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Environmental Assessment

North Washoe Valley Wildfire Risk Reduction and Ecosystem Enhancement Project



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SUMMARY

The Humboldt Toiyabe National Forest proposes to reduce the risk of wildfire and improve ecosystem conditions in the North Washoe Valley area of Washoe County, Nevada. The project includes 5600 acres of which 2500 acres would be actively treated. This includes 400 acres of brushfields 2000 acres of forested stands, and 100 acres of riparian vegetation.

This area is proposed for treatment now because it is among the largest blocks of forested land remaining along the Sierra Front. Much of the front country has suffered stand-replacing fires in the past few decades (Fire History Map). Areas that were forested are now brushfields. A major concern is a repeat of the events that caused the Little Valley fire just south of the project area twenty years ago. This includes a large number of lightning strikes along the Sierra Front, exceeding the capacity of firefighting resources, particularly air resources.

Treatments in brushfields would primarily involve mechanical treatment to produce chips that would be removed or decompose on site over time or to pile the brush and burn the piles during the winter.

Treatments in forested stands would involve mechanical thinning of mostly smaller trees to decrease the amount of ladder fuels and increase the spacing between trees. All trees over 30 inches in diameter would be left on site. The target canopy cover would be roughly 40 percent in treated areas. The trees would be harvested through a combination of ground based logging equipment and helicopters (Project Overview Map).

In riparian areas, conifers would be removed to allow for expansion of aspen and other riparian species.

Mechanical treatments would be followed by broadcast or underburning in low risk areas

away from adjacent parks and homes. Broadcast or underburning is needed because the mechanical treatment is targeted at removal of ladder and canopy fuels. To be most effective, treatment of surface fuels is also needed (Peterson, 2003). This would only occur under proper weather conditions and only after small test burns have been completed and fire hoses have been laid.

In order to accomplish these treatments, about 15.5 miles of roads would need to be used. Most of the roads currently exist and would need either maintenance or reconstruction for truck use. About three miles of new roads would be needed. All of the roads would be closed and gated after the project is completed. They would be used for administrative uses only, primarily fire fighting and law enforcement. No new roads or areas would be open for motor vehicle use.

Pursuant to timely guidance from the Sierra Forest Plan Amendment of 2004, about half the area is proposed for strategically placed land area treatments. Treatment locations have been designed to serve as "speed bumps" in the event of the wildfire. They would slow the spread of the fire and cause it to drop from the crowns of the trees down to the ground. This would provide for safe firefighting conditions and for returning fire to a more natural role in the ecosystem.

Monitoring of on-the-ground implementation of this project would include participation by Forest Service personnel, other agencies, interest groups, adjacent homeowners, and other interested



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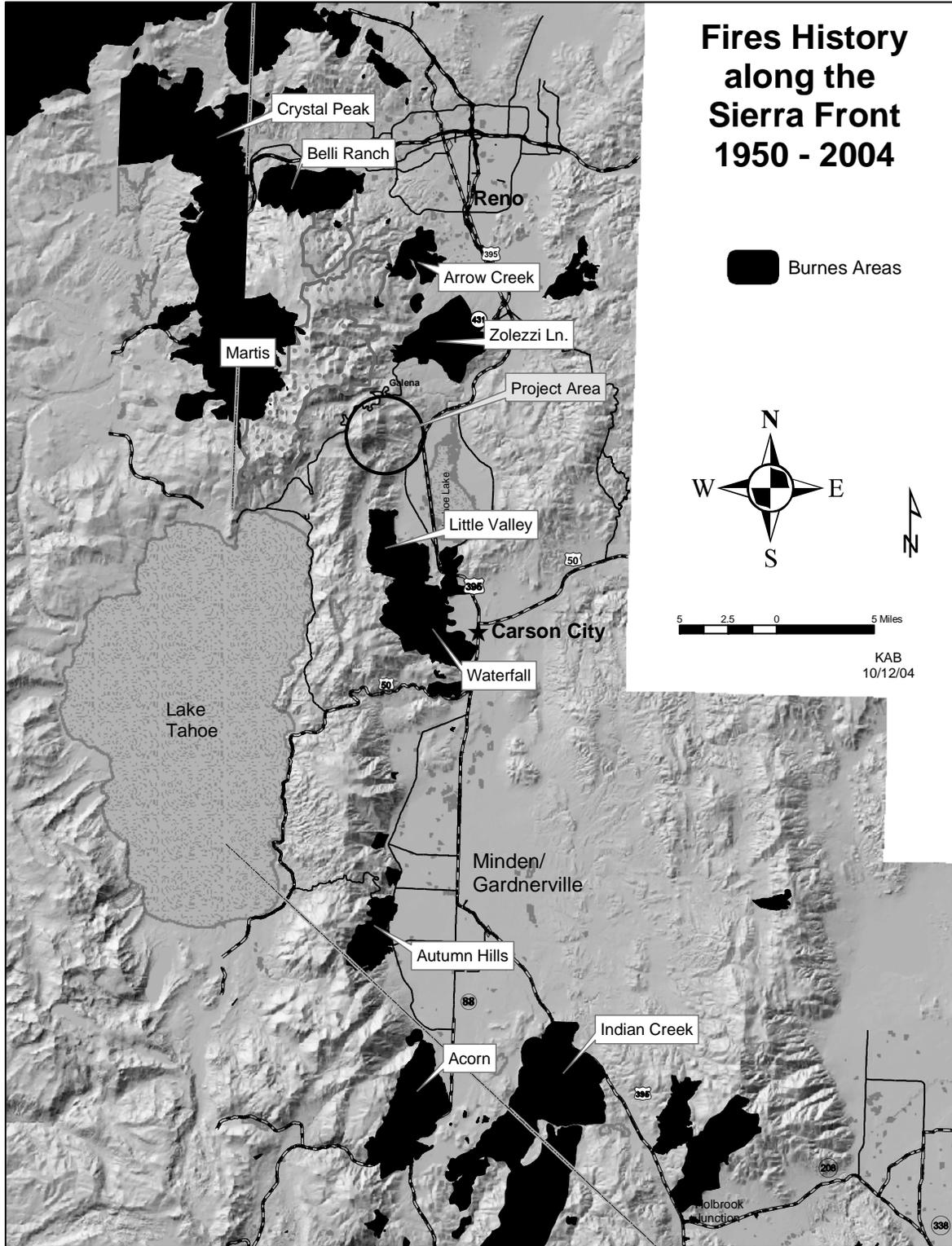
parties. This monitoring would be done on a unit-by-unit basis to ensure that the project is carried out as proposed and that needed adjustments in the timing, intensity, and types of treatments are made in an open, cooperative manner.

The project area is located adjacent to Washoe County's Galena Creek Park, Davis Creek Park, and Bowers Mansion Park southwest of Reno, Nevada and is within the Carson Ranger District, Humboldt-Toiyabe National Forest. This action is needed to reduce the risk of wildfire to forest ecosystems and adjacent parks and homes and to enhance ecosystem characteristics of the area.

The proposed action would decrease the threat of wildfire, reducing both the potential for spread and intensity of burn.

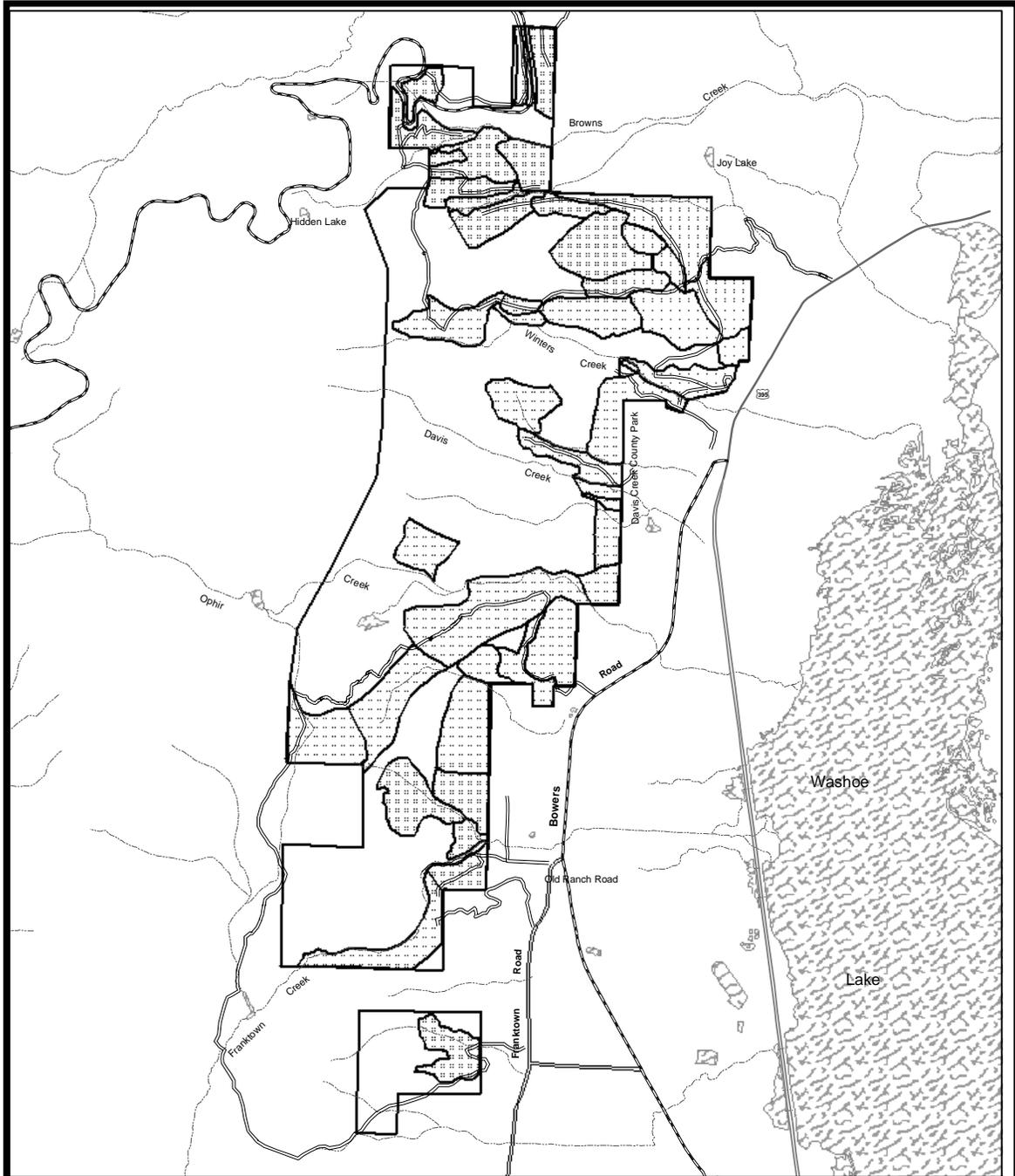
In addition to the proposed action, the Forest Service also evaluated the No Action alternative. Under no action, the area would retain its heavy fuel loading and be subject to a high risk of a high intensity fire, threatening adjacent homes and parks and the future of the forested stands in the area.

Based upon the effects of the alternatives, the responsible official will decide whether or not to proceed with the project to reduce the threat of wildfire in the North Washoe Valley area.



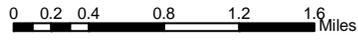


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- Legend**
- Project Area
 - Proposed Road System
 - Proposed Treatment Units

**North Washoe Fuels Project
 Overview**





INTRODUCTION

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act, the Healthy Forest Restoration Act and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives.

Additional documentation may be found in the project planning record located at the Carson Ranger District Office in Carson City, Nevada.

BACKGROUND / PURPOSE AND NEED FOR ACTION

The North Washoe Valley project is proposed at this time to respond to goals and objectives of the National Fire Plan and the Toiyabe Forest Land and Resource Management Plan as amended by the Sierra Nevada Forest Plan Amendment. Comparison of the existing condition of the project area and the desired conditions from the Forest Plan indicates a need for:

- reduced forest fuels loading;
- reduced ladder fuels;
- reduced risk of uncharacteristically intense fire;
- reduced risk to life, property, and natural resources;

- increased safety to fire suppression crews;
- development of sustainable forest conditions;
- and restoration of natural ecological systems.

The purpose of the North Washoe Valley project is to reduce the risk of wildfire to the homes and ecosystems of the North Washoe Valley area. The project is needed here because the North Washoe Valley area is located in the urban wildland interface zone where homes and county parks are mixed with flammable wildland grass, brush, and trees. Trees in the area are currently under attack by the Ips pine beetle due in part to the recent years of drought. Pockets of trees killed by the beetles are particularly flammable. The project is needed now because these pockets are increasing in size. Trees in the area are particularly susceptible to the beetles and to wildfire because they are relatively even aged and spaced close together.

These conditions are the result of two major human interventions in the natural ecosystem. First was the logging that occurred in the Comstock mining era. Most of the trees in the area were harvested in the late 1800s to provide mine timbers in the Virginia City area. The trees that have grown back are spaced much closer together than under natural (pre euroamerican settlement) conditions. Second has been the effect of aggressive wildland fire fighting. Under natural conditions, small low intensity fires caused by lightning were common in the North Washoe Valley country. They took out the smaller trees and brush, naturally thinning the forest. In the absence of fire, the forest is thicker and brush is common



– creating high risk conditions for large, high intensity fires of the type than can threaten adjacent homes and do long term damage to the ecosystem.

These conditions are common throughout the Sierra Front country and have resulted in many stand replacing fires that have eliminated the tree cover on much of the area (Fire History Map).

In the event of a wildfire, the primary concern of fire agencies like the Forest Service is the safety of their firefighters. Fire agencies will not put firefighters on the ground in unsafe conditions that are thick with trees, where there are lots of dead trees and brushy ladder fuels, and where access/escape routes are poor.

The desired conditions for this area are detailed in the Sierra Nevada Forest Plan Amendment. They are:

- Open stands dominated primarily by larger, fire tolerant trees.
- Surface and ladder fuel conditions are such that crown fire ignition is highly unlikely.
- The openness and discontinuity of crown fuels, both horizontally and vertically, result in very low probability of sustained crown fuels.

Achieving these conditions would restore the area to a more natural fire regime. This would involve decreasing surface fuels, ladder fuels, and canopy cover and increasing the average size of trees to move from the current condition class 3 towards the desired condition class 1.

The following table and diagrams describe the current and desired conditions.

Condition Class Description Table	
Condition Class	Description
1: Minimal departure from historical fire regime	Vegetation composition, structure, and fuels are similar to those of the historic regime and do not predispose the system to risk of loss of key ecosystem components. Wildland fires are characteristic of the historical fire regime behavior, severity, and patterns.
2: Moderate departure from historical fire regime	Vegetation composition, structure, and fuels have moderate departure from the historic regime and predispose the system to moderate risk of loss of key ecosystem components. Wildland fires are moderately uncharacteristic compared to the historical fire regime behaviors, severity, and patterns.
3: High departure from historical fire regime	Vegetation composition, structure, and fuels have high departure from the historic regime and predispose the system to high risk of loss of key ecosystem components. Wildland fires are highly uncharacteristic compared to the historical fire regime behaviors, severity, and patterns.



Current and desired conditions illustrations.

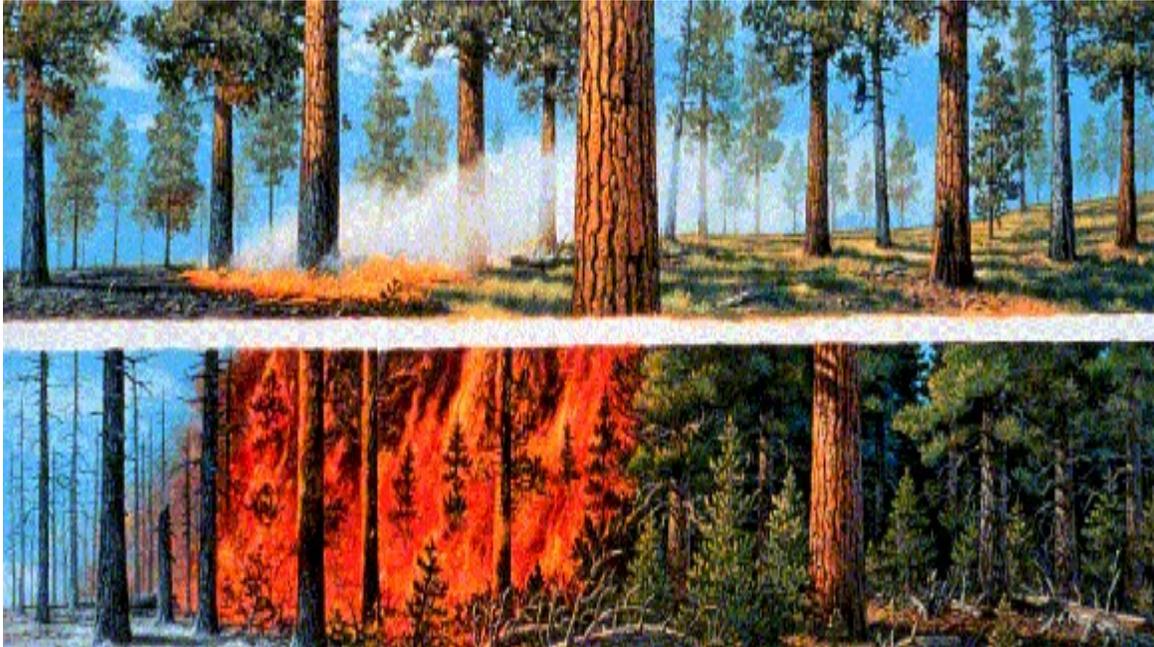


Figure 1: The top panel illustrates desired conditions where fires stay on the ground and can be fought safely with hand crews. The bottom panel illustrates current conditions with heavy fuel loading and unsafe firefighting conditions.



Figure 2: Pre-treatment current conditions on a sample stand in the Galena area near the northern boundary of the project area. This stand has a basal area of 217 square feet per acre and a canopy cover of 84 percent.

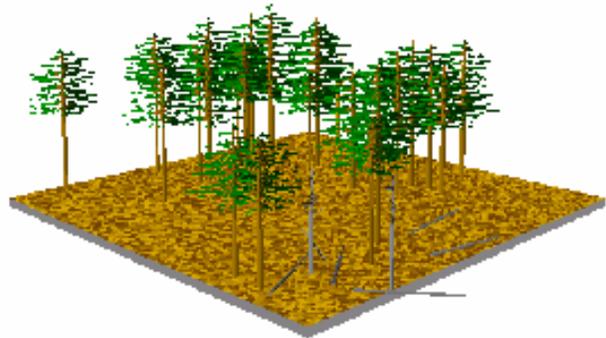


Figure 3: Post treatment desired conditions in the same stand. Basal area is 80 square feet per acre, canopy cover is 41%, and the larger, more fire resistant trees have been retained.



The Proposed Action

The main action needed is to reduce fuel loading within the 5,600-acre project area. Within this area, treatment units totaling 2,500 acres have been identified for fuels reduction. In each unit, the trees and brushfields would be thinned. This would be done through mechanical treatments, prescribed fire, or a combination.

Relationship to Forest Plan

The Forest Service has two types of decisions: programmatic (e.g., the Forest Plan) and project level which implements the Forest Plan. The North Washoe EA is a project-level analysis; its scope is confined to addressing the significant issues and possible environmental consequences of the project. It does not attempt to address decisions made at a programmatic level.

The Forest Plan embodies the provisions of the National Forest Management Act of 1976, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Humboldt-Toiyabe National Forest. It includes overall management emphasis in the North Washoe area on protecting key resource values and property from wildfire (USDA, 1986 p IV-79). The Forest Plan also includes timely direction for fire and fuels management as developed through the Sierra Nevada Forest Plan Amendment of 2004. The Amendment includes direction for landscape level analysis and for determining the extent of the wildland urban interface threat zones on a project level basis.

This Environmental Assessment reflects a landscape level approach, recognizing the niche that the project area plays in the broader landscape. It recognizes that to the west lies the high country of the Carson Front Range, an area less susceptible to stand replacing wildfire due to greater precipitation, lower temperatures, different vegetation types, and a higher percentage of rock outcrops. To the north lie subdivisions with active fire safe councils that have reduced fuel loading in their areas. Also to the north lie County Park and Forest Service lands that have already been treated to reduce fuels. To the east are two County Parks that are being treated to reduce fuel loading. There are also many homes. Some have already been well treated to reduce fuels, but others are in need of further treatment. It is anticipated that this project will serve as the catalyst to initiate those needed efforts. South of the project lie private, state, and Forest Service lands that suffered a stand replacing fire two decades ago. Forested lands have been replaced by brush lands. The major goal of this project is to prevent that from happening in the project area. University of Nevada lands lie to the southwest of the project area. The University has proposed to initiate fuels treatments on its property and there are ongoing discussions between the University, the Nevada Division of Forestry, homeowners, and the Forest Service regarding those proposals.

The North Washoe project was initially identified through the Sierra Front Strategic Fuels Planning Workshop in January 2002. The workshop was a collaborative strategic assessment process, identifying and prioritizing 31 fuels projects needed across the Sierra Front landscape. The workshop included the Sierra Front Wildfire Cooperators, the



University of Nevada Cooperative Extension, Nevada Division of Forestry, Bureau of Land Management, and County representatives (USDA, 2002).

The Sierra Nevada Forest Plan Amendment also provides for a determination of the defense zone for wildland urban interface on a project level basis. For this project, the defense zone has been determined to encompass the whole project area. This determination was based on the high level of risk of a stand replacing fire burning into adjacent neighborhoods and County Parks. This risk level is evident in the fire history of similar eastside pine ecosystems in the Sierra Front (Fire History Map). The most recent example is the Waterfall Fire of 2004, which burned 18 homes in Carson City, ten miles south of the project area. The defense zone in the project area is of sufficient extent that fuel treatments within it will help reduce wildland fire spread and intensity sufficiently for suppression forces to succeed in protecting human life and property as directed by the Sierra Nevada Forest Plan Amendment.

Public Involvement

The proposal was listed in the Schedule of Proposed Actions in October 2003; January 2004; April 2004; and July 2004. The proposal was provided to the public and other agencies for comment during scoping from July 25, 2004 to August 23, 2004. In addition, as part of the public involvement process, the agency conducted a public open house meeting on August 11, 2004 at the Pleasant Valley Elementary School gave presentations twice to the West Washoe Valley Citizens Advisory Board and held numerous discussions and field visits with Washoe County Parks and Recreation Department,

Nevada Division of Forestry, University of Nevada, the West Washoe Association, Galena Forest Estates Homeowners Association, Joy Lake Homeowners Association, Sierra Club, Nevada Department of Transportation and many individuals with land or homes adjacent to the project.

Most of the comments received indicated strong support for the project. The need to reduce fuel loading in the area was widely recognized and supported. Concerns related to the project included the need for and impact of the road system, logging traffic safety and noise, the potential for prescribed fire escape, air quality, scenery, and long term public access to the road system. These comments were used to develop the issues analyzed in this document.

Issues

The following is a list of issues developed to guide the impact analysis for the proposed action:

Forest Health: What impact would the project have on the long term health of the forest?

Fire Risk: What is the potential for wildfires from the current conditions versus after treatment and what is the risk posed by prescribed fire?

Air Quality: What impacts to air quality would occur, particularly from the use of prescribed fire?

Aesthetics: What are the potential impacts from logging and other operations on the level of traffic and noise in adjacent neighborhoods? What visual impacts would occur with and without the project?



Recreation: How does the project affect recreation? How would recreation be managed after the project is completed?

Watershed: What are the potential impacts from the proposed treatments and road systems to soils and other watershed conditions?

Heritage Resources: What are the potential impacts to the Comstock era and other heritage resources found in the area?

Wildlife/Plants: What would the short and long term impacts be to wildlife and plants, including mule deer, Sierra Valley ivesia and Washoe tall rockcress in the area be with and without the project?

Alternatives, Including the Proposed Action

This section describes and compares the alternatives considered for the North Washoe Valley Wildfire Risk Reduction and Ecosystem Enhancement Project. It includes a description of the proposed action and no action alternatives.

During the formulation of alternatives, the following proposal was considered, but not carried forward for detailed analysis:

Use prescribed fire only to treat three of the interior units.

After further analysis it was determined that these units should be effectively treated through helicopter thinning first before applying prescribed fire. This approach is consistent with the Healthy Forest Restoration Act that encourages efficient analysis through limiting the number of alternatives to only those that are needed.

Proposed Action

The main action needed is to reduce fuel loading within the 5,600-acre project area. Within this area, treatment units totaling 2,500 acres have been identified for fuels reduction. These units were strategically placed on the landscape based on creating a pattern of treatment areas across the landscape to interrupt fire spread that are weighted by stands with high density; pockets of insect and disease mortality; condition class; proximity to homes, private lands and parks; slope, with emphasis on the relatively few areas of flatter ground; and proximity to existing or historical road networks. Due to the complexity of these interrelated criteria, a numerical model approach was not feasible; instead, an interdisciplinary team with on-the-ground expertise and knowledge developed the units. Untreated units include areas with rocky outcrops, lower stand density, limited insect and disease mortality, steep slopes, lower condition class, and away from useable roads, homes, and parks.

The amount of treatment needed in each unit was determined by examination of wildfire results in past treatments in the area, particularly the Sunrise Basin area of the Crystal fire. In each unit, the surface, ladder, and canopy fuels would be reduced through a combination of mechanical treatments only or a combination of mechanical treatment with prescribed fire (See Proposed Treatment Maps). The units would be treated in a phased process over a period of about five years. As each unit is completed, it will be evaluated and the information used to refine treatments in subsequent units. The treatments are design to reduce the risk of wildfires; they are not expected to prevent wildfire under extreme weather conditions.



Treatments in these units include:

Ground Based Thinning.

These stands are primarily in condition class 3. Thinning would be limited to trees less than 30 inches in diameter. The 30-inch limit was fully analyzed in the Sierra Nevada Forest Plan Amendment and found to be appropriate for fuels treatments. Limitations that are more restrictive were found to be ineffective in terms of reducing wildfire risk.

This treatment would involve thinning from below by removing smaller understory trees that are most susceptible to wildfire and leaving the dominant tallest trees that are less susceptible to fire. Thinning from below is the most common type of thinning used for reducing fire hazard. Thinning from below removes intermediate and suppressed trees from the lower crown strata. This thinning type can be effective at reducing the probability of crown initiation and fire spread, and is precise in that manager-designated trees are targeted and removed from the fuelbed (Peterson, 2004).

Residual overstory trees would be irregularly spaced across the landscape. Small groups of typically 3-6 closely spaced overstory trees would be left to retain structural diversity. Slash would be treated through a combination of prescribed burning, chipping, and lopping and scattering based on site-specific conditions, including distance from structures, slope, and access. Within those thinned areas canopy cover would be reduced to forty percent with an average spacing between crowns of fifteen to thirty feet. This treatment is proposed for 1,500 acres.

Ground based equipment would be utilized, with whole tree yarding applied

wherever feasible to reduce fuel loadings. Surface fuels would be mechanically or hand treated. Surface fuel mechanical treatments would primarily entail machine piling, but could include mastication, or chipping and removing treated fuels. Hand treatments would entail hand thinning and bucking (cutting) surface and small ladder fuels.

Prescribed fire would be used in most stands to either burn machine piles or broadcast burn surface fuels. All prescribed fire implementation would follow a specific Burn Plan that follows Region 4 Requirements. These can be found at http://www.blm.gov/utah/egbcc/trng_pub.htm. Pile burning involves placing cut trees and brush into piles and burning them when weather conditions are safe. Pile burning was done during the winter of 2003/2004 in the Lakeview area where it helped firefighters save homes during the Waterfall Fire of 2004. Broadcast burning involves construction of fire lines around the areas to be treated, mechanical treatment first to remove ladder fuels, plumbing the area with fire hoses, and then burning an area under the appropriate weather conditions.

Burn plans will include calculations of the rate of spread and flame length using the BEHAVE fire modeling program. A test fire will be used to verify that the fire behavior will achieve the fire treatment and resource objectives. The test fire will be done in a location that can be easily controlled or extinguished and be representative of the general fuel type and other conditions in the burn unit. Detailed, site-specific descriptions of ignition and holding procedures will be required. This will include analysis of pre-burn preparation, specifically including fire



lines, hose lays, and water sources. Smoke emission reduction techniques will be identified. Mop up and patrol and monitoring plans will be required for each burn. Spot weather forecasts will be required. A post-burn evaluation and summary that documents burn day weather and fuel conditions, observed fire behavior, problems, concerns, and recommendations for future projects will be required. The prescribed fire results must be compared to the fire treatment objectives and resource objectives that were identified for the project.

Mechanical equipment will be used to fell the smaller co-dominant, intermediate and suppressed trees in the treatment areas to bring the stand conditions more in line with natural historic levels. Mechanized felling equipment (feller/bunchers) make a single pass over the treatment area during the felling operation. A typical felling cycle includes positioning the equipment, swinging the felling head to the tree, grabbing the bole severing the stump and finally positioning the tree for the yarding cycle. The felling operation sets the trees to facilitate the yarding phase. Hand felling would be used for larger trees or when ground conditions restrict mechanical felling.

The yarding operation will consist of a grapple skidder driving to the bunch positioned by the feller, grabbing it with the grapple, then driving to the landing and unloading the turn of trees for processing into logs at the landing. The tops and limbs are severed at the landing and stacked and the logs are loaded for transport.

Down woody material 12-inches in diameter or greater would be retained at approximately 5 to 7 tons per acre, where it exists. Approximately 3-5 tons per acre

of woody material less than 3-inches in diameter would be retained.

The largest trees on the site will be left. Studies have found that tree size plays a crucial role in resistance to fire damage (Omi and Martinson, 2002). Smaller trees will be left where they do not pose a threat as ladder fuels to the residual overstory canopy. The target average basal area would be about 80 square feet per acre. Basal areas down to 60 square feet per acre would be located along the National Forest boundary adjacent to County Parks, residential neighborhoods and private lands as well as along fire access roads and along linear features such as ridge tops that serve as prime areas for stopping or slowing the spread of fire. Basal area targets are based on modeling results that indicate that greater basal areas would be less effective in reducing the risk of wildfire and on interdisciplinary analysis that indicates that lower basal areas would have greater short term impacts to species such as deer and birds as well as to visual resources (See Environmental Consequences section).

Trees eight inches and larger dbh will be removed for saw timber. Stems three inches and larger will be designated as biomass and removed if market conditions allow. The basic method of tree removal will be whole tree yarding. Tops, limbs, and biomass will be processed at the landing. Saw timber will be removed in log form. Biomass would be removed in chip trucks. In the event there is no biomass market; tops and limbs would be piled at the landing for consideration as fuelwood. After fuel wooding, the remaining material at the landing would be piled and burned during the winter.

Winter thinning operations would be managed to limit affects on critical deer



winter range by controlling the number of units thinned simultaneously. Summer thinning operations would be managed to limit affects on adjacent County Parks by limiting operations on major summer holidays and events, such as the Fourth of July.

Steep mechanical operations would be used where conditions are appropriate. In areas with side slopes between 30% and 55%, ground based operations will be designated on a unit by unit basis only after soil stability, soil rock content and the location of the steep slope in relation to the remaining portions of the treatment unit have been determined to be appropriate by the Forest Service. This approach is consistent with the Forest Plan, which provides for such operations where conditions are suitable (USDA, 1986 p IV-34).

The Comstock era logging transportation system will be used in combination with downhill skidding in most of the project area. When the roads are at or near the bottom of the unit, landings will be constructed adjacent to the existing roads. In steeper areas, go-back roads may be located along ridges.

Skid roads will occupy less than 12% of the thinning areas. When the roads are located above the steep areas, skyline logging will be designated. Skyline parameters include spans up to 800 feet when tail holds, person lines, and payload analysis determines that the leading end of the logs can be suspended during inhaul. Approximately 100 to 200 acres may be designated for skyline yarding within the proposed treatment units.

Helicopter Thinning

High priority treatment areas on steep ground with inadequate road access will be designated for helicopter treatment. Ladder fuels will be planned for piling mechanically if the unit is mechanically felled. Hand piling and/or underburning will be used to treat the biomass fuels in the helicopter treatment areas. This treatment is proposed for 400 acres.

Brush removal

This includes sagebrush, bitterbrush, and mountain mahogany. These stands are in condition class 3. Surface fuels and concentrations of understory ladder fuels would be treated. This would be accomplished with either tracked machines or rubber-tired machines equipped with a cutting head that chips/shreds the vegetation. Where the ground is too steep for equipment, work would be accomplished by hand crews. This treatment is proposed for 400 acres.

Mechanical treatments would primarily entail machine piling but could include masticating or chipping and removing treated fuels. Hand treatments would include hand thinning and hand piling. Prescribed fire would be used in most stands to either burn piles or broadcast burn surface fuels. Broadcast burning would only be used in low risk units away from homes and private property and would include advance laying of fire hoses.

Small conifers in brushfields within this treatment would be thinned to a 20 by 20 spacing favoring pine over white fir (approximately 200 trees per acre). Brush canopy reductions would range from 50% to 80% existing canopy cover. The 80% treatment would be limited to those areas about 500 feet from the National Forest



boundary, along fire access roads, and along linear features such as ridge tops that would be used to slow or halt the spread of fire.

Mechanized treatments will be planned for all areas where ground conditions allow. Mechanized treatments include tracked or wheeled equipment that can masticate the unwanted vegetation by chipping it on the spot with a masticating head. In this method, the chips are left on the site to decompose on the surface of the soil. Tracked excavator type equipment with a masticating head mounted on a boom can operate on steeper slopes than wheeled equipment. Specifications will include retaining conifers on a 20' by 20' spacing and retaining a 20 percent brush cover in areas where no conifers can be found. This method requires a single pass of the ground based equipment

Another method that will be utilized is to sever the brush and pile it in windrows as with an excavator with a bucket and thumb. The piles can then be burned at a time when conditions permit. Machine trampling can also be used in brushfields to make the brush field more suitable for prescription burning.

When ground conditions preclude mechanized treatments, hand treatments using saws and hand piling will be employed. In some cases, brushfields will include small amounts of products, including fuelwood and biomass. Additional information on brush removal and other treatments by unit can be found in the appendix.

Riparian Treatment

Riparian treatments will include reducing the expansion of conifers into aspen stands through mechanical removal of conifer

trees. This treatment is proposed for 100 acres.

Treatments would be applied to reduce the potential for undesirable high intensity fire within riparian habitat areas. Additionally, treatments are designed to meet riparian management objectives; prescriptions vary by habitat type. Measures for the protection of riparian habitat areas are as follows:

Treatments within riparian habitats.

Ground disturbance would be minimized within swales.

Construction and use of landings in riparian areas would not occur.

Thinning prescriptions would incorporate site-specific riparian management objectives for streams, meadows, lakes, or fens.

Use of mechanized equipment within the riparian areas would be prohibited on slopes greater than 15 percent.

Meadows

No mechanical equipment would be used in meadows.

No burn piles would be located in meadows.

Streams

Machine piles would be placed outside of the riparian habitat area.

Vegetation would be cut and removed by hand, or by reach of equipment.

Preferred method to remove fuels would be endlining. It would involve using care to avoid soil plowing or gouging, to used to winch logs out of stream areas. Where feasible, trees will be felled directionally so the tops extend out of the stream areas, allowing the trees to be skidded without



having to operate equipment within the stream areas.

Ground based equipment would be used to remove trees and excess down fuels from within the riparian habitat area, however no new skid trails would be constructed unless the interior of the area cannot be treated without ground based equipment and use of equipment would be limited during wet periods.

Conifers needed to maintain stream bank stability or shading would be retained.

Aspen treatment areas

Preferred method to remove fuels would be endlining.

Ground-based equipment would be used to remove most conifer trees and excess down fuels from within the riparian habitat area and most conifer trees from the edges of the aspen clone.

No pile burning would occur in aspen stands or within 1 ½ times the height of the nearest aspen tree.

Landings, Temporary Roads, and Skid trails

Approximately 120 acres of the proposed treatments will be used for temporary roads, skid trails, and landings. These would be located to minimize the removal of large logs. The landings, including helicopter landings, will be located within treatment areas.

Permanent Roads

The project would include the use of 15.5 miles of roads. Light maintenance only would be needed on three miles. Reconstruction would be needed on 9.5 miles of existing roads. In addition, three miles of new roads would be proposed for

construction. Maintenance includes grading and re-establishing surface drainage structures. Reconstruction includes minor changes to road alignment and installation of new drainage structures such as culverts.

Following completion of the project, all of these roads would be rehabilitated or gated for administrative use only, primarily for firefighting and law enforcement purposes. Exceptions would apply to roads 040 and 041, which are currently open to public use and would remain open to public use (See Roads Map in the Environmental Consequences Section under Traffic). Removal of trees and snags may be necessary during road construction/reconstruction. This could include up to 25 trees over 30" diameter. More than 99.5 % of the trees over 30" diameter would be retained.

Watershed Protection

Soil Quality Standards and appropriate Best Management Practices that protect water quality and soils would be implemented for the entire project.

Landings and temporary roads utilized during operations will include reasonable and appropriate topsoil storage management, including storing surface topsoil during operations for use in landing and temporary road restoration.

Landings will be roughened, recontoured, and drained as needed to prevent channeling of surface runoff.

Slash will be used to protect disturbed soils along temporary roads, skid trails, and landings from rainfall impacts.

To the extent possible, utilize existing landings and skid trails and minimize any new disturbance within the project area.



Any post harvest areas lacking suitable ground cover necessary to preclude sediment to surface water shall be slashed/mulched with native material so that a minimum of 50 percent ground cover is maintained.

Seeding will be used to revegetate any areas where natural revegetation does not occur.

Standard Best Management Practices will be used during all operations to protect roads and other surfaces from erosion.

Wildlife / Plant Protection

New populations of Washoe tall rockcress were found in the project area during surveys conducted in 2004. The Sierra Valley ivesia has been noted in one proposed treatment unit. Prior to commencing ground disturbing activities additional plant surveys will be conducted and individuals/aggregations of Washoe tall rockcress and Sierra Valley ivesia will be flagged in order to avoid disturbance. Surveys will be conducted during the appropriate time (June and July) for proper identification of the plants. Treatments and roads will be designed to protect the plants.

To minimize the risk of introducing and spreading noxious weeds into the project area, the appropriate prevention and control measures listed in the Forest Service Manual, Chapter 2081.2, Sections 2 and 10 will be implemented.

Additionally, all burn piles will be seeded with the appropriate weed free seed mix.

As a general guideline, three of the largest snags per acre will be retained.

Potential goshawk habitat occurs along Ophir Creek, the upper part Browns Creek, Winters Creek and a southern fork of Browns Creek. Two years of surveys

have revealed no goshawks in the Ophir Creek area. One year of goshawk surveys has occurred in the other areas and revealed no goshawks. However, current protocols call for two years of surveys for goshawks. The second, follow up survey will occur in 2005 in these areas. If it confirms the first year survey finding of no goshawks, these areas will be treated as described in the proposed action.

However, if the second year survey reveals that goshawks are nesting in the area, a protected activity center will be established around the nest trees and the standards and guidelines for the defensive zone of the wildland urban interface will be placed on the treatments within the center. In the interim, before the second year of surveys is completed, no treatments will occur in these areas.

Air Quality Protection

Prescribed fires are subject to permitting by the Washoe County Air Quality Management Division. For each prescribed fire, the Forest Service will have contingency plans identified enabling it to reduce smoke emissions.

Contingency plans shall be implemented when meteorological conditions warrant, the Washoe County Air Quality Management Division determines that acceptable limits of smoke accumulation are or will be exceeded, and/or the Forest Service anticipates that the prescription for a particular fire will be exceeded. Should prescriptive elements cease to conform to those in the Washoe County open burn permit; the Forest Service will take the appropriate corrective action to reduce further impacts in consultation with the Washoe County Air Quality Management Division.



The Carson Ranger District will work with other Ranger Districts, the Bureau of Land Management, and the Forest Service Washoe County Air Quality Management Division to ensure that multiple burns would not exceed air quality standards.

Monitoring

The proposed action includes establishing a collaborative multiparty monitoring, evaluation, and accountability process. The process will be used to assess the positive or negative ecological and social effects of the proposal on a unit-by-unit basis. This monitoring would be done on a unit-by-unit basis to ensure that the project is carried out as proposed and that needed adjustments in the timing, intensity, and types of treatments are made in an open, cooperative manner.

Diverse stakeholders, including interest groups and neighborhood homeowners will be included in the monitoring and evaluation process. Multiparty monitoring will be subject to available funding and the ability of stakeholders to contribute funds or in-kind services.

Monitoring shall include a description of the changes in condition class, specifically comparing end results to pretreatment conditions, historical fire regimes, and desired conditions as outlined in the Sierra Nevada Forest Plan Amendment. This will include monitoring to determine the need for implementing weed eradication projects or other control measures. It will also include continued monitoring of Nevada Department of Wildlife mule deer population trends to determine if adjustments in the project would be needed. Adjustments to project prescriptions based on monitoring that are

within the general scope of the proposed action analyzed in the document would likely not require a new decision. Any adjustments outside the general scope of the proposed action would likely require a new decision.

Maintenance of Treated Areas / Roads

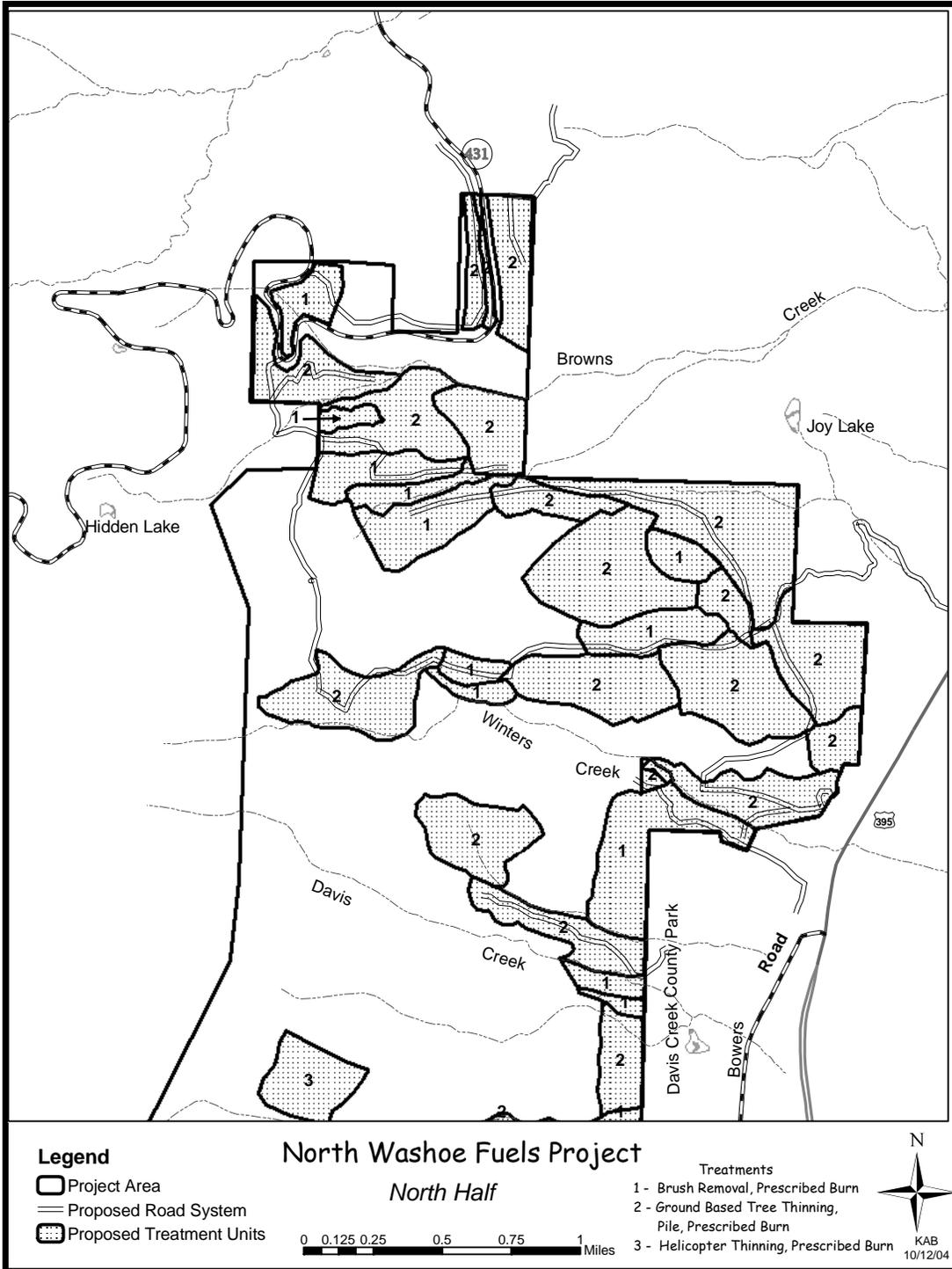
The proposed action includes maintaining treated areas over time. For example, areas requiring treatment to move from Condition Class 3 to Condition Class 1 also will require periodic treatments. The estimated maintenance schedule includes periodic broadcast/underburning every five to ten years. Although the road system will be largely closed to public use, roads will require maintenance during thinning activities and over the long term. Maintenance treatments will be scheduled into the annual program of work. The maintenance workload will be fully considered when assessing the ability to implement this proposed action.

No Action

Under the no action alternative, current management would continue. There would be no new brush or tree thinning in the area and no roads would be maintained, reconstructed, or newly constructed.

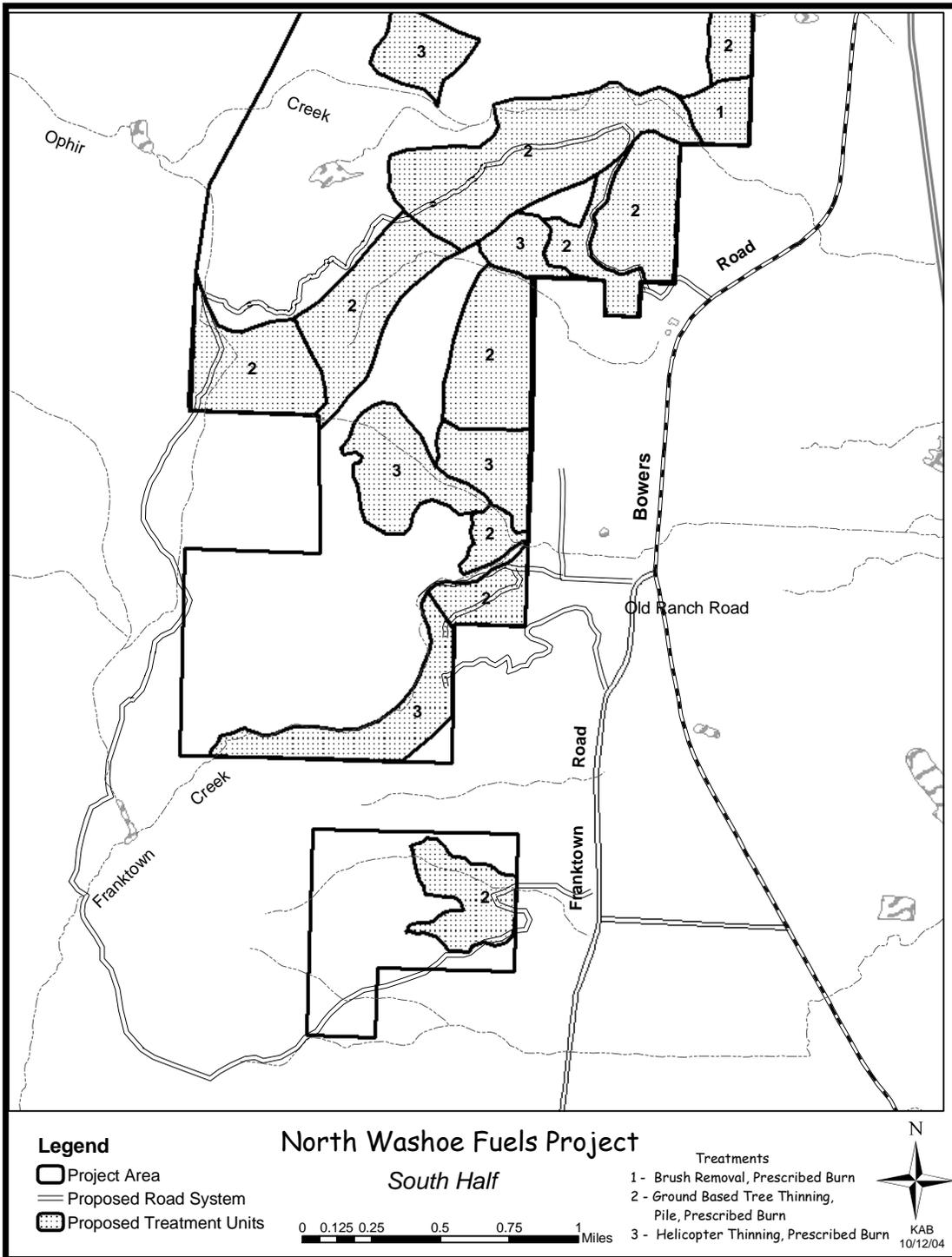


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Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Activity/Effect	No Action	Proposed Action
Wildfire Risk	High risk of a major stand replacing fire and threat to adjacent residences. Projected flame lengths of 50 feet in brush types and 13 feet in forest types.	Substantially reduced risk of a stand replacing fire and threat to adjacent residences. Projected flame lengths of 13 feet in brush types and nine feet in forest types.
Forest Health	High probability of increase insect and disease activity and loss of most of the trees. Brush stands would remain decadent.	Substantially reduced risk of insect and disease activity. Brush stands would be less decadent.
Wildlife/Plants	High probability of major habitat loss from a stand replacing fire.	Some short term disturbance from road construction and fuels work. Benefits in the long term due to protection from stand replacing fires and habitat improvement.
Visual Resources	Adverse – the landscape would likely be burnt.	Minor short term disturbance from roads. Major benefits in the long term due to reducing the risk of burning the landscape.
Recreation	Adverse – burnt over landscapes provide limited recreation opportunities.	Recreation opportunities would be maintained by protecting the area from wildfire.
Heritage Resources	High risk of destruction from an intense wildfire.	Reduced risk of destruction from an intense wildfire.
Noise levels as heard in nearby neighborhoods	Short term intense noise from firefighting operations.	Longer term impacts at lower noise levels from thinning operations and brush treatment.
Watershed	High risk of damage from a stand replacing wildfire.	Some short term disturbance from road construction and fuels work. Reduced risk of damage from a stand replacing fire in the long term.



ENVIRONMENTAL CONSEQUENCES

Analysis Qualification

Forest ecosystems are inherently complex entities about which we have limited understanding. As a result, fire behavior and severity can be understood and predicted in general terms, but exact predictions are not possible. In addition, while fuels treatments can reduce the risk of severe fires, they cannot guarantee benign fire behavior particularly under severe weather conditions.

A key area of uncertainty is in how to determine thresholds of treatment for brushfields and forest stands. The models used for this analysis are effective in showing the effects of surface, ladder, and crown fuels treatments, they Even though models cannot predict how a given structure created by a fuel treatment will fare when a wildfire encounters it, there is uncertainty about how much treatment is needed in each fuel type to achieve desired results. (Graham et. al. 2004)

Despite these uncertainties, there is a long-standing and large body of knowledge about the role of forest structure and fuels on fire behavior and severity that provided a sound foundation for the development of the proposed action for this project.

Forest Vegetation

Affected Environment

The project is within an area that was intensively logged in the 1860's to provide timber, lumber, and fuel for the Comstock mining boom at Virginia City. The existing vegetation conditions reflect the

natural regeneration that followed the Comstock-era logging and consists of forest stands that are approximately 120 years old.

The average diameter of the stands ranges from seven to 14 inches. Approximately 97 percent of the stands proposed for treatment are moderately to densely stocked stands (crown closure more than 40 percent) of poles and small trees (6 inches to 24 inches dbh). Stocking in these stands is variable, but are generally under-stocked with medium sized and larger trees (24 inches dbh or larger), and overstocked with saplings, poles and small trees.

Canopy cover averages from 28 percent to 86 percent with an average of 77 percent. Shade tolerant species such as white fir have encroached around and under the more fire tolerant species (Jeffrey pine and ponderosa pine).

A common measure of the density of trees is basal area – the number of square feet of trees at their base per acre. Basal area measurements in the project area range from 48 square feet per acre to about 260 square feet per acre, with an average of 201 square feet per acre. These types of stands support uncharacteristically intense stand replacement wildfire and have a high fire hazard. Field observations have shown that stands with high densities are currently receiving mortality from both insects and disease.

Most stands are exhibiting indications of stress from competition among adjacent trees. Stress on these trees has been magnified as drought conditions continue. Lower elevation stands are infected with dwarf mistletoe. Conditions indicate that drought related mortality could be expected. Even the relatively healthier dominant and codominant trees are at risk



from a potential mountain pine beetle epidemic.

Much insect activity has occurred over the last 20 years. The fir engraver killed pockets of white fir in higher elevations of the project area more than ten years ago, leaving small but significant fuel loadings in some areas. More recently, Ips and Jeffery pine beetle have resulted in small clumps of 8 to 15 trees that have been killed in the northern half of the project area.



Figure 2: Current fuel loading conditions in the project area.

A noxious weed risk assessment was conducted for this project. Noxious weed surveys were part of the stand exam data collected for this project. No weeds were identified in the project area. There are limited noxious weed populations on private lands adjacent to the project area in Washoe Valley. Therefore the risk is low under risk factor 1, which states "Undesirable plant species present in areas adjacent to but not within the project area. Project activities can be implemented and prevent the spread of undesirable species into the project area."

Environmental Consequences

No Action

Over the long term, the most likely outcome of the no action alternative would be a stand replacing fire, killing most of the trees in the project area. Forested stands would be replaced by brushfields as has occurred immediately to the south of the area from the Little Valley fire.

In the short term stand structure and composition will continue to be dominated by small understory trees. Individual large and medium diameter conifers will continue to die from resource competition and continued insect and disease mortality.

High stocking levels of up to 600 trees per acre and basal areas of over 200 square feet per acre will continue to predispose the stands to outbreaks of insects or disease. Plant diversity will remain the same or decline given no active management. Plant species requiring openings, or that require frequent fire or other disturbance, will still be present, but in lower numbers and in fewer areas.

Pine associated stands would likely lose a majority of the large tree component. As the younger trees grow, competition for moisture and other resources will increase resulting in the suppression mortality in the smaller stems and gradual loss of the larger trees. White firs are less tolerant than the Jeffrey and ponderosa pine of moisture-related competition stress, and will be affected sooner than the more drought tolerant pine. Bark beetles will be the main contributor to the large tree mortality as stress makes larger trees more susceptible to successful insect attack.

Epidemic levels of bark beetles will eventually develop as well, and potentially kill 50 to 90 percent of entire stands or groups of stands. Fuels will increase, and



the risk of loss to large-scale fires will increase as well.

Aspen, willows and other riparian vegetation would continue to decline and possibly disappear from some sites. Meadow and aspen diversity would decline, as pine and white fir continue to encroach

Given the lack of noxious weeds in the project area, the risk of weed problems under this alternative is low.

Proposed Action

The stands in the project area will be moved toward an open, park-like condition with the proposed action. The stands will be more sustainable, i.e. have less mortality from insects and disease, and will be less likely to support stand-replacing fires.

The proposed fuel reduction treatments will reduce tree stocking, increase spacing between tree crowns, and reduce ladder fuels. The vegetation left after treatment will have more growing space and access to needed resources such as water, nutrients, rooting space, and sunlight. Basal area would average about 80 square feet per acre, compared to about 200 under current conditions. Canopy cover would average about 40 percent – a reduction of less than 50 percent below current levels. This will result in increased growth and vigor for individual trees and treated stands as a whole. Trees will be more resistant to drought, wildfires, insects, and disease.

Litter layers will be reduced and mineral soils exposed with underburning. While increased light and precipitation will become more available to understory species following burning, some areas of exposed soils would lose moisture more rapidly until litter layers re-establish. Site

resources will be more readily available to grasses and forbs. New, more nutritious brush will come from resprouts or from newly started plants. Hardwood species such as aspen would be regenerated and would have more growing space.

Stand structure would change in the proposed forest treatment areas by: (1) reducing conifer stocking levels; (2) retaining all large trees (>30 inches DBH); (3) favoring aspen and willow patches by removing nearby conifers; (4) shifting growth from small conifers to large conifers, shrubs, grasses, and forbs; and (5) reducing the majority of the decadent brush with a combination of mastication and underburning. Average conifer diameters will increase to 25 inches from the current average of 15 inches.

Stand structure would change in brushfields by: (1) reducing conifer stocking; (2) reducing the majority of the decadent brush with a combination of mastication and underburning; (3) shifting growth from decadent brush to the selected trees, younger shrubs, grasses, and forbs.

The proposed action will greatly reduce the number of high-risk stands in the project area. Over time, some untreated stands will grow into high risk as stocking continues to increase.

Given the lack of noxious weeds in the project area and the use of prevention and control measures during project implementation, the risk is low for risk factor 2, which states, "No cumulative effects expected on native plant communities." The final rating for the assessment is low and allows the project to proceed as planned, but to initiate control treatments on undesirable plant populations that get established in the area.



Fire/Fuels

Affected Environment

The North Washoe eastside pine type was historically associated with frequent, light surface fire (5-15 year fire-free intervals). This is consistent with Fire Regime 1, the low severity fire regime (See Fire Regime Map).

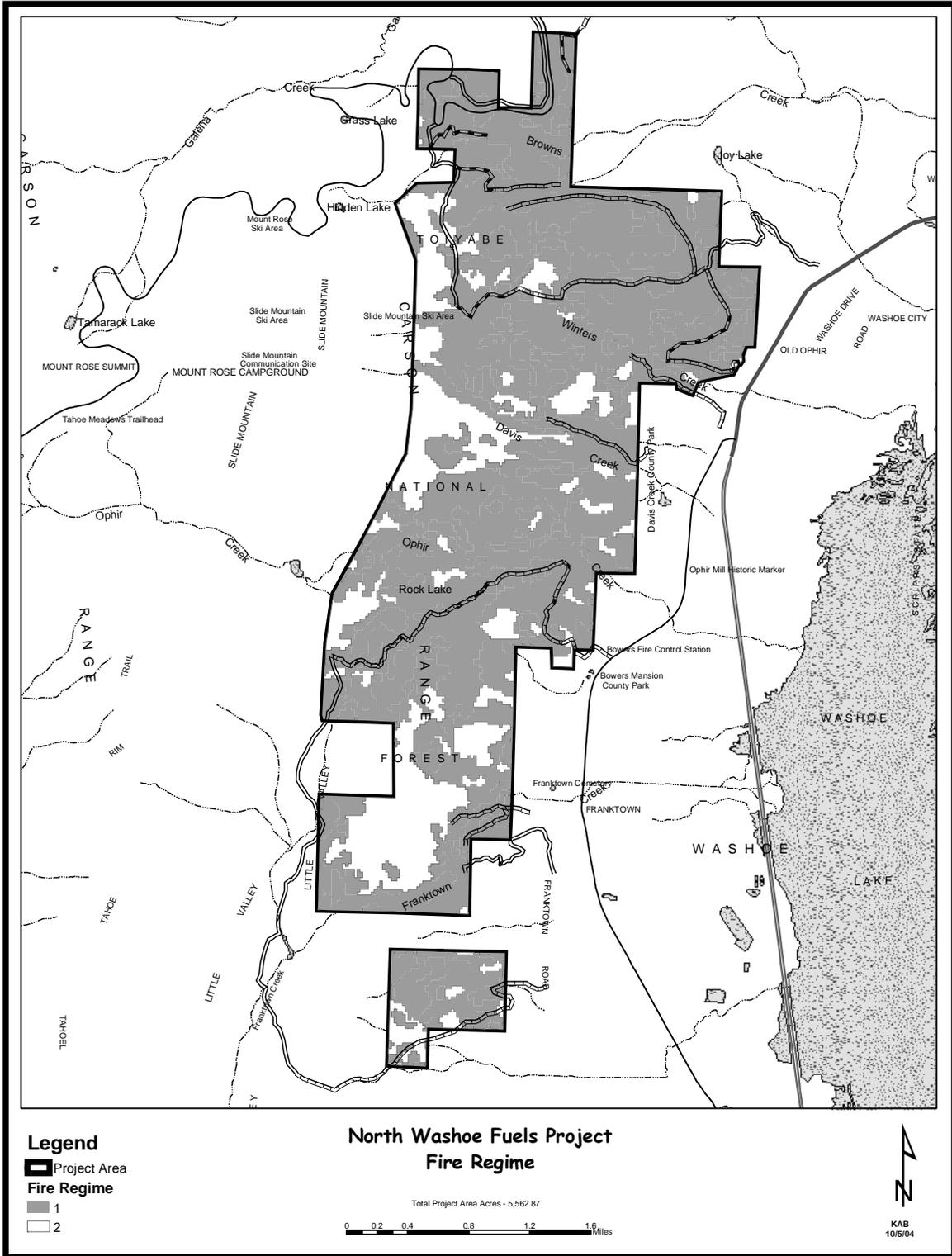
In a fire regime with frequent fire return intervals of low and moderate intensity, as in North Washoe, the vegetation historically consisted of well-spaced fire tolerant species such as ponderosa pine in the low elevations and Jeffrey pine in the upper elevations. The frequent, low intensity fires maintained the open stand structures by killing brush, small trees, and seedlings; and consuming fuels before they accumulated to the level where the entire stand was threatened. Shade tolerant, and fire intolerant thin barked

species, such as white fir, were regularly thinned out or excluded by fire from most of the North Washoe area. Thus these low intensity fires developed characteristics that made the stands more resistant to fires by reducing surface and ladder fuels and favoring fire tolerant species (Graham et. al., 2004).

Regime 2 in North Washoe is associated with the shrub communities located on the skeletal, granitic soil areas on the southern portions of the project area that historically had minor stocking levels of pine (Fire Regime Map). Historically, these areas had fire-free intervals ranging from 10-25 years. Fires played a variable role. In some cases, it functioned as a stand replacement event on creating varying sized patches by killing most of the vegetation.



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Past management activities, in particular timber harvest and fire suppression, as well as grazing have changed stand structure, composition, and landscape pattern. Currently, North Washoe is composed of well-stocked and overstocked multi-storied Jeffrey and ponderosa pine stands, with minor amounts of incense cedar, and white fir.

There are no examples remaining of the historic open, fire-maintained stands. Stands have less of a large tree component and many more small trees than existed in the past. This has created a continuous fuel ladder from the ground to the crowns of the larger trees and contributes to a continuous layer of fuels such as needles, limbs, and dead trees.

The total amount of fuel has also increased over time. Fuels have accumulated from needle fall and other conifer litter. Dry climatic conditions and very slow decomposition rates have lead to large accumulations of burnable materials. Brush species have become thick and decadent, with a large component of dead stems.

The brushfields have also increased their vegetation cover and fuel loads. Ground fuels have accumulated to provide a more continuous fuel bed.

Given current stand structures and fuel loadings, fire can no longer function in the same way that it did historically. Uncharacteristically severe stand-replacement fire events have now become the norm, replacing the light ground fires that were characteristic of the historically timbered areas, and the patchy fires in the brushfields (Graham et. al. 2004).

Existing conditions within the proposed project area include moderate (approximately 25 percent of the treatment

area) to high (approximately 5 percent of the treatment area) fuel loads with surface fuels ranging between 15 to 50 tons per acre. Heavier fuel loadings are found in areas that have experienced pockets of bark beetle mortality. Bark beetles have been active in the area for the last 15 to 20 years and have created increases in fuel loadings locally due to tree mortality.

Surface vegetation in brushfields is comprised mostly of sagebrush, manzanita, ceanothus, bitterbrush, and mountain mahogany. Coniferous vegetation exists in most brushfields in the northern portions of the project area, but at low densities, indicating that coniferous occupancy may be slowly recovering from earlier wildfires. In the southern portions of the project area, brush field vegetation may be resulting from skeletal granitic soil conditions that have an inability to retain moisture to support tree cover vegetation.

Current Condition Class Rating

Condition class relates to the degree of departure from historical fire regimes and the resulting alterations of key ecosystem components such as species composition, structural stage, stand age, and canopy closure.

Past activities and fire exclusion on federal lands have changed 95% of the North Washoe Project Area from a Condition Class 1 to mostly Condition Class 3. These stands were once dominated by large old-growth ponderosa and Jeffrey pine in an open park-like setting with little surface fuels or understory. Now, with more fire suppression and less fires occurring, these areas consist of multi-storied Jeffrey and ponderosa pine stands with white fir encroachment, heavy fuel loadings of dead and down material, and a large brush component. Wildfires burning in these areas during the summer months



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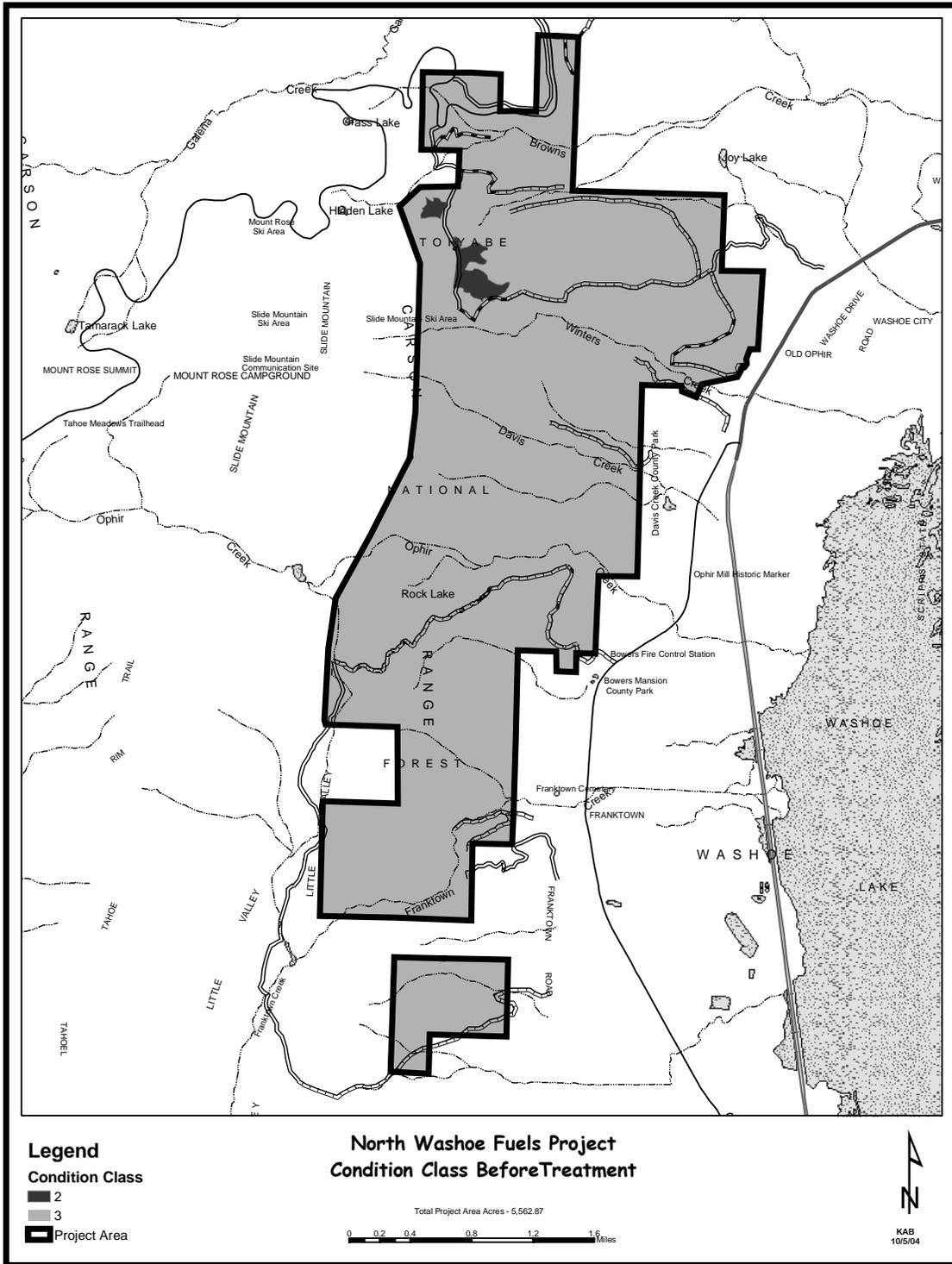


could have a devastating effect on the ecosystem. Only adjacent treated private land fuel treatments and Davis, Bowers and Galena county parks treatments are in

Condition Class 1. Existing condition classes for North Washoe are shown on the following condition class map.



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Under current stand conditions and 90th percentile weather, a wildfire could result in crown fire activity in many stands within the project area.

Ladder fuels within the North Washoe Project are relatively dense and live crown base heights range from seven to 12 feet. These existing ladder fuels and low crown base heights increase the risk that fire could be transferred into the crown, thereby increasing the probability of sustained crown fire and unsafe conditions for fire suppression efforts. Given the current surface fuel condition, combined with existing live crown base height, a wildfire in the 90th percentile fire weather condition could transfer fire from the surface to the tree canopy. The current fuel conditions do not provide for safe fire suppression efforts.

ENVIRONMENTAL CONSEQUENCES

No Action

The no action alternative proposes no treatments during this planning cycle. The need for lower level of fuel loading and reduction of ladder fuels will not be met.

In the long term, the most likely outcome of the no action alternative would be a severe stand replacing fire. In brushy areas, the fire would spread very fast at a rate of five miles per hour and the flames would reach 50 feet high at the head of the fire. In forested areas, the rate of spread would be $\frac{3}{4}$ of a mile per hour and flame lengths would reach 13 feet high. Under these conditions, firefighters would not be able to control the fire and would have to concentrate their efforts in areas where their safety is not in jeopardy.

There would be a high likelihood of losing homes and other structures as occurred

during the Waterfall fire of 2004. The area is subject to both human caused and lightning fires. The project area borders on the Little Valley fire area. That fire was started by heavy lightning strikes along the Sierra Front that started many fires. Firefighting resources were unable to control all of the fires and the Little Valley fire burned out of control. This scenario could be repeated in the project area under the no action alternative.

During the short term, the threat to life and property by wildfire will escalate. Fire suppression will continue to occur, but with less success and higher risk to the public and firefighters. The condition class and the fire hazard will remain constant in the short term (one to five years), at a high risk of a stand replacement fire. In the longer term, more of the area will be classified as high fire hazard and Condition Class 3 as hazardous fuels continue to accumulate. The meadows, riparian and non-forest lands would continue to deteriorate with encroachment of conifers, and fuel accumulations. Wildlife forage will continue to decline as conifers increase their dominance of most stands.

Stands that are at risk from insect or disease infestation will not be thinned and mortality will continue to occur, contributing to the fuel loading. Natural fuels, the pine needles and other dead vegetation, will continue to accumulate. Natural processes of decay will not remove the down and dead woody debris before the next fire cycle in the dry, cool climatic conditions of the North Washoe area. As available fuel increases, so will the potential for a large, stand replacement fire.

No action will increase the buildup of available fuels throughout the project area,



moving the area further away from the desired conditions. The effects on fire management will be more rapid rates of fire spread, greater fire line intensities, and a substantial increase in resistance to control. Fires will be more difficult for suppression resources to contain at a reasonable size, or prevent from spreading to adjacent private land.

The BEHAVE fire modeling system projects that in forested stands, a fire under high risk conditions would kill 100 percent of the trees under 15" in diameter and 80 percent of the trees over 20 inches in diameter.

Similarly, the FSVEG model projects up to 100 percent mortality in dense stands under high-risk conditions. The following diagrams illustrated the consequences of a fire burning through an inventoried stand near the north end of the project area:

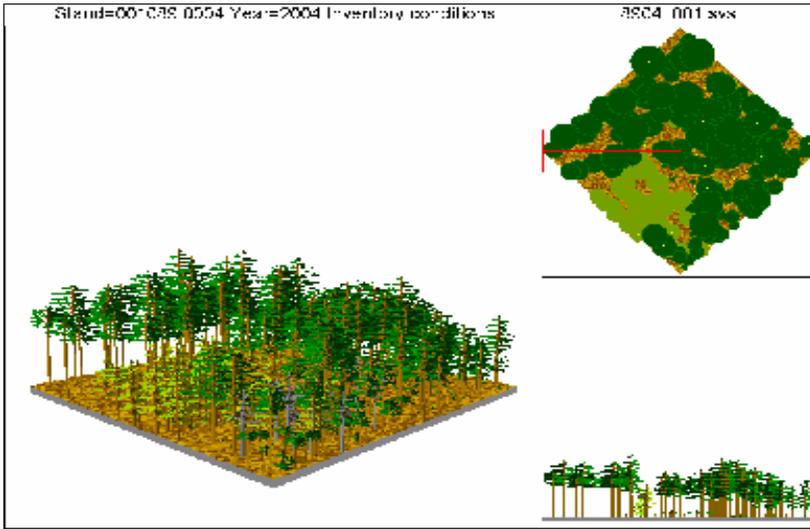


Figure 3: Current Stand Conditions - This plot has very heavy tree stocking and is typical of many of the stands of trees in the project area

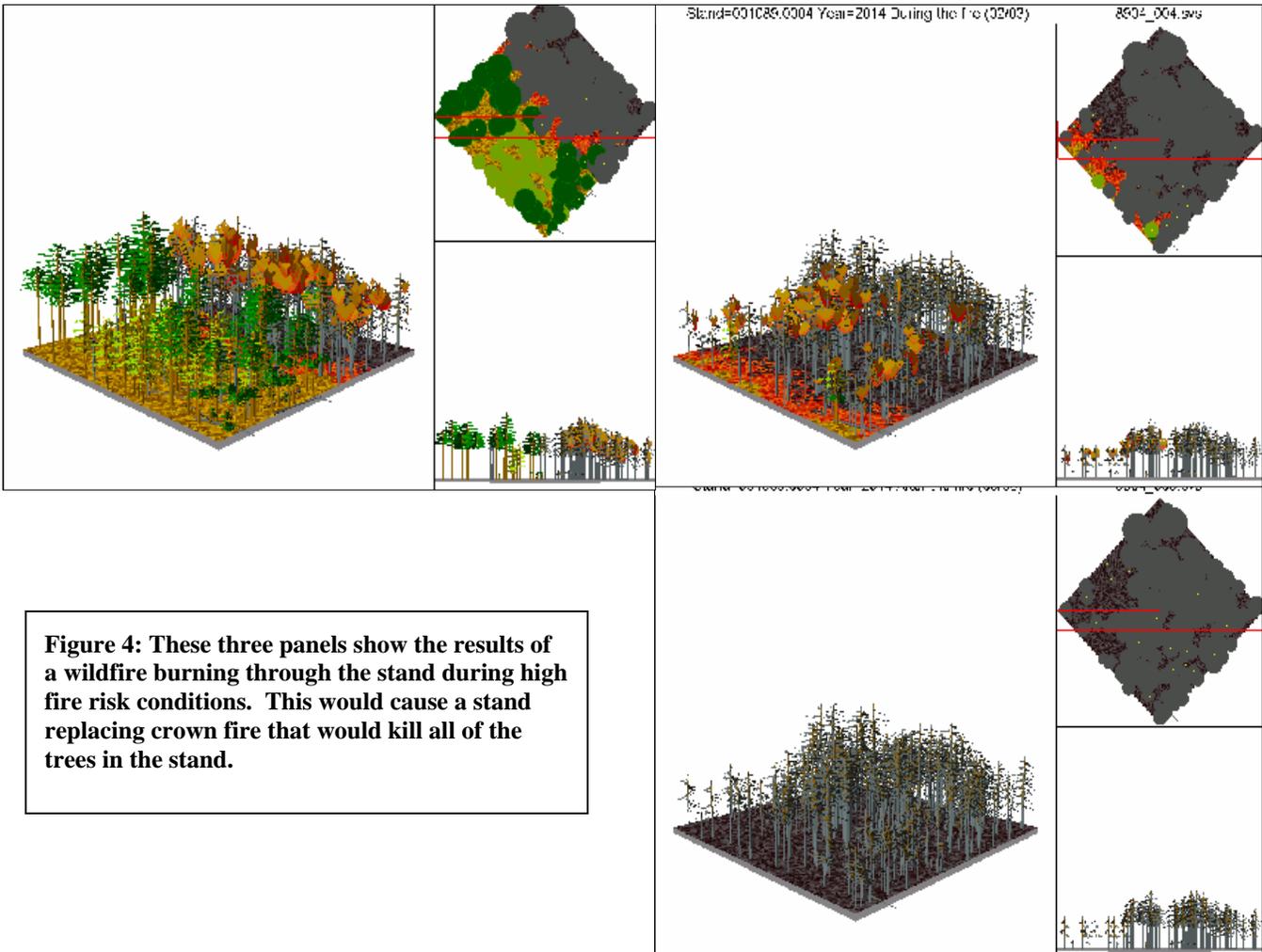


Figure 4: These three panels show the results of a wildfire burning through the stand during high fire risk conditions. This would cause a stand replacing crown fire that would kill all of the trees in the stand.



Proposed Action

The proposed action will assist in developing a more sustainable ecosystem. Sustainability refers to maintaining the composition, structure, and process of an ecological system. The sustainable condition of the North Washoe Project will meet the Desired Future Conditions within the treatment area. Fire will perform as a stand maintenance process rather than a stand replacement event.

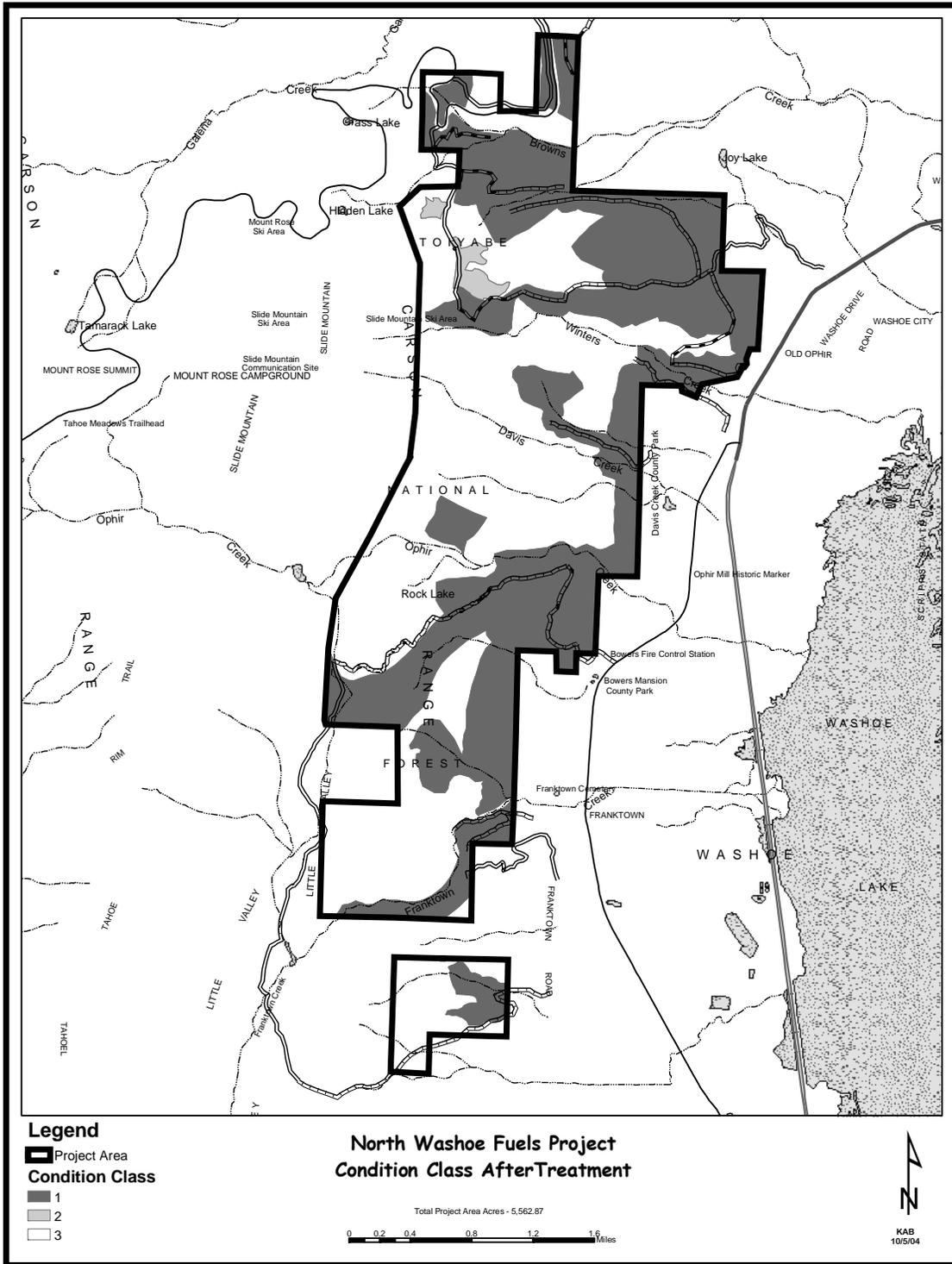
Thinned areas will be returned to Condition Class 1 following completion of all activities, including harvest, post sale fuels treatments, and underburning. Local experience shows that the treated areas will remain in the low fire hazard and in Condition Class 1 for a minimum of 10 to 15 years (Condition Class After Treatment Map). At this time, a maintenance

underburn would be needed to sustain a Condition Class 1 for another 10 to 15 years. Maintenance underburning is planned in the future to reduce the accumulation of needles, small limbs and other ground fuels that had accumulated since the original prescribed burn, as well as to reduce the number of seedling conifers that had become established, and to reduce the grasses and brush component.

While the potential for escape exists with any prescribed fire, it would be minimized through the burn planning process and the laying of fire hoses in advance of any burn as described in the proposed action. No prescribed fires conducted by the Carson Ranger District have ever escaped.



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Thinning surface, ladder, and crown fuels would reduce the rate of spread of fire, reduce flame lengths, reduce the probability of crown fire, and provide for a safer and more effective fire suppression environment.

Stands would be fairly open and dominated by larger, fire tolerant trees. The height to live crown would increase from the current range of 7 to 14 feet to a post treatment range of 16 to 33 feet.

The openness of crown fuels would create a network of intermingled openings between the clumps of large trees, the absence of most small diameter trees, and the low amount of surface fuel and would produce safe conditions for maintenance underburning and a lower probability of sustained crown fire. There is very strong evidence of the effectiveness of this type of treatment (Omi and Martinson, 2002). It should be noted however that under the most extreme weather conditions a severe stand replacing crown fire could still occur.

Based on First Order Fire Effects modeling under high fire risk conditions, reducing the brush and understory component by 80% would decrease the rate of a wildfire spread in heavy brush types from five miles per hour down to $\frac{3}{4}$ mile per hour. Flame lengths would be reduced from 50 feet to less than 13 feet. In forested areas, the rate of spread would increase slightly due to a more open canopy, but flame lengths would be reduced by more than 30 percent – from 13 feet down to nine. Most importantly, the risk of fires reaching the crowns of the trees would be substantially reduced. These reductions would allow firefighters more time and better odds of containing the fire spread with helicopters, air tankers, bulldozers, and hand crews.

The non-treatment areas will continue to remain at risk, but the landscape will be changed with the proposed action to reduce damaging effects in the event of a wildfire or bark beetle epidemic. Wildfire suppression and bark beetle attacks could be more effectively managed upon completion of the proposed action in the event of wildfire start or a beetle epidemic in the non-treated stands.

The BEHAVE fire modeling system projects that following treatment, while most of the smallest trees would be killed, up to 90 percent of the largest trees would survive. Similarly, the FSVEG model indicates survival of up to 100 percent of the largest trees. The following diagrams show the same plot described under the no action alternative after thinning with a fire start under high fire risk conditions:

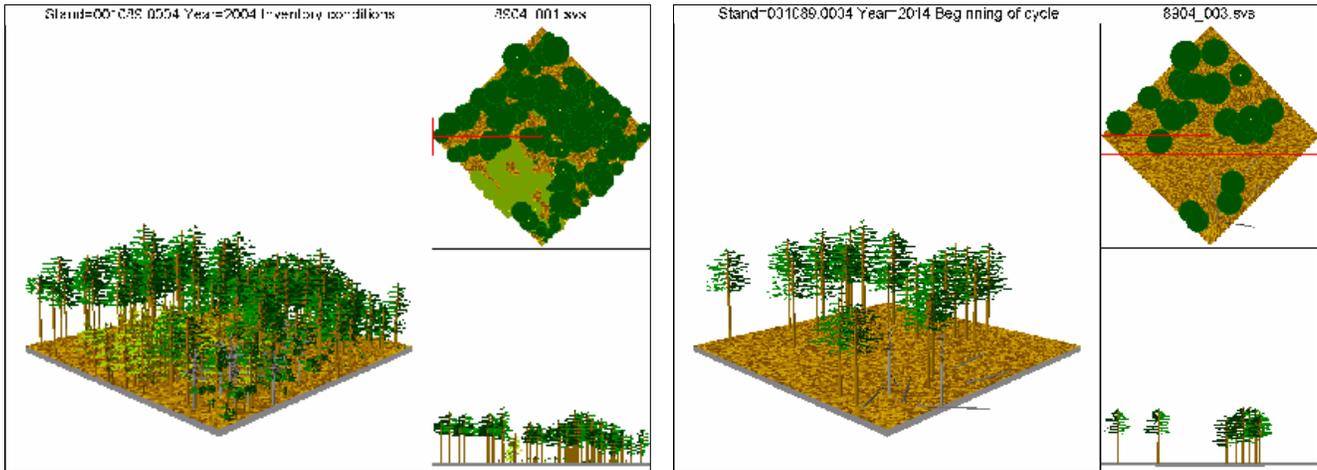


Figure 6: These panes show the pre and post thinning stand conditions.

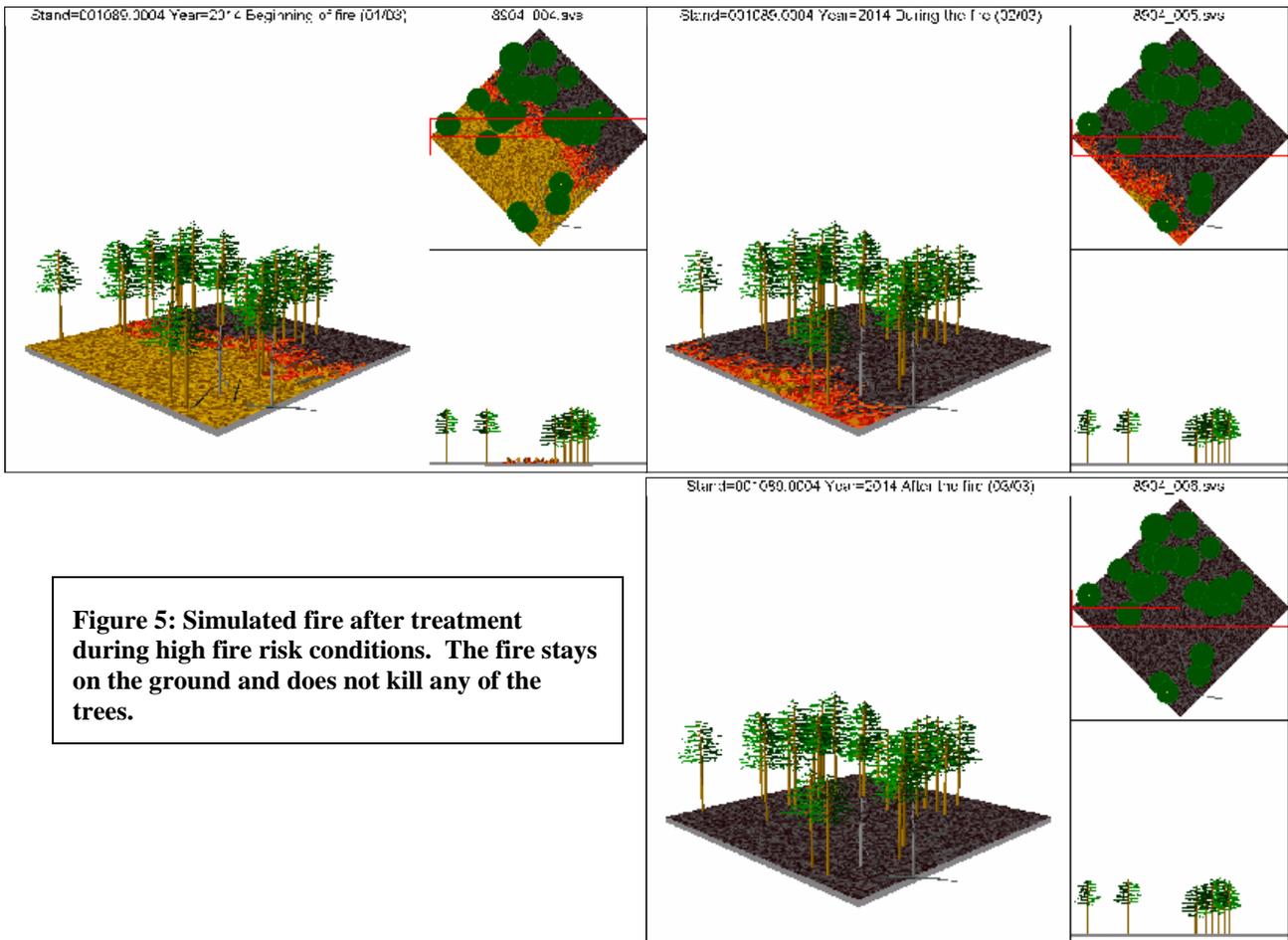


Figure 5: Simulated fire after treatment during high fire risk conditions. The fire stays on the ground and does not kill any of the trees.



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On a cumulative basis, this treatment would tie in well with recent Forest Service, Washoe County, and private land treatments to the north and east of the project area. Forest Service treatments in the area have occurred in the Thomas and Whites creek areas to the north of the project area. The Galena Recreation project will further reduce the potential for severe fires on National Forest System lands. Future treatments are projected further south at Clear Creek in Carson City and Genoa in Douglas County. Private landowners adjacent to the project area have completed a number of fuels reduction projects, including Joy Lake and Galena Forest Estates. Additionally, The University of Nevada is proposing to initiate fuels treatments on its lands to the south and west of the project area. Cumulatively, these projects should reduce the threat of stand replacing fires along a 30 miles stretch of the Sierra Front.

Air Quality

Affected Environment

All of Washoe County is currently a nonattainment zone for ozone emissions. The Truckee Meadows portion is also in nonattainment for PM10 and Carbon Monoxide. A small portion of this project is located in the Truckee Meadows zone.

Environmental Consequences

No Action

Under this alternative, a severe wildfire in the area is likely. This would cause major short term air quality impacts from smoke emissions that could be life and health threatening.

Proposed Action

Air quality impacts would stem primarily from pile burns and underburning following thinning of trees. Prescribed fires are subject to permitting by the Washoe County Air Quality Management Division. For each prescribed fire, the Forest Service will have contingency plans identified enabling it to reduce smoke emissions. Contingency plans shall be implemented when meteorological conditions warrant, the Washoe County Air Quality Management Division determines that acceptable limits of smoke accumulation are or will be exceeded, and/or the Forest Service anticipates that the prescription for a particular fire will be exceeded. Should prescriptive elements cease to conform to those in the Washoe County open burn permit; the Forest Service will take the appropriate corrective action to reduce further impacts in consultation with the Washoe County Air Quality Management Division. Given these conditions, it is unlikely that health threatening air quality impacts would occur. However, smoke generated from prescribed fires cannot be totally prevented and would likely be an annoyance to some individuals in local neighborhoods as well as to traveler through the area.

On a cumulative basis, the Carson Ranger District will work with other Ranger Districts, the Bureau of Land Management, and the Forest Service Washoe County Air Quality Management Division to ensure that multiple burns would not exceed air quality standards, therefore no cumulative impacts exceeding those standards are anticipated.

Visual Resources

Affected Environment

The scenery of the North Washoe Valley is highly prized by the neighborhoods of



Washoe Valley, the nearby communities of Reno, Sparks and Carson City, and visitors to the region from throughout the nation. The forested canyons and mountain slopes define the sense of place for the Sierra Front communities. The integrity of the scenery is an important component to the quality of life of these communities and is therefore vital for their economic future.

The area is highly visible from throughout Washoe Valley, including from Highway 395, which has an average traffic count of 31,000 vehicles per day. Foreground views from the highway are mainly pastoral – pastures with grazing by cattle and horses. The project area forms the middleground view from the highway. Views are primarily of steeply incised forested canyon and mountain slopes at the base of 10,000-foot Slide Mountain. Scenic integrity is high in this area. The character of this landscape is predominantly natural, affected mostly by the natural processes of erosion and plant succession. Vegetation ranges from sparse rock outcrops to brushfields and stands of ponderosa, Jeffrey Pine, white fir, and mixed conifer. Aspen and willow add visual interest in the major drainages: Browns, Winters, Ophir, Davis, and Franktown Creeks. Cultural factors play a minimal role in the landscape, limited to a few water supply facilities and the remains of Comstock era lumbering activity. Several groves of beetle-killed trees detract from scenic integrity on a localized basis, but overall the area retains a sense of natural wholeness in an unimpaired condition. The most significant threat to scenic integrity is wildfire. The area encompasses the largest expanse of yellow pines along the entire Carson Range. Many other areas have been subject to stand replacing fires that will affect scenic integrity for decades. Other actions in the area affecting scenic integrity include the construction of a new freeway

from Carson City to Reno through Washoe Valley.

Environmental Consequences

No Action

In the absence of action to reduce fuel loading, it is likely that the area will experience a stand replacing fire. This would degrade visual quality for decades, first replacing the green forests with blackened trees, then with common brushfields. The loss of tree cover would make cultural features highly visible, particularly the remains of the Comstock era logging road system. In the shorter term, before a stand replacing fire, this alternative would result in degraded scenic integrity through the likely spread of pine beetles causing increasingly large and more numerous stands of dead brown trees.

Proposed action.

In the long term, the project would maintain scenic integrity by reducing the risk of a severe stand replacing wildfire. Natural forested canyons and mountain slopes would continue to enhance the quality of life of residents and visitors to the area. As more natural ecosystem conditions are restored over the long term, scenic integrity would improve over the current conditions, primarily because there would be fewer, smaller patches of bug killed trees, the stands of trees would be more open and park like and there would be more aspen and other deciduous trees, adding color to the landscape.

In the short term, the most visible direct impacts from the proposed action would be associated with construction/reconstruction of roads. The road system would be more visible than at present, but because much tree cover would be retained, it would not degrade overall scenic integrity. Since tree



thinning would leave the larger trees and improve aspen regeneration, little change to overall visual quality would result, but changes in the landscape would be evident with a thinner, more mosaic like forest structure. Brushfield treatments would adversely affect visual quality in the short term, but would have little long term impact. Indirect effects would be positive because the project would reduce the potential for visually disruptive beetle kills and stand replacing wildfires. On a cumulative basis, any impacts to visual quality from this project would be overshadowed by construction of the new freeway and would be evident in the short term only.

Noise

Affected Environment

This section describes the relationship between wildfire risk reduction activities and the soundscape of the project area and adjacent neighborhoods. For the purpose of this analysis, *noise* is defined as human-caused sound. Noise levels in any one part of the project area are influenced by the number of people, the amount and type of traffic and other mechanical noise, and distance to sources of noise. Atmospheric effects such as wind, temperature, humidity, topography, rain, fog, and snow can affect the presence or absence of noise. *Natural sound* from the forests flowing water, animals, wind, and rustling tree leaves may be quite loud, however it is not considered to be noise. Natural sound levels in the project area vary by location, time of day (birdsong), and season (water in the creeks is highest in the spring).

Whether a noise or sound is considered unpleasant depends on the individual listening; an individual's tolerance for noise, expectations of noise levels, and activity

when the sound is heard (i.e., working, playing, resting, sleeping) all influence the perception of noise and sound. Noises have different effects on people depending on where they are and where the noise originates.

While no specific measurements of noise were taken for this project, noise was measured in the adjacent Galena Park area for a recent project. That study measured noise levels in the Galena Forest Estates neighborhood of 51.6 dba. This level is consistent with quiet suburban norms of 48 to 52 dba (SEA Consulting Engineers, 1992, Washoe County, 2004). Other neighborhoods in the project area likely have similar noise levels, although those adjacent to Highway 395 likely experience higher noise levels, particularly those near construction activities associated with the new freeway project.

Environmental Consequences

No Action

If a catastrophic wildfire were to occur, suppression efforts would be likely to generate high levels of noise during the burning period. Noise levels would be intense for the duration of the wildfire. Fire control and suppression efforts noise would be from engines, pumps, chainsaws, dozers, air tankers, and helicopters. Indirect effects include wildfire rehabilitation and lost structure reconstruction efforts that could continue for a few weeks to a few months after the fire is controlled; this could include heavy equipment and helicopters. Crews would likely be conducting work that could be heard from the nearby neighborhoods.

Proposed action

Direct noise levels would generally not be as intense as in the no action alternative, but they would be spaced out over a longer



duration and they would be occurring during regularly scheduled times. Noise levels will be noticeable in the neighborhoods when equipment is operating within 2000 feet of homes. The duration of noise exposure would be controlled by contract administration so that operations are completed in one area before they will be allowed to move to another area. In addition, contracts may be able to include daily start and stop hours for operations. Helicopters would be operating for up to 3 months across the project area. The hot saws on the feller-bunchers would generate disturbing noise levels when they are within 2000 feet of homes. Unless the noise is

blocked by terrain or dissipated by wind, residents within 2000 feet would notice helicopter and saw noise. Other mechanized equipment including skidders, masticators, loaders, de-limbers, and log trucks would be generating noise near the landings and along the haul routes. Some of the haul routes would experience noise for a week or two. The main access routes would have cumulative noise durations ranging from approximately 16 weeks on the Browns Creek Road to 50 weeks along the Bowers Road. The Potential Duration of Haul Table gives a logging production estimate that indicates the duration of noise along each identified haul route.



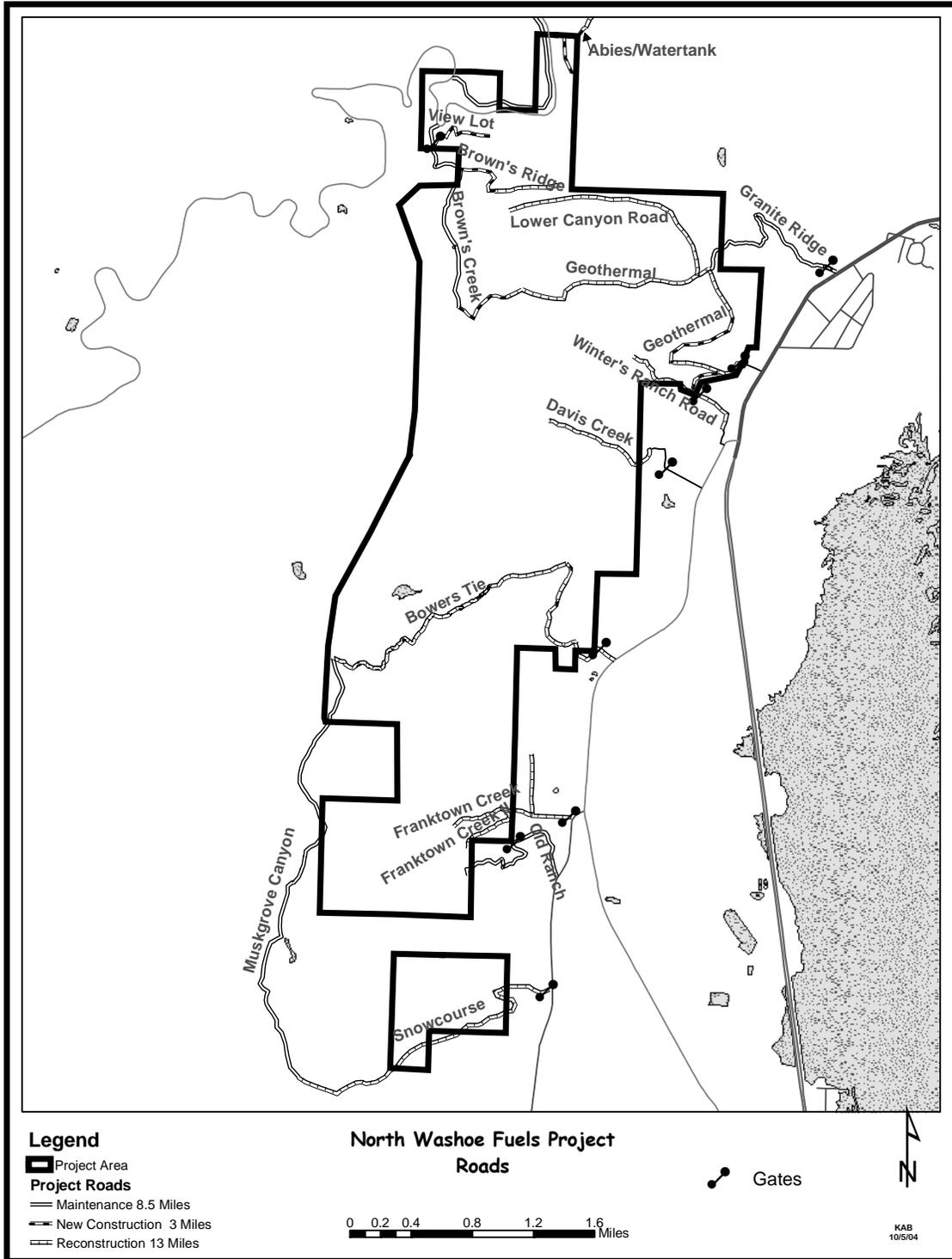
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Potential Duration of Haul Table				
Road Name	Thinning Type	Anticipated Log Truck Round Trips	Round Trips Per Day	Duration of Haul (Days)
Abies Watertank	Ground Based	80	4	20
Snowcourse	Ground Based	110	4	28
Old Hwy	Ground Based	24	4	6
	Helicopter	40	10	4
Old Ranch	Helicopter	164	40	9
Browns Cr.	Ground Based	340	4	85
Bowers Tie	Ground Based	920	4	230
	Helicopter	270	10	27
Winters	Ground Based	720	4	180
	Helicopter	3	10	1
Davis Creek	Ground Based	32	4	8
	Helicopter	160	10	16
Franktown Creek	Ground Based	34	4	9
	Helicopter	130	10	13
Geothermal	Helicopter	3	10	0.3
Note: Not all of these roads have secured access – negotiations are currently underway on several of these roads.				



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Traffic

Affected Environment

Major roads in the area include the Mount Rose Highway with an average daily traffic volume of 6000 vehicles per day Bowers Road with 1500 vehicles per day and Franktown Road with 400 vehicles per day. Nearby Highway 395 has 31,000 vehicles per day. A new route for this Highway is currently under construction in the project area. It will include a frontage road that will likely be used for the project. Currently only two roads inside the project area are open to motorized traffic – National Forest System Road 041 enters the northwestern boundary of project area from a sharp curve on the Mount Rose Highway. National Forest System Road 040 is a stretch of the old Mount Rose Highway route, also along the northwestern boundary of the project area. Access to it is also on a curve of the current Mount Rose Highway. There is restricted access to portions of the project area on a number of private roads, but most of the area has only the remains of hundred-year-old logging roads.

Environmental Consequences

No Action

No increase in traffic from the proposed project would occur. The major change in traffic conditions in the area would be completion of a major reroute of Highway 395 in the area.

Proposed Action

A number of routes would be used to remove logs from the thinning operations. The most heavily used route would be the “Bowers Tie” that would have a total of 257 days of truck traffic averaging between four and ten round trips per day.

This route would access Bowers Road at the Nevada Division of Forestry Fire Station. Average daily traffic volume would increase by about ten vehicle trips per day during this period. This amounts to an increase of 0.6%. Due to the phased nature of the project, this is likely to be the maximum level of traffic increase for the project. Safety concerns would be most evident at the Mount Rose Highway / Forest Road 041 intersection since it occurs at a very sharp curve in the highway. A Nevada Department of Transportation encroachment permit will be required for the use of any logging trucks in this area and will likely include the use of flaggers to ensure traffic safety.

Other than currently open roads, all roads used for the project would be closed to future motorized use except for administrative purposes such as firefighting and law enforcement. This would improve the efficiency and effectiveness of firefighting and law enforcement in the area.

It is anticipated that the closure of these roads will be effective because the steep topography and incised canyons will enhance the effectiveness of the gates used to close the roads. In addition, many of the access points are through private lands that are unavailable for motorized public access.

Recreation

Affected Environment

The project area is a heavily forested area that affords scenic beauty, broad vistas, and relative isolation within close proximity to urban settings. Three county parks (Bower’s Mansion, Davis Creek Campground, and Galena Creek) border the project area. Together, they host



364,000 visits per year. Facilities include museums, swimming pools, playgrounds, picnic sites, snow play areas, amphitheatres, and a campground. In addition the Mt Rose Ski Resort), various roadways, and private residences surround the area.

Recreation opportunities within the project area are limited. The only designated hiking trail that allows access into the area is the Ophir Creek-Price Lake Trail located at Davis Creek Campground. However, overgrown Comstock-era roads and pioneered trails are utilized for non-motorized access along the eastern base of the Carson Range. The total length of undesignated roads and/or trails is estimated to be less than 10 miles, although these pathways extend beyond the project area boundaries. The level of use undesignated paths receive is, at this time, unknown. Other non-motorized recreation that occurs in the area includes mountain biking, horse back riding, and fishing.

Limited motorized access currently exists within the project area. There are not more than 10 miles of classified roads on Forest System Lands throughout the 5,500 acre parcel. Private and public access is limited to the project margins, particularly along the eastern base of the Carson range (Old Ranch Road, Will Sauer Road, FS Road #503), in Little Valley (Musgrove Canyon/FS Road #446), and from Mount Rose Highway (Old Mount Rose Highway, FS Road #041).

Environmental Consequences

No Action

A no action decision would maintain the current minimal level of non-motorized recreation within the project area. The Ophir Creek-Price Lake Trail would

remain open and undesignated roads/trails could still be accessed. This decision maintains large tracts of dense forest and/or brush fields along with the recreational opportunities possible in this kind of setting. The current road network would be maintained at its present minimum level. On the other hand, a no action decision allows for the continued exposure for catastrophic wildland fire in the area.

Motorized recreation opportunities within the project area would not change. A no action decision would maintain limited private and public access to the area.

Proposed Action

A proposed action decision could result in a minor increase in non-motorized recreational activities within the North Washoe project area. New roads constructed for the project and closed to public motorized travel would be available for non-motorized use, such as hiking, mountain biking and horse back riding. The density of trees and brush will be substantially reduced in some parts of the project area. These tracts, however, will maintain a forested quality and continue to allow for relative isolation.

.This decision would decrease the exposure for catastrophic wildland fire that could damage or destroy the forested qualities that attract people to the area.

Motorized recreation opportunities within the project area would not change. New roads constructed during the project will have gates installed to close motorized access after the project ends.



Watershed Condition

Affected Environment

The project area includes five stream systems: Browns Creek, Winters Creek, Davis Creek, Ophir Creek, and Franktown Creek. A small part of the project lies within the Galena Creek watershed, although there is no channel in this area. There are also several first order streams in the small intervening drainage areas between the delineated watersheds. Browns Creek flows into Steamboat Creek, while the other streams are tributary to Washoe Lake. These streams support riparian corridors of willow, alder, aspen, and a variety of other riparian vegetation.

Franktown Creek is listed on Nevada's 2002 303(d) impaired waters list. The stressor of concern is low dissolved oxygen for a reach of about nine miles from Washoe Lake upstream to the first irrigation diversion. This reach of Franktown Creek flows through the project area.

Soils in the area are generally coarse and sandy over granitic rock. Soils on slopes less than 30% have a low to moderate hazard of water erosion. Soils on slopes greater than 30% have a moderate to high hazard of water erosion.

Environmental Consequences

No Action

Without reducing the amount of fuels within the project area, the risk of a stand-replacing fire remains high. These types of fires can have a severe effect on watershed condition. The loss of vegetation and ground cover can result in increased runoff, soil erosion, and sedimentation to stream channels. The

loss of riparian vegetation can reduce stream bank stability and result in degraded stream channels.

Proposed Action

The proposed treatments of concern to watershed condition are thinning with ground based equipment, mechanical piling and mastication. The direct and indirect effects of these activities include the potential for soil disturbance and erosion, soil compaction, increased runoff and sedimentation in stream channels. The risk of impacts to soil and water would be reduced through implementation of Best Management Practices including designating skid trails and landings, restoring landings and temporary roads, limiting equipment in riparian zones, and installing and maintaining drainage features on roads. In addition, snow conditions for winter operations would be monitored to assure proper snow depth on roads and skid trails.

Thinning using ground-based equipment will be implemented on about 1500 acres within the project area. The amount of thinning within each watershed is shown in the (Treatments by Watershed Table). Within these treatment units about 120 acres will be impacted with skid trails and landings. Overall, the amount of disturbance within each watershed is quite small, thus limiting the potential effects. The skid trail system and landings will be designated on the ground to reduce the area covered. After use, the compacted skid trails will be ripped, and waterbars will be built on all the skid trails. Some of the skid trails may be recontoured. Topsoil will be removed from new landings and stockpiled. After thinning is completed, the landings will be recontoured, the topsoil spread out, and slash or wood chips put on top.



Mechanical piling will be done on about 100 acres. Piling will be done using an excavator with a thumb to pick up the slash and place it in windrows or piles: the slash is not pushed into piles. The excavator only makes one pass over the area, which limits compaction. Pile burning can result in loss of organic matter underneath the piles and soil sterilization. Within a treatment unit, the piles will cover about five percent of the area. The area affected within each watershed is small.

Brush thinning using a masticator will be done on about 280 acres. The masticator makes one pass over the ground and leaves the chipped brush as ground cover. This type of equipment moves over the duff and slash, so ground cover is not removed.

Broadcast burning would occur on most of the thinned areas that are away from structures. Some loss of ground cover may occur.

Winter operations may occur in some of the units. The potential effects of driving and operating on wet roads include soil compaction and rilling. The roads will be plowed to leave a base layer of compacted snow over which the equipment will drive. Drainage features on the road will be reconstructed so snowmelt can drain off the road through the bermed snow. Operations will cease when conditions are too wet to operate equipment without damage to the roads and soil.

Most of the riparian areas along the streams are not suitable for treatment due to steep topography and the incised nature of the channels. In the Browns Creek watershed, about 40 riparian acres could be treated. Within this zone, the trees would be directionally felled away from the channel and removed from the riparian

corridor. Slash will be piled outside the riparian zone. There are about 30 riparian acres in the Winters Creek watershed and 15 acres along Davis Creek that may be treated. These riparian zones are in helicopter units; the larger trees would be hand felled and removed, while the smaller material would be hand piled and burned. Smaller riparian areas, wet meadows, and seeps within treatments units will be excluded from equipment. Treatment of these riparian zones meets the standards and guidelines prescribed in the Sierra Nevada Forest Plan Amendment for riparian conservation objective #4. This objective ensures that management activities, including fuels reduction actions, with riparian conservation areas will maintain or enhance the characteristics associated with aquatic and riparian dependent species.

Roads are generally considered one of the primary sources of erosion within a watershed. There are 15.5 miles of roads proposed for use in the project area with six road/stream intersections. Some of these roads are in a deteriorated condition and will be reconditioned before the area is treated. Drainage features, such as waterbars, will be constructed on all the roads. About three miles of new road will be constructed, most in the Franktown Creek watershed. The new roads will not cross any streams.

The amount of ground disturbance expected from the proposed action is relatively small in relation to the watershed area. Implementation of best management practices will limit the amount of sediment delivered to the streams in the area. It is anticipated that beneficial uses of water would be maintained and the risk of adverse direct and indirect effects would be minimal.



Treatments by Watershed	Acres	Acres w/in Project	Acres Thinning w/ ground equipment	Acres Affected Skid trails/landings	Acres Machine Piled	Acres Brush Masticated
Browns	2,695	735	322	39	54	122
Winter/Davis	1,800	1,190	214	26	10	122
Ophir	3,765	805	268	32	12	24
Franktown	9,755	790	16	2	10	0
Intervening			176	21	22	9

Note: this table includes only heavy equipment ground disturbing acres, not total project acres.

Past, present and future activities in a watershed can contribute to cumulative sediment delivery to streams. The watersheds within the project area have a long history of disturbance. These watersheds were logged during the Comstock era. It was during this time that many of the roads in the area were built. In addition, there have been several wildfires in this area.

The Ophir Creek landslide in May 1982 contributed a huge amount of sediment and debris to the stream and alluvial fan. The East Bowl of Mt. Rose Ski Resort has about six major runs. A master development plan for the ski area was recently completed and work is currently being done to install waterbars and snowmaking, and to revegetate the runs with grasses.

Because the overall amount of disturbance is limited and the appropriate measures are

being taken for other projects, it is anticipated that beneficial uses of water would be maintained and the risk of adverse cumulative effects would be minimal.

Heritage Resources

Affected Environment

Prehistoric use of the Carson Range's eastern slope by prehistoric Native American populations appears to be minimal. Findings include a number of isolated projectile points that suggest the eastern slope served primarily as a hunting ground. Large artifact scatters have been found on the floor of Washoe Valley, indicating some degree of residential stability nearby. This is supported by anthropological fieldwork that has shown that, historically, the Washoe lived in single-family residences on the floor of



Washoe Valley during the winter. The proposed project area lies within the traditional homelands of the Washoe Tribe of Nevada and California.

With the Comstock mining boom of 1859, vast amounts of timber were needed to support the burgeoning Euro-American population in western Nevada. Lumber was used for mine frames, buildings, and fuel, among other things. Historic documentation shows that the Carson Front in Washoe Valley was among the first places to be logged.

Archaeological survey, to date, has found 20 Comstock-era sawmill or habitation sites. Numerous roadways, one water flume, and evidence for three other water conveyance pipelines have been found. There are also several water ditches and flumes, originally constructed during the Comstock-era or shortly thereafter, still in use today. Many of these sites have the potential to provide information relevant to early Euro-American history including land use patterns, logging technology, and domestic life.

Not all of the abovementioned sites are considered eligible for nomination to the National Register of Historic Places (NRHP). Those resources within the project area that are eligible for inclusion on the NRHP will be managed in compliance with 36 CFR Part 800 of the National Historic Preservation Act. Additionally, the water ditches and flumes that are still in use will not be damaged or destroyed by project activities.

A programmatic agreement between the Humboldt-Toiyabe National Forest and the Nevada State Historic Preservation Office is currently being developed to ensure heritage resource protection.

Environmental Consequences

No Action

A no action decision allows the continued exposure of important archaeological resources to damage or destruction by catastrophic wildland fires and may constitute an adverse effect on these resources.

Proposed Action

Reducing the high level of combustible wood in the forest by hand or machine treatments will significantly reduce the potential for archaeological sites to be destroyed by catastrophic wildland fire.

Wildlife and Plants

Affected Environment

Plants

No federally listed threatened, endangered, candidate, or Forest management indicator plants are known to occur in the area. One Forest Service sensitive species is found in the area, Sierra Valley ivesia (*Ivesia aperta* var. *aperta*). It occurs in Washoe and Storey Counties in Nevada as well as in California. It has been found on Peavine Mountain, the Virginia Range, and the Carson Range, including one site in the project area. There are six mapped occurrences with an estimated population of 2.6 million individuals on about 11 acres. Its trend is declining and it is impacted by road development and maintenance and off road vehicle use, water diversions, fire suppression, and invasive weeds. It is found mostly in meadows, seeps, and intermittent drainages.

Another plant of interest, Washoe tall rockcress (*Arabis rectissima* var. *simulans*) is found in the area. It is a rare



plant species which is endemic to the north half of the Carson Range in Douglas and Washoe counties. Washoe tall rockcress has been proposed for listing as a sensitive species in Region 4 and is ranked in the most vulnerable category by the Nevada Natural Heritage Program. This plant is only known to occur in eight locations, totaling 29 acres of Federal, county, state, and private lands. The plant occurs on relatively flat dry, sandy soils between 6,000 and 7,500 feet elevation.

Populations have been found in thinly littered openings among mid- to late-seral stands of Jeffrey pine and white fir. Some preference for inhabiting mildly disturbed sites such as old picnic and camping areas and recovering road banks has also been observed. However, plants that occur in these disturbed locations appear to often be hybridized with *Arabis holboelli* (Morefield 2002).

Seven new detections of the plant were found in plants surveys conducted for this project in 2004 – six were located in the project area.

Of the total 4700 acres of potential habitat for the rockcress, 535 are in the project area (Morefield 2004). About 420 acres overlap proposed treatment units.

Birds

No threatened, endangered, or candidate birds are found in the area.

Northern goshawk is a Forest sensitive species with potential habitat in the project area. Surveys were conducted during the breeding seasons of 2003 and 2004 along Ophir Creek and resulted in no detections of goshawks. The first year of goshawk surveys in Winters and Browns Creek also resulted in no detections. A second year of surveys will be conducted in Winters and Browns Creek in 2005. Other

sensitive bird species with potential habitat in the area are white-headed woodpeckers, mountain quail and flammulated owls...

Both the white headed woodpecker and flammulated owl prefer ponderosa and Jeffrey pine and white fir forests with large diameter trees and snags for nesting. Flammulated owls prefer stands with dense understory vegetation with multi-layered stands for roosting and nesting. White-headed woodpeckers will utilize more open-canopied stands as long as suitable snags for nesting are present.

Mountain quail occur throughout the western United States and are found in a wide variety of habitat types including old growth coniferous forest, mixed shrub and grasslands, regenerating clear cuts and old burned areas. Nests are often concealed under logs or fallen pine branches, in shrubs, or at the base of large trees.

Several other birds with potential to occur in the area have been identified as management indicator species and could be affected by the proposed action. These are yellow warbler, yellow-rumped warbler, hairy woodpecker, and Williamson's sapsucker.

Hairy woodpeckers and Williamson's sapsuckers prefer forested stands with large diameter trees and the presence of snags. Yellow warblers prefer riparian sites with willow, alder, and elderberries. The yellow rumped warbler is highly adaptable and can be found in a variety of habitats including coniferous forest, mixed woodlands, deciduous forest, pine plantations, bogs, forest edges, and openings. Hairy woodpecker and yellow-rumped warbler populations have increased in the Sierra Nevada between 1966 and 2003, while yellow warbler populations have declined (Sauer 2003).



Specific trend data was not available for Williamson's sapsucker in the Sierra Nevada or the state of Nevada (Ibid).

Neotropical migratory birds can be found in virtually every habitat on the continent. They are protected by the Migratory Bird Treaty Act. The two largest threats to these birds are habitat fragmentation on breeding grounds and deforestation of wintering habitat (Finch 1991). Compared to other birds, migratory species are the most negatively affected by fragmentation, and are usually absent from small or highly isolated forests. Species such as MacGillivray's warbler, Wilson's warbler, and common yellowthroat are considered high priority species and require heavy shrub or herbaceous cover for nesting and foraging. Human disturbance can also have an effect on songbirds. Along the Eastern Sierra, the critical breeding season is generally between March 1 and August 30 (Heath and Ballard 1999).

Mammals

No threatened, endangered, candidate, or sensitive mammals are found in the project area. Habitat for two management indicator species occurs in the area - mule deer and American marten.

The Verdi sub unit of the Loyalton-Truckee Interstate mule deer herd occupies portions of Washoe County, including the proposed project area. The majority of the proposed project area is used by mule deer for transition and winter range, while some portions overlap with the migration, summer and fawning ranges.

The project area includes 1150 acres of critical deer winter range and migration corridors in proposed treatment units and 600 outside of treatment units. The winter range provides for food and thermal cover that is not covered with deep snow during

the winter. The project area also contains approximately 1200 acres of transition range in treatment units and 2100 outside treatment units. Transitional areas provide an important corridor of food and cover for deer migrating between the summer and critical winter areas. Approximately 100 acres of summer range occurs within treatment units, 25 acres of which are considered critical fawning range. There are 600 acres of summer and 115 acres of critical fawning range outside of treatment units in the project area.

Important forage and cover species for mule deer in both summer and winter ranges include bitterbrush, sagebrush, mountain mahogany, and aspen. Mule deer breeding season begins in the fall and ends in June or July when fawns are born. According to NDOW, mule deer populations in Nevada have fluctuated from 75,000 in 1970 to 149,000 in 1993 and 109,000 in 2003. The Verdi sub-unit of the Loyalton-Truckee herd has declined from approximately 4,200 hundred animals in 1980 to approximately 1,400 deer currently (Lidberg 2004). This decline can be attributed to the loss of critical winter range lost in western Washoe County due to wildfires, urban development, and increased recreation use (NDOW 2004).

The project area is within the Nevada Department of Wildlife hunting unit 194. About 75 deer per year are taken from this unit. The area has consistently ranked as the best in the State with a success ratio of over 80% (NDOW, 2003). Although statistics are not kept on a subunit basis, it is likely that most of the deer are taken from the northern portion of this unit, away from the project area.

Although American martens have not been observed in the project area, they have



been found nearby on Slide Mountain one mile west of the area. Martens prefer areas with dense tree canopy and ample large snags and downed logs near riparian corridors with small openings with good ground cover.

Suitable habitat for American marten exists within portions of the project area

Environmental Consequences

No Action

In the long term the most likely consequence of the no action alternative would be habitat destruction by a severe stand replacing fire. Fires similar to the Martis fire in 2001, the Waterfall fire in 2004, and the Little Valley Fire in 1981 have been stand replacing fires that leave very little habitat to wildlife and plants.

In the short term habitat will continue to be available for plants and animals that exist within the project area. Natural disturbance such as drought, mistletoe, and insects will continue to provide snags and open up overgrown stands for new growth, which could improve wildlife habitat.

However, in the absence of sufficient natural disturbance, the brush and forested stands will continue to become denser, lowering habitat quality for wildlife and elevating the risk of losing the entire area to catastrophic wildfire.

Proposed Action

In the long term, the proposed action would reduce the risk of a severe, stand replacing fire, protecting habitat conditions for plants and wildlife in the project area. In addition, thinning densely stocked trees and brush may benefit many species by opening up stand canopies and allowing for the growth of nutritious brush, grass, and forbs.

Plants

In the long term, the proposed action would reduce the risk of a severe, stand replacing fire, protecting habitat conditions for the Washoe tall rockcress. Despite the loss of 30 acres (0.6%) of potential habitat to roads, overall habitat would be enhanced for the plant since the species prefers open, mid-seral conditions in Jeffrey pine forests, with neither bare ground nor very deep litter (Morefield 2004).

Short term impacts to the rockcress from project activities include incidental trampling by workers, timber equipment, road construction and reconstruction and broadcast burning. To minimize these impacts, all known locations of Washoe tall rockcress will be resurveyed prior to project implementation and plants will be flagged and avoided. Resurveying the area will account for all known plant locations as well any new plant locations not identified during initial surveys. To minimize the potential of hybridization, direct ground disturbance in and near known plant locations will be avoided.

Birds

In the long term, the proposed action would reduce the risk of a severe, stand replacing fire, protecting habitat conditions for birds in the project area. Shrub associated bird species will benefit from thinning activities as decadent brush stands are replaced with the growth of new, more nutritious shrubs. Over time, the project will result in an increased percentage of larger trees, potentially benefiting species such as white-headed woodpeckers, flammulated owls, hairy woodpeckers, and Williamson's sapsuckers. The retention of larger trees will provide structure and replace snags that will eventually decay and fall.



In addition, many birds will benefit from the improvement of about 100 acres of aspen/riparian stands by removing most of the conifer to allow the aspen to release. This would improve overall habitat conditions for riparian dependent species such as the yellow warbler and should increase the number of insects favorable to birds such as flammulated owls and yellow rumped warblers.

In the short term, direct effects to birds, from project activities include temporary disruptions in foraging, resting and nesting during the construction, reconstruction or maintenance of 15.5 miles of roads, the contouring and placing of water bars on 120 acres of skid roads, temporary roads and landings and fuels reduction treatments, including understory and pile burning. These temporary disruptions would be scattered over about five years at various locations in the project area. They would also be scattered throughout the year and not be concentrated in any single time period. The temporary disruptions would be from the use of heavy equipment, helicopters, and hand crews with chainsaws. Birds present in the project area may not nest in or near treatment units while work is being done. However, suitable habitat for songbirds is available adjacent to the treatment units.

Indirect effects on birds would be caused by the reduction of cover, nesting, and forage habitat in the short term.

Reductions in brush cover would range from 50% to 80%. Tree cover in treated stands would be reduced by about 45% to an average of about 40%. This would range from a zero percent reduction in a stand that current has 28% canopy cover to a 60 percent reduction in a stand that currently has an 81 percent canopy cover and would have 32 percent canopy cover

after treatment. The non-treated 3100 acres in the project area, including 600 acres of forested stands, will give birds such as mountain quail and flammulated owl, areas to seek cover, nesting areas and forage.

The 15.5 miles of roads that would be maintained for long term firefighting access would remove potential bird habitat of about 220 acres or 4 percent of the project area. The roads would be closed to motorized recreation, but could be used non-motorized recreationists, including birdwatchers, hikers, and mountain bikers. These activities could cause temporary disruptions to bird nesting, resting, and foraging along the roads.

Bird habitat could also be affected by the removal of about 25 trees larger than 30" in diameter during road construction/reconstruction. However, this amounts to about ¼ of one percent of the trees of this size – meaning that 99.75 percent of the large trees would be retained. Furthermore, an average of three of the largest snags per acre will be left in the treatment units to provide habitat for birds such as white-headed woodpeckers, flammulated owls, hairy woodpeckers, and Williamson's sapsuckers. . To minimize impacts to the highest density of nesting songbirds, work in aspen and riparian areas will be limited to August 15 through March 15, which covers the majority of their critical nesting season.

In regards to goshawks, if the second year of surveys finds any nesting sites, the main and most immediate impacts will be to habitat and to the prey base, primarily outside of potential activity centers, within areas utilized for foraging.

Of the 600 acres of potential protected activity centers (PACs), approximately 300 acres overlap nine treatment units.



Although the potential nest buffer (500 feet around the potential nest sites) allows for hand treatment, such treatment would not alter habitat quality. This project proposes to enter three potential PACs.

Approximately 700 acres of foraging habitat will be treated, leaving about 240 acres not treated within one mile of the nests.

Treated areas would be thinned to meet fuels objectives and although minimal canopy densities would be retained, other attributes such as decadence and ground cover (hiding cover for prey) will be reduced. These attributes are considered necessary for the primary prey species and therefore the project will have an adverse affect on foraging opportunities. Long-term habitat would improve over time due to the reduction of competition between trees while maintaining stand structure. Cover for prey will also return.

Species-specific summary follows:

Impacts to bird species	
Species	Impact of proposed action
Flammulated Owl	MIIH
Northern Goshawk (if found)	MIIH
White Headed Woodpecker	MIIH
Hairy Woodpecker	MIIH
Yellow Warbler	MIIH
Yellow Rumped Warbler	MIIH
Williamson's sapsucker	MIIH
Mountain Quail	MIIH
Effects Determination Code for Species of Concern	
NI = No Impact from the project on the	

species or its habitat

MIIH = The project may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species.

Mammals

In the long term, the proposed action would reduce the risk of a severe, stand replacing fire, protecting habitat conditions for deer in the project area. In portions of the project area, habitat conditions will be improved for mule deer as decadent stands of brush are removed and replaced by new growth of grasses, forbs, and brush for forage

In the short term direct effects to mule deer from project activities include temporary disruptions in foraging, resting and fawning during the construction, reconstruction or maintenance of 15.5 miles of roads, the contouring and placing of water bars on 120 acres worth of temporary roads, skid roads and landings and fuels reduction treatments. This would include the flushing of deer along roads due to project related traffic as well as long term nonmotorized recreation by birdwatchers, hikers, mountain bikers, and others.

Project activities would be spread over five years with the use of heavy equipment, helicopters, and hand crews with chainsaws limited to only a portion of the area in any given year. Deer present in the project area may be temporarily displaced by the noise and human presence during project activities.

Project activities will also be scattered throughout the year, limiting disturbance in any given season. In the transition range, the mule deer may seek different



drainages from the areas being treated while they move between the summer and winter ranges. Due to the limited number of acres in summer and fawning ranges, it is expected that very few deer will be disturbed during the critical fawning season.

Habitat related effects to mule deer include the reduction of thermal and protective cover and forage in the treated units. Reduction in brush and tree canopy cover would reduce viable thermal and protective cover and winter forage for mule deer, causing the deer to seek shelter and forage in other locations. Of the 1760 acres of critical winter range in the project area, approximately 1150 acres will be treated and 610 acres will not be treated. There are also 1250 acres east of the project boundary and west of Highway 395 of critical winter range on private land for deer to use developed or undeveloped land. Untreated areas will give the deer areas to seek thermal cover and forage that is needed for deer in their winter range. Once treatments are completed in the transition area, mule deer may limit their use in areas with a higher reduction of shrubs and trees. This may cause the deer to use other sections of the transition area or move more quickly through it. Although portions of summer and critical fawning range overlap with treatment units, impacts to these habitats are expected to be minimal due to the relatively small numbers of acres being treated.

Although portions of summer and critical fawning range overlap with treatment units, impacts to these habitats are expected to be minimal due to the relatively small numbers of acres being treated. Habitat related impacts to the summer and critical fawning ranges would

be minimal due to the small acreage being treated.

Other habitat related impacts include the loss of forage on about 120 acres of deer habitat due to temporary roads and landings. This amounts to about two percent of the project area

In the long term, the cumulative effect of this project and other fuels reduction projects in the area would be a reduction in the risk of a severe, stand replacing wildfire. This would likely protect critical deer winter range in this area from destruction. In the short term, however, project related disturbance, including loss of forage and thermal cover, coupled with disturbance from construction of homes, businesses, and a new freeway adjacent to the area would adversely affect mule deer. The long term trend for the Loyalton – Truckee herd is a continued decline of the population due to the loss of habitat from housing developments and other land alterations. For example, a major development near Verdi is anticipated in the near future that would further reduce critical deer winter range for this herd.

It is expected that implementation of the proposed action will negatively impact mule deer in the short term, but should increase the quality of habitat in the long run. This project will not contribute to a downward trend in the population viability of the Verdi-sub-unit of the Loyalton Truckee deer herd.

American marten are generally associated with mature forest vegetation with significant down and dead woody debris. In the short term, the removal of brush and understory trees and broadcast burning in these treatment areas will affect marten habitat by decreasing down and dead woody debris, and the dense canopy cover typically required by marten. However, in



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the long term, project activities will result in a mature forest with larger diameter trees, more understory vegetation and some large down and dead woody material. Furthermore, three of the largest snags per acre as well as down logs and woody debris will be retained to provide habitat for marten. Therefore, the proposed action will not cause a downward trend in American marten populations or affect population viability of the species.



CONSULTATION AND COORDINATION

The proposal was listed in the Schedule of Proposed Actions in October 2003; January 2004; April 2004; and July 2004. The proposal was provided to the public and other agencies for comment during scoping from July 25, 2004 to August 23, 2004. In addition, as part of the public involvement process, the agency conducted a public open house meeting on August 11, 2004 at the Pleasant Valley Elementary School gave presentations twice to the West Washoe Valley Citizens Advisory Board and held numerous discussions and field visits with interested parties.

List of Tribes, Agencies, and Organizations Consulted

Tribal

Washoe Tribe

Federal

Fish and Wildlife Service

State

Nevada Department of Transportation
University of Nevada
Nevada Division of Wildlife
Nevada State Historic Preservation Office
Nevada Division of Forestry
Nevada Natural Heritage Program

Local

Washoe County Comprehensive Planning
Washoe County Parks and Recreation
Washoe County Air Quality Management District
Truckee Meadow Fire Department
West Washoe Citizens Advisory Board

Organizations

West Washoe Association
Galena Forest Estates Homeowners Association
St. James Village Homeowners Association
Toiyabe Chapter, Sierra Club
Nevada Fire Safe Council

LIST OF PREPARERS

Name	Responsibility	Education: Degrees	Experience
Terry Birk	Heritage Resources	Master of Arts, Anthropology Bachelor of Arts, History and English	22 Years
Doug Booth	Wildlife , Plants	Master of Science, Resource Conservation Bachelor of Arts, Biology	3 Years
Kathy Branton	GIS	Associate of Arts, Forestry	25 Years
Amanda Brinnand	Forest Vegetation	Bachelor of Science, Natural Resource Forestry	17 Years



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Sally Champion	Watershed	Master of Science, Watershed Science Bachelor of Science, Biology	14 Years
Ed DeCarlo	Forest Vegetation	Bachelor of Science, Forest Management	23 Years
Maureen Easton	Wildlife, Plants	Bachelor of Science, Wildlife Biology	8 Years
Greg Haynes	Heritage Resources	Doctor of Arts, Anthropology Bachelor of Arts, Anthropology	2 Years
Bob Jiron	Fire/Fuels	Bachelor of Science, Forestry	18 Years
David Loomis	Project Manager, Noise, Air Quality, Visual Resources	Master of Science, Land Use Planning Bachelor of Arts, Economics	26 Years
Kelly Martin	Fire/Fuels	Bachelor of Science, Resource Forestry	11 Years
Larry Randall	Recreation	Bachelor of Science, Forestry	22 Years



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APPENDIX

Treatment by unit

Unit	Acres	Treatment	Basal Area	
			Before	After
A5	64	Whole Tree Tractor, Perimeter Machine Pile, Underburn	206	60 to 100
B1	42	Whole Tree Tractor, Machine Pile	217	60 to 100
B2	8	Whole Tree Tractor, Machine and Hand Pile	217	60 to 100
B3	17	Log Length Helicopter, Hand Pile	217	60 to 100
B5	48	Whole Tree Tractor, Hand Pile	235	60 to 100
B6	27	Brushfield with Thinning, Mastication	40	40
B8	53	Whole Tree Tractor, Hand Pile, Mastication	201	100
B9	66	Whole Tree Tractor, Perimeter Machine Pile, Underburn	210	60 to 100
B10	10	Thinning, Hand Pile	31	18
C1	123	Whole Tree Tractor, Perimeter Machine Pile, Underburn	197	60 to 100
C2	28	Whole Tree Tractor, Underburn	260	60 to 100
C3	104	Whole Tree Tractor, Underburn	204	60 to 100
C4	21	Brushfield with Thinning, Mastication	40	40
C5	20	Whole Tree Tractor, Underburn	197	60 to 100
C6	40	Understory Brushfield with Thinning, Machine Pile	48	48
C9	57	Whole Tree Tractor, Underburn, Aspen Release	225	60 to 100
C10	22	Whole Tree Tractor, Underburn, Aspen Release	260	88
D1	14	Whole Tree Tractor, Perimeter Hand Pile, Underburn	120	60 to 100
F1	81	Log Length Helicopter, Underburn	236	60 to 100
F2	21	Log Length Helicopter, Perimeter Hand Pile, Underburn	160	60 to 100
F7	90	Log Length Helicopter, Machine and Hand Pile, Underburn	211	60 to 100
F8	40	Whole Tree Tractor, Perimeter Machine and Hand Pile, Underburn	215	60 to 100
FB3	86	Understory Brushfield with Thinning, Machine, Hand Pile, Mastication	60	60



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N1	60	Log Length Helicopter, Underburn	203	60 to 100
N4	49	Log Length Tractor and Skyline, Perimeter Hand Pile, Mastication, Underburn	180	60 to 100
O1	30	Brushfield with Thinning, Mastication	40	40
O3	49	Log Length Helicopter, Underburn	200	60 to 100
O6	206	Whole Tree Tractor, Log Length Skyline, Underburn	225	60 to 100
O9	95	Whole Tree Tractor, Perimeter Machine and Hand Pile, Underburn	180	60 to 100
O10	106	Whole Tree Tractor, Underburn	220	60 to 100
P1	82	Whole Tree Tractor, Log Length Skyline, Perimeter Machine and Hand Pile, Underburn	223	60 to 100
P2	42	Whole Tree Tractor, Underburn	245	60 to 100
P4	30	Understory Brushfield with Thinning, Perimeter Hand Pile	60	60
P5	102	Log Length Helicopter, Perimeter Hand Pile, Underburn	193	60 to 100
P6	54	Understory Brushfield with Thinning, Perimeter Hand Pile	60	60
S2	7	Understory Brushfield with Mastication, Machine and Hand Pile	60	60
S3	34	Whole Tree Tractor, Machine and Hand Pile	180	60 to 100
W1	41	Understory Brushfield with Thinning, Mastication	60	60
W3	14	Brushfield with Thinning, Mastication	40	40
W4	72	Whole Tree Tractor, Log Length Skyline, Underburn	211	60 to 100
W5	87	Whole Tree Tractor, Underburn	197	60 to 100
W6	70	Whole Tree Tractor, Log Length Skyline, Perimeter Machine and Hand Pile, Underburn	197	60 to 100
W7	21	Brushfield with Thinning, Mastication	20	20
W8	57	Brushfield with Thinning, Mastication	30	30
W9	11	Log Length Helicopter, Underburn	180	60 to 100
W10	6	Whole Tree Tractor, Underburn	180	60 to 100
W12	74	Whole Tree Tractor, Underburn	148	60 to 100



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