

Summary

■ S.0 Introduction

The East Fork Fire started on June 28th, 2002 in the East Fork of the Bear River drainage (see Appendix A, Map 1.1.1). Over the next three weeks, the fire burned toward the east and crossed into the Mill Creek and West Fork of the Blacks Fork drainages. Approximately 14,200 acres of the Evanston Ranger District of the Wasatch-Cache National Forest, and intermixed private lands burned (see Appendix A, Map 1.1.2).

The East Fork Fire greatly increased local public awareness of forest management and wildfire suppression policies on National Forest System Lands.

■ S.1 Project Background

Immediately following the fires, the Wasatch-Cache National Forest began assessing conditions in the burned areas. The Burned Area Emergency Rehabilitation Report (USDA Forest Service, BAER 2002) evaluated the need for emergency rehabilitation measures and considered opportunities for long-term monitoring.

Overall the fire burned in a mosaic, at intensities and patterns that were likely for the most part within the historic range of variability. In some areas, the fires burned as low intensity understory burns, leaving the larger trees stressed, but still alive. In other areas the fires burned with moderate or high intensity, fully consuming both understory vegetation and tree canopy. Although stand replacing fires are historically normal in the forest types affected, these high intensity burn areas may have exceeded the historic range of variability in extent due to continuity of heavy fuel loading

and fuel ladders that developed over the last 100 years.

The fire degraded watershed conditions in many locations. It destabilized soils and drainage ways, and increased sediment delivery to fisheries habitat. In some areas, due to the loss of tree canopy, peak watershed flows may also have been increased to levels above the capacity of existing structures. In other areas, the fires killed or weakened trees.

However, the fire occurred in areas that have historically experienced stand replacing fires that can burn with relatively high severity. The adverse effects of this fire are probably not far outside of the historical range of variability. The fire has also returned vegetation types to early successional stages that provide a diversity of vegetation and wildlife habitat. It has helped to maintain the disturbance dependent aspen component in the landscape.

The fire also provided a situation where the commercial value of forest products could be recovered from areas designated as suitable for resource management and jobs and economic opportunities could be gained.

■ S.2 Proposed Action

To respond to the resource conditions and opportunities created by the East Fork fire, the National Forest is proposing to harvest some dead timber resulting from the fire that would address the need to work with local communities and people affected by the fires.

The Forest's proposed salvage activities would include harvest of fire killed trees. Green trees and dead trees below the merchantable diameter (7" for lodgepole pine, 8" for Englemann spruce and subalpine fir) will be retained on most of the harvest units, except where removed for

skidtrails and landings. Optional removal of post and pole material between 4” and 7” would be allowed on harvest unit #2. This salvage would also result in removal of dead standing trees that would contribute to future heavy down woody fuel loading.

The proposed action includes 20 units totaling 781 acres (see Appendix A, Map 2.3.2). Two of the units are within the East Fork of the Bear River drainage, three are within the West Fork of the Blacks Fork drainage, and the rest are within the Mill Creek drainage. Approximately 4.4 miles of temporary roads would be required to access the timber. Slash resulting from temporary road construction will be placed on the downhill side of the road to provide a filter for sediment. Temporary roads will be obliterated at completion of their use. Obliteration includes returning the ground to the original contour and placement of slash on the surface to discourage use and prevent erosion. Harvest would be accomplished using ground based systems such as tractors, forwarders, or rubber tired skidders.

The proposed action includes maintenance and improvement of drainage on about 20 miles of existing roads. This work involves blading, shaping, installation of drain dips and ditch relief culverts, and replacing log culverts or undersized or improperly positioned culverts.

Approximately 100 acres of containerized spruce seedlings would be planted in areas where there is no adjacent seed source to ensure a future seed source.

Forest Road #80299 would be decommissioned in the upper East Carter Creek drainage. This road is approximately 1.3 miles long. Remove two old log culverts, install water bars, scarify surface, and recontour 200 feet near the junction with Forest Road #80743.

Access to units 8, 9, 18, and 19 would be on Forest Road #80293. Several segments of this road on National Forest land were scheduled for decommissioning under the Mountain View and Evanston Travel Plan. Anadarko Corporation decided to decommission a 0.5 mile segment of the existing public access from Mill Creek to Lym Lake and Elizabeth Ridge that fords Mill Creek on their land in Section 29, T2N, R11E. This ford is a source of sediment in Mill Creek due to steep approaches. About 0.5 miles of

Forest Road #80293 on National Forest Land would be kept open to maintain public access from Mill Creek to Lym Lake and Elizabeth Ridge.

Salvage and reduce fuel loading on approximately 781 acres of fire killed timber in 20 units. Harvest is limited to the roaded portion of the affected area.

Construct approximately 4.4 miles of temporary road to access proposed salvage units.

Perform maintenance and improve drainage on about 20 miles of existing roads.

Plant approximately 100 acres with containerized spruce seedlings.

Decommission Forest Road #80299 in the upper East Carter Creek drainage.

Keep 0.5 miles of Road #80293 open for public access to Lym Lake and Elizabeth Ridge.

Figure 2.1. Proposed Action. *The project proposal is focused on salvage of merchantable timber.*

It is anticipated that the implementation of the proposed timber salvage activities would occur over a two-year period. Resource conditions would determine priorities for timing and implementation of all activities.

Details of the Proposed Action are described in Chapter 2 and displayed in S.5.2 and Map 2.3.2 at the end of this document.

■ S.3 Purpose and Need for the Proposed Action

The purpose and need for the proposed action is to provide timber for commercial harvest and to capture economic value of timber killed by the East Fork Fire consistent with goals for watershed health, sustainable ecosystems, biodiversity and viability and scenic/recreation opportunities. Other management activities are needed to improve vegetation, watershed conditions and public access and are included in the proposed action if they are feasible and practical in conjunction with a timber sale.

The Forest has identified several reasons for proposing timber salvage activities in burned areas. These are based on working with people and communities, and maintaining watershed health.

The Proposed Action is driven by the Forest's desire to respond to the direct effects of the East Fork Fire. This is primarily the recovery of economic value from burned timber. Resource impacts from the fire will be reduced utilizing the timber sale contract where that is feasible and practical.

The Proposed Action is also driven by recognition and mitigation of the effects of past fire suppression, timber harvesting, road development, and other land uses that have had a cumulative impact on the drainages where the East Fork Fire burned.

□ *Forest Products and Jobs*

While the East Fork Fire provided immediate jobs for fire suppression and fire rehabilitation, it also produced opportunities for commercial harvesting of fire damaged timber. Salvage of burned timber would provide both forest products and jobs to community workers. The primary purpose of the proposed action is to utilize burned timber and recover economic values and to provide jobs associated with watershed restoration and commercial use of forest products. Salvage harvest of burned timber would provide an economic return and contribute to the industry demand for wood products.

□ *Vegetation, Fire and Fuels*

The fire removed all sources of conifer seed in some areas. Planting of conifers where natural regeneration is not occurring or is unlikely would ensure better regeneration of native forest species. A purpose of the proposed action is to ensure that stands within the project area will adequately regenerate with forest vegetation native to the area.

Wildfire is one of the key disturbance processes affecting vegetation and forest conditions (Arno et al. 1995). Virtually all of the vegetation on the Forest is a component of fire-adapted ecosystems where fire recycles nutrients, regulates how forests develop, maintains diversity, reduces biomass, controls insect and

disease populations, and maintains biological processes.

Fire exclusion effects in long fire interval fire regimes, such as those in lodgepole pine and spruce-fir are not yet manifest at the stand level, but are detectable at the landscape level. There are many examples of heightened insect and disease with fire suppression including dwarf mistletoe proliferation resulting from fire suppression, especially in lodgepole pine and ponderosa pine. Increased patch contagion (probability that similar patches are adjacent to each other) from lack of fire may amplify the severity of insect and pathogen outbreaks. Fire exclusion has converted some forests from lodgepole pine to fir and spruce. (Keane, et.al. 2002). Arno, et.al. (2000) describe the tendency toward greater uniformity in stand ages, physiological stresses, opportunity for extensive mortality caused by insects and disease, increased loadings of dead and ladder fuels, which increases the likelihood of unusually severe and extensive wildfires in forests with historic mixed severity fire regimes that are now tending to have more stand replacement fires. They continue to cite other literature that when a large and unusually severe fire occurs in a wilderness environment, it ultimately creates a correspondingly large mass of heavy fuels, starting 12 to 15 years after the fire when much of the dead timber has fallen. Modeling suggests that the effects of continuing this trend will be higher proportions of large stand-replacement fire in wilderness landscapes. There is no reason to believe that this would not also apply in similar forest types and fire regimes in relatively large non-wilderness landscapes like the north slope of the Uinta Mountains, if no salvage harvesting is done.

The newly created fuels from the East Fork fire may increase susceptibility to soil damage and loss of regeneration in the event of future wildfires. McIver and Starr (2000) found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged. But they also report that no studies have specifically looked at how postfire logging alters the size distribution of fuel and the concomitant changes in future fire risk. In general, logging of large-diameter material in green tree stands will lead to decreases in total fuel accumulations over the intermediate term but increases in fine activity fuels over the short term. They note that work examining fuels on

harvested green tree stands suggests that postfire logging may increase short-term fuel loads and fire risk, owing to increased fine activity fuels, but reduce intermediate and long-term fire risk through removal of larger dead structure (Brown 1980). They state that logging in postfire stands, however, would be expected to produce less fine activity fuel because the fine material burned, and one would expect removal of large-diameter material to have an intermediate-term effect similar to green tree stands.

A secondary purpose is to reduce future heavy fuel loading that could contribute to increased fire intensity in the event of a future wildfire. This could reduce risks to natural resources, private property and human life. Salvage of fire killed trees would result in lower fuel loading and risk of high intensity fires in the future within areas salvaged. It would also reduce the continuity of heavy fuel loading and provide locations for firebreaks to stop the spread of a high intensity wildfire in an area where human caused fires are not uncommon.

Watershed

The existing roads in the East Fork Bear River, Mill Creek, and West Fork Blacks Fork drainages that are scheduled to remain open to public use under the Mountain View and Evanston Travel Plan are generally on good locations and designed properly.

The Burn Area Rehabilitation Plan obtained funding to repair damage from the fire and to replace culverts that failed. However, additional maintenance and improvements in drainage are needed on most of the roads within the East Fork Fire perimeter to reduce sediment reaching stream channels. There is also a change in an access route and road decommissioning that could be done under the timber sale contract to reduce the likelihood of sediment reaching stream channels.

Maintenance and drainage improvement activities would help reduce the effect that roads have on other resources including water quality and aquatic habitat. Improving road drainage using best management practices (BMPs) would reduce the effects of the roads on watersheds and reduce maintenance costs.

S.4 Process Used to Formulate Alternatives

S.4.1 Wasatch-Cache National Forest Plan

The Wasatch-Cache National Forest Plan (USDA Forest Service 2003) provides the framework for determining the management of areas burned by the East Fork Fire. Although the East Fork Fire Salvage is designed to reflect all of the goals and objectives outlined within the Plan, two Forest Plan goals are especially pertinent to the burned areas. These two goals are displayed in Figure 4.1.

Forest Plan Goals
Maintain and/or restore overall watershed health (proper functioning of physical, biological and chemical conditions). Provide for long-term soil productivity. Watershed health should be addressed across administrative and political boundaries. (<i>Wasatch-Cache National Forest Plan, Forestwide Goal 2-Watershed Health</i>).
Contribute to the social and economic well-being of local communities by promoting sustainable use of renewable natural resources and...provide timber for commercial harvest consistent with goals for watershed health, sustainable ecosystems, biodiversity and viability and scenic/recreation opportunities (<i>Forest Plan Goal #10</i>).

Figure 4.1. Key Forest Plan Goals. Two Forest Plan goals are especially pertinent to the East Fork Fire Salvage.

S.4.2 Public Involvement

Project Scoping

Following completion of the Burned Area Assessment and during development of the Proposed Action for the East Fork Fire Salvage Project (March-April 2003), the Forest initiated public involvement by mailing a scoping document on March 10, 2003 containing a preliminary Proposed Action and conducting a scoping meeting on March 18, 2003 at the Historic Railroad Depot in Evanston, Wyoming, the community most directly influenced by the

fire. This meeting provided the public with an opportunity to discuss post fire treatment needs. This meeting also provided a forum for the public to review and critique the previous season’s fire fighting efforts, public involvement during the wildfire season, and other forest management issues.

Information, comments, and concerns expressed in mailed comments on the scoping document and at the scoping meeting led to a formal proposal to manage lands affected by the East Fork Fire. This became the Wasatch-Cache National Forest East Fork Fire Salvage EIS “Proposed Action”.

Public Involvement - Concepts for Developing the Proposed Action
Desire to salvage burned timber to provide timber related jobs to local communities and reduce future fuel accumulations.
Concern with effects of timber harvest and road construction on soil, aquatic resources and wildlife habitat.
Concern with effects of timber harvest on ecosystem functions.
Concern about weed spread near private land and on Forest roads.
Concern with fuel accumulations and ability to control future fires.
Concern with closing roads, reducing public access, foregoing ability to manage timber resources, and suppressing future wildfires.

Figure 4.2. Public Involvement for Proposed Action.
Some members of the public supported and advocated East Fork restoration and recovery efforts including watershed restoration, land restoration, and the recovery of commercial products from burned areas. Others expressed concerns that the project would have too many adverse effects on soil, watershed, wildlife, and ecosystem processes.

Public comments received at a scoping meeting and from responses to a scoping document were used to gauge public sentiment for conducting post fire restoration and recovery activities and to help develop the proposed action and alternatives.

■ **Involvement of other Agencies**

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

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

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

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

□ **S.4.3 Issue Development**

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

Thirty-two of the Consolidated Public Issue Statements were identified as relevant to driving the development of alternatives or mitigation measures. Driving issues were used to formulate alternatives, prescribe mitigation measures, or analyze environmental effects. Consolidated public issues and internal issues were then combined into “Combined Public and Internal Issue Statements” to be tracked through the EIS (See Figure 4.3 and FEIS Appendix B, Issues). These public issues were combined with internal interdisciplinary team issues to be carried through the analysis.

Combined Public and Internal Soil Issue Statement

The fire has increased the potential for accelerated soil erosion to occur by removing ground covering vegetation and litter and creating a hydrophobic layer in some areas. There is an area in the West Fork Blacks Fork with unstable soils and landform where the potential for a landslide due to the fire may have increased. Timber salvage and road construction could result in additional detrimental soil impacts.

Measures or means of resolving the issue considering mitigation under each of the alternatives:

- a. Adequacy of woody debris retention.
- b. Amount of detrimental soil disturbance.
- c. Risk of landslide.

Combined Public and Internal Water Issue Statement

Removal of forest tree cover by the fire can increase erosion, in-stream flows, peak discharges, and sediment loads in streams and wetlands, which may adversely affect channel morphology and stability and ecological functions of streamside riparian areas, seeps, bogs, and fens. Timber salvage operations, road construction, and increased motorized recreational use could further increase these effects. Road maintenance, decommissioning, and salvage operations could also mitigate some of them.

Measures or means of resolving the issue considering mitigation under each of the alternatives:

- a. Effects on water quality from sediment.
- b. Amount of water yield increase.
- c. Effects on wetlands.

Combined Public and Internal Scenery Issue Statement

Timber salvage and road construction may have impacts on the area's natural beauty due to reductions in visual quality, impacts of litter and off road vehicle damage.

Measures or means of resolving the issue considering mitigation under each of the alternatives:

- a. Effects on scenic integrity.

Internal Heritage Issue Statement

Timber salvage and road construction carried out within the affected areas have the potential to impact recorded and/or unrecorded prehistoric and historic resources.

Measures or means of resolving the issue considering mitigation under each of the alternatives:

- a. Effects on heritage resources.

Combined Public and Internal Infrastructure Issue Statement

Infrastructure: Permanent or temporary road construction and improvements affect commercial uses, aesthetics and recreation opportunities, sometimes positively and sometimes negatively.

Measures or means of resolving the issue considering mitigation under each of the alternatives:

- a. Effects on public access.
- b. Effects on road conditions.

Combined Public and Internal Vegetation Issue Statement

Timber salvage and road construction could affect TES plant species. Timber salvage and logging equipment and other off-road vehicle use could spread noxious weed seeds into weed-free areas.

Measures or means of resolving the issue considering mitigation under each of the alternatives:

- a. Effects on TES species.
- b. Effects on noxious weeds.

Combined Public and Internal Fire/Fuel Issue Statement

Future fires could result in high intensity reburns with high resistance to control where heavy fuel loading occurs from logging slash and after fire-killed trees fall.

Measures or means of resolving the issue considering mitigation under each of the alternatives:

- a. Effects from logging slash.
- b. Effects on large diameter fuel loading.
- c. Effects on resistance to control of any future wildfire.

Combined Public and Internal Wildlife Issue Statements

Timber salvage units and roads could disrupt natural ecosystem processes, fragment large undisturbed areas, increase poaching and cause barriers to wildlife movement.

Measures or means of resolving the issue considering mitigation under each of the alternatives:

- a. Percent of acres with snag and future down woody debris removal.
- b. Remaining patch distribution and connectivity.

Salvage of fire-killed timber could adversely affect habitat for large and small wildlife species including avians that use this habitat for foraging, breeding, or hiding cover.

Measures or means of resolving the issue considering mitigation under each of the alternatives:

- a. Effects on other species at risk.
- b. Effects on management indicator species.
- c. Effects on big game habitat.
- d. Effects on snag habitat.

Removal of fire-killed stands of dead trees could adversely affect habitat for listed sensitive, threatened, and endangered species including denning habitat for Canada lynx.

New roads may facilitate snowmobile and other human uses in the winter that facilitates movement by competing carnivores to the detriment of lynx.

Measures or means of resolving the issue considering mitigation under each of the alternatives:
 a. Effects on TES species.

Combined Public and Internal Fishery Issue Statements
Increased sedimentation from logging close to streams, particularly along sections with steep or unstable hill slopes and loss of shading in riparian areas, stream banks, and ponds, could affect cutthroat trout populations.

Measures or means of resolving the issue considering mitigation under each of the alternatives:
 a. Effects of sediment on fisheries.

Potential positive effects of erosion control on fish may not be accomplished without timber salvage.

Measures or means of resolving the issue considering mitigation under each of the alternatives:
 a. Effects of road maintenance.

Timber salvage or road construction in riparian areas could have adverse effects on boreal toad and other amphibian habitat.

Measures or means of resolving the issue considering mitigation under each of the alternatives:
 a. Effects of salvage logging.
 b. Effects of temporary roads.

Combined Public and Internal Recreation Issue Statement

Timber salvage and road construction may result in the loss of quiet, back-country, non-motorized recreational opportunities.

Measures or means of resolving the issue considering mitigation under each of the alternatives:
 a. Effects on non-motorized recreation.

Combined Public and Internal Socio/Economic Issue Statement

The local economy could lose timber values if salvage is not accomplished and is not done in an expeditious manner.

Measures or means of resolving the issue considering mitigation under each of the alternatives:
 a. Expected timber volume.

Figure 4.3. Driving Issues. *Thirty-two of the Consolidated Public Issue Statements were identified as relevant to driving the development of alternatives. These were combined with internal issues for issue statements to be tracked through the analysis.*

In order to avoid developing alternatives that were not environmentally, technically or economically feasible, “Design Criteria” were developed to limit the scope of alternatives within known resource constraints, Forest Plan Standards, and laws and regulations. These constraints served as a basis for resource protection or enhancement when developing all of the action alternatives.

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

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

■ S.5 Description of Proposed Alternatives

Three alternatives were designed to reflect the range of issues and resource conditions and the purpose and need of the project (Figure 5.1).

Proposed Alternatives

- Alternative 1** – No Action
- Alternative 2** – Proposed Action
- Alternative 3** – No New Road Construction

Figure 5.1. Proposed Alternatives. *Three alternatives were designed to reflect the range of issues and resource conditions, and to meet the purpose and objectives of the project.*

□ S.5.1 Alternative 1 – No Action

Alternative 1 serves as a baseline for the project and displays existing resource conditions. Under the “No Action” Alternative, ongoing Forest Management would continue. Previously authorized projects, roads and facility maintenance, and other “normal” Forest management activities would remain ongoing. Natural restoration processes would recover areas impacted by the fires and previous land uses. Road management would be in accordance with the current Evanston and Mountain View Districts Travel Plan (USDA Forest Service 2003b).

This alternative would not preclude Forest management activities identified under previous decisions, nor would this alternative preclude the potential for activities identified under future decisions.

□ S.5.2 Alternative 2 - Proposed Action

Alternative 2 responds to the public’s request for an alternative that salvages fire killed timber and captures economic value of the timber (See Appendix A, Map 2.3.2). It responds to the combined internal and public issues that address concerns relating to water quality and effects associated with proposed timber harvest. This alternative focuses primarily on the purpose and need to provide timber for commercial harvest and to capture economic value of timber killed by the East Fork Fire consistent with goals for watershed health, sustainable ecosystems, biodiversity and viability and scenic/recreation opportunities. Alternative 2 responds to Wasatch-Cache National Forest Plan Goals 3 and 10. No management activities would occur in Inventoried Roadless Areas in this Alternative.

This alternative addresses salvage of burned timber and other management activities that are needed to improve vegetation, watershed conditions and public access. Approximately 4.4 miles of temporary road would be needed for access to salvage units. Salvage of timber would reduce high fuel loads on 781 acres. Maintenance would be performed and drainage improved on about 20 miles of existing roads. It includes 100 acres of tree planting. It includes decommissioning of 1.3 miles of existing road

#80299 to reduce erosion and protect water quality (see Appendix A Map 4.6.1). This alternative keeps Forest Road #80293 open to public use to allow closure of a ford across Mill Creek in private Section 29.

Figure 5.2 summarizes the activities that would be included in this alternative.

Alternative 2 - Activities	
<u>Activity</u>	<u>Quantity</u>
Timber Salvage in Burned areas	781 acres
Tree Planting	100 acres
Watershed Treatment	Decommission 1.3 mi. Eliminate Mill Creek Ford
Fuel Treatment	781 ac.
Temporary Roads	4.4 mi.
Road Maintenance and Drainage Improvement	19.8 mi.

Figure 5.2. Alternative 2. *This alternative responds to the public’s request for an alternative that focuses on salvaging timber impacted by the East Fork Fire.*

□ S.5.3 Alternative 3 - No New Road Construction

Alternative 3 responds to the public’s concern with effects of temporary roads and request to provide an alternative that constructs no new permanent or temporary roads (See Appendix A, Map 2.3.3). It responds to Wasatch-Cache National Forest Plan Goals Nos. 3 and 10. No management activities would occur in Inventoried Roadless Areas in this Alternative.

This alternative addresses salvage of burned timber accessible from existing roads and other management activities that are needed to improve vegetation, watershed conditions and public access. Salvage of timber would reduce high fuel loads on 597 acres. Maintenance would be performed and drainage improved on about 12 miles of existing roads. It includes 100 acres of tree planting. It includes decommissioning of 1.3 miles of existing road #80299 to reduce erosion and protect water quality (see Appendix A Map 4.6.1). This alternative keeps Forest Road #80293 open to public use to allow closure of a ford across Mill Creek in private Section 29.

Figure 5.3 summarizes the activities that would be included in this alternative.

Alternative 3 - Activities	
Activity	Quantity
Timber Salvage in Burned areas	597 ac.
Tree Planting	100 acres
Watershed Treatment	Decommission 1.3 mi. Eliminate Mill Creek Ford
Fuel Treatment	597 ac.
Temporary Roads	0.0 mi.
Road Maintenance and Drainage Improvement	11.9 mi.

Figure 5.3. Alternative 3. *This alternative responds to the public’s request for an alternative that focuses on salvaging timber impacted by the East Fork Fire with no new roads.*

□ S.5.4 Alternative Treatment Descriptions

Although the proposed salvage activities would vary by amount, and location (see Maps 2.3.2 and 2.3.3), treatments are expected to be similar in nature throughout all of the alternatives. The following paragraphs provide a description of the treatments including (1) where (in general) the treatments would occur, and (2) what they would include. The following paragraphs also describe what the treated areas are intended to look like after completion of the treatment activities.

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

□ *Timber Salvage in Burned Areas*

Timber salvage in burned areas would occur across three drainages. The salvage of burned and insect killed trees would be completed using ground based yarding methods. Standing fire-killed trees with merchantable value would be removed from areas that burned at low to high severities in order to recover economic benefits and reduce fuels. Within the salvage units, some larger “reserve” snags and many smaller snags and down logs would be retained for vertical structure, snag replacement, and long term nutrient recycling, in accordance with Forest

Plan guidelines. Snags located within the hydrologic area of protected stream courses and riparian/wet areas would be emphasized and would be part of the retention objectives.

Following salvage, the treated areas would appear more open, yet would still blend with the surrounding burned landscape. These areas would contain moderate numbers of standing and down dead trees, large snags, and scattered unburned trees (Figures 5.4 and 5.5).

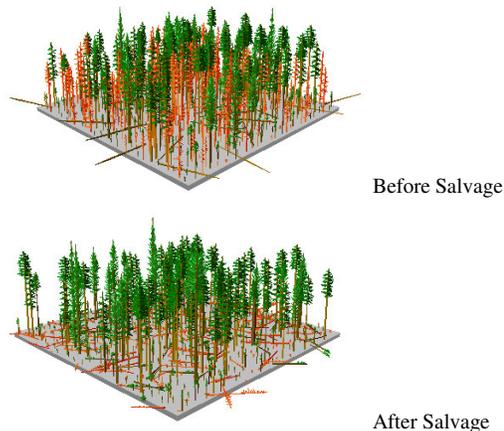


Figure 5.4. Salvage in Low Severity Burns. *Larger snags and all unburned trees would be retained.*

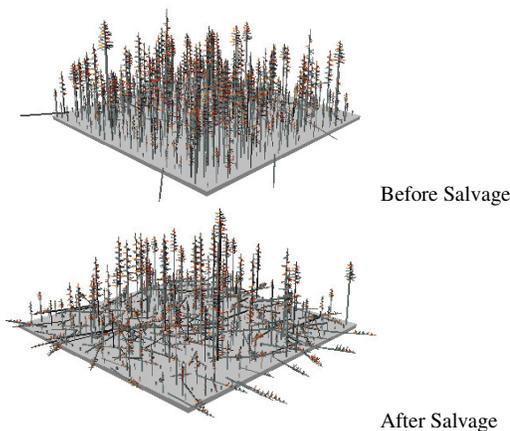


Figure 5.5. Salvage in High Severity Burns. *These areas would retain moderate numbers of small diameter standing and down dead trees, and large snags.*

Timber salvage would be completed as a part of timber sale contracts and be financed by timber generated revenue. Timber sale activities would be completed within approximately 2 years.

□ *Tree Planting*

Funding would be requested for planting trees in areas that monitoring show are not regenerating

adequately. It is expected that approximately 100 acres scattered through areas that contain mixed conifer and spruce/fir types proposed for timber salvage would need planting to ensure adequate regeneration of spruce and that a 40 acre plantation in the West Fork of the Blacks Fork may need planting to replace lodgepole pine saplings that burned during the fire.

☐ Watershed Treatment

Forest Road #80299 would be decommissioned to reduce current and large potential future sediment sources. This road has old log culverts that could fail. It would be used as a haul route for salvage harvest units #3 and #4 and then stabilized with cross drains, scarifying, seeding, culvert removal and recontouring of several segments over a distance of 1.3 miles.

Forest Road #80293 was scheduled for decommissioning under the Mountain View and Evanston Travel Plan (2003b). This road had a failed culvert and the public was using a road that crosses Mill Creek at a ford on private land to gain access between Mill Creek, Lym Lake and Elizabeth Ridge. The ford on this road is a source of sediment in Mill Creek due to steep approaches. Road #80293 would be kept open in Alternatives 2 and 3 to maintain the access while allowing the private landowner to close the road that crosses the ford.

☐ Fuel Treatment

Fuel treatment would be accomplished as part of the timber salvage. Merchantable size trees would be removed while retaining snags and down woody material in compliance with Forest Plan Guidelines.

☐ Temporary Road Construction

Approximately 4.6 miles of temporary road would be constructed to access timber harvest units in the preferred alternative, Alternative 2 (See Figure 5.6). There would be no temporary road construction under Alternative 3. Some “jump landings” would need to be constructed where log landings on heavily used roads would block traffic under Alternative 3. These landings would be within 100 feet of the road and would disturb soils on an average of about 0.1 acre per landing for an estimated 13 landings.

Temporary roads would be constructed to minimal standards. These roads would be

located to minimize their potential to impact water quality. As part of the initial road clearing, slash removed from the right-of-way would be placed in a windrow below the excavated soil so that it could be replaced on the recontoured surface following use. Following unit harvest, the road would be fully recontoured. Recontouring efforts would include replacing soil back onto the road prism to return the ground to its natural contour, placing slash and woody debris on the disturbed area, and seeding the disturbed area.

Following use, the road would appear as a linear opening. Within 10 to 15 years (depending on location), the area would become heavily brushed in or grown in with young trees.

Temporary road construction and closure would be completed as a part of timber sale contracts and be financed by timber generated revenue.

Alternative 2 Temporary Roads		
Watershed	Unit	Miles
East Fork Bear	2	0.5
	3	0.2
East Fork Total		0.7
Mill Creek	4	0.9
	5	0.0
	6	0.0
	7	0.2
	8	0.0
	9	0.0
	10	0.2
	11	0.0
	12	0.0
	13	0.0
	14	0.0
Mill Creek	15	0.3
	16	0.4
	18	0.3
	19	0.0
	Mill Creek Total	
West Fork Blacks	21	0.2
	23	0.7
West Fork Blacks	24	0.5
	West Fork Total	
Analysis Area Total		4.6

Figure 5.6. Alternative 2 Temporary Roads.
Approximately 4.6 miles of temporary road would be constructed to access timber harvest units in only one alternative, Alternative #2.

□ Road Maintenance and Drainage Improvement with Best Management Practices (BMPs)

Maintenance and drainage improvement using Best Management Practices are proposed on the West Fork Blacks road and Mill Creek Road in the project area. The treated mileage would vary by alternative (see Figures 5.2 and 5.3).

Road maintenance and drainage improvement activities would include a variety of treatments intended to reduce the delivery of sediment from road prisms, improve fish passage at culvert locations, reduce weed spread, and bring the roads to Best Management Practice (BMP) standards. In most situations, these treatments would only be applied to roads intended for long-term Forest access. Best Management Practices would also be applied to any roads intended for timber haul.

Road maintenance and drainage improvement would include: (1) improving driving surface, (2) installing drain dips and other surface water diversions, (3) installing ditch relief culverts, and (4) replacing undersized or improperly positioned culverts.

Culvert installations, removals and replacements would occur at 7 locations under Alternative 2 and 6 locations under Alternative 3. There are several locations where the culverts are old log culverts installed decades ago. These culverts have deteriorated to the point that they could fail.

Following this work, some segments of roads would appear newly disturbed. Culverts would be more obvious until roadside vegetation became reestablished.

This work would be financed by timber generated revenue and would occur prior to or along with timber harvest.

■ S.6 Summary Comparison of the Activities, the Predicted Achievement of the Project Objectives and the Predicted Environmental Effects of All Alternatives

□ S.6.1 Introduction

The effects of the alternatives on the human environment vary according to the location and quantity of activities proposed in each alternative. The alternatives can be compared quantitatively and qualitatively by: (1) their activities, (2) how they meet the Purpose and Need, (3) their response to the driving issues, and (4) their effects on individual resources.

The summary comparison of the alternatives provides a clear basis of choice between alternatives for the Forest Supervisor and the public. The comparison of alternatives is supplemented by information on existing resource conditions displayed in Chapter 3, and by detailed analysis of the effects of the alternatives on each resource as displayed within Chapter 4.

□ S.6.2 Comparison of Alternative Activities

Because each alternative was designed to address various driving issues, the types and quantity of activities varies by alternative. The following table provides a comparison of the quantity of treatments that would occur under each alternative.

This information provides a baseline for the ability for each alternative to meet the purpose and need of the project, the ability for the alternatives to respond to issues, and the effects of the alternatives on individual resources.

□ S.6.3 Achieving the Purpose and Need

Because each alternative was designed to address various driving issues, the types and quantity of

activities in each alternative provide different levels of meeting the purpose and need. Table

6.1 displays how each alternative meets the objectives of the purpose and need.

Table 6.1. Comparison of Achieving the Purpose and Need. *Because each alternative was designed to address various driving issues, the types and quantity of activities in each alternative provide different levels of meeting the purpose and need.*

	Alternative 1	Alternative 2	Alternative 3
Forest Products and Jobs	No forest products or jobs would be created.	Approximately 9,248 ccf of merchantable sawtimber would be offered for sale.	Approximately 5,706 ccf of merchantable sawtimber would be offered for sale.
Vegetation, Fire and Fuels	There would be no planting funded although it would continue to be considered if necessary.	Approximately 100 acres of trees would be planted. Approximately 781 acres of heavy fuel loading would be reduced.	Approximately 100 acres of trees would be planted. Approximately 597 acres of heavy fuel loading would be reduced.
Watershed	No additional road maintenance or drainage improvement. No changes in infrastructure or travel management to protect watersheds. Completed fire suppression restoration activities and ongoing BAER restoration and road maintenance would protect soil properties.	Road maintenance, drainage improvement, BMPs, road decommissioning, and a travel management change would be conducted to reduce erosion. These activities would be supplemented by completed fire suppression restoration activities, ongoing BAER restoration, and road maintenance activities.	Road maintenance, drainage improvement, BMPs, road decommissioning, and a travel management change would be conducted to reduce erosion. These activities would be supplemented by completed fire suppression restoration activities, ongoing BAER restoration, and road maintenance activities.

□ S.6.4 Response to Driving Issues and Resource Concerns

Each alternative was designed to respond to particular groupings of the Driving Issues. Because the effects of the alternatives are resource associated, they are described by resource. The consolidated driving issues associated with each resource heading are listed so the effects on the issue can be compared. Resource and issue comparisons are described in order of resource headings displayed in Chapters 3 and 4.

■ Soil

Soil: The fire has increased the potential for accelerated soil erosion to occur by removing ground covering vegetation and litter and creating a hydrophobic layer in some areas. There is an area in the West Fork Blacks Fork with unstable soils and landform where the potential for a landslide due to the fire may have increased. Timber salvage and road construction could result in additional detrimental soil impacts.

All alternatives, would maintain long-term soil productivity.

Under Alternative 1, there would be no direct or indirect effects from salvage logging because no salvage logging would occur. There would be continued short-term erosion and sedimentation due to the 2002 East Fork Fire. Accelerated erosion due to the fire is expected to occur for several years and the WEPP model estimates that erosion would revert to pre-fire rates in about 20 years.

Alternatives 2 and 3 could have short-term detrimental impacts to soils associated with ground based yarding in harvest units. Soil compaction, displacement, and rutting would be reduced by implementation of mitigation measures that prohibit equipment operation on wet soils and by requirements for post harvest restoration on sites disturbed during harvest activities. Temporary roads constructed under Alternative 2 and log landings under Alternatives 2 and 3 would be fully rehabilitated following use. For Alternatives 2 and 3, very little if any additional erosion is expected from skid trails during low intensity storm events for all of the harvest units during the 2 to 3 year period of harvesting. This is because skid trails tend to compact the soil that results in lower erosion rates than those under existing conditions and

mitigation measures that require installation of water bars every 50 feet that should be effective in controlling runoff and erosion. The WEPP model reflects this for a 10-year event storm in that it shows a reduction in sediment yield rates from existing rates for skid trails on all units and no sediment yield for 17 of the 24 harvest units. For high intensity storms, some erosion is expected from skid trails and for most of the units the sediment yield rate would still be lower

than existing rates because of the compaction of the soil from skidding. Compacted soil particles are less easily dislodged and moved off site. With the implementation of mitigation measures, none of the short-term or long-term effects of Alternatives 2 and 3 would exceed soil quality standards.

Table 6.2. Comparison of Effects on Soils. *With the implementation of mitigation measures, none of the short-term or long-term effects would exceed soil quality standards.*

Comparison of Effects on Soils			
	Alternative 1	Alternative 2	Alternative 3
Maintain Short-Term Soil Productivity	Slightly higher risk of excessive erosion due to 50 year storm or return.	Yes, except on temp roads, landings, skid trails.	Yes, except on landings and skid trails
Maintain Long-Term Soil Productivity	Yes	Yes	Yes
Detrimental Soil Disturbance (measured as acres/average percent of activity areas)	N/A	49.6 ac/6.3 % (total)	6.0 % (total)
Harvest Activities on Soils Highly Susceptible to Erosion	0 acres	581 acres	467 acres
Harvest Activities on Soils Highly Susceptible to Compaction	0 acres	1 acre	0 acres

* Based on 40% of high burn reflectivity from burn reflectivity gis layer.

■ **Water**

Water: Removal of forest tree cover by the fire can increase erosion, in-stream flows, peak discharges, and sediment loads in streams and wetlands, which may adversely affect channel morphology and stability and ecological functions of streamside riparian areas, seeps, bogs, and fens. Timber salvage operations, road construction, and increased motorized recreational use could further increase these effects. Road maintenance, decommissioning, and salvage operations could also mitigate some of them.

Under all alternatives, riparian areas and wetlands would be protected. Watershed improvement work initiated under the Burned Area Emergency Rehabilitation (BAER) Plan would continue to be implemented and monitored.

As described in 3.4.12, water yield increases due to past timber harvest and fires are negligible. There will be increased water yields from effects of the East Fork Fire over about 15 years with the higher amounts likely in the first few years,

depending on precipitation events. This increase is unlikely to be measurable in the larger drainage.

Salvage harvesting under Alternatives 2 or 3 is unlikely to have any measurable cumulative effect on water yields since the salvage is only removing dead or dying trees and the areas affected have already been burned. A review of watershed research on water yield by Troendle and Nankervis (2000) has shown that studies have shown similar responses in stream flow from fire as in timber harvest.

Most of the past activities have little effect on the water quality of the analysis area as indicated by water sampling that shows that water quality standards have been met in these waters since 1993 when water samples have been collected at regular intervals as part of a cooperative program between the USFS and the State of Utah. The East Fork Fire has a great potential for increasing erosion and sedimentation because of the large area that was burned. Within each of the

proposed timber harvest units, the potential for accelerated erosion and sedimentation from the East Fork Fire is expected to be equal to or greater than the proposed timber harvest activities, particularly when considering the

mitigation measures that would be in place to reduce the effects of the proposed timber harvest. Cumulatively, the proposed timber harvest is not expected to increase erosion and sedimentation in the analysis area.

Table 6.3. Comparison of Effects on Water Resources. *With the implementation of mitigation measures, none of the short-term or long-term effects of the action alternatives would exceed those of the no action alternative.*

Comparison of Effects on Water Resources			
	Alternative 1	Alternative 2	Alternative 3
Average Road Densities on all lands in Miles/Square Mile	1.26	1.25	1.25
Predicted Sediment Production from a 10 Year Storm Event (based on WEPP Computer Model)	6.1 tons/acre, average in proposed salvage units under Alternatives 2 and 3	6.0 tons/acre, 781 acres	5.7 tons/acre, 597 acres
Predicted Sediment Production from a 50 Year Storm Event (based on WEPP Computer Model)	8.8 tons/acre, average in proposed salvage units under Alternatives 2 and 3	8.7 tons/acre, 781 acres	8.1 tons/acre, 597 acres
Water Yield	Increase from fire effects, but unlikely to cause stream channel instability	No measurable increase over Alternative 1.	No measurable increase over Alternative 1.

■ **Visual Resources**

Scenic Integrity: Timber salvage and road construction may have impacts on the area's natural beauty due to reductions in visual quality, impacts of litter and off road vehicle damage.

The East Fork Fire has had substantial effects on the viewsheds within and adjacent to the Fire. Alternative 1 would have no additional effects.

Alternative 2 would have short and long-term effects on scenic integrity and the landscape character. Harvest unit design criteria and mitigation measures would be required to reduce short-term negative scenic impacts. The long-term effect would be the same as Alternative 1.

The visual effects of timber harvest activities in Alternative 2, as viewed in the foreground and middle ground from travel ways during the short term would place all units in a scenic integrity of High. The effects to the texture of landscape from the salvage would leave a number of small diameter standing and down dead trees, large snags, and scattered unburned tree to mimic the surrounding wildfire affected forest. Temporary

roads and skid trails would be evident during the salvage operation. Their effects would diminish with time as re-contouring and re-vegetation efforts take place.

Alternative 2 would also have short and long-term effects on the landscape character. Harvest unit design criteria and mitigation measures would be required to reduce short-term negative scenic impacts. The long-term effect would be the same as Alternative 1. (See Appendix A, Map 4.3.1).

Alternative 3 would have the same effects as alternative 2 other than there would be no temporary roads constructed (See Appendix A, Map 4.3.2).

While all alternatives would show an improving trend in scenic integrity in areas of Low Scenic Integrity, these improvements would occur faster because of timber harvest activities in Alternatives 2 and 3.

All alternatives could meet the scenic integrity objective (SIO) when mitigation is applied as

specified within the allocated land in the Wasatch-Cache National Forest Plan.

Because no actions would be proposed within the roadless areas, existing cultural and heritage sites, unique vegetation communities and patterns, and geologic formations would be left in their present status. The removal of surface litter in burned roadless may expose heritage sites that were previously not visible.

■ **Heritage Resources**

Heritage: Timber salvage and road construction carried out within the affected areas have the potential to impact recorded and/or unrecorded prehistoric and historic resources.

Alternative 1 would have no direct effects on the heritage resource.

Alternatives 2 and 3 would include several harvest units that contain heritage sites. Adverse effects to these sites would be prevented through mitigation measures including “no-activity” buffer zone.

■ **Infrastructure and Improvements**

Infrastructure: Permanent or temporary road construction and improvements affect commercial uses, aesthetics and recreation opportunities, sometimes positively and sometimes negatively.

Under Alternative 1, no road construction, temporary or system, on National Forest lands would occur.

Alternative 2 would include road work applied in locations where maintenance and drainage improvement are necessary to protect or restore resources. Road drainage improvement work would occur on approximately 19.8 miles of road within this alternative. Timber sale activities would complete all of the maintenance and drainage improvement. Approximately 4.6 miles of temporary road would be constructed to provide access to proposed timber harvest units. Road 80299 would be decommissioned.

Road drainage improvement would increase maintainability of 19.8 miles of road and would maintain generally good access throughout the

area. Decommissioning of Road 80299 would eliminate costly maintenance needs on that road. A very limited amount of motorized recreational access would be lost. Road 80293 would be kept open to provide access to Elizabeth Ridge and Lym Lake. This will provide access that is currently provided by a ford on private land across Mill Creek that will be closed by the landowner.

Alternative 3 is similar to Alternative 2 in that maintenance and drainage improvement work would be completed on existing system roads used to access timber. However, eliminating some of the units would preclude timber sale associated maintenance and drainage improvement on the West Fork Blacks Road and the East Carter Creek Road. A total of 11.9 miles of maintenance and drainage improvement would be completed with this alternative. No temporary roads would be constructed with this alternative.

Road drainage improvement would increase maintainability of 11.9 miles of road and would maintain generally good access throughout the area. Closure of Road 80299 would depend on gaining appropriated funds. It would eliminate costly maintenance needs on that road. A very limited amount of motorized recreational access would be lost.

The Mountain View / Evanston District Travel Plan Decision in early 2003 has reduced road density within this analysis area to an acceptable level while maintaining and improving the opportunities for loop routes for recreational access. Closure of Road 80299 under Alternatives 2 and 3 would provide a slight further reduction in road density with very little effect on recreational access.

Table 6.4. Comparison of Effects on Infrastructure. *The major difference between alternatives is maintenance and drainage improvement of existing system roads, and temporary road construction with Alternative 2.*

Comparison of Effects on Infrastructure			
	Alternative 1 (miles)	Alternative 2 (miles)	Alternative 3 (miles)
Road Maintenance and Drainage Improvement	0.0	19.8	11.9
Yearlong Restrictions (Gated)	6.2	6.2	6.2
Open Roads	92.2	90.9	90.9
N.F. Open Road Density	0.99	0.98	0.98
Temporary Road Construction	0	4.4	0
Road Decommissioning	0	1.3	1.3*

* Dependent on appropriated funds.

■ Vegetation and Forest Resources

Vegetation:

Timber salvage and road construction could affect TES plant species.

Timber salvage and logging equipment and other off-road vehicle use could spread noxious weed seeds into weed-free areas.

□ Insect Predation (Mountain Pine and Spruce Beetles)

■ Effects Common to All Alternatives

Salvage of an estimated 719 acres of fire killed timber from private lands is expected to proceed under all alternatives. Most of those (652 acres) are located within the Mill Creek drainage, with an additional 67 acres in West Fork Blacks.

The effects on beetle predation would be minimal under any alternative because of the extensive acreages that in are in roadless or management prescription categories that preclude management, and the mixed species condition of surrounding stands. Also, no harvest would occur until the second year after the fire, further limiting the effects of any alternative on insect predation.

■ Alternative 1

□ Direct and Indirect Effects

Alternative 1 would provide no direct reduction of bark beetle (mountain pine beetle and spruce beetle) infestation or risk of future infestation of host trees. There could be some loss of mature and old trees (particularly Englemann spruce) from endemic bark beetle predation in unburned stands within the analysis area.

A beneficial effect of Alternative 1 would be the role bark beetle predation plays in forest succession described in Chapter 3. Early seral species, such as lodgepole pine and aspen would benefit from this successional effect of spruce beetle, although lodgepole would be impaired by the effects of mountain pine beetle.

□ Cumulative Effects

Although the fire is not expected to cause widespread beetle outbreaks, the pre-wildfire bark beetle populations and observed predation of host trees could result in an eventual outbreak. The cumulative effects of the eventual outbreak would chiefly relate to the significant mortality of large diameter host trees and the environmental conditions associated with standing dead trees that ultimately fall to the ground, e.g. increased fuel loading and potential for increased wildfire intensity. Whether beetle populations actually increase would depend upon the number of insect brood emerging next year from fire-weakened, infested spruce trees and continued successful host infestation over ensuing years.

Continued unaltered high-risk conditions would predispose stands containing large sized host trees to significant mortality from bark beetles. There have been no recent or planned projects in proximity to the analysis area that would have a noticeable effect on this high-risk condition.

■ Alternatives 2 and 3

□ *Direct and Indirect Effects*

The direct, indirect and cumulative effects would be similar to Alternative 1 except that Alternative 2 would treat 435 acres of low and moderate burn reflectance stands that would provide suitable host for beetles. This would reduce the risk on adjacent stands. The timing of the treatment would be too late for beetles that have already attacked standing trees, but may be useful in preventing future attacks within the treated acres.

The direct, indirect and cumulative effects of Alternative 3 would be similar to Alternative 2 except that Alternative 3 would treat fewer acres. Approximately 349 acres of low and moderate burn reflectance burn stands would be treated.

□ *Cumulative Effects*

The combined of National Forest and private land harvesting would reduce bark beetle predation and risk on approximately 10 percent of the area within the wildfire perimeters (Alternative 2) and less than 10 percent (Alternative 3). In the untreated areas, cumulative effects would be the same as Alternative 1.

□ *Mature and Old Structure*

Burned areas would require at least 80 years of regrowth without major disturbance before they again achieved mature structures, and 150 years before they reach the old class. Therefore, the determination of effects of the alternatives on such structures is limited to the remaining unburned areas within the analysis area. All alternatives provide for more than 40% in mature and old classes.

□ **Threatened, Endangered and Sensitive Species**

Effects on Threatened, Endangered and Sensitive Species were analyzed by assessing the activities proposed in each alternative and the potential effects to the species that are known or have potential habitat in the project area (refer to Threatened, Endangered and Sensitive Plant section in Chapter 3). There would be no effects to any Federally Listed (Threatened or Endangered), Proposed, or Candidate species. Because no sensitive species are within the harvest units or the burn perimeter, there would be no effects to sensitive species under any alternative (Duncan 2003).

□ **Noxious Weeds**

Alternative 1 would not have any effect on noxious weed spread. The ground disturbing activities proposed in Alternatives 2 and 3 would have a high risk of weed spread in (1) habitats that have high susceptibility to weed invasion or (2) areas that are already disturbed. However, washing and inspection of logging equipment that would be operated off roads (skidders, dozers, loaders) would be required prior to bringing the equipment onto the Forest. Knutson-Vandenburg (KV) funds would be collected from the timber revenues to fund noxious weed spraying, which would reduce or eradicate noxious weeds and improve the vigor of native vegetation, thereby increasing resistance to further weed invasion. Where KV funds are not available, appropriated funds would be requested. Weed control, both direct herbicide use and non-herbicide prevention measures, would be included as design criteria. Musk thistle and Canada thistle have been recorded near, but not within, proposed harvest units. Both of these species disperse seed primarily by wind. Due to their presence in the fire perimeter and the primary mode of seed dispersal, the movement of harvesting equipment and vehicles in and around the harvest units and between units would have minimal effect on the introduction of these weeds to new sites.

Table 6..5. Comparison of Effects on Vegetation. Alternatives are compared based on their effects on bark beetle susceptibility, maintenance of old and mature classes, TES and introduction of noxious weeds.

Comparison of Effects on Vegetation			
	Alternative 1	Alternative 2	Alternative 3
Harvest Treatments			
East Fork Bear	0 acres	186 acres	164 acres
Carter Creek	0 acres	70 acres	24 acres
Mill Creek	0 acres	432 acres	375 acres
West Fork Blacks Fork	0 acres	93 acres	34 acres
Total	0 acres	781 acres	597 acres
Mature and Old Age Classes			
Amount of analysis area mature and old forest remaining	40%+	40%+	40%+
Threatened, Endangered or Sensitive Plant Species			
Biological Determination	No Effect	No Effect	No Effect
Noxious Weeds			
Disturbance Area (National Forest + Private Harvest Acres)	719 acres	1500 acres	1316 acres

■ Fire and Fuels

Fire/Fuel: Future fires could result in high intensity reburns with high resistance to control where heavy fuel loading occurs after fire-killed trees fall.

Alternative 1 would provide no direct reduction of large fuels that pose a future risk of potential soil damage a high intensity reburn on National Forest land. A nominal amount of removal may occur from personal use firewood gathering along open roads. The relevance of any adverse effects would be proportional to the extent of heat duration causing soil damage during a reburn, which is uncertain at this time. Beneficial and adverse effects of Alternative 1 would be the role these a typically high levels of large woody debris play in the forest environment. High levels of large woody debris in severely burned sites would facilitate spruce regeneration on high elevation and high reflectance burn areas by ameliorating the harsh post-fire environment, providing a seed source is available. Adversely, this same woody debris loading would increase the degree of tree mortality in the event of a future wildfire. A total of 7,244 acres of high and moderate burn reflectance stands would remain untreated and provide potential fuel for

future wildfires. The removal of future fuel from private lands would reduce the ability of fire to spread through the private lands to adjacent National Forest lands, and may therefore limit the extent of a future fire within the lower elevation, “checkerboard” ownership.

Fuel loading due to logging comes primarily from tops, limbs, and unmerchantable portions of the boles of trees. All landing slash under Alternatives 2 and 3 would be treated. Much of the smaller diameter material would remain on site, but the amount of fine fuels remaining would be lighter than that following harvest of green trees since needles, twigs, small branches, and duff layers were substantially reduced by the fire in moderate to high reflectance areas. Only fire-killed trees will be removed in those areas mapped as low intensity burn or unburned. Fine fuels would also be fairly light in these areas since generally a small percentage or small patches of the trees would be removed. Fine fuels were substantially reduced by the fire in most of these small patches as well. Alternative 2 would provide direct reduction of large fuels on 781 National Forest acres through salvage of fire-killed timber (See Table 6.6). Of those acres treated, 296 are high and 196 are moderate

reflectance. Timber harvest would remove boles of merchantable fire-killed trees, which would eventually become large down woody fuel. The effectiveness of salvage is limited to the merchantable portion of the fire-killed trees and does not include large boles that are non-salvable from decay or severe checking. Alternative 2 would directly reduce uncharacteristic risk conditions on treated sites. The potential for uncharacteristic soil damage to occur in the event of a reburn would be reduced. Continuity of heavy fuel loading would be interrupted where treatments occurred. An additional 719 acres of intermixed private lands are planned for salvage by the private landowner. Approximately 13,409 acres within the burn would receive no

treatment, with 6,622 of those in high and moderate burn reflectance. The remaining untreated acres would become predisposed to the same insect, disease and fire disturbances as discussed under Alternative 1. Continuity of heavy fuel loading would be interrupted where treatments occurred.

The direct, indirect and cumulative effects of Alternative 3 would be similar to Alternative 2, except that Alternative 3 would treat fewer acres (597 acres), and leaves more acres untreated (6,827 acres with high and moderate burn severity).

Table 6..6. Alternative Comparison of Effects on Fire and Fuels. *Effects on fire and fuels is determined by the acres treated on both private and National Forest lands.*

Comparison of Effects on Fire and Fuels (Acres Treated)			
	Alternative 1	Alternative 2	Alternative 3
National Forest	0 acres	781 acres	597 acres
Private Land	719 acres	719 acres	719 acres

■ **Wildlife**

Salvage of fire-killed timber could adversely affect habitat for large and small wildlife species including avians that use this habitat for foraging, breeding, or hiding cover.

Removal of fire-killed stands of dead trees could adversely affect habitat for listed sensitive, threatened, and endangered species including denning habitat for Canada lynx.

Timber salvage units and roads could disrupt natural ecosystem processes, fragment large undisturbed areas, increase poaching and cause barriers to wildlife movement.

New roads may facilitate snowmobile and other human uses in the winter that facilitates movement by competing carnivores to the detriment of lynx.

Because the project area does not include any suitable wintering habitat or nesting habitat for bald eagles, all alternatives would have no effect on bald eagles. None of the alternatives would render any of the project area unsuitable for future use by foraging bald eagles. All alternatives would have no direct, indirect or cumulative effects on bald eagles (Hollingshead 2003a, USDI F&WS 2004).

Canada Lynx

No salvage is proposed in any lynx foraging habitat (lodgepole pine stands 15-30 years old) under any alternative; therefore, all alternatives would have no effect on foraging habitat. Gains in foraging habitat would only occur as young, unsuitable stands mature. Alternative 1 would have no effects on lynx. Some potential (future) denning habitat would be treated. Salvage of 288 acres of low intensity burn is proposed, reducing potential denning habitat by an estimated 150 acres. Potential denning habitat is abundant in both of the LAUs and the LAU with the least denning habitat still has well over the amount recommended in the Lynx Conservation Assessment and Strategy (LCAS). Alternatives 2 and 3 would salvage some potential denning habitat; therefore, Alternatives 2 and 3 may

□ **Threatened and Endangered Species**

The effects of the alternatives on Threatened, Endangered, Sensitive and Management Indicator species are summarized in Table 6.7.

Bald Eagle

affect, but would not be likely to adversely affect lynx denning habitat

A Biological Assessment (Hollingshead 2003a) determined that the East Fork Fire Salvage “may affect, but is not likely to adversely affect” Canada lynx. The U.S. Fish and Wildlife (USDI, Fish and Wildlife Service 2004) concurred with this determination in a Biological Opinion issued on February 25, 2004 after requesting and receiving an addendum (Jaureguie 2004) to the Biological Assessment.

Black-footed ferret

Because the project area does not include any black-footed ferret habitat, all alternatives would have no effect on black-footed ferrets. All alternative would have no direct, indirect or cumulative effects on black-footed ferrets (Hollingshead 2003).

Western yellow-billed cuckoo

Because the project area does not include any yellow-billed cuckoo habitat, all alternatives would have no effect on yellow-billed cuckoo. All alternative would have no direct, indirect or cumulative effects on yellow-billed cuckoo.

□ Sensitive Species

Peregrine falcon

Because no activities would take place near potential nesting habitat in cliffs, all alternatives would have no impact on peregrine falcons. All alternative would have no direct, indirect or cumulative effects on peregrine falcons (Hollingshead 2003).

Northern goshawk

The East Fork Fire burned 6,925 acres at high to moderate severity, which moved these stands back to newly developing stands of trees. The severely burned stands will take several decades to return to suitable goshawk habitat. Alternative 1 would have no effects on goshawks. Alternatives 2 and 3 may impact individual goshawks, but are not likely to cause a trend toward federal listing or a loss of viability to the potential goshawk population (Hollingshead 2003).

Boreal owl

Boreal owls are not likely to find suitable habitat in acres burned at high or moderate fire intensities, therefore none of the proposed salvage activities in these burned acres would negatively impact boreal owls. Suitable habitat may exist within areas burned at low intensities. Alternative 1 would not affect boreal owls. Alternatives 2 and 3 may impact individual boreal owls, but is not likely to cause a trend toward federal listing or a loss of viability to the potential boreal owl population (Hollingshead 2003).

Flammulated Owl

There is no suitable flammulated owl habitat within the East Fork Fire area, therefore all alternatives would have no impact on flammulated owls. All alternatives would have no direct, indirect or cumulative effects on flammulated owls. (Hollingshead 2003)

Great Gray Owl

Great gray owls are not likely to find suitable habitat in acres burned at high or moderate fire intensities, therefore none of the proposed salvage activities in these burned acres would negatively impact great gray owls. Suitable habitat may exist within areas burned at low intensities. Alternative 1 would not affect great gray owls. Alternatives 2 and 3 may impact individual great gray owls, but are not likely to cause a trend toward federal listing or a loss of viability to the potential great gray owl population (Hollingshead 2003).

□ *Townsend's big-eared bat*

Because the project area does not contain any caves, mines or abandoned buildings, all alternatives would have no impact on Townsend's big-eared bats (Hollingshead 2003).

Three-toed Woodpecker

All proposed salvage units would have dead trees marked as reserve trees in order to provide habitat for woodpeckers and other snag-dependent wildlife habitat. The Wasatch-Cache Forest Plan direction includes leaving approximately 30 snags per 10 acres of salvage proposed. In many cases the trees would be left in clumps or patches and these would be spread

across the landscape or in corridors along riparian areas. Alternative 1 would have no effects on three-toed woodpeckers. Alternatives 2 and 3 may impact individuals or habitat, but would not likely result in a trend toward federal listing of three-toed woodpeckers (Hollingshead 2003).

Wolverine

Because all proposed salvage activities are located in previously roaded areas with regular human activity providing little suitable wolverine habitat, all alternatives would have no impact on wolverine (Hollingshead 2003).

□ Other Species at Risk

Williamson's sapsucker

Effects for this species are closely associated to those of the three-toed woodpecker. Studies have found sapsuckers' nesting in snags in post fire areas, while foraging in adjacent live stands. Alternative 1 would have no effects on Williamson's sapsuckers. Alternatives 2 and 3 may impact individuals or habitat, but would not likely result in a trend toward federal listing of Williamson's sapsuckers.

Pine Marten

Effects common to All Alternatives

The loss of vegetative cover in areas burned will cause some level of habitat fragmentation. This level of fragmentation has likely occurred repeatedly through time with the fire regimes of this vegetative type. In areas of high to moderate burning where canopy was decreased to less than 30%, a negative short-term effect is associated with the marten. However martens benefit where fires were less intense and small openings of diverse habitat were created. Marten population numbers tend to return to burn areas several decades after fire when adequate food and cover return. Alternative 1 would not affect the existing situation. Alternative 2 would have a minor effect on amounts of snag and down woody habitat. Temporary roads may affect movement under Alternative 2 in the short term, but there should not be any increase of habitat fragmentation in the long term. Alternative 3 would have a minor effect on amounts of snag and down woody habitat.

□ Management Indicator Species

Northern goshawk

See effects on goshawks under "Sensitive Species". The percentage of monitored territories that were active between 1999 and 2003 remained relatively constant across the Wasatch-Cache National Forest and north slope of the Uinta Mountains, except in 2000 when the percentage was low for some unknown reason. This data is a representation of the population across the planning unit. Except for the low intensity burn areas where some harvest will take place (279 acres out of 781 acres) the rest of the proposed sale area was essentially rendered unsuitable for goshawk habitat by the fire. The nesting areas of the two pairs of goshawks were not burned and post-fledging areas are still adequate despite the fire. These two pairs have been active since the fire and are expected to continue to use their nest territories. The project will not affect the viability or distribution of the goshawk across the planning unit.

Snowshoe Hare

Stands of sapling size aspen and conifer are not included for salvage in any alternative, therefore the salvage activities would have no effects on snowshoe hare habitat. These fire-killed stands would regenerate to a size class of trees that can provide for snowshoe hare foraging and would in turn provide an increase in foraging opportunities for predators that feed on snowshoe hare. All alternatives would have no direct, indirect or cumulative effects on snowshoe hare.

Beaver

Because no activities would occur within riparian areas, all of the alternatives would have no effect on beaver habitat. All alternatives would have no direct, indirect or cumulative effects on beaver.

□ Big Game Habitat

There are short-term adverse effects of the East Fork fire on security cover for all big game species. Long term effects of the fire are generally positive due to increased forage. Elk are the most affected by loss of security cover and travel corridors. All alternatives would have no adverse impacts on summer big game habitat.

There are no critical calving areas or elk or deer winter range within the fire perimeter. After 15 to 30 years, both the severely burned areas as well as old clearcuts would again provide hiding cover and elk security cover would increase in the herd unit. Alternative 1 would have no effects on big game habitat. Alternatives 2 and 3 would have very little effect on big game habitat. Decommissioning of Forest Road #80299 would increase security cover in the large mature forest strip remaining between the East Fork Fire and the 1980 Lily Lake Fire.

❑ Snag Habitat

Removal of snags during harvesting, fire suppression, and extensive salvage programs have impacted snag habitat, a component of old growth forest. Harvesting can remove snags, and fire suppression reduces the number of snags created in a landscape. Alternative 1 would have no effect on snag habitat. Alternatives 2 and 3 would remove fire killed trees from stands that have potential to provide the snag component of old growth habitat within the fire perimeter. This salvage affects approximately 0.6% of the 48,000 forested acres in the analysis area. Older dead trees would be retained and minimum Forest Plan snag densities would be maintained. All alternatives would meet Forest Plan Guideline 16 for snag retention.

❑ Forest Land Birds

The effects of any action, from timber harvest to fire suppression, would be an improvement for some species and detrimental for others. Selected bird species with restricted habitat needs (including snag dependent species) are discussed in separate sections in this Wildlife section. All alternatives would likely have little effect on these birds, considering the small extent of the habitat treatments compared with the fire effects.

❑ Fragmentation

The loss of vegetative cover in areas burned at high and moderate fire intensities will cause some level of fragmentation across the landscape. This level of fragmentation has likely occurred repeatedly through time with the fire regimes of this vegetative type. Alternative 1 would have no effect on fragmentation. Alternatives 2 and 3 would provide a slight decrease in cover and open road density, which may make it easier for some species to move across the landscape. Because there would be only a temporary change in vegetative cover and the open road density would decrease, these alternatives would have little effect on fragmentation.

Table 6.7. Comparison of Effects on Wildlife. Alternatives are compared based on their effects on several wildlife issues, including TES, MIS, lynx habitat and species at risk.

Comparison of Effects on Wildlife			
	Alternative 1	Alternative 2	Alternative 3
Threatened and Endangered Species			
Bald Eagle	No Effect	No Effect	No Effect
Lynx	No Effect	May affect, but would not likely to adversely affect	May affect, but would not likely to adversely affect
Black-footed ferret	No Effect	No Effect	No Effect
Western Yellow-billed cuckoo	No Effect	No Effect	No Effect
Sensitive Species			
Peregrine Falcon	No Impact	No Impact	No Impact
Northern goshawk	No Impact	May impact individuals, not likely to cause a trend toward listing or a loss of viability	May impact individuals, not likely to cause a trend toward listing or a loss of viability
Boreal owl	No Impact	May impact individuals, not likely to cause a trend toward listing or a loss of viability	May impact individuals, not likely to cause a trend toward listing or a loss of viability
Flammulated Owl	No Impact	No Impact	No Impact
Great Gray Owl	No Impact	May impact individuals, not likely to cause a trend toward listing or a loss of viability	May impact individuals, not likely to cause a trend toward listing or a loss of viability

Comparison of Effects on Wildlife			
	Alternative 1	Alternative 2	Alternative 3
Townsend’s Big – Eared Bat	No Impact	No Impact	No Impact
Three-toed Woodpecker	No Impact	May impact individuals, not likely to cause a trend toward listing or a loss of viability	May impact individuals, not likely to cause a trend toward listing or a loss of viability
Wolverine	No Impact	No Impact	No Impact
Other Species at Risk			
Williamson’s sapsucker	No effect	May impact individuals, not likely to cause a trend toward listing or a loss of viability	May impact individuals, not likely to cause a trend toward listing or a loss of viability
Pine Marten	No effect	May impact individuals, not likely to cause a trend toward listing or a loss of viability	May impact individuals, not likely to cause a trend toward listing or a loss of viability
Management Indicator Species			
Snowshoe Hare	No effect	No effect	No effect
Beaver	No effect	No effect	No effect
Big Game			
Big Game Habitat	No effect	Little Effect	Little Effect
Lynx Habitat			
Open Road Density - LAU 34	0.93 mi/sq mi	0.93 mi/sq mi	0.93 mi/sq mi
Open Road Density - LAU 35	0.94 mi/sq mi	0.93 mi/sq mi	0.93 mi/sq mi
Unsuitable Acres - LAU 34	6120 (12.9%)	6390 (13.5%)	6342 (13.4%)
Unsuitable Acres - LAU 35	1510 (5.4%)	1519 (5.5%)	1517 (5.5%)

■ Fish and Aquatic Resources

Fisheries: Increased sedimentation from logging close to streams, particularly along sections with steep or unstable hill slopes and loss of shading in riparian areas, stream banks, and ponds, could affect cutthroat trout populations.

Potential positive effects of erosion control on fish may not be accomplished without timber salvage.

Timber salvage or road construction in riparian areas could have adverse effects on boreal toad habitat.

Under existing conditions, soil erosion has been greatly accelerated by severely burned soil conditions resulting from the 2002 East Fork Fire. Much of this increased sediment runoff however did not make it into fish bearing streams because of the large amounts of unburned vegetation which exists in the riparian zones. The exceptions to this include the lower end of Boundary Creek where the fire originated and the west fork of upper Mill Creek where runoff from the burned slopes entered the

channel. Runoff from proposed unit 2 did enter the streams but these tributaries fan out prior to reaching the East Fork of the Bear River.

The indirect effects on aquatic and semi-aquatic species from the East Fork Fire include a loss of shading stream and the potential for increased water temperature. Sediment runoff may have also affected some of the macroinvertebrate communities causing a shift to sediment tolerant species. The increased runoff in the drainage has caused what appears to be an increase in spawning habitat in upper Mill Creek as fine sediment has been washed out of the gravel and more gravel appears to be available.

Under Alternative 1, there would be no direct or indirect effects from salvage logging because no salvage logging would occur. There would be continued short-term erosion and sedimentation due to the 2002 East Fork Fire. Accelerated erosion due to the fire is expected to occur for several years and the WEPP model estimates that

erosion would revert to pre-fire rates in about 20 years.

Alternative 2 would harvest 781 acres. A total of 4.6 miles of temporary road would be constructed. Two units (11 and 12) have buffer strips less than 100 feet that, during major storm event, may contribute sediment to the fish bearing streams. During average storm events the mitigation should reduce the risk of sediment to the streams. Mitigation measures were developed to reduce the potential for sediment from reaching fish bearing streams or ponds where amphibians may be impacted. The primary mitigation measure used to protect aquatic and semi-aquatics species was prohibiting logging operations adjacent to water bodies. Other mitigation measures such as limiting skidding operations near the edge of the units; ripping, seeding, slash placement and water barring would slow runoff, increase water infiltration, and enhance revegetation, helping to reduce runoff into the streams and small ponds. The potential for large trees to be recruited into the channel was also considered in setting no harvest areas adjacent to streams.

Cumulative effects on Bonneville cutthroat trout for Alternative 2 are similar to the effects for Alternative 1. The proposed timber harvest would employ site specific mitigation measures that would reduce or eliminate the impacts of the harvest. Cumulative effects on Colorado River cutthroat trout were not evaluated for the proposed harvest activity in the West Fork Blacks Fork drainage. It is believed that these populations of Colorado River cutthroat trout will persist over the next 15 years in the Blacks Fork Drainage, based on the limited risks and moderate threats. It is anticipated that the Colorado River cutthroat trout will persist over the next 100 years also. Again the risks and threats are expected to remain constant. Affects on other fish in the drainage are believed to be similar to those of the Colorado River cutthroat trout. Cumulative effects on amphibians are similar to those on fish. Past timber harvest has removed trees adjacent to riparian areas in some cases which may have reduced large woody debris recruitment into riparian areas. Road construction across riparian areas has removed riparian habitat. These activities have occurred on a small percentage of the total riparian habitat available in the analysis area. Historic grazing removed riparian vegetation. More recent grazing management has resulted in recovery of

riparian areas to a properly functioning condition in this analysis area.

There are no irretrievable losses of the aquatic or semi-aquatic resources under Alternative 2. Best management practices (BMPs) are the primary mechanism to enable achievement of water quality goals and soil retention. BMPs include, but are not limited to, structural and non-structural controls and operations and maintenance procedures to reduce or eliminate introduction of pollutants into receiving waters. Project specific BMPs are in the project file and incorporated by reference.

Alternative 3 would harvest 597 acres. During average storm events the mitigation listed under Alternative 2, for the harvest units, should reduce the risk of sediment to the streams. The direct and indirect effects of Alternative 3 would be the same as Alternative 2 except for the effects of temporary road construction since temporary roads would not be constructed under this alternative. Based on research, roads cause the highest rates of sediment yield. For low intensity storms, very little if any sediment yield would occur from skidding and, based on the WEPP model, would most likely be less than existing conditions because of the same mitigation applied as in Alternative 2. For high intensity storms, some erosion is expected from skid trails and for most of the units the sediment yield rate would still be lower than existing rates because of the compaction of the soil from skidding.

Cumulative effects for alternative 3 are similar to those for Alternative 2. With the elimination of unit 24, there would be no effect in the Blacks Fork drainage. The elimination of units and associated road construction would also reduce the impacts in the Mill Creek drainage

A Biological Evaluation (Chase 2004) determined that the proposed fire salvage "**may impact individuals**, but is not likely to cause a trend toward federal listing or a loss of viability" to the Bonneville cutthroat trout population on the Forest and that the proposed fire salvage activities will have "**no impact**" on Colorado cutthroat trout due to distance between cutting units and the streams.

Bonneville and Colorado River cutthroat are management indicator species under the Wasatch

Cache Forest Plan. Based on post fire monitoring and expected effects on the habitat of these species from Alternative 2, it is believed that the Bear River and Mill Creek populations of Bonneville cutthroat trout and the West Fork Blacks Fork population of Colorado River cutthroat trout will persist over the next 15 years, based on the limited risks and moderate threats. The Mill Creek Drainage is important in that it provides habitat for a metapopulation. It is expected that the risks and threats will increase over the next 15 years as more land is sold for development. The primary concerns in the drainages are the non-native fish and some habitat impacts from historic tie hacking and grazing. It is anticipated that the Bonneville and Colorado River cutthroat trout will persist over the next 100 years also. The risks and threats are expected to increase over the next 100 years as demands for recreational opportunities and water increases.

Major populations of Colorado River cutthroat trout exist in Smiths Fork, Blacks Fork, Brush Creek, and Sage Creek. The synchrony risk is 2 with impacts from historic tie hacking continuing to affect fish habitat. The frequency and potential of large-scale uncharacteristic events is assumed moderate. The harvest of units 23 and 24 in the Blacks Fork Drainage should not impact the population in the West Fork of the Blacks Fork Drainage.

There are no irretrievable losses of the aquatic or semi-aquatic resources under Alternative 3. Soil and Water Conservation practices (SWCPs) are the primary mechanism to enable achievement of water quality goals and soil retention. SWCPs include, but are not limited to, structural and non-structural controls and operations and maintenance procedures to reduce or eliminate introduction of pollutants into receiving waters. Project specific SWCPs are in the project file and incorporated by reference.

Table 6.8. Comparison of Effects on Fisheries and Aquatic Resources.

Comparison of Effects on Fisheries and Aquatic Resources			
	Alternative 1	Alternative 2	Alternative 3
Biological Evaluations of TES Fish Populations			
Bonneville Cutthroat Trout	MIIH*	MIIH*	MIIH*
Colorado River Cutthroat Trout	MIIH*	MIIH*	MIIH*
Road and Related Effects			
Increases in sediment yield have occurred due to fire effects.	No change from existing	Slight improvement over existing	Slight improvement over Alternative 2
Water yields have increased due to fire, but unlikely to be measurable.	No change from existing	No measurable change from existing	No measurable change from existing
Instream debris recruitment is likely to increase due to fire effects.	No change from existing	No change from existing	No change from existing

* MIIH – May impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

■ **Recreation**

Reduction in Aesthetics: Timber salvage and road construction may result in the loss of quiet, back-country, non-motorized recreational opportunities.

The broader scale patterns and types of recreation uses would not change appreciably under any of the alternatives. Relatively low density recreation uses such as driving for pleasure, undeveloped primitive car camping, camping, firewood gathering, hunting, cross

country skiing, snow shoeing, hiking and horseback riding would continue to occur across all of the project area. There would be no change to the designated Recreation Opportunities Spectrum (ROS) for any of the affected areas. On the Wasatch-Cache National Forest, off highway vehicle (OHV) travel is allowed only on designated routes and areas for winter and summer recreation.

Standing fire-killed trees would present a safety concern for recreationists and a continuing

maintenance problem along travelways within the project area.

The popularity of firewood gathering is likely to increase under all alternatives. So long as fire-killed trees remain near open roads, there are likely to be increased levels of firewood collection. This is expected to diminish after several years, when the supply is depleted near roads.

Increased forage production may increase deer and elk numbers in the burned areas somewhat in coming years. It is likely that this and the more open nature of the stands may increase big game hunting opportunities.

Although this project has no effects related to Forest Plan standards for recreational uses, implementation of any of the alternatives would be consistent with guidelines, broad goals and objectives of the revised Wasatch-Cache National Forest Land and Resource Management Plan.

Under Alternative 1, the current system of open, closed, and seasonally restricted roads would remain in place. Undeveloped primitive camping and other recreation activities would remain the same. Choices to camp in certain camps may change because of user preference for camping in shaded areas. Snowmobile use would continue to be allowed or restricted as it currently is. Because of the opening up of the stands, more snowmobilers may choose to spend time in burnt stem stands. This would be a short term effect as the forest re-growth makes travel difficult as time passes.

Under Alternative 2, roads would be improved to better accommodate logging traffic. As a by-product of this work, recreationists could find roads less rutted with less challenging driving conditions than they now sometimes are. During the salvage operation recreationists would be affected by the truck traffic creating dust and noise but this would be a short-term effect (See Map 4.11.1, Appendix A). Winter recreation would be the same as Alternative 1.

Alternative 2 would have the same effects as Alternative 3 (See Map 4.11.2, Appendix A).

The major past cumulative effect that continues to affect the recreation opportunities in the analysis area is the relatively extensive network of roads. Consequently, recreation opportunities are and would continue to be of a more developed nature (semi-primitive, motorized and roaded natural ROS) around the harvest units.

■ Socio-Economics

Economics: The local economy could lose timber values if salvage is not accomplished and done in an expeditious manner.

Alternative 1 would produce no economic outputs. There would be no return on the cost of planning and analysis. Economic impacts of this alternative would be minimal when compared to other alternatives.

Alternative 2 would provide an estimated 9,248 CCF (4.4 MMBF) of timber volume offered for sale, the greatest amount of any alternative. This is approximately 50% of the annual volume needed to supply local mills. It would also maintain a total of almost 20 miles of existing system roads during the period of use. Road maintenance expenditures with this alternative are estimated to be over \$93,000. The total PNV for this alternative is estimated at \$10,500 (refer to Table 6.9).

Alternative 3 would provide an estimated 5,706 CCF (2.7 MMBF) of timber volume for sale. If all the timber volume were sold and harvested, this alternative would provide approximately 30% of the annual volume needed to supply local mills. This alternative would also maintain roads, but because of the lower level of harvest, some roads would not be used and therefore not maintained. Maintenance would not be performed on two roads within the East Fork Bear drainage because the sales would be small offerings, and prospective purchasers are unlikely to have the equipment or expertise to complete such work. The sale in the West Fork of the Blacks also would not maintain any roads I that drainage. However, maintenance deposits would be collected into the road maintenance pool for future use. Road maintenance work and deposits would be approximately \$41,300. The Present Net Value of the alternative is -\$21,400 (refer to Table 6.9).

Table 6.9. Comparison of Economic Effects. *PNV considers costs and benefits over a 60 year timeframe, with the benefits and costs discounted to current values. It provides an additional way to compare alternatives.*

Comparison of Economic Effects			
	Alternative 1	Alternative 2	Alternative 3
Timber Sale Volume			
Total Volume	0 ccf	9,248 ccf	5,706 ccf
Sale Size			
Sales Offered Under 2000 ccf	0	0	2
Sales Offered Over 2000 ccf	0	3	2
Present Net Value (PNV)			
Total Discounted Benefits (\$1000)	0	335	210.2
Total Discounted Costs (\$1000)	0	-324.5	-231.6
Total PNVs (\$1000)	0	10.5	-21.4

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

The Wasatch-Cache National Forest Supervisor has identified "Alternative 2" as the agency's preferred alternative (40 CFR 1502.14(e)).

Alternative 2 more closely fulfills the objectives of the East Fork Fire Salvage Project as stated within the Purpose and Need than the other proposed alternatives. It also more closely meets the statutory mission and responsibilities of the Wasatch-Cache National Forest, as stated within the Goals, Objectives, and Standards of the Wasatch-Cache National Forest Plan.

Given consideration of the environmental, technical, social, and economic factors identified through both internal and external scoping, this alternative more closely balances the issues, concerns and opportunities associated with restoring and recovering watersheds and the land, and working with communities and people. With carefully selected Design Criteria, Mitigation Measures, and Monitoring Requirements, this alternative protects and improves watershed conditions, and protects or improves habitat for sensitive, threatened, and endangered fish and wildlife species.

■ S.8 Identification of the Environmentally Preferred Alternative

"Alternative 3" has been identified as the environmentally preferred alternative (40 CFR 1502.14(e)). Alternative 3 also meets the statutory mission and responsibilities of the Wasatch-Cache National Forest, as stated within the Goals, Objectives, and Standards of the Wasatch-Cache National Forest Plan.

Other than reduced volume salvaged and less acres treated for fuel reduction, Alternative 3 is similar in most ways to Alternative 2. However, it does not require any temporary road construction. The primary adverse effect of temporary roads is soil displacement and estimated sediment yields associated with soil exposure. Although Alternative 2 also reduces sediment yield due to effects of compaction on skid trails, the associated temporary road construction negates some of this benefit. Loss of productivity on temporary road locations for an extended period of time is also higher under Alternative 2. Recontouring of temporary roads following one season of use mitigates most other adverse effects of the roads.

BLANK PAGE