

Chapter 2 – Alternatives Including the Proposed Action

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2.0. INTRODUCTION

This chapter outlines the public scoping process that led to the identification of significant issues and development of alternatives to the proposed action. The significant issues are described in this chapter, while information on other concerns raised during scoping can be found in the project file, located in the Nez Perce Forest's Supervisor's Office.

Several alternatives were developed in response to the significant issues and are analyzed in detail. Alternatives considered, but eliminated from detailed study, are summarized in this chapter. The chapter concludes with a tabular comparison of the alternatives analyzed in detail. The comparison is based on indicators selected by the project interdisciplinary team (IDT) to evaluate how each alternative responds to the significant issues and to the purpose and need for action.

In September 2003, a scoping letter providing information and seeking public comment was mailed to approximately 30 individuals and groups that had previously shown interest in Forest Service projects on the Nez Perce National Forest. This included Federal and State agencies, Idaho Native groups, municipal offices, businesses, interest groups, and individuals. The Forest Service received 20 responses to this mailing.

CHANGES TO THE PROPOSED ACTION SINCE SCOPING

The proposed action for the American and Crooked River project was scoped in September 2003. Because of public comment and further field review, the proposed activities have been refined. The result is a change of 227 acres in the total fuel reduction activity acres. In the scoping letter, the Forest proposed to treat 3,000 acres of vegetation and that has been refined to 2,744 acres of vegetation treatments.

In addition, further field review found a total of 18 miles of roads to be decommissioned as opposed to the 30 miles identified during scoping. These are roads that do not improve access to the area for recreation or administrative use. These roads are either currently contributing sediment to streams or are so overgrown with vegetation that there is no longer a road prism. The overgrown roads would be abandoned (Appendix F).

2.1. ISSUE DEVELOPMENT

The intent of the scoping process is to notify affected Federal, State, and local agencies, affected Indian tribes, and interested persons of the proposed action, to solicit input regarding the proposed action, to identify the scope of the issues to be addressed in an EIS and to determine the relevant issues related to the proposed action (CFR/CEQ 1501.7).

Preliminary issues were identified through consultation with Forest Service resource specialists and from issues identified from similar, past projects. A comprehensive list was developed after the IDT and Responsible Official reviewed the comments received during scoping.

Comments were categorized as follows:

- Covered in the effects analysis
- Addressed through project mitigation or design
- Beyond the scope of the proposed action
- Already decided by law, regulation, Forest Plan, or higher level decision
- Considered irrelevant to the decision being made
- Considered a general comment, opinion or position
- Significant issues driving an alternative

See project file for the list of comments and issue disposition.

Significant issues that could be resolved using mitigation measures, or addressed through the effects analysis are discussed in this document. Other significant issues drove alternative development. These issues are described below.

The CEQ regulations require federal agencies (in implementing NEPA) to focus on the significant environmental issues related to the proposed action. The regulations also require the identification of significant environmental issues deserving study. There are four categories of significant issues that drove alternative development; soils, water quality, fish habitat, and fuel reduction effectiveness, which follow:

WATER QUALITY

Vegetation treatments, temporary road construction, road reconstruction, road decommissioning, and in-channel improvements may affect water quality in the short and/or long term. Cumulative effects need to be considered in the American and Crooked River watersheds.

WATERSHED CONDITION

Watershed condition indicators are a series of metrics that can be used to index the level of disturbance in a watershed. They are usually expressed as densities or discrete amounts of various disturbances within a watershed. For example, road density expressed in miles of road per square mile of watershed area (mi/mi²) is a common watershed condition indicator. Roads affect watershed function in a variety of ways, related to both water yield and sediment yield.

INDICATOR OF WATERSHED CONDITION

- Road Density

WATER YIELD

A number of physical factors determine the relationship between canopy conditions and water yield. These include interception, evapotranspiration, shading effects and wind flux. These factors affect the accumulation and melt rates of snow and how rainfall is processed in the watershed. Live vegetation affects water yield in several ways. Leaves and needles intercept moisture from the air; roots of live trees and other vegetation take up ground water; and ground cover aids infiltration of water, decreasing runoff. Dead trees and vegetation, along with removal of vegetation can alter water yield.

Additional factors affecting water yield include compacted surfaces due to roads, skid trails, and landings. They contribute to flashy flows, due to their impervious surfaces, interception of groundwater and extension of the channel system in the form of ditches. As impervious surfaces increase, increased peak flows generally result. Peak flows can result in mobilization of both large and small materials, causing increased erosion in steep stream reaches and deposition in downstream areas.

INDICATOR OF WATER YIELD

- Equivalent Clearcut Area

SEDIMENT YIELD

The American and Crooked River watersheds have been affected by past activities such as timber harvest, road building, grazing, and mining. This has resulted in high road densities in most subwatersheds. These activities have affected water quality through increased sediment delivery to streams.

The proposed harvest and watershed improvement activities could affect sediment yield over time. Harvest and roadwork have the potential to increase sediment production and delivery into streams. Some watershed improvement projects have the potential to produce sediment in the short-term, but are designed to result in long-term reductions in sediment yield.

INDICATOR OF SEDIMENT YIELD

- Sediment yield percent over base as modeled by NEZSED

CHANNEL MORPHOLOGY

Water and sediment yield can interact to change channel morphology conditions through erosion of stream channels or deposition of sediment. Channel morphology can also be affected directly through activities such as road encroachment, stream crossings, and in-channel improvements. Sediment delivery and routing processes vary by upland settings, stream types and disturbance level and type.

INDICATORS OF CHANNEL MORPHOLOGY

- Channel geometry
- Substrate composition

WATER QUALITY

Water quality includes physical and chemical characteristics of water. Parameters commonly measured include pH, alkalinity, hardness, specific conductance, nutrients, metals, sediment, and water temperature. Many of these parameters are affected to only a slight degree by forest practices. Water temperature controls the rate of biologic process, is of critical concern for fish populations, and is a primary indicator of habitat conditions.

Water temperatures in the American and Crooked River watersheds currently exceed Idaho Water Quality Standards at certain times of the year. In part, this is due to natural conditions, but has also been affected by reductions of streamside shade and changes in channel morphology.

INDICATORS OF WATER QUALITY

- Water Temperature
- Canopy density in forested reaches
- Percent shade in non-forested reaches

FISH HABITAT

Vegetation treatments, temporary road construction, road reconstruction, road decommissioning, and in-channel improvements may affect fish habitat short-term, especially considering cumulative effects in the American and Crooked River watersheds.

Vegetation treatments in Riparian Habitat Conservation Areas (RHCAs) could affect fish habitat short-term.

DEPOSITED SEDIMENT

Historically, increased sediment yield to the American and Crooked River watersheds has resulted in high levels of deposited sediment in many streams, including mainstem American and Crooked Rivers. The American and Crooked River watershed has been identified as a priority watershed for anadromous fish. Existing roads produce continued sediment yields above the base (natural) rate, reducing the ability of the watershed to recover to predevelopment conditions on its own. High levels of deposited sediment reduce the biological carrying capacity for fish and other aquatic organisms and quality of spawning habitat.

Short-term increases in sediment yield from proposed activities might contribute to degraded substrate conditions and further reduce carrying capacity and quality of spawning habitat. Long-term reduction in sediment yield could result in long-term improvement of substrate conditions.

INDICATORS OF DEPOSITED SEDIMENT

- Cobble embeddedness
- Quality of summer and winter habitat carrying capacity as modeled by FISHSED

LARGE WOODY DEBRIS

Large woody debris in project area streams has been reduced by historical in-channel mining activities, timber harvest in streamside zones, fire suppression, and construction of roads in streamside zones. Many stream reaches in the project area have been identified as debris-deficient. Large woody debris contributes to stream productivity, creates pools, provides hiding cover for fish, and increases habitat complexity.

INDICATORS OF LARGE WOODY DEBRIS

- Estimated number of pieces of large wood in the channel following project activities
- Qualitative assessment of debris recruitment, cycling, and how the project could affect future riparian health concerning this element.

POOLS HABITAT

With reduction in large woody debris, accelerated sediment yield, and impacts to stream channels from instream mining activities, road encroachment and timber harvest, there are fewer high quality pools in the American and Crooked River watersheds than would be expected under a more natural scenario.

Some proposed activities may result in a short-term reduction in pool quality from increased sediment yield. Other proposed activities may result in direct improvement in the number of pools. Long-term sediment reduction may result in long-term improvement in pool quality.

INDICATORS OF POOLS QUALITY

- Sediment yield (peak percent over natural or base rate), as it would affect sediment deposition
- Pool: riffle ratios as a measure of existing condition
- Number of pools

WATER YIELD

Water yield specific to fish habitat is measured by Equivalent Clearcut Acres (ECA), the indicator here of water yield. With increased timber harvest and road construction comes increased water yield. Increased water yield can cause stream channel instability.

INDICATOR OF WATER YIELD

- ECA threshold

WATER QUALITY

Water quality from a fish habitat standpoint is measured by the amount of toxicants in the water. Toxicants can be introduced as a result of fuel transport, storage, spillage, or use of herbicides near water bodies, wetlands, and riparian zones.

INDICATOR OF TOXICS

- Mitigated to discountable by Best Management Practices (BMP) and State Requirements

WATER TEMPERATURE

Water temperatures in the American and Crooked River watersheds currently exceed Idaho Water Quality Standards at certain times of the year. This is due in part to natural conditions, but also has been affected by reductions of streamside shade and changes in channel morphology.

INDICATOR OF WATER TEMPERATURE

- Riparian timber harvest and riparian planting (shade).

HABITAT CONNECTIVITY/FISH PASSAGE

Existing conditions limit fish passage/connectivity by isolating fish populations and restricting movement with undersized culverts.

INDICATOR OF HABITAT CONNECTIVITY/FISH PASSAGE

- Culverts improved and additional miles of stream accessible.

FUEL REDUCTION EFFECTIVENESS

The effectiveness of the proposed activities for reducing fuels across the landscape has been questioned. Many commenters stated that the most effective methods involve clearing trees and brush away from structures. This has been proven to be an effective method of protecting inholdings and structures, and this is already being done in the area. However, the intent of this project is to reduce the effects of wildfire across the landscape. Many feel that there is no effective method to reduce the effects of wildfire on the landscape other than to reduce road density (if a fire goes through an area, removing the ground cover, the roads would intercept, transport and add to the sediment reaching the streams). Some believe that thinning in lodgepole pine would tend to allow for greater fire spread and severity and that dead trees may present less of a fire hazard than green live trees.

There are concerns that the proposed fuel hazard reduction activities would not reduce the effects of large-scale fire.

INDICATORS OF FUEL REDUCTION EFFECTIVENESS

- Area and distribution of fire regime
- Acres of fuel hazard reduction

2.2. DESCRIPTION OF ALTERNATIVES

Section 102(2) of the National Environmental Policy Act (NEPA) states that all Federal agencies shall “...study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources”. These unresolved conflicts, identified by the Forest Service and the public, are the NEPA issues related to the Proposed Action.

In addition to responding to unresolved conflicts, an environmental impact statement (EIS) must “...rigorously explore and objectively evaluate all reasonable alternatives” [40 CFR 1502.14(a)]. The courts have established that this direction does not mean that every conceivable alternative must be considered, but that selection and discussion of alternatives must permit a reasoned choice and foster informed decision making and informed public participation. Together, these requirements determine the NEPA range of alternatives.

The alternatives considered in detail were developed in response to the significant issues, discussed previously and are discussed below. Those that were considered but eliminated from detailed study are also discussed below.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

As the team worked with the scoping and project information that was available to fine tune our response to the issues, and worked through the matrix of possible vegetative treatments, the following alternatives were considered, but dismissed from detailed study.

“RESTORATION ONLY” AND/OR “NO TIMBER HARVEST”

Several respondents requested this alternative. This alternative would have considered implementing watershed improvements, such as road decommissioning, improving stream crossings, etc. No fuel reduction activities would be considered.

This alternative does not respond to the purpose and need of treating existing and potential fuel loads to reduce the effects of potential large-scale wildfire and improving the safety and effectiveness of firefighters in fire suppression activities.

DEFENSIBLE SPACE

Many commenters responded that reducing trees and brush within 200 feet of structures is a more effective method of reducing fire effects.

A defensible space alternative was not evaluated under this analysis because this type of action is currently being implemented in the American Crooked River Watersheds under the Crooked River Demonstration Project Decision Memo, and the proposed Orogrande Defensible Space project (on file at the Elk City Ranger Station, Red River Ranger District).

EXPANDED ACTION VIA ACCESS THROUGH THE ROADLESS AREA

Some commenters requested we consider alternatives that either constructed roads into the roadless area to access the Kirks Fork and Box Sing Creeks, or requested fuels reduction in the roadless areas. Roadless designation does not allow for temporary or road construction in these areas.

EXPANDED ACTION WITH ACCESS OUTSIDE OF ROADLESS AREA

It was suggested that treatments be concentrated in the wildland urban interface areas or the WUI areas near the Elk City Township. To access WUI areas near the township at the Kirks Fork and Box

Sing Creek areas, an alternate route was suggested that did not enter the roadless area. This route is beyond the time and complexity of this analysis.

ALTERNATIVES CONSIDERED IN DETAIL

Five alternatives, including the No Action alternative, were considered in detail. A brief summary is outlined below in Table 2-1: Alternatives Overview American River Watershed, and Table 2-2: Alternatives Overview Crooked River Watershed. Superscript notes explain the activity at the end of Table 2-2.

ALTERNATIVES B, C, D, AND E - ACTION ALTERNATIVES

Alternative C was the proposed action and Alternatives B, D, and E respond to the significant issues and are alternatives to the proposed action. Alternative D is the preferred alternative and is discussed below in the section “Alternative D preferred alternative.”

None of the action alternatives would treat fuels, harvest timber, or construct roads in allocated old growth areas or inventoried roadless areas.

- There would be no new permanent roads constructed.
- Management activities in riparian areas would be minimized.
- Activities in high hazard landslide prone areas would be avoided.
- All action alternatives would address State of Idaho TMDL limiting factors and implement watershed restoration activities designed to meet the Forest Plan requirements to establish an upward trend in water quality and fish habitat conditions that are below current objectives.
- Each action alternative implements the restoration activities to meet Forest Plan requirements.
- Alternatives address the effectiveness of fuel reduction activities by providing a range of acres treated.
- Action alternatives would maintain shade and large woody debris with PACFISH regulated buffers.

Treatments would include roadside salvage within 100 feet of main haul roads and the design criteria would be as follows:

- Roadside salvage would be limited to dead or dying trees, with no harvest of standing trees more than 20 inches in diameter. (Windthrown trees would not be subject to the diameter limit.)
- Salvage would be limited to areas adjacent to haul roads. No tree cutting or yarding would occur in RHCAs or in allocated existing or replacement old growth.
- All yarding would be done from the road. Areas above steep cutslopes that cannot be protected from yarding damage would be omitted from salvage. Yarding distance would not exceed 100 feet.
- No more than 80 dead or dying trees per mile (approximately 8 trees/acre) could be designated for cutting on each side of the road.
- Maximum opening size is one acre on each side of a road, or a maximum of 400 feet along the road.
- Openings would be separated from other forest openings by at least 200 feet of pole size or larger forest along the road, on both sides, to provide cover for wildlife crossing.
- Slash from salvage would be lopped and scattered, hand piled and burned in the woods, or removed from the site at the discretion of the District Ranger considering the Forest objective of maintaining less than 12 tons per acre of fine fuels.

- This component of the action would comply with all applicable design criteria developed for the action as a whole.
- These design criteria are not intended to limit or interfere with brushing, clearing, or hazard reduction activities associated with routine road maintenance.

Table 2.1: Alternatives in the American River Watershed, and Table 2.2: Alternatives in the Crooked River Watershed displays the activities for all the action alternatives. See maps 2a, 2b, 3a, 3b, 4a, 4b, 5a, 5b of the alternatives for the proposed fuel reduction areas and Map 11 for the proposed watershed improvement activities.

Table 2.1: Alternatives in the American River Watershed.

Proposed Activity - American River		Alt B	Alt C	Alt D	Alt E
Acres of Treatment	Tractor Yard/Machine Pile	409	482	729	283
	Cable Yard/Broadcast Burn	175	239	239	79
	Roadside Salvage	135	151	137	138
	Total Acres Treated	719	872	1,105	500
	Percent Clearcut	41%	41%	32%	15%
	Percent Partial Cut/Thin	59%	59%	68%	85%
Miles temporary road construction ¹		3.6	8.1	8.1	1.9
Miles road improvement ²		31.4	32.0	35.1	30.4
Watershed Restoration Package Improvements					
Miles of decommissioned roads ³		5.9	8.1	9.2	20.2
Miles of Watershed Road Improvement		6.6	6.6	6.6	6.6
Number of sites of Watershed Road Improvement		0	0	0	0
Stream crossing improvements ⁴		3	3	3	10
Miles of instream improvements		0	0	0	0
Miles of Recreation and Trail improvements		2.2	2.2	2.2	3.0
Acres of Recreation & Trail improvements		0	0	0	0
Acres of Mine Site Reclamation		0	0	0	0
Acres of Soil Restoration		5	8	9	21
Access change for vehicle use - motorized trail use (ATV) to restricted use (snowmobiles over snow) ⁵		0	0	0	0
Access change for vehicle use – road to trail ⁶		0	0	0	0

¹ Temporary roads would be decommissioned within one to three years of construction.

² Road improvement covers a range of activities, such as surface blading, drainage repair, and roadway brushing with occasional culvert installations, slump repairs, and stabilization work. Road improvements stated in this table are not to be considered or confused with routine road maintenance that may include but not limited to road prism brushing, clearing, or hazard reduction activities.

³ Road decommissioning for this project covers a range of activities, from recontouring to abandonment due to grown in conditions. See Appendix F

⁴ Stream crossing improvements include upgrading or improving culverts and bridges to improve fish passage and peak water flows and are listed as the number of sites.

⁵ This is an access change, which restricts use to two wheeled vehicles or snowmobiles over snow, from previous all terrain vehicle use (ATV).

⁶ This is an access change of miles of roads to trails use.

Table 2.2: Alternatives in the Crooked River Watershed.

Proposed Activity – Crooked River		Alt B	Alt C	Alt D	Alt E
Acres of Treatment	Tractor Yard/Machine Pile	729	690	1,003	618
	Cable Yard/Broadcast Burn	770	856	968	701
	Roadside Salvage	332	326	329	337
	Total Acres Treated	1,831	1,872	2,300	1,656
	Percent Clearcut	43%	43%	35%	32%
	Percent Partial Cut/Thin	57%	57%	65%	68%
Miles temporary road construction ¹		4.4	6.2	6.2	3.5
Miles road improvement ²		58.2	45.8	59.9	64.1
Watershed Restoration Package Improvements					
Miles of decommissioned roads ³		9.0	9.8	9.8	17.3
Miles of Watershed Road Improvement		8.6	9.2	9.2	17.2
Number of sites of Watershed Road Improvement		1	3	3	3
Stream crossing improvements ⁴		7	7	9	24
Miles of instream improvements		15.2	15.8	15.8	23.8
Miles of Recreation and Trail improvements		0.7	0.7	0.7	1.8
Acres of Recreation and Trail improvements		0	4	4	4
Acres of Mine Site Reclamation		7	7	7	9
Acres of Soil Restoration		13	18	23	37
Access change for vehicle use - motorized trail use (ATV) to restricted use (snowmobiles over snow) ⁵		1.0	1.0	1.0	1.0
Access change for vehicle use – road to trail ⁶		1.5	1.5	1.5	1.5

Appendix H contains a detailed description of all the treatment types by unit by alternative. This is summarized above in Table 2.1: Alternatives in the American River Watershed and Table 2.2: Alternatives in the Crooked River Watershed. The vegetation section in Chapter 3 contains an explanation of the existing conditions and environmental consequences of these alternatives. General information on the developed alternatives is below.

¹ Temporary roads would be decommissioned within one to three years of construction.

² Road improvement covers a range of activities, such as surface blading, drainage repair, and roadway brushing with occasional culvert installations, slump repairs, and stabilization work. Road improvements stated in this table are not to be considered or confused with routine road maintenance that may include but not limited to road prism brushing, clearing, or hazard reduction activities.

³ Road decommissioning for this project covers a range of activities, from recontouring to abandonment due to grown in conditions. See Appendix F

⁴ Stream crossing improvements include upgrading or improving culverts and bridges to improve fish passage and peak water flows and are listed as the number of sites.

⁵ This is an access change, which restricts use to two wheeled vehicles or snowmobiles over snow, from previous all terrain vehicle use (ATV).

⁶ This is an access change of miles of roads to trails use.

ALTERNATIVE A – NO ACTION

Both Forest Service and the CEQ regulations require the development of the No Action alternative. This alternative serves as the baseline for comparison of the effects of all action alternatives.

Under this alternative, there would be no change in current management direction or in the level of ongoing management activities within the project area. No fuel reduction or watershed improvement activities would be implemented. Work previously planned within and/or adjacent to the project area would still occur under this alternative (Chapter 3; Table 3-0, Projects considered for cumulative effects).

ALTERNATIVE B – REDUCED ACTION

This alternative was developed in response to concerns that the proposed action was treating too many acres. This alternative treats 2,550 acres. It contains the watershed improvement activities described in Appendix D and summarized above that would provide for an upward trend in fish habitat and water quality.

ALTERNATIVE C – PROPOSED ACTION

The proposed action was developed to respond to the purpose and need and was scoped in June 2003. This alternative would reduce existing and potential fuel loads through removing dead and dying lodgepole pine and live ladder fuels. It would treat 2,744 acres. It would also implement watershed improvement activities that would provide for an upward trend in fish habitat and water quality.

ALTERNATIVE D – PREFERRED ALTERNATIVE

The preferred alternative was developed in response to significant issues raised by the public. This alternative looks at more possibilities along roads than the proposed action. It would treat 3,405 acres. Entry into mixed conifer stands is included to meet the economic objective. It would also implement watershed improvement activities that would provide for an upward trend in fish habitat and water quality.

ALTERNATIVE E – AQUATIC IMPROVEMENT

This alternative proposes activities that would reduce impacts to soils and aquatics in the American and Crooked River watersheds. It reduces ground-disturbing activities and includes the most comprehensive watershed improvement package. This alternative addresses the soils and aquatics issues beyond what would be required to attain an upward trend. It contains the maximum aquatics improvements package. It would treat 2,156 acres. The economic impact of this alternative is discussed in Chapter 3, section 3.12.

2.3. MITIGATION, MONITORING, COMPARISON OF ALTERNATIVES & OBJECTIVES SUMMARY

The rest of this chapter discusses the design and mitigation measures, the monitoring plan that would apply to all action alternatives. A comparison of alternatives and a summary of how each alternative meets objectives for this project. The action alternatives are designed to have minimal long-term detrimental impacts and substantial long-term beneficial impacts on the environment. Short-term impacts may be minimized through mitigations measures. The following table outlines the project design and mitigation measure. This list is not all-inclusive as the Forest Plan standards are incorporated by reference.

Project design measures are applied prior to and during activity implementation to reduce potential impacts to resources (Table 2.3: Mitigation Measures).

Project design measures, mitigation measures, and Best Management Practices have been incorporated into the action alternatives with the intent of preventing or reducing adverse impacts to resources.

The comparison section summarizes and compares the alternatives based on the indicators identified for each significant issue and how well the alternatives meet the purpose and need (Table 2.4: Alternative in the American and Crooked Rivers Project and Table 2.5: Action Alternatives Comparison Summary), are also in this chapter.

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Table 2.3: Project Design and Mitigation Measures for the American and Crooked River Project

Design and mitigation measures would apply to all action alternatives. Forest Plan standards and other Agency direction, along with information derived from monitoring past projects, were used to identify design and mitigation measures applicable to the action alternatives. Mitigation measures are practices used during implementation of the activities.

#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
Areas Excluded from Timber Harvest or Fuel Reduction Activities			
1	No timber harvest or fuel reduction activities would occur in Forest Plan old growth, allocated replacement old growth, Inventoried Roadless Areas, streamside RHCAs, or high hazard landslide prone areas	NEPA project design, silviculture prescription, and field prep.	High, based on past experience
Fuel Reduction			
2	Falling would be done to minimize breakage and damage to residual trees.	Field preparation, contract and contract administration/ inspection	High, based on past experience.
Riparian Habitat Conservation Areas			
3	No cutting of trees would be allowed in streamside or wetland RHCAs, except at temporary road crossings, instream habitat improvements, and to facilitate anchoring of cable yarding systems.	Field preparation, contract and contract administration/ inspection	High, based on past experience
4	Low burning intensities would be maintained to limit streamside shrub reduction and exposure of bare soil, by lighting backing fires outside of RHCAs and allowing them to burn into the RHCA.	FS Fuels management	High, based on Research, PNW Lab, Starkey Project
5	Landslide prone areas are also considered Riparian Habitat Conservation Areas (RHCAs). No timber harvest would occur in areas of high landslide hazard, as described in (1) above. Timber harvest or fuel reduction in areas of moderate landslide risk would be modified as needed to protect slope stability. Areas of moderate landslide risk may require some restriction of harvest intensity of live trees (basal area reduction), including site-specific tree marking or adjustment of the burning prescription to protect larger residual trees. If additional, unmapped landslide prone areas are found during project implementation, activities would be modified.	NEPA project design, silviculture prescription, and field prep.	High, based on past experience.

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#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
Soils, Water Quality, and Fish Habitat			
6	Planned activities would be modified in any proposed timber harvest or fuel reduction unit that is found to have previously unidentified significant soil impacts from past human-caused disturbance. The planned activities in that unit would be modified or dropped to ensure that cumulative impacts would not exceed Forest Plan soil quality standard number 2 (percent of area detrimentally impacted upon completion of activities). Site-specific review of treatment units prior to implementation would identify extent of detrimental soil disturbance.	NEPA project design, silviculture prescription, and field prep.	Moderate, based on research and forest monitoring data.
7	Forest Plan soil quality standard number 2 would be met by contract specification of mechanized equipment and operational requirements based on site-specific conditions.	NEPA project design, silviculture prescription, and field prep, contracting.	Moderate, based on research and forest monitoring data.
8	Tractor harvest would be limited to slopes less than 35 percent.	NEPA project design, silviculture prescription, and field prep.	High, based on past experience.
9	Timber harvest or fuel reduction activities would be coordinated with soil restoration activities for greatest efficiency.	Contract administration	High, based on past experience.
10	Broadcast burning would be applied in preference to excavator piling wherever practical to reduce soil damage.	NEPA project design, silviculture prescription, and contract.	High, to the degree implemented; based on forest monitoring data.
11	Temporary roads would be built, used, and decommissioned within a 1 to 3-year period, in order to reduce the amount of sediment production. Coordination of temporary road use and decommissioning with the BLM Eastside Township project would be required.	NEPA project design and contract administration	High, based on NEZSED modeling
12	New, temporary roads would be constructed using minimal road widths and out-sloped surface drainage. Road cuts, fills, and treads would be stabilized with annual grass cover where roads are held more than one year. Temporary roads would be located to avoid live water and high-risk landslide prone terrain. If avoidance of live water is not possible, stream crossings would be designed consistent with criteria described below and in Forest Plan Amendment 20 (PACFISH)	Contract and contract administration/inspection	High, based on literature (Water/Road Interaction Technology Series, USDA Forest Service, San Dimas Technology and Development Program, 1999)
13	Coarse woody debris greater than 3 inches diameter would be retained in timber harvest or fuel reduction units in amounts to meet guidelines in Appendix D. This would also comply with LCAS for lynx.	NEPA project design, silviculture prescription, contract, and contract administration.	High, based on research.

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#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
14	Yarding of tops and limbs would be minimized to maintain soil nutrients (especially potassium) on sites where excessive slash would not be a fuel concern. If yarding tops and limbs is needed to meet fuel reduction objectives, the preference is for removal of excess slash larger than 3 inches for burning at landings and retaining finer slash on the unit.	NEPA project design, silviculture prescription, BD plan, and contract.	High to the degree implemented, based on research.
15	Winter harvesting would only occur during frozen conditions. Frozen conditions are defined as greater than 4 inches of frozen ground, a barrier of snow greater than two feet in depth (unpacked snow), or one foot in depth (packed snow).	Contract administration	Moderate, based on monitoring
16	Timber harvest, fuel reduction, and soil and stream restoration activities would be limited when soils are wet, such that resource damage may occur, to reduce rutting, displacement and erosion.	Contract and contract administration/inspection	High, based on research.
17	Skid trails, landings, and yarding corridors would be located and designated to minimize the area of detrimental soil effects. Tractor skid trails would be spaced 80 to 120 feet apart, except where converging on landings, to reduce the area of detrimental soil disturbance. This does not preclude the use of feller bunchers if soil impacts can remain within standards.	Contract and contract administration/inspection	High, based on research.
18	On excavator piled units, additional trail construction would be minimized, machines would be restricted to existing trails as much as possible, number of passes would be minimized, and excavator piling would be minimized, to reduce soil compaction.	Contract and contract administration/inspection	Moderate, based on forest monitoring data.
19	Cable systems would use one-end or full suspension wherever possible to minimize soil disturbance.	Contract and contract administration/inspection	High, based on research/forest monitoring.
20	Topsoil would be stockpiled and replaced on excavated landings after scarification.	Contract and contract administration/inspection	Moderate to high, based on research.
21	Excavated skid trails and excavated landings would be scarified and recontoured to restore slope hydrology and soil productivity. The Forest soil scientist may waive this mitigation when restoration would compound negative impacts.	Contract and contract administration/inspection	Moderate, based on research.
22	Slash would be scattered over recontoured and decompacted areas on skid trails and landings with a goal of achieving 10 tons per acre of fines and 15-20 tons per acre of larger material, up to 35 tons total where acceptable to fuel managers.	Contract and contract administration/inspection	High, based on research.
23	Areas of intact functioning riparian vegetation would be retained where possible during stream restoration work.	Contract and contract inspection	High, based on past experience.
24	Soil restoration areas would be stabilized within 14 days of completing work, using erosion barriers, mulch, slash, and revegetation as needed.	Contract and contract administration/inspection	Moderate, based on past experience.

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#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
25	Non-excavated skid trails and landings compacted or entrenched 3 inches or more would be decompacted with an excavator to a depth of 4 – 10 inches, or as directed by contract administrator or Forest soil scientist, to restore soil permeability.	Contract and contract administration/inspection	Moderate to high, based on research.
26	Sediment and erosion control measures such as dewatering culverts, sediment barriers, rocking road surfaces and/or ditches, etc., would be used as needed when constructing, reconstructing, and decommissioning roads to protect fish habitat and water quality.	Contract and contract administration	High, based on literature, San Dimas, Road/Water Interaction
27	Activities would be conducted in fish bearing streams between July 1 and August 15 to avoid sediment deposition on emerging steelhead or Chinook redds, or disturbance to bull trout moving to natal streams. These dates may be site-specifically adjusted through coordination with Central Idaho Level I team review and approval.	NEPA project design, contract and contract administration/inspection	Moderate to high, based on past experience.
28	Stream crossing structures would provide for channel width, flow velocities, substrate condition, and stream gradients that approximate the natural channel and accommodate passage of streamflow, debris, fish, and other aquatic organisms. When designing new structures, consider and give preference to open-bottom arches, bridges and oversized culverts.	NEPA project design, contract and contract administration/inspection	High, based on literature, San Dimas, Road/Water Interaction
29	During instream habitat improvement activities, tree felling in RHCAs would occur only where that activity would not affect Riparian Management Objectives for shade and woody debris recruitment. Wood for instream placement would be taken from outside the RHCA wherever feasible.	Contract and contract administration/inspection	High, based on past experience.
30	Prior to instream habitat improvement activities, heavy equipment would be inspected to assure no leakage of oil, fuel, or hydraulic fluid.	Contract and contract administration/inspection	Moderate to high, based on past experience.
31	A Spill Prevention Control and Countermeasures Plan (40 CFR 112) would be prepared and implemented that incorporates the rules and requirements of the Idaho Forest Practices Act Section 60, Use of Chemicals and Petroleum Products; and US Department of Transportation rules for fuels haul and temporary storage; and additional direction as applicable.	Contract and contract administration/inspection	High, based on past experience.
32	For instream activities in fish-bearing streams that contain listed species, fish are expected to disperse from the project area. If needed, additional measures would be used to ensure fish are not harmed or killed by instream activity. If electrofishing were necessary, it would be conducted in accordance with NOAA Fisheries electrofishing guidelines found at http://www.nwr.noaa.gov .	Contract and contract administration/inspection	Moderate, based on past experience.

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#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
33	The State of Idaho Best Management Practices (BMPs) and Forest Service Soil and Water Conservation Practices (SWCPs) would be applied. These are incorporated by reference.	Contract and contract administration/inspection	High, based on past experience.
Trails/Recreation			
34	Coordination would minimize conflict with winter hauling on roads used as groomed snowmobile routes.	Project design, contract and contract administration/inspection	Moderate, based on past experience.
35	Trails 820, 832, 838, 844, 848, and others as identified, would be protected during activities. Designate all system trails as Protected Improvements in the Timber Sale Contract. No skidding across trails, except over snow, fall trees away from trails, cut stumps less than 12" in height within 100 feet of trails, leave regeneration within 100 feet of trails to create a visual buffer between treatment areas and trails, construct firelines to protect the regeneration buffer and trail during slash treatment, and trails are not to be used a firelines.	Contract and contract administration/inspection	High, based on past experience.
Access/Public Safety			
36	Temporary roads would be closed to public motorized use, except as specifically authorized.	Contract and contract administration/inspection	Moderate for sediment reduction, based on monitoring
37	Operator would be required to set up warning signs advising of equipment operations or hazards for public safety.	Contract and contract administration/inspection	High, based on past experience.
Air Quality			
38	Procedures outlined in the North Idaho Smoke Management Memorandum of Agreement would be followed, including restrictions imposed by the smoke management-monitoring unit.	FS fuels management	High, based on past experience.
39	Prescribed burning would be conducted over several years to reduce the amount of smoke in any one year. Priority in scheduling would be given to units accessed by temporary roads scheduled for decommissioning	FS fuels management	High, based on past experience.
40	Additional restrictions, beyond those imposed by the smoke management-monitoring unit, would be considered for prescribed burning for local air quality reasons, including visual.	FS fuels management	High, based on past experience.

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#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
Wildlife			
41	Should any of the following be sighted in the project area during project implementation, the Unit biologist would be notified: lynx or a lynx den, bald eagle, new wolf den or rendezvous site, active goshawk nest. Appropriate protection measures would be implemented.	NEPA project design, silviculture prescription, field prep, and contract administration/inspection.	Moderate; based on past experience
42	Should an active goshawk nest be discovered within a 450 feet distance of timber harvest or fuel reduction activities, the nest tree will be protected, as well as a 10-15 acre no-treatment buffer area around the nest tree, as designated by the unit biologist to provide for foraging and nesting sites.	Field prep, contract and contract administration/inspection	Moderate; based on IDFG, et al, 1995, State Conservation Effort
43	MA21 moose/yew: The Pacific yew component would be maintained in clumps where it exists in timber harvest or fuel reduction units.	Field prep, NEPA project design, contracting, and contract admin.	High; based on past experience
44	To the extent practical, slash piles would not be placed within patches of Pacific yew.	NEPA project design, silviculture prescription, field prep, and contract administration.	Moderate; based on past experience (pre-Forest Plan)
45	In MA 21, timber harvest or fuel reduction would only be allowed in those stands with less than 35 percent slope that do not require broadcast burning.	NEPA project design, silviculture prescription, and field prep.	Moderate; based on past experience
46	Broadcast burning would not be prescribed in MA 21, and Pacific yew would not be slashed except to provide room to machine pile.	NEPA project design, silvicultural prescription, and field prep.	High; based on past experience
47	Snags and snag replacement green trees would be retained in numbers consistent with Regional Guidelines (Appendix F). This would comply with LCAS for lynx protection.	Field preparation, NEPA project design, contracting and contract administration	Moderate, based on forest monitoring data
48	Timing of prescribed burning would be coordinated with the unit biologist, silviculturist, and fuels management specialist to achieve objectives and reduce impacts to species during important reproductive and natal period, as well as other resources.	NEPA project design, silviculture prescription, burn plans, field prep, and contract administration.	Moderate, based on past experience and local habitat relationships
49	The integrity of existing access management restrictions would be maintained within the planning area for wildlife security purposes. Current access management restrictions would apply to existing reconstructed roads after implementation of activities to maintain or improve existing access and wildlife security. No contractor or their representatives may use motorized vehicles to hunt or trap animals on a restricted road.	Contract and contract administration/inspection	High; based on monitoring data and past experience.

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#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
Heritage Resources			
50	Known historic properties or sites would be avoided or protected.	NEPA project design, field prep, contract, and administration/inspection	High, objective to achieve a “no adverse effect” on these resources
51	If any historic properties are discovered during implementation of activities, all work must stop in compliance with 36 CFR 800.11.	Field prep, contract and contract administration/inspection	Moderate based on COR recognition of resource and contact with Heritage Personnel
52	If additional cultural resources are discovered during project operations, all ground-disturbing activities would be halted until such cultural materials can be properly documented and evaluated by the Forest Archaeologist in compliance with 36 CFR 800.	Field prep, contract and contract administration/inspection	Moderate based on COR recognition of resource and contact with Heritage Personnel
Noxious Weeds			
53	Desirable vegetation would be promptly established on all disturbed areas, using native and non-native plant species, as approved by the Forest botanist.	Contract and contract administration/inspection	Moderate based on experience
54	Seed would be certified blue-tagged free of noxious weeds and all straw and mulch would be certified as free of noxious weed seed.	Contract and contract administration and inspection	High, based on experience
55	All mud, soil and plant parts would be removed from all off-road equipment before moving into the project area to limit the spread of weeds. Cleaning must occur off National Forest lands. This does not apply to service or hauling vehicles that would stay on the roadway, traveling frequently in and out of the project area.	Contract and contract administration and inspection	Moderate; based on past experience
56	All rock used for surfacing would be county-certified as free of noxious weed seed	Contract and contract administration/inspection	Moderate; based on past experience
TES Plants			
57	Candystick, a Region 1 sensitive plant species, occurs in some management units. Where live lodgepole are associated with candystick, groups of live lodgepole pine would be left to protect candystick from management activities.	NEPA project design, field prep, contract and contract administration/inspection	High based on past monitoring and experience.
58	During implementation, if activities would impact previously unknown sensitive plant occurrences, appropriate protection measures would be implemented. Appropriate measures will vary depending upon the ecology of the species involved and nature of the proposed action and would be directed by a botanist.	Silvicultural prescription, field preparation, contract, and contract administration/inspection	High based on monitoring, experience, and logic.

Table 2.4: Alternatives in the American and Crooked River Project.

Proposed Activity – Total Project		Alt B	Alt C	Alt D	Alt E
Acres of Treatment	Tractor Yard/Machine Pile	1,138	1,172	1,732	901
	Cable Yard/Broadcast Burn	945	1,095	1,207	780
	Roadside Salvage	467	477	466	475
	Total Acres Treated	2,550	2,744	3,405	2,156
	Percent Clearcut	42%	42%	34%	28%
	Percent Partial Cut/Thin	58%	58%	66%	72%
Miles temporary road construction ¹		8.0	14.3	14.3	5.4
Miles road improvement ²		89.6	77.8	95.0	94.5
Watershed Restoration Package Improvements					
Miles of decommissioned roads ³		14.9	17.9	19.0	37.5
Miles of Watershed Road Improvement		15.2	15.8	15.8	23.8
Number of sites of Watershed Road Improvement		1	3	3	3
Stream crossing improvements ⁴		10	10	12	34
Miles of instream improvements		15.2	15.8	15.8	23.8
Miles of Recreation and Trail improvements		2.9	2.9	2.9	4.8
Acres of Recreation and Trail improvements		0	4	4	4
Acres of Mine Site Reclamation		7	7	7	9
Acres of Soil Restoration		18	26	32	58
Access change for vehicle use - motorized trail use (ATV) to restricted use (miles) ⁵		1.0	1.0	1.0	1.0
Access change for vehicle use – road to trail ⁶		1.5	1.5	1.5	1.5

¹ Temporary roads would be decommissioned within one to three years of construction.

² Road improvement covers a range of activities, such as surface blading, drainage repair, and roadway brushing with occasional culvert installations, slump repairs, and stabilization work. Road improvements stated in this table are not to be considered or confused with routine road maintenance that may include but not limited to road prism brushing, clearing, or hazard reduction activities.

³ Road decommissioning for this project covers a range of activities, from recontouring to abandonment due to grown in conditions. See Appendix F

⁴ Stream crossing improvements include upgrading or improving culverts and bridges to improve fish passage and peak water flows and are listed as the number of sites.

⁵ This is an access change, which restricts use to two wheeled vehicles or snowmobiles over snow, from previous all terrain vehicle use (ATV).

⁶ This is an access change of miles of roads to trails use.

Table 2.5: Action Alternatives Comparison Summary
 (Related to Significant Issues and Purpose and Need of the Project)

	Alternative B	Alternative C	Alternative D	Alternative E
Significant Issues from Public Scoping				
Hazardous Fuels ¹	★★	★★★	★★★★	★
Water Quality and Fish Habitat ²	★★★	★★	★★	★★★★
Elements of Purpose and Need Not Covered Above				
Forest Health ³	★★	★★★	★★★★	★
Socio-Economic Effects ⁴	★★	★★★	★★★★	★

★ - Least Responsive

★★★★ - Most Responsive

¹ Hazardous fuel reduction effectiveness ranking considers total acres of treated fuels and location factors related to landscape patterns and proximity to additional completed and proposed actions on adjacent lands and lands administered by the Bureau of Land Management.

² Ranking considers short-term disturbance effects combined with net long term trends in fish habitat potential and water quality. All action alternatives meet Forest Plan Standards.

³ Ranking considers the number of acres with silvicultural prescriptions designed to meet the long-term vegetative objectives of the project.

⁴ Ranking considers direct socio/economic effects.