9	13.3	0
	FEIS	6.4	14.1	36.6	18.5	28.4	6.4
	% change between DEIS & FEIS	33	0	17	43	114	N/A
5	DEIS	4.8	14.1	31.4	12.9	10.2	0
	FEIS	4.8	14.1	31.4	12.9	10.2	0
	% change between DEIS & FEIS	0	0	0	0	0	0
6	DEIS	13.1	0	47.1	0	6.4	
	FEIS	10	0	42.4	12.7	33.1	6.4
	% change between DEIS & FEIS	(36)	0	(10)	N/A	417	N/A

Summary

Table S.4: Harvest-related details of each alternative.

Alternative		Hazard Tree Removal	Salvage	Root Rot Treatment	Commercial Thinning	Slashbuster & Deck ⁹	Total	Logging Systems			
								Tractor	Harvester/Forwarder	Helicopter	
1	Harvest	0	0	0	0	0	0	-	-	-	
	Temp. road miles	0	0	0	0	0	0				
2 & 3	Acres	663	3,028	271	846	0	4,808	2,274	1,133	1,401	
	Mbf	1,326	16,957	1,518	2,115	0	21,916				
	Temporary road miles	Reopen existing	0	1.2	0	0.6	0	1.8			
		New construct.	0	4.0	0	0.5	0	4.5			
4	Harvest	0	0	0	0	0	0	-	-	-	
	Temp. road miles	0	0	0	0	0	0				
5	Acres	0	399	0	598	0	998	0	0	998	
	Mbf	0	2,234	0	1,495	0	3,732				
	Temp. road miles	0	0	0	0	0	0				
6	Acres	668	1,528	0	598	371	3,165	668	1,768	729	
	Mbf	1.33	8,556	0	1,495	742	12,129				
	Temporary road miles	Reopen existing	0	1.2	0	0.6	0	1.8			
		New construct.	0	1.1	0	0.4	0	1.5			

⁹ While this activity is classified as a fuel reduction treatment, resulting decks of trees too large for the slashbuster could be sold as firewood, chip material, etc. This activity would also result in effects on soil similar to those encountered through harvest.