Final Environmental Impact Statement Summary

Viveash Fire Salvage Project

Lead Agency:

USDA Forest Service
Pecos/Las Vegas Ranger District
Santa Fe National Forest

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ABSTRACT

This Final Environmental Impact Statement documents the analysis of four alternatives to harvest a portion of the fire-killed trees on the 29,000-acre burn area of the Viveash Fire. The Viveash Fire began on May 29, 2000, and burned approximately 29,000 acres in the Pecos/Las Vegas Ranger District on the Santa Fe National Forest. The primary purpose of this project is to recover value in the wood from a portion of the burn area by putting it to beneficial use in the local and regional communities. A secondary purpose is to increase employment opportunities in the area, particularly San Miguel County, which has high poverty and unemployment rates. Alternatives 2, 3, and 4 propose different levels of harvesting and roadside salvage. Alternative 1 is the No Action alternative. Alternative 2 is the preferred alternative and the Proposed Action. This document is a summary of the Final Environmental Impact Statement.

NOTE TO REVIEWERS

This decision is subject to appeal pursuant to the Forest Service regulations at 36 CFR. Any written appeal of this decision must be fully consistent with 36 CFR 5.14, "Content of an Appeal," and must be postmarked or received by the Appeal Deciding Officer, Regional Forester Harv Forsgren, USDA Forest Service, Southwestern Region, 333 Broadway SE, Albuquerque, NM, 87102 within 45 days after the date of publication of the legal notice of this decision appears in the Albuquerque Journal in Albuquerque, New Mexico.

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Summary

DESCRIPTION OF PROJECT AREA

The Viveash Fire Salvage Environmental Impact Statement (EIS) Project Area is located in north-central New Mexico (Figure 1), between the southern ends of the Sangre de Cristo and Santa Fe mountains. The Project Area encompasses 35,875 acres of public and private lands. Approximately 30,470 acres are National Forest System lands administered by the Pecos/Las Vegas Ranger District of the Santa Fe National Forest.

A large portion of the Project Area falls within the Cow Creek Watershed, which is a major tributary of the Pecos River (Figure 1-2). Elevations within the Project Area range from approximately 7,717 feet (ft) at the southern extent of Cow Creek to 11,661 ft at the summit of Elk Mountain. The Pecos Wilderness borders the Project Area to the north.

BACKGROUND

The Viveash Fire began in the Sangre de Cristo Mountains on May 29, 2000, and burned approximately 29,000 acres in the Pecos/Las Vegas Ranger District of the Santa Fe National Forest between the towns of Pecos and Las Vegas, New Mexico. The fire burned 2,000 acres of forest the first day and more than 26,000 acres the following day.

Both private and national forest lands were burned. Approximately 40 privately owned structures were threatened by the fire, and a portion of the Gallinas River Watershed, the source of municipal water for the city of Las Vegas, was burned. The fire, suspected to be human-caused (USDA Forest Service 2000a), was fully contained on June 9, 2000.

PURPOSE AND NEED

There is a need and demand for wood and various wood products used throughout New Mexico. The local communities of Pecos, Santa Fe, and Las Vegas rely on the national forest harvest for wood products, including firewood, vigas, poles, and latillas. The primary purpose of the proposed harvesting is to recover value in the wood from a portion of the burn area by putting it to beneficial use in the local and regional communities. A secondary purpose is to increase employment opportunities in the area, particularly in San Miguel County, which has high poverty and unemployment rates and a low average income.

Areas proposed for harvest include high- and moderate-burn severity areas within ¼ mile of existing roads that are less than 35 percent slope. These areas were selected in order to minimize damage to green trees, eliminate the need for new roads, and minimize erosion from harvesting.

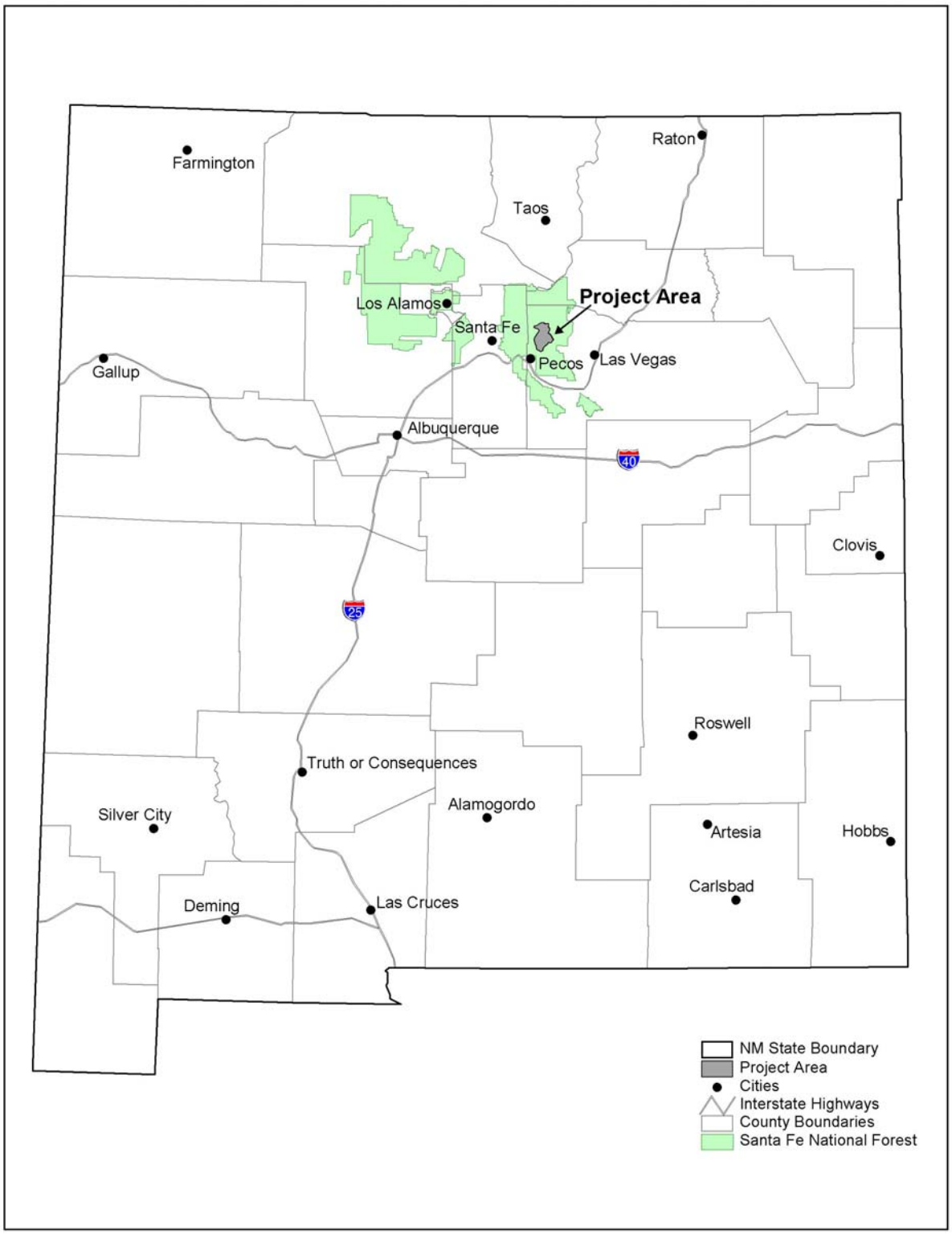

Figure 1. Viveash Fire EIS Site Location Map

PROPOSED ACTION

The U.S. Department of Agriculture (USDA) Forest Service (USFS) proposes to harvest a portion of the fire-killed trees on approximately 6,700 acres of the 29,000-acre area burned in the wildfire. Fire-killed trees are defined as those having no green needles present on the tree. The proposed harvesting activities are described below.

- Harvest 40 to 80 percent of standing fire-killed trees on approximately 5,600 acres from within the high- to moderate-burn severity areas on lands with slopes generally less than 35 percent and within ¼ mile from existing roads in the Project Area. The slash would be mostly left onsite to aid in erosion control. This large area, or block area, salvage would be accomplished with ground-based equipment, including skidders and feller-bunchers. This type of salvage is primarily outside roadside areas, where logging equipment is needed to remove material. These areas would be treated primarily through timber sales contracts of all sizes.

- Along selected roadside areas outside the block salvage harvest areas described above, fire-killed and hazard trees would be harvested for sawtimber, firewood, and other specialty products. This would occur on approximately 1,100 acres throughout the Project Area, and is in addition to the 5,600-acre harvest area. A total of 6,700 acres would be salvaged.

- Approximately 43 miles of currently closed roads would be opened to facilitate salvage operations for the Proposed Action. These roads would be closed or decommissioned after salvage activities have taken place. Closure of roads would involve using barricades to prevent access, and decommissioning would include removing culverts, providing for natural stream course function in intermittent and ephemeral draws, installing waterbars and dips, and barricading the road.

A comprehensive analysis of the transportation system and watershed conditions was performed to identify forest roads that are unnecessary, unstable, or poorly located so that they can be improved, decommissioned, or obliterated. This Roads Analysis identified the following road projects (Foster Wheeler Environmental 2001a). These road projects are not connected to the salvage proposal. They are considered similar actions, that, when viewed with the salvage actions, have similarities that provide a basis for evaluating their environmental consequences together. The proposed road projects and salvage harvest will be analyzed in this EIS in order to adequately assess the combined impacts of these similar actions.

Road Realignments

These activities would involve closing or decommissioning a portion of a road and constructing a new road or segment in a different location.

- Murphy's private land access would remove approximately 5 miles of existing roadway in the Willow Creek Watershed and replace it with approximately 1.5 to 2 miles of new road located upslope. The existing road along Willow Creek would be closed and parts of it would be decommissioned. The new road would be constructed to reduce current erosion and sedimentation in Willow Creek and to improve access to private land.

- A portion of Forest Road (FR) 86 would be realigned. The realignment covers approximately 1.5 miles beginning at the junction of FR 86/92 and ending at the Manzanares Creek crossing. The realigned segment of road would have a Maintenance Level (ML) of 3, which allows for sedan passage with some rider comfort. The purpose of the realignment of this portion of FR 86 is to move the road to a better location for resource protection and public safety. The existing road is located in the bottom of Tijeras Canyon, which leads to water runoff and stream sedimentation even during moderate runoff events. This makes the road unusable and creates a safety hazard for people who may attempt to drive on it during a runoff event.

- FR 86 from the Manzanares Creek crossing to the Bull Creek crossing would also be realigned for 2.3 miles, resulting in a stable and maintainable surface that would protect streams and water quality without requiring ML 3 maintenance standard.

- Approximately 1 mile of FR 92 within the Rito de la Osha Creek would be realigned away from the stream channel and the old section closed or decommissioned. Culverts would be installed at all stream crossings of tributaries in this realigned section. Portions of FR 92 in the Project Area would also be upgraded, with 13 miles of road becoming ML 2 (allowing passage of high-clearance vehicles) and 7 miles becoming ML 3 for use by passenger vehicles.

Bridge or Culvert Replacement/Construction

- Bull Creek private land access (Tapia property) would require construction of a bridge or culvert where FR 86 crosses Bull Creek. The crossing is near the end of FR 86 and is presently a low water crossing of Bull Creek. This proposal would serve to provide access to private land in the Bull Creek area and protect the stream channel and water quality of Bull Creek.

- The FR 86 culvert at Cow Creek would be replaced with a larger arch culvert. The current culvert is undersized for the high volume of water and debris that pass through it during runoff events. Replacing the culvert with a larger one would reduce the risk of failure and consequent damage to the stream and the road.

- Three concrete bridges over Cow Creek on FR 92 would be replaced. This would serve to straighten the road alignment and increase vehicle safety at the crossings. These bridges were built in the 1960s and while structurally sound, have been affected by the flooding. Replacing these bridges will improve debris passage and enhance public safety.

- A temporary crossing of FR 92V at Elk Creek would be constructed for harvest activities and would be removed following all the proposed management actions.

Decommissioning Activities

Decommissioning of a road is a process that involves more than preventing access with a gate. In the Proposed Action, decommissioning a road would include removal of culverts, restoration of drainages, and natural revegetation.

- The FR 92V system, which includes 12.5 miles of road and seven stream crossings, would be decommissioned following management actions. Decommissioning of this system would include removing culverts, installing waterbars and dips, and barricading the road to reduce road density in this area to meet the Santa Fe National Forest Plan (Forest Plan) standards designed to improve watershed and wildlife habitat conditions. The FR 92V system is not necessary for public or private land access.

Timing of Proposed Action

Salvage harvesting would occur over a 3- to 5-year period. This salvage harvest project must be implemented quickly, before the commercial value of the wood is significantly reduced due to damage from insects, weathering, and decomposition. The road projects would occur within the first 1 to 2 years, except for the decommissioning of the FR 92V system, which would occur after all salvage and rehabilitation activities are completed.

Proposed Mitigation

Harvest activities would not occur on wet or saturated soils, within occupied spotted owl or goshawk territories or within areas that may impact heritage resources. Salvage would not occur in designated stream management zones (SMZs) and logging equipment would not be allowed within riparian areas.

PUBLIC INVOLVEMENT

The public scoping process was initiated with the publication of the Notice of Intent (NOI) to prepare an EIS on March 16, 2001, in the Federal Register. Public scoping continued with the distribution of a Scoping Notice to local newspapers and individuals, organizations, and government agencies on the project mailing list. A public meeting was also held on March 29, 2001, to inform the public about the EIS and to solicit public input.

ISSUE IDENTIFICATION

The scoping process identified several issues with the Proposed Action. These issues were analyzed by the USFS and the technical team completing the EIS to identify issues key to alternative development. Three significant issues that were key to alternative development were identified. These issues were then used to develop alternatives to the Proposed Action that would respond to the Purpose and Need and address the issues. The effects of the alternatives on these issues were analyzed and are presented in Chapter 4 of this EIS.

Significant Issues

The significant issues that encompass soil, water quality, and quality of fish habitat were key to alternative development. Salvage harvesting would entail the use of heavy machines that are designed to cut trees and/or remove logs. These heavy machines, operating on moderately to severely burned sites, could increase soil compaction, which could lead to increased surface runoff. Operation of heavy equipment could increase soil disturbance and erosion rates that are already above normal due to the burned soil conditions. Skid trails, created by dragging the logs to the road, could create channels for surface runoff that could increase erosion. If eroded soil reaches a stream, it may be deposited and increase sedimentation and turbidity, which may adversely impact water quality and fish habitat. This could delay recovery of fisheries in Cow Creek and its tributaries.

Construction of new roads (FR 86 realignment and Murphy's private land access) includes the cutting and removing of trees and stumps and the use of bulldozers to create the road surface. This soil disturbance could lead to increases in soil erosion, and if the eroded soil reaches a stream, it could cause increased sedimentation with effects similar to those described above for the harvesting activities.

Important Issues

The first important issue is the economic effects of the salvage sale. There are two aspects to the economic issue—jobs and the availability of wood products to the local community. Many new jobs could be created in Pecos and surrounding communities from the salvage activities. San Miguel County has higher poverty rates, lower average incomes, and higher unemployment rates than state averages. The county would benefit from the creation of jobs associated with the salvage activities. The local community values the wood products from the forest for use as firewood, house logs, vigas, and latillas, and sawlogs.

Other important issues include transportation, terrestrial wildlife, forest vegetation, and visual resources. These concerns were not identified as significant issues and therefore did not lead to the development of additional alternatives. The Project Record for this EIS contains additional detail on the analysis and mitigations for these concerns.

Other Concerns

Concerns that are easily addressed through mitigation are analyzed in less detail in Chapter 4 of the EIS, including range resources, recreation, heritage resources, air quality, fire and fuels, noxious weeds, wetlands, sensitive plants, and roadless areas in the Project Area, in accordance with 40 CFR Part 1500.4. The Project Record for this EIS contains additional detail on the analysis for these concerns.

ALTERNATIVE DEVELOPMENT

An alternative is a set of management actions that meet both the Purpose and Need of the Proposed Action while addressing one or more significant issues. An alternative is considered reasonable if it is feasible and would achieve the Purpose and Need. Alternatives considered but eliminated from further analysis included those that were beyond the scope of this action, failed to meet the Purpose and Need, were poorly defined, or were unlikely to be implemented.

Alternatives Considered but Eliminated from Detailed Study

There were two alternatives that were considered but eliminated from further analysis in the FEIS. The first one considers the entire area within the Cow Creek Watershed burned by the Viveash Fire for salvage timber harvesting. This would involve salvage logging of fire-damaged trees on approximately 27,500 acres of high-, moderate-, and low-burn severity (approximately 100 to 200 million board ft [MMBF]). The salvage logging would require extensive new road construction for access, temporary opening and maintenance of existing forest roads, cable/helicopter yarding systems on steeper terrain, and access across adjacent private lands.

This alternative was not considered in further detail because it is not economically feasible (due to amount of cable/helicopter logging costs) and would require salvaging on steep slopes close to streams that would result in unacceptable impacts to water quality.

The second alternative considered but dismissed from further analysis involves logging approximately 14,042 acres of high-burn severity and 3,207 acres of moderate-burn severity areas within the Viveash Fire perimeter. These burned areas are located in the Cow Creek and Upper Bull watersheds. The potential harvest area would provide approximately 50 to 60 MMBF of timber.

Logging of the burned areas would entail new road construction, modification of the existing transportation system, use of cable/helicopter yarding systems, and access across adjacent private lands. This alternative was not considered in further detail because it is not economically feasible for the same reasons identified for Alternative A.

ALTERNATIVES CONSIDERED IN DETAIL

There are four alternatives developed and analyzed in the EIS, including a No Action alternative, and three action alternatives, including the Forest Service Preferred Alternative.

Alternative 1—No Action

Under Alternative 1, none of the proposed actions of salvage harvesting or road management would be implemented in the Project Area.

Alternative 2—Proposed Action

This is the Forest Service Proposed Action and Preferred Alternative. This alternative is described in detail under the Proposed Action section above.

Alternative 3

This alternative was developed in response to the key issues of soil erosion, water quality, and fish habitat.

Harvest Activities

Salvage activities are the same as those identified for Alternative 2 with the following changes:

- Standing fire-killed trees on approximately 2,900 acres from areas of high- and moderate-burn severity in the Cow Creek Watershed would be removed. Over a 3- to 5-year period, the estimated output of wood products expected to be removed from the Project Area would be approximately 10,000 cords of firewood and 12 to 15 MMBF of sawtimber.

- Roadside salvage areas for this alternative would include 2,000 acres.

Road Management Activities

The road management activities for this alternative would be the same as those described in Alternative 2, the Proposed Action. Approximately 43 miles of currently closed roads would be opened to facilitate salvage operations for this alternative. These roads would be closed or decommissioned after salvage activities have taken place. Closure of roads would involve using

barricades to prevent access and decommissioning would include removing culverts, providing for natural stream course function in intermittent and ephemeral draws, installing waterbars and dips, and barricading the road.

Alternative 4

Alternative 4 was developed in response to the key issues of soil erosion, water quality, and fish habitat. Under this alternative, 2,600 acres would be designated for roadside salvage. The proposed treatment area would not exceed 150 ft on either side of the roads. This alternative was designed to minimize the potential for adverse soil erosion, water quality degradation, and impacts to fish habitat by allowing salvage only within 150 ft on either side of existing roads. The trees would be removed as firewood through the issuance of firewood cutting permits, and other specialty products and sawtimber through small commercial sales. Under this alternative, an estimated 10,000 cords of firewood, including specialty wood products, would be the potential output of wood products over a 3- to 5-year period.

Road Management Activities

The road management activities for this alternative would be the same as in Alternative 2. Refer to Alternative 2 for a discussion of transportation activities for this alternative.

Approximately 37 miles of currently closed roads would be opened to facilitate salvage operations for this alternative. The 2,600 acres of roadside salvage are adjacent to these roads, which would be closed or decommissioned after salvage activities have taken place. Closure of roads would involve using barricades to prevent access and decommissioning would include removing culverts, providing for natural stream course function in intermittent and ephemeral draws, installing waterbars and dips, and barricading the road.

ALTERNATIVE COMPARISON

Some selected features that differ by alternative are displayed in Table 1.

Table 1. Comparison of Proposed Salvage and Streamside Buffers by Alternative

Proposed Activities	Alternative			
	1	2 Proposed Action	3	4
Harvesting				
Fire Salvage Area (acres)	0	5,600	2,900	0
Roadside Salvage (acres)[2]	0	1,100	2,000	2,600
Salvage Volume	0	10,000 cords and 20–25 MMBF	10,000 cords and 12–15 MMBF	10,000 cords
Streamside Buffers (ft)[1]				
Category 1 and 2 Subwatersheds	NA	100	200	100
Category 3 and 4 Subwatersheds	NA	200	NA	100

[1] Category 1, 2, 3, and 4 subwatersheds are defined in Foster Wheeler Environmental (2001b).
[2] Roadside salvage areas are outside of the block area salvage.
NA = Not applicable

Table 2 provides a summary of the effects of the alternatives with respect to the Purpose and Need and significant issues. Differences in effects provide a basis for choice among the alternatives. A brief discussion is provided below on the effects of the alternatives on the key issues. Detailed analyses and discussion of the effects for all resources are presented in Chapter 4 of the EIS with additional details contained in the Project Record.

Table 2. Comparison of the Effects of Alternatives

Purpose/Need and Issues	Alternative			
	1	2 Proposed Action	3	4
Significant Issue: Soils				
Soil Loss Change	0%	< 11%	< 7%	<2%
Significant Issue: Water Quality				
Road density (mi/sq mi)	2.6	2.3	2.3	2.3
Sediment delivery Change	0%	<11%	<7%	<2%
Delay in Sediment Yield Recovery (years)	0	<1	<1	<1
Significant Issue: Fish Habitat				
Reduction in physical fish habitat	No Effect	Low probability	Low probability	Low probability
Important Issue: Economics				
Wood recovery (MMBF)	0	20–25	12–15	0
Specialty products (cords)	0	10,000	10,000	10,000
Full-time jobs created	0	248–302	146–178	52–57
Total regional income creation (millions)	$0	$6.4–7.8	$3.7–4.6	$1.4–1.6
Important Issue: Transportation				
Delay Log truck trips	0	5,556	3,334	0
Small vehicle (e.g., pickups) trips	0	6,667	6,667	6,667
Important Issue: Terrestrial Wildlife				
Threatened, endangered, and sensitive Species	No effect	May affect, not likely to adversely affect	May affect, not likely to adversely affect	May affect, not likely to adversely affect
Management indicator species	No effect	No effect	No effect	No effect
Migratory bird species	No effect	No adverse effects	No adverse effects	No adverse effects
Important Issue: Forest Vegetation				
Change in forest structure	None	Minor	Minor	Minor
Change in live forest vegetation	None	No effect	No effect	No effect
Important Issue: Visual Resources				
Visual effects	None	Short-term	Short-term	Short-term

mi/sq mi = miles per square mile

Significant Issues

Soils

The primary concern relating to soil resources is that logging may increase soil erosion from burned areas, which would reduce site productivity and revegetation potential. Substantial amounts of soil productivity have already been lost because of the Viveash Fire, and soil productivity may decrease with the creation and use of roads, landings, and skid trails.

Alternative 2 would result in 15.5 fewer miles of road for the entire Project Area, once roads are decommissioned after implementation of salvage activities. In order to relocate roads away from streams, there would be some soil productivity loss caused by creating new road segments.

However, there would be an overall gain in vegetative recovery and long-term soil productivity by the extensive amount of proposed road decommissioning. The effects of decreasing road density would be a reduction in soil erosion and improvement of soil productivity. Therefore, the effect would be positive for soil productivity in the long term.

Ground cover would also improve with the scattering of treetops, limbs, and unmerchantable wood from the salvage activities. Leaving this material on site would reduce overall soil erosion. The WEPP model predicts the effects of harvesting would be increased soil erosion of up to a maximum of 11 percent above the existing soil erosion rates (Table 2). However, with the expected application and effectiveness of BMPs and other mitigation measures, the actual increase in soil erosion should be well below the 11 percent increase predicted by the model.

Water Quality

The primary water quality issue is that salvage logging could cause erosion that would adversely affect water quality in Cow Creek, its tributaries, and ultimately the Pecos River. Water quality is particularly important because Cow Creek is a high-quality cold-water fishery. Most of the streams in the Project Area were impacted by increased sediment deposition as a result of the Viveash Fire and storms that followed, and do not currently support beneficial uses. Most of the Project Area streams, including Cow Creek, currently do not support fish populations.

Alternative 2 would result in reduced road density, from 2.6 mi/mi^2 to 2.3 mi/mi^2 for the entire Project Area and improve several stream crossings. Sediment delivery resulting from existing roads would be lowered through the reduction in road density. The application of appropriate BMPs would reduce most of the potential impacts to water quality caused by road relocation and replacement of culverts and bridges. The projected effects of decreasing road density would be to reduce soil erosion and sediment delivery to streams and, therefore, maintain or enhance water quality.

The reduced road densities, low predicted increases in sediment delivery, no delay in recovery of sediment delivery, and specific mitigation measures designed to reduce sediment delivery to streams result in a low probability of generating noticeable or measurable effects from this alternative. Implementation of the mitigation measures and BMPs, and the effectiveness monitoring would ensure compliance with the CWA and Forest Plan. Therefore, the direct and indirect effects of Alternative 2 on water quality in the Project Area would have a low probability of generating noticeable or measurable changes.

Fish Habitat

The primary concern for fish habitat and riparian ecosystems in the Project Area is the movement of sediment through the stream systems that results in a reduction in quality of fish and stream habitat. Fine sediment inputs from surface erosion and road failures are known to have deleterious effects on fish species, including the Forest Service Region 3 sensitive species, Rio Grande cutthroat trout. In fact, large amounts of fine ash sediment in addition to increased streamflows have eliminated all fish species from the majority of the Cow Creek drainage. The potential for direct and indirect effects to fish and aquatic resources from the Proposed Action is measured in relation to potential for sediment input from the miles of road to be decommissioned, acres and types of timber

harvested, and location of timber harvest on sensitive land types that would be more prone to erosion and sediment input.

The primary effect of ground-based logging activities on fish habitat and riparian ecosystems would be in the form of additional sediment delivery to stream channels, which could potentially affect fish habitat and spawning areas. The water quality analysis concluded that the Proposed Action would have a low probability of generating noticeable or measurable sediment increases in stream channels (Table 2). Therefore, there would be a corresponding low probability of adverse effects to fish habitat due to sediment impacts for the Proposed Action.

The cumulative effects of the Proposed Action are analyzed in combination with future foreseeable actions in and around the Project Area. These future foreseeable actions may include private land harvest activities, restoration activities, and construction and restocking of privately owned fish ponds. Post-fire restoration activities on private land and rehabilitation activities on national forest land are predicted to continue to contribute to an improvement in water quality and fish habitat. The direct and indirect effects of this alternative are predicted to have a low probability of generating noticeable or measurable changes. Road improvements and decommissioning would likely contribute to the existing positive trend for fish habitat. Although harvesting may detract slightly from that trend, the overall cumulative effect would be maintaining the trend of fish habitat recovery in the Project Area. Therefore, the cumulative effects of the Proposed Action would be that the Rio Grande cutthroat trout would likely be unaffected. This conclusion is based upon the direct and indirect effects discussed above, use of Best Management Practices (BMPs), evaluation of the magnitude and locations of the actions, and professional judgment.

Important Issues

Economics

The evaluation of the effects of the alternatives on economics was based on income and employment generated. The analysis of products harvested used volumes as the unit of measure expressed as thousand board feet (MBF) or million board feet (MMBF). Employment impacts were estimated using the combined harvest volume from sawlogs, specialty products, and firewood.

As shown in Table 2, total harvest level of products sold and removed under the Proposed Action would be expected to be between 20 MMBF and 25 MMBF and approximately 10,000 cords of specialty wood products would be produced. Total employment in logging and wood products industries and the indirect and induced employment generated would be between 248 and 302 full- or part-time job opportunities created or retained if all proposed harvesting were to occur in a single year. Estimated total income generated from these job opportunities would translate into a total income range of $6.4 million to $7.8 million. This also translates into an additional 2.06 job opportunities are created throughout other sectors of the regional economy for every wage and salary job in the logging and wood specialty products industries. When combined with private logging activities, the cumulative number of jobs generated would be between 312 and 366. Though not all job opportunities associated with the Proposed Action would occur in every year, it is clear from these numbers that the job opportunities associated with this sale and other logging activities in the area would contribute substantially to forest-products related employment in San Miguel, Santa Fe, and Rio Arriba counties.

Transportation

A detailed Roads Analysis has been completed for the Project Area (Foster Wheeler Environmental 2001a). In this Roads Analysis, road management objectives were set for all roads in the Project Area other than those slated for decommissioning or obliteration. The transportation system would be substantially improved through the projects described under the Proposed Action. The road realignment and upgrade of culverts would reduce the continuing deterioration to the road system and improve subsequent maintenance. By raising the maintenance level (ML) of the public road portion of system, budget increases for road maintenance and operations would be stimulated. The Proposed Action would minimize difficult driving conditions in portions of the Project Area.

The removal of the 20-25 MMBF of sawtimber, vigas, and house logs would require a maximum of 5,556 logging truck trips, assuming 4,500 board ft per logging truck. An additional 6,667 small vehicle trips would be required to harvest the 5,000 to 10,000 cords located in the 1,100 acres of roadside salvage. The overall effects of the Proposed Action on traffic are not significant because the logging trucks would be required to operate during the hours of 7 a.m. to 7 p.m., while at the same time avoiding peak traffic hours. The estimated number of daily trips by all logging vehicles is 16. The main intersection in the village of Pecos involves Highways 50 and 63, and it currently has a high traffic volume. Therefore, 16 logging trucks passing through each day would have a negligible effect.

Noise mitigations within the village of Pecos include the prohibition of log truck hauling during weekends and holidays and between the hours of 7:00 p.m. to 7:00 a.m. weekdays. Noise would be mitigated further by prohibiting the use of jakebrake type brakes. The large number of personal vehicles utilized for roadside salvage efforts would result in a slight increase in noise effects when traveling through the village of Pecos.

Noise emanating from logging vehicles on national forest lands would be noticeable to those using the area for recreation. This noise effect is not long-term, and would only affect the Project Area until the logging efforts are complete.

Terrestrial Wildlife

Current management direction on desired conditions for selected wildlife on the national forest land are included in the National Forest Management Act of 1976 (NFMA), Endangered Species Act (ESA), Migratory Bird Treaty Act (MTBA), Forest Service Manual, Forest Plan for Santa Fe National Forest (Forest Plan), species-specific recovery plans, species management plans or conservation strategies, and the Regional Forester's policy and management directions.

Threatened, Endangered, and Sensitive Species

A preliminary screening of terrestrial species was conducted to identify species to be included in the effects analysis. One federally listed species, the threatened Mexican spotted owl; four Forest Service Region 3 Sensitive Species including American peregrine falcon, northern goshawk, New Mexican (meadow) jumping mouse, and Rio Grande cutthroat trout; twenty migratory bird species (Table 3-14); and five terrestrial Management Indicator Species (MIS) including Merriam's turkey, mourning dove, Mexican spotted owl (covered under ESA), hairy woodpecker, and Rocky Mountain elk were found to potentially occur in the Viveash Project Area. Other species that were determined to have low probability of occurrence in the Project Area were not further considered in the EIS. The

Mexican spotted owl, a management indicator species and federally threatened species is covered in detail in the Biological Assessment (BA) found in the Project Record. The northern goshawk, and other Forest Service Sensitive Species, is covered in detail in the Biological Evaluation (BE) found in the Project Record.

Direct and indirect effects on these species include the potential impacts on individuals of a species or the loss of suitable habitats.

The salvage areas in the Proposed Action overlap designated Mexican spotted owl Protected Activity Centers (PACs). However, in general, salvage logging would be modifying already unsuitable or marginal Mexican spotted owl habitat created by the catastrophic wildfire. The Viveash Fire left a mosaic of moderate-/high-burn severity and low-burn severity/unburned areas in the Project Area. The loss of closed canopy, tree dominated habitats on national forest land and adjacent private land has had an impact on the distribution of nesting/roosting habitats preferred by the Mexican spotted owl. The management actions in the Proposed Action include the removal of fire-killed trees. Reforestation in the burned areas would contribute positively to Mexican spotted owl habitat by developing desired forest conditions in the future. Streamside areas may provide some level of habitat connectivity at the landscape-level by retaining what is left of the tree-dominated riparian areas that were not burned by the Viveash Fire.

Mexican spotted owl surveys conducted in 2001 and 2002 indicated the presence of owls in the Cow Creek/Lower Cow and Creek/Upper Cow Mexican spotted owl PACs. There would be no logging activities within these occupied PACs. Activities within a ¼ mile PAC buffer would be conducted outside of breeding season. Further, no salvage logging would take place on any slopes greater than 35 percent. All PACs, with the exception of the fire-destroyed Rosilla/Elk/Middle Cow PAC would be surveyed during the 2002 breeding season prior to project implementation. In the event spotted owls are located, all applicable mitigation measures would be implemented. This procedure is in compliance with the Mexican spotted owl Recovery Plan (U.S. Fish and Wildlife Service 1995) protocol, in that no more than one breeding season will have elapsed since the last survey and the action. Therefore, the activities associated the Proposed Action may affect, but not likely adversely affect, the Mexican spotted owl. The U.S. Fish and Wildlife concurred with this decision in a letter dated May 9, 2002 (located in Project Record).

Based on historic occurrences, four designated northern goshawk Post-Fledgling Areas (PFAs) are located within the Project Area. Similar to the Mexican spotted owl, the northern goshawk is closely associated with closed-canopy late successional forests. As a result of the catastrophic wildfire, open-grassland/early seral forests dominate the landscape and the existing forest condition provides mostly unsuitable habitat for the northern goshawk. A survey conducted in 2001, indicated that that there is only one active PFA, Manzanares, in the Project Area. This PFA was only partially damaged by the wildfire.

The determination of effects in the BE concluded that the Proposed Action would not likely adversely affect the northern goshawk. No salvage activity is planned in the currently active northern goshawk PFA. The Proposed Action activities would not take place in the Manzanares PFA during the breeding season months of March through September

Management activities on National Forest System lands within the Project Area and elsewhere, and on adjacent private lands, could cause incremental loss of suitable nesting habitat for the goshawk, such as closed-canopy forest with large trees. However, the Proposed Action would remove fire-killed trees with altered canopy structure. Reforestation (natural regeneration and/or tree planting) in the burned areas would contribute positively to northern goshawk habitat by developing the desired stand structure and canopy cover.

The cumulative effects analysis of the Proposed Action on the northern goshawk includes evaluating activities on private land combined with the salvage and road projects. Activities on private land may have occurred within designated PFAs; however the salvage and road projects proposed in Alternative 2 would not contribute cumulative effects. The cumulative effects of the Proposed Action may affect, but not likely adversely affect, the northern goshawk.

Management Indicator Species

As described above, there are five MIS that have potential habitat and/or occurrence within the Project Area. The Mexican spotted owl is discussed above and will not be repeated here. Effects to Merriam's turkey, mourning dove, hairy woodpecker, and Rocky Mountain elk are the same for all action alternatives, including the Proposed Action.

These species (and associated wildlife species) would be subject to disturbance and/or displacement for the short duration of the activities under the Proposed Action. The effects of disturbance would not likely be measurable above normal population fluctuations that occur from year to year. Over the long term, the reduced road density would decrease the disturbance associated with road use.

Harvesting dead trees would not significantly alter habitat for the turkey, dove, or elk since these species do not depend on an abundance of dead trees. Therefore, the Proposed Action would not be likely to influence the overall population status, viability, or trend of these species. No adverse impacts to these species are anticipated. Further, given the minimal short-duration nature of direct or indirect effects expected, even when adding normal levels of disturbance from other management activities, rehabilitation efforts, recreational activities, and private land uses in the area, cumulative effects expected to be minimal.

The hairy woodpecker would be similarly affected by the short-duration noise disturbance and may be temporarily displaced as a result. However, no adverse or long-term impacts would be expected from harvesting a portion of the dead trees in the area and implementing the road improvement activities. The number of snags that would remain in the area after salvage harvest is completed would be higher than pre-fire levels. Thus, the direct, indirect, and cumulative effects on the hairy woodpecker would not differ overall from the effects described for other species above.

Migratory Bird Species

The effects on migratory birds were analyzed by evaluating the New Mexico Partners in Flight Species of Highest Priority for each habitat type found in the Project Area. There are twenty species identified The nationwide list of Important Bird Areas was evaluated, and the Viveash Project Area is not on the list. It was also assessed for its potential as an important overwintering area. Due to its relatively high elevation and lack of large water bodies, it is not an important overwintering area.. For short periods, salvage and road management activities could disturb migratory birds during

operations. However, the noise and visual disturbance would not be expected to have long-term effects on these bird species. They would avoid the areas of disturbance temporarily, then return to these areas or move to other areas.

Forest Vegetation

The forest-wide and management area directions, goals, standards, and guidelines in the Forest Plan were reviewed and would be met for all action alternatives, including the Proposed Action.

Under the Proposed Action, salvage timber harvest would only remove standing fire-killed trees from areas of high-and moderate-burn severity. Thus, there would be no effect on live forest vegetation. The salvage harvest would alter the forest structure by reducing the number of snags. However, the forest canopy cover has been modified by the catastrophic wildfire, with opened forest structure and a future potential for downed logs characterizing the post-fire conditions. Snags would be left at a density of 4 to 6 stems per acre and downed wood would be retained under the Proposed Action. This meets Forest Service Plan standards.

Road relocation and roadside salvage activities would not have direct, indirect, or cumulative effects associated with forest composition and structure because of their small area. Salvaging on private land has reduced the number of snags, and the salvage activities on national forest lands under the Proposed Action would not significantly alter the landscape structure that currently exists within the Project Area. The natural-caused landscape pattern would undergo the pathways of forest development starting with even-aged forest structure. Snag and downed dead wood standards in the Forest Plan would be met even after many snags have fallen down 15 years after the Viveash Fire. Therefore, the direct, indirect, and cumulative effects of the Proposed Action on forest structure are expected to be minor.

Scenic Resources

Management direction regarding scenic resources is derived from the Forest Plan and *Landscape Aesthetics: A Handbook for Scenery Management* (USDA Forest Service, 1995b). The evaluation criteria used to analyze the effects of the Proposed Action on scenic resources includes immediate scenic effects of project activities and whether scenic integrity objectives are being met throughout the Project Area as assessed through long-term monitoring of scenic resources.

Under the Proposed Action, the potential exists for adverse direct effects on scenic resources. Slash and unmerchantable trees could create scenic impacts on roads, trails, scenic corridors, or residential areas. However, all roads, trails, and access areas would be kept free of slash and unmerchantable trees. In addition, within 100 ft of roads and trails, unpiled slash and unmerchantable tree accumulations would be less than 1.5 ft in height.

Logging trucks, skid trails, and landings could also create scenic impacts. In general, such impacts would be short-term impacts viewed from the foreground that would occur during harvest activities. These impacts would also be minimized through mitigation measure described earlier.

Cumulative effects on scenic resources from the Proposed Action would be short-term in duration (1-2 years) and the positive effects of erosion control measures would lead to very positive long-term cumulative scenic effects from the regeneration of vegetation.

This Final Environmental Impact Statement (FEIS) is organized to comply with Council on Environmental Quality (CEQ) regulations and Forest Service Guidelines for implementing National Environmental Policy Act (NEPA) and CEQ regulations. Chapter 1 describes the Purpose and Need for this FEIS. Chapter 2 details the range of alternatives that were developed in response to issues raised during the scoping process and describes those alternatives that were eliminated from further analyses. Chapter 3 describes the environment that may be affected by the decision of this FEIS. Chapter 4 describes, evaluates, and compares the potential impacts of the range of alternatives selected for analysis on physical, biological, and socioeconomic resources. Chapter 5 contains the works cited, list of preparers, Forest Service personnel consulted, list of agencies, organizations and individuals to whom the FEIS and/or Record of Decision are sent, glossary, and an index.

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