



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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SUMMARY

FINAL BIOLOGICAL OPINION ON THE EFFECTS TO THE MEXICAN SPOTTED OWL FROM THE PROPOSAL TO IMPLEMENT THE APRIL 2001, WILDFIRE HAZARD REDUCTION PROJECT PLAN (WHRP), ON LOS ALAMOS NATIONAL LABORATORY (LANL), LOS ALAMOS, NEW MEXICO

Cons. #2-22-01-F-432

Date of the final opinion: July 16, 2001

Action agency: Department of Energy, Los Alamos National Laboratory

Project: The project concerns the proposal to implement the April 2001, Wildfire Hazard Reduction Project Plan (WHRP), on Los Alamos National Laboratory (LANL), Los Alamos, New Mexico. The focus of the WHRP is to: 1) reduce the risk of damage and injury to property, human life and health, and biological resources from high-intensity wildfires at LANL; and 2) enhance forest health at LANL. This program will initially be composed of a series of individual, relatively small-scale projects that would be conducted over approximately the next three years with ongoing, long-term maintenance projects conducted thereafter. These initial projects would be conducted to bring the forests at LANL to the desired end-state conditions for wildfire risk followed by an ongoing maintenance program to maintain the forests in this desired state with enhancements to improve overall forest health. An estimated 35 percent, approximately 10,000 acres (ac) (4,000 hectare (ha)), of LANL would be treated under this program, including portions of LANL burned during the Cerro Grande fire. The treatment would thin approximately 250 ac (100 ha) of mixed conifer, 6,150 ac (2,490 ha) of ponderosa pine (*Pinus ponderosa*), and 3,600 ac (1,457 ha) of piñon pine (*Pinus edulis*) and juniper (*Juniperus monosperma*) woodlands

Listed species affected: Mexican spotted owl (*Strix occidentalis lucida*)

Biological opinion: Non-jeopardy

Incidental take statement: Mexican spotted owls are not expected to be taken as a result of this project.

Conservation Recommendations: Implementation of conservation recommendations is discretionary. **Four** conservation recommendations are provided.

July 16, 2001

Cons. #2-22-01-F-432

Mr. David A. Gurule
Department of Energy
Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

Dear Mr. Gurule:

This responds to your June 11, 2001, request for formal consultation with the U.S. Fish and Wildlife Service (Service) under section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The request concerns the proposal to implement the April 2001, Wildfire Hazard Reduction Project Plan (WHRP), on Los Alamos National Laboratory (LANL), Los Alamos, New Mexico.

We strongly support the fire abatement projects, such as this, especially in areas of wildland-urban interface. Protecting human life and property should be the highest priority. In addition, threats of wide-scale habitat loss due to fire are real and immediate on many public lands. Reducing fuels in these areas also may help to protect habitat for threatened and endangered species.

In the May 3, 2001, Biological Assessment (BA) concerning WHRP you determined the proposed action would have "no effect" on the whooping crane (*Grus americana*) and the black-footed ferret (*Mustela nigripes*) because there is no suitable habitat on LANL. You also determined that although there is habitat for the southwestern willow flycatcher (*Empidonax trailii extimus*) on LANL, the project will not affect suitable or potential habitat, and you determined that the proposed action would have "no effect" on the flycatcher. We concur with your determinations that the proposed action will have "no effect" on the whooping crane, black-footed ferret, and southwestern willow flycatcher.

You also determined that the proposed action "may affect, is not likely to adversely affect" the threatened bald eagle (*Haliaeetus leucocephalus*). WHRP treatments are likely to alter bald eagle potential foraging habitat; however, these effects are insignificant, discountable, or beneficial (positive effects without any adverse effects) because: 1) bald eagles on LANL rarely use upland areas for foraging purposes; 2) treatments will improve habitat diversity for the eagle; and 3) no live or dead ponderosa pine trees (i.e., roosting trees) would be cut in potential or suitable habitat for bald eagles with the exception of thinning of ponderosa pines growing within 100 feet (ft) (30 meters (m)) of structures at TA-33. Therefore, we concur with your determination of "may affect, is not likely to adversely affect" for the bald eagle.

As a result of meetings on May 16, and June 7, 2001, a field visit by us to LANL on May 24, 2001, you amended the BA on June 11, 2001, and requested formal consultation because you determined the WHRP "may affect is likely to adversely affect" the Mexican spotted owl (*Strix occidentalis lucida*) (owl). Therefore, this document represents our biological opinion (BO) on the effects of the WHRP on the owl in accordance with section 7 of the Act.

This BO is based on information provided in the BA; the June 11, amended BA, the April 2001, WHRP; the August 10, 2000, environmental assessment (EA) concerning WHRP; the January 1999, threatened and endangered species habitat management plan for LANL (HMP) (LANL 1999); email and telephone conversations between our staffs; data presented in the final Recovery Plan for the owl (USDI 1995); data in our files; Forest Service regional owl data; literature review; and other sources of information. References cited in this biological opinion are not a complete bibliography of all literature available on the owl, the proposed action and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation History

Informal consultation began on December 16, 1999, when we provided comments on your draft EA and a species list. We met with you on numerous occasions from 1999 through June 2001, to discuss the project and any concerns with potential adverse impacts of the proposal on the owl and its habitat. On May 4, 2001, the Department of Energy (DOE) submitted the WHRP and BA with request for comments on the proposed project. We received all the information necessary to begin formal consultation on June 11, 2001, when you submitted an amended BA and request for formal consultation. The request for formal consultation was acknowledged by this office in a letter dated June 15, 2001.

Tribal Trust Resources

At the time of our June 15, 2001, response to DOE, the Service also informed the agency of the Secretarial Order No. 3206 regarding the Endangered Species Act and enhanced Native American participation. The Order requires that the Service provide timely notification to affected Tribes as soon as the Service is aware that a proposed Federal agency action subject to formal consultation may affect Tribal rights or Tribal trust resources. Because LANL contains resources that have been claimed through ancestral tradition by San Ildefonso Pueblo, Santa Clara Pueblo, Cochiti Pueblo, and Jemez Pueblo (and may also include the other 14 recognized American Indian Tribes of Puebloan Ancestry), the implementation of the WHRP may affect areas or resources used for traditional activities or Tribal trust resources. The Order states that when the Service enters into formal consultation with agencies not in the Departments of Interior or Commerce on a proposed action that may affect Tribal rights or Tribal trust resources, the Service shall notify the affected Native American Tribes and encourage the action agency to invite the affected Tribes and the Bureau of Indian Affairs to participate in the formal consultation process. The Service

directly informed the above named Pueblos, the Bureau of Indian Affairs, and the Eight Northern Indian Pueblos Council of the formal consultation request. To date, the Service has not received a response from any Tribal entity or representative concerning this consultation.

BIOLOGICAL OPINION

It is our biological opinion that the implementation of the April 2001, Wildfire Hazard Reduction Project Plan on Los Alamos National Laboratory, as addressed in this document, is not likely to jeopardize the continued existence of the Mexican spotted owl.

DESCRIPTION OF THE PROPOSED ACTION

Many southwestern forests have shown an increase in ladder fuels (i.e., smaller diameter trees and shrubs), so that crown fires, once rare, for example, in ponderosa pine, are now more common (Dahms and Geils 1997). The long-term effect of land management practices and climate on LANL-area forests has been an increase in overall tree stand densities, lack of frequent low-intensity fires, and the unnatural buildup of fuels. Today's forested areas within and surrounding LANL are generally overgrown with dense stands of unhealthy trees and excessive amounts of standing and fallen dead tree material. Forested areas with these conditions, coupled with the joint probability of unfavorable weather conditions, present an extreme hazard to nearby communities and properties as the danger of high-intensity wildfires is greatly enhanced. Given the terrain of the Pajarito Plateau, namely numerous narrow, finger-like mesas separated by deep west-to-east oriented canyons, fire suppression of high-intensity wildfires is very difficult, particularly within the canyon reaches. Additionally, the frequency and severity of wildfires in the LANL region over the past several decades have increased. In May 2000, the Cerro Grande fire burned approximately 43,000 ac (17,200 ha) of land, of which about 7,650 ac (3,061 ha) were located within the boundaries of LANL. Thus, the implementation of the WHRP program will attempt to reduce the wildfire hazard on LANL.

The focus of the WHRP is to: 1) reduce the risk of damage and injury to property, human life and health, and biological resources from high-intensity wildfires at LANL; and 2) enhance forest health at LANL. This program will initially be composed of a series of individual, relatively small-scale projects that would be conducted over approximately the next three years with ongoing, long-term maintenance projects conducted thereafter. These initial projects would be conducted to bring the forests at LANL to the desired end-state conditions for wildfire risk followed by an ongoing maintenance program to maintain the forests in this desired state with enhancements to improve overall forest health. An estimated 35 percent, approximately 10,000 ac (4,000 ha), of LANL would be treated under this program, including portions of LANL burned during the Cerro Grande fire. The treatment would thin approximately 250 ac (100 ha) of mixed conifer, 6,150 ac (2,490 ha) of ponderosa pine (*Pinus ponderosa*), and 3,600 ac (1,457 ha) of piñon pine (*Pinus edulis*) and juniper (*Juniperus monosperma*) woodlands (Table 1).

Three phases of implementation have been developed according to wildfire hazard reduction priorities. They are:

1. Phase 1: High priority strategic projects, primarily fuel breaks, and defensible space in heavily forested urban interface areas to reduce the wildfire hazard to the public, LANL employees, and key facilities and infrastructure. Also included are firing site treatments to reduce the risk of wildfire ignition and escape. These projects are planned for FY01-FY02
2. Phase 2: Moderate priority, larger forest fuels reduction projects in heavily forested areas to reduce the general wildfire hazard and improve forest health. These projects are planned for FY02-FY03.
3. Phase 3: Lower priority, larger forest fuels reduction projects in more moderately forested and remote areas to reduce wildfire hazard in general and to improve forest health. These projects are planned for FY03.

A key planning objective is to establish desired conditions as the end-state of the fuels-reduction and maintenance projects initiated under the WHRP. There are multiple end-state conditions, depending on the location and use of the area. High-risk sites require lower fuel loadings and more intensive management than remote forests and woodlands. The majority of LANL will be managed for forest health. Table 1 shows total acreages and acreages to be thinned in each of the major vegetation types on LANL.

The WHRP will be implemented with the following objectives: 1) reduce fuel loads within LANL forests to reduce wildfire hazards; 2) reduce the risk of wildfire escapes at LANL-designated firing sites by treating fuels; 3) improve wildland fire suppression capability through fire road improvements; 4) monitor the effectiveness of wildfire hazards reduction actions and modify management techniques as appropriate; 5) conduct fire management activities in a manner that will comply with all applicable regulatory requirements; and 6) integrate the WHRP Plan with other resource management plans including the HMP and the Biological Resources Management Plan.

Table 1. Total amount of each habitat type and amount of each habitat type proposed to be treated by the wildfire hazard reduction project, Los Alamos National Lab, New Mexico.									
Planning area	Mixed conifer	Mixed conifer treated	Ponderosa pine	Ponderosa pine treated	Pinyon juniper	Pinyon juniper treated	All types total	All types treated total	
1	100	30	1,500	1,500	300	0	1,900	1,530	
2	0	0	300	0	400	100	700	100	
3	300	90	2,200	2,000	400	200	2,900	2,290	
4	0	0	1,200	500	4,300	1,500	5,500	2,000	
5	100	30	600	600	0	0	700	630	
6	300	90	1,900	1,500	2,300	800	4,500	2,390	
7	0	0	100	0	2,900	700	3,000	700	
8	0	0	0	0	400	0	400	0	
9	50	10	500	50	2,200	300	2,750	360	
Total	850	250	8,300	6,150	13,200	3,600	22,350	10,000	
Percent	100	29	100	74	100	27	100	45	

General end-state conditions would be a spatial mosaic of tree sizes, age classes, and densities with a herbaceous plant understory that is resistant to high-intensity wildfires and that can be maintained with selective cutting and underburning. This condition would closely emulate conditions that likely existed under a natural fire regime in which higher-frequency, low-intensity surface fires kept the fuel load and tree density low. For example, the diversity of shrubs, herbs, and grasses in the understory should increase within treated areas (e.g., see Dahms and Geils 1997).

The Threatened and Endangered Species Habitat Management Plan for LANL (LANL 1999) identified two primary threats to the Owl on LANL property: 1) impacts on habitat quality from LANL operations; and 2) disturbance of nesting owls. To address these threats, LANL delineated Areas of Environmental Interest (AEI) for known occurrence of owls and for areas meeting the requirements of habitat suitability of the owl. An AEI consists of two areas—a core area and a buffer area. The core of the habitat is defined as suitable canyon habitat from rim to rim and 100 m out from the top of the canyon rim. The buffer area is 400 m wide, extending outward from the edge of the core area. Although adult Owls may be found within their home range anytime throughout the year, the primary threat from disturbance is during the breeding season when owl pairs are tied to their nest sites. Therefore, management of disturbance factors for the owls within the LANL AEIs is concentrated on the breeding season.

Management of habitat destruction or degradation within the AEI is guided by criteria of acreage within either the core or buffer areas. Habitat alterations are considered for all AEIs and for both core and buffer areas. Activities causing disturbance are considered only for occupied AEIs and only for impacts on core areas. Under the HMP, all Owl AEIs are considered occupied during March 1 through August 31 or until surveys show AEIs to be unoccupied. Surveys are conducted annually in the Owl AEI core areas, with at least four surveys conducted for each AEI each field season between April 1 and August 31 (specific survey methods are discussed in the HMP, LANL 1999).

The HMP indicates that habitat alteration is not restricted in developed areas unless it impacts undeveloped core areas of an AEI. Current ongoing disturbance activities are not restricted in developed areas (categorized as all building structures, paved roads, improved gravel roads, paved and unpaved parking lots, and firing sites). Disturbance activities not currently ongoing are restricted when impacts occur to undeveloped occupied core areas of an AEI.

WHRP thinning treatments will be implemented in Owl AEIs core and buffer areas throughout LANL. The BA indicates that the following conservation measures, consistent with the HMP guidelines for the owl, will be followed at all times including:

1. activities will be restricted in AEI core areas during the owl's breeding season (March 1 to August 31) unless current year surveys show that no owls are present;

2. in historically occupied core areas of AEIs, fuels treatments may not exceed 10 percent of the undeveloped core area and would only be conducted during the nonbreeding season, which is from September 1 to the end of February;
3. fuel treatments would not be allowed within 1,335 ft (400 m) of historically occupied owl nesting sites (e.g., Canon de Valle);
4. in unoccupied, undeveloped core areas of AEIs, on slopes greater than 40 percent, in the bottoms of steep canyons, and within 100 ft (30 m) of a canyon rim, trees less than 9 in. (22.5 cm) diameter at breast height (dbh) can be thinned and other fuels can be removed;
5. trees greater than 9 in. (22.5 cm) dbh will be thinned within 100 ft (30 m) of buildings to protect facilities;
6. for human health and safety reasons, trees growing within 100 ft (30 m) of buildings but outside of a developed area may be thinned to achieve a 25-ft (7.5-m) spacing between tree crowns;
7. habitat alterations (any action that alters the long-term soil structure, vegetative components necessary for the owl, prey quality and quantity, water quality, hydrology, or noise or light levels), including thinning, will not be restricted in developed areas;
8. trees and snags along canyon rims will be retained in developed areas to the maximum extent possible;
9. large logs (>12-in/30-cm diameter) and snags (large standing trees that are dead or diseased) will be retained to the maximum extent practicable to provide habitat for prey species;
10. thinning in unoccupied core areas not meeting the characteristics listed above (i.e., on slopes greater than 40 percent, in the bottoms of steep canyons, and within 100 ft (30 m) of a canyon rim, trees less than 9 in. (22.5 cm) dbh and in buffer areas may include trees of any size to achieve a 25-ft (7.5-m) spacing between tree crowns; and
11. no more than 20 percent of the unoccupied, undeveloped core areas of AEIs will be treated.

Because of the extreme fire danger associated with firing sites and the potential effect of a fire on Owl habitat (as in the Cerro Grande fire), explosives testing and firing sites and waste treatment areas will be treated as follows:

1. trees within 1,200 ft (365 m) of firing sites and burn areas in both core and buffer AEI areas may be thinned to a 50-ft (15-m) spacing between trees, except on slopes greater than 40 percent or in the bottoms of steep canyons; and
2. any tree over 9 in. (22.5 cm) dbh within 1,200 ft (365 m) of a firing site may have its lower limbs removed up to a height of 6 ft (1.8 m) above the ground to help prevent crown fires.

Following the conservation measures outlined above, the WHRP will implement the following prescriptions to reduce the risk of damage and injury to property, human life and health, and biological resources from high-intensity wildfires at LANL, and also to enhance forest health. A typical thinning project will use from 6 to 20 qualified personnel, axes, chainsaws, and heavy equipment. Areas with greater than 30 percent slopes would not be treated using heavy equipment, but hand-held equipment will be used to cut tree limbs or small-diameter trees on areas with slopes as great as 40 percent.

Defensible Space around Buildings

Protection measures will be based on "Urban-Wildland Interface Code 2000" (UWIC 2000). In extreme fire hazard areas, the first 50 ft (15 m) from a building would be cleared of combustible trees and brush. The next 50 ft (15 m) would be thinned to a fuel break specification. In high fire hazard areas, the first 25 ft (7.5 m) would be cleared of combustible trees and brush. The next 25 ft (7.5 m) would be thinned to a fuel break specification. In moderate fire hazard areas, the first 10 ft (3 m) and 20 ft (6 m) will be cleared and thinned respectively. Low fire hazard areas are cleared out to 10 ft (3 m) as a standard practice.

Fuel Breaks

LANL fuel breaks will be comprised of open forests and low surface fuel loads and may vary from 100 to 700 ft (30 to 213 m) in width. Tree crowns may be 10 to 25 ft (3 to 8 m) apart, tree density should be about 50 trees/acre (124 trees/ha) or have a basal area of about 60 ft²/acre (14 m²/ha). Limbs could be removed from the lower 6 to 8 ft (2-2.5 m) on residual trees.

Firing Sites

LANL Firing Sites will be treated as fuel breaks as mentioned above except Firing Sites are treated out to 1200 ft (365 m).

Utility Corridors

All aboveground utilities would be cleared of trees within the easement corridor that potentially could interfere with the transmission of the utility. Power lines will be prioritized from most important to least important and cleared accordingly. Power line corridors are usually cleared of trees depending on the size of the power line (13.8-kv lines have a 50-ft (15-m) easement; 115-kv lines have a 100-ft (30-m) easement, and corridors are cleared out at a 45 degree angle from the edge.

Tree Thinning

In general, thinning will consist of mechanically and manually reducing the density of trees by selective cutting. Understory thinning will be conducted to remove select woody vegetation, fallen trees and limbs, and low-growing tree limbs that could act as "ladder fuels" that can carry a surface fire upwards into the tree crowns. Tree thinning will remove select trees to interrupt the continuity of the forest canopy and, consequently, the potential for a crown fire to spread. Trees selected for thinning will be marked at least 6 in. (15 cm) above the ground and on the side away from trails or potential public viewing areas. Remaining tree stumps will be 6 in. (15 cm) or less. Large, fire-resistant species of trees, (e.g., ponderosa pines), will usually be retained.

Thinning treatments produce logs, piles of cut small branches, and brush. Some of this material may be donated or salvaged for use by the surrounding communities. However, some of the smaller logs, branches, and brush (slash) would require disposal as waste. The presence or absence of contamination and type of contamination within the waste will primarily dictate the method(s) of disposal. Proposed methods of removal of wood materials and waste disposal are described in the following paragraphs. One, all, or a combination of measures may be used.

Timber Salvage

Commercial size timber (typically at least 9 in. [22.5 cm] in diameter) that is free of contamination may be salvaged. Logs would be removed by truck either directly to off-site facilities or to on-site temporary storage locations within the project area.

Contaminant-Free Wastes

Slash and other wood wastes could be mechanically reduced (chipped) or burned in pits using a mechanical burn enhancement device known as an air curtain destructor. These air curtain destructors employ very high temperatures and efficiently reduce combustible waste materials to a residual ash. Both mobile trench and self-contained systems will likely be employed. Air curtain destructors will be used in conformance with regulations and permit requirements.

Wood chips produced during cleanup activities from slash could be used as mulch in selected areas at LANL to foster soil stability and establishment of grasses and shrubs. The depth of wood chip mulch would not exceed 2 in. (5 cm). If slash is used for erosion control at LANL in an unchipped state, it will be used in such a manner that it will not pose a fire hazard.

Potentially Contaminated Wood Materials

Wood materials produced in an identified Potential Release Site (PRS) or other suspected contaminated site would be managed according to the respective LANL Division Standard Operating Procedure for Waste Management. LANL has begun a wood sampling program to ensure that contaminants in wood do not pose a risk to human health or to the environment. If wood materials contain high explosives (HE) or depleted uranium (DU) or both, they could be burned at any of the Resource Conservation and Recovery Act (RCRA)- or New Mexico Administrative Code 2.60 (NMAC)-permitted burning facilities within LANL Technical Areas (TAs) 14, 15, 36, 39, and 40, or at other locations at LANL utilizing burn pits and an air curtain destructor. HE contamination is consumed during burning and DU does not aerosolize at typical wood burning temperatures.

Construction or Reclamation of Access (Fire) Roads

New access roads may have to be constructed as a part of the treatment measures and for improved access to facilitate fire suppression efforts in the event of a wildfire (as in the case of the recent Cerro Grande fire). These roads would be constructed by blading an approximately 16-ft (4.8-m) wide swath. Bar ditches and turnouts would be integral to road construction as needed. Existing access roads also may require improvements such as grading and ditching. The planning process may demonstrate that some existing access roads as well as firebreaks are no longer necessary. In this case, existing access roads would be disced and revegetated with native plant species. No new roads will be constructed within AEI core areas, nor will any existing access roads be reclaimed in these areas.

Surface Fuels

When DOE finalizes its policy on prescribed fire, it will be considered as a means to reduce surface fuels as a post-treatment tool. If prescribed fire is proposed to be used in fuels management or maintenance, DOE, in conjunction with the Service, will evaluate the potential for impacts to listed species, and determine whether additional consultation is required. Under the WHRP, forest treatment areas (excluding fuel breaks, firing sites, and defensible space) will contain a few slash piles and logs at least 12 in. in diameter for small mammal habitat purposes and will be arranged so as not to create a fire hazard to surrounding trees.

Maintenance

Long-term maintenance projects will follow each fuels reduction project to maintain the desired end-state conditions for each of the habitat types proposed for treatments. Project areas would be reviewed approximately every five years. Furthermore, periodic mowing and grading of access roads are included within long-term maintenance of project areas.

The prescriptions described above will be implemented within pinyon-juniper woodlands, ponderosa pine, and mixed conifer forests. Each of these habitat types and "end-state" conditions are further explained below.

Piñon-Juniper Woodland

Proposed end-state conditions for piñon-juniper woodlands on LANL property will be a mix of open, savanna-like conditions with interspersed closed canopy (untreated) woodland. Where appropriate, slash generated during the thinning treatments will be left on-site to help reduce soil erosion and promote herbaceous plant response. This would increase surface fuel loads; consequently, these areas would be isolated from adjoining woodlands to reduce the risk of wildfire carrying from one area to another. The desired end-state conditions for thinned piñon-juniper woodlands would fall within the following parameters:

1. Individual tree crowns would be separated by a distance of no less than 25 ft (7.6 m);
2. The crowns from a high-density cluster of trees will be isolated by at least 40 ft (12 m);
3. Diseased, malformed, or weakened trees will be preferentially removed; and
4. The remaining trees should represent a mix of sizes and ages.

Thinning treatments should promote herbaceous plant response, reduce surface runoff of precipitation, and increase wildlife habitat quality. Areas appropriate for thinning will include woodlands with less than 25 ft (7.6 m) between tree crowns and relatively low slope (<40 percent).

Ponderosa Pine Forest

The desired end-state conditions for thinned ponderosa pine forests will fall within the following parameters:

1. Individual tree crowns (or in some cases, groups of trees) will be separated by a distance of about 10 to 25 ft (3 to 7.5 m);

2. the crowns from a group of trees will be separated by a distance of about 40 ft (12 m) from each other;
3. tree density will be about 50 to 150 trees per acre (124 to 370 trees per ha);
4. canopy cover ranges from 40 percent to 60 percent of the project area;
5. "ladder" fuels that will allow fire to move from the ground into the tree crowns will be removed;
6. the majority of trees to be removed will be approximately 9 in. (22.5 cm) in diameter breast height (dbh) or less;
7. some trees 12 to 16 in. (30 to 40 cm) dbh may be removed to achieve the desired spacings; and
8. diseased, malformed, or weakened trees will be preferentially removed during thinning treatments.

Mixed Conifer Forest

The desired end-state conditions for thinned mixed conifer forests will fall within the following parameters:

1. No more than 30 percent of mixed conifer habitat within LANL will be treated in a 3-year period;
2. all hardwoods and shrubs will be retained within the treatment area;
3. all large logs (12-in. diameter) will be retained for small mammal habitat;
4. "ladder" fuels that will allow fire to move from the ground into the tree crowns will be removed;
5. the majority of trees to be removed will be approximately 9 in. (22.5 cm) dbh or less;
6. some trees 12 to 16 in. (30 to 40 cm) dbh may be removed to achieve the desired spacing;
7. diseased, malformed, or weakened trees would be preferentially removed during thinning treatments with the exception of wildlife snags; and

8. treatment areas will be small (1 to 20 acre [0.40 to 8 ha]), irregularly shaped, and designed in a mosaic pattern with untreated areas.

STATUS OF THE SPECIES (range-wide)

Mexican spotted owl

The Mexican spotted owl was listed as threatened on March 16, 1993 (58 FR 14248). Critical habitat for the owl was designated on June 6, 1995 (60 FR 29914), but was subsequently withdrawn on March 25, 1998 (63 FR 14378). Critical habitat was proposed again on July 21, 2000 (65 FR 45336) and finalized on February 1, 2001 (66 FR 8530). Background and status information on the owl is found in the Final Rule listing the owl as a federally-threatened species (58 FR 14248), previous biological opinions provided by us to the Forest Service, and the final Recovery Plan. The information on species description, life history, population dynamics, status, distribution, and range-wide trends provided in those documents is included herein by reference and is summarized below.

The American Ornithologist's Union currently recognizes three spotted owl subspecies, including the California spotted owl (*Strix occidentalis occidentalis*); Mexican spotted owl (*S. o. lucida*); and northern spotted owl (*S. o. caurina*). The Owl is distinguished from the California and northern subspecies chiefly by geographic distribution and plumage. The Owl is mottled in appearance with irregular white and brown spots on its abdomen, back and head. The spots of the Owl are larger and more numerous than in the other two subspecies giving it a lighter appearance. Several thin white bands mark an otherwise brown tail. Unlike most owls, spotted owls have dark eyes.

The *lucida* subspecies is a distinguishable taxon based on allozyme electrophoresis (Barrowclough and Gutiérrez 1990). Analysis of mitochondrial DNA shows further evidence that the three designated subspecies are valid. Despite the demonstrated phylogenetic relatedness, there is evidence of reduced gene flow between the subspecies, indicating the three subspecies should be treated as separate conservation units (Barrowclough *et al.* 1999).

The Owl has the largest geographic range of the three subspecies. The range extends north from Aguascalientes, Mexico, through the mountains of Arizona, New Mexico, and western Texas, to the canyons of southern Utah, and southwestern Colorado, and the Front Range of central Colorado. Because this is a broad area of the southwestern United States and Mexico, much remains unknown about the species' distribution within this range. This is especially true in Mexico where much of the owl's range has not been surveyed. The owl occupies a fragmented distribution throughout its United States range corresponding to the availability of forested mountains and canyons, and in some cases, rocky canyon lands. Although there are no estimates of the owl's historic population size, its historic range and present distribution are thought to be similar.

According to the Recovery Plan, 91 percent of owls known to exist in the United States between 1990 and 1993 occurred on land administered by the Forest Service; therefore the primary administrator of lands supporting owls in the United States is the Forest Service. Most owls have been found within Region 3, which includes 11 National Forests in New Mexico and Arizona. Forest Service Regions 2 and 4, including 2 National Forests in Colorado and 3 in Utah, support fewer owls. The range of the owl is divided into 11 Recovery Units (RU), 5 in Mexico and 6 in the United States, as identified in the Recovery Plan (USDI 1995). The Recovery Plan also identifies recovery criteria and provides distribution, abundance, and density estimates by RU. The Upper Gila Mountain Recovery Unit has the greatest known concentration of owl sites (55.9 percent), followed by the Basin and Range-East (16.0 percent), Basin and Range-West, (13.6 percent), Colorado Plateau (8.2 percent), Southern Rocky Mountain-New Mexico (4.5 percent), and Southern Rocky Mountain-Colorado (1.8 percent) RUs.

A reliable estimate of the number of owls throughout its entire range is not currently available due to limited information. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico in 1990 using information gathered by Region 3 of the Forest Service. Fletcher's calculations were subsequently modified by us (USDI 1991), who estimated a total of 2,160 owls throughout the United States. However, these numbers are not considered reliable estimates of current population size for a variety of statistical reasons, and a pilot study (Ganey *et al.* 1999) conducted in 1999, estimated the number of owls for the upper Gila Mountains Recovery Unit (exclusive of tribal lands) as 2,950 (95 percent confidence interval 717-5,183). While the number of owls throughout the range is currently not available, the Recovery Plan reports an estimate of owl sites based on 1990-1993 data. An owl "site" is defined as a visual sighting of at least one adult owl or a minimum of two auditory detections in the same vicinity in the same year. Surveys from 1990 through 1993 indicate one or more owls have been observed at a minimum of 758 sites in the United States and 19 sites in Mexico. In addition, these surveys indicate that the species persists in most locations reported prior to 1989, with the exception of riparian habitats in the lowlands of Arizona and New Mexico, and all previously occupied areas in the southern States of Mexico.

In a summary of all territory and monitoring data for the 1995 field season, a total of 869 management territories (MT) were reported to us (U.S. Forest Service, *in litt.* January 22, 1996). Based on this number of owl sites, total numbers in the United States may range from 869 individuals, assuming each known site was occupied by a single owl, to 1,738 individuals, assuming each known site was occupied by a pair of owls. The 1996 data are the most current compiled information available to us; however, more recent surveys efforts have likely resulted in additional sites being located in all Recovery Units.

Owls breed sporadically and do not nest every year. This owl's reproductive chronology varies somewhat across its range. In Arizona, courtship apparently begins in March with pairs roosting together during the day and calling to each other at dusk (Ganey 1988). Eggs

are laid in late March or typically early April. Incubation begins shortly after the first egg is laid, and is performed entirely by the female (Ganey 1988). The incubation period for the owl is assumed to be 30 days (Ganey 1988). During incubation and the first half of the brooding period, the female leaves the nest only to defecate, regurgitate pellets, or receive prey from the male, who does all or most of the foraging (Forsman *et al.* 1984, Ganey 1988). Eggs usually hatch in early May, with nestling owls fledging four to five weeks later, and then dispersing in mid-September to early October (Ganey 1988).

Little is known about the reproductive output for the owl. It varies both spatially and temporally (White *et al.* 1995), but the subspecies demonstrates an average annual rate of 1.001 young per pair. Current demographic research in Arizona and New Mexico has documented populations that are declining at "greater than" 10 percent a year (Seamans *et al.* 1999). Possible reasons for the population declines are declines in habitat quality and regional trends in climate (Seamans *et al.* 1999). Based on short-term population and radio-tracking studies, and longer-term monitoring studies, the probability of an adult owl surviving from one year to the next is 0.8 to 0.9. Juvenile survival is considerably lower, at 0.06 to 0.29, although it is believed these estimates may be artificially low due to the high likelihood of permanent dispersal from the study area, and the lag of several years before marked juveniles reappear as territory holders and are detected as survivors through recapture efforts (White *et al.* 1995). Little research has been conducted on the causes of mortality, but predation by great horned owls, northern goshawks, red-tailed hawks, and golden eagles, as well as starvation, and accidents or collisions, may all be contributing factors.

Owls nest, roost, forage, and disperse in a diverse array of biotic communities. Nesting habitat is typically in areas with complex forest structure or rocky canyons, and contain mature or old-growth stands that are uneven-aged, multi-storied, and have high canopy closure (Ganey and Balda 1989a, USDI 1991). In the northern portion of the range (southern Utah and Colorado), most nests are in caves or on cliff ledges in steep-walled canyons. Elsewhere, the majority of nests appear to be in Douglas fir trees (Fletcher and Hollis 1994, Seamans and Gutierrez 1995). A wider variety of tree species is used for roosting; however, Douglas fir is the most commonly used species (Ganey 1988, Fletcher and Hollis 1994, Young *et al.* 1998). Owls generally use a wider variety of forest conditions (mixed conifer, pine-oak, ponderosa pine, piñon-juniper) for foraging than they use for nesting/roosting.

Seasonal movement patterns of Owls are variable. Some individuals are year-round residents within an area, some remain in the same general area but show shifts in habitat use patterns, and some migrate considerable distances 12-31 miles during the winter, generally migrating to more open habitat at lower elevations (Ganey and Balda 1989b, Willey 1993, Ganey *et al.* 1998). Home-range size of Owls appears to vary considerably among habitats and/or geographic areas (USDI 1995), ranging in size from 647 - 3,688 ac for individuals birds, and 945 - 3,846 ac for pairs (Ganey and Balda 1989b, Ganey *et al.* 1999). Little is known about habitat use of juveniles during natal dispersal. Ganey *et al.* (1998) found

dispersing juveniles in a variety of habitats ranging from high-elevation forests to piñon-juniper woodlands and riparian areas surrounded by desert grasslands.

Owls consume a variety of prey throughout their range but commonly eat small and medium sized rodents such as woodrats (*Neotoma* spp.), peromyscid mice, and microtine voles. They may also consume bats, birds, reptiles, and arthropods (Ward and Block 1995). Habitat correlates of the owl's common prey emphasizes that each prey species uses a unique habitat. Deer mice (*Peromyscus maniculatus*) are ubiquitous in distribution in comparison to brush mice (*Peromyscus boylei*), which are restricted to drier, rockier substrates, with sparse tree cover. Mexican woodrats (*N. mexicana*) are typically found in areas with considerable shrub or understory tree cover and high log volumes or rocky outcrops. Mexican voles (*Microtus mexicanus*) are associated with high herbaceous cover, primarily grasses; whereas, long-tailed voles (*M. longicaudus*) are found in dense herbaceous cover, primarily forbs, with many shrubs, and limited tree cover. A diverse prey base is dependant on the availability and quality of diverse habitats.

The Owl Recovery Plan provides for three levels of habitat management: protected areas, restricted areas, and other forest and woodland types. "Protected habitat" includes all known owl sites, and all areas in mixed conifer or pine-oak forests with slopes greater than 40 percent where timber harvest has not occurred in the past 20 years, and all reserved lands. Protected Activity Centers (PACs) too are delineated around known Owl sites. A PAC includes a minimum of 600 ac designed to include the best nesting and roosting habitat in the area. The recommended size for a PAC includes, on average from available data, 75 percent of the foraging area of an owl. The management guidelines recommended in the recovery plan for protected areas are to take precedence for activities within those areas. "Restricted habitat" includes mixed conifer forest, pine-oak forest, and riparian areas; the recovery plan provides less specific management guidelines for these areas. The recovery plan provides no owl-specific guidelines for "other habitat."

Past, current, and future timber harvest practices in Region 3 of the Forest Service, in addition to catastrophic wildfire, were cited as primary factors leading to the listing of the owl as a federally-threatened species. Other factors that have or may lead to the decline of this species include a lack of adequate regulatory mechanisms. In addition, the Recovery Plan notes that forest management has created ecotones favored by great horned owls, increasing the likelihood of predation on the owl. Increases in scientific research, birding, educational field trips, and agency trips are also likely to increase. Finally, there is a potential for increasing malicious and accidental anthropogenic harm, and the potential for the barred owl to expand its range, resulting in competition and/or hybridization with the owl.

ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the effects of the action on federally listed species, we are required to take into consideration the environmental baseline. Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone section 7 consultation, and the impacts of State and private actions that are contemporaneous with the consultation in progress. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

A total of 519 projects have undergone formal consultation for the owl. Of that aggregate, 255 projects resulted in a total anticipated incidental take of 465 owls plus an additional unknown number of owls. These consultations have primarily dealt with actions proposed by the Forest Service, Region 3, but have also addressed the impacts of actions proposed by the Bureau of Indian Affairs, Department of Defense (including Air Force, Army, and Navy), Department of Energy, National Park Service, and Federal Highway Administration. These proposals have included timber sales, road construction, fire/ecosystem management projects (including prescribed natural and management ignited fires), livestock grazing, recreation activities, utility corridors, military overflights, and other activities.

On the adjacent Santa Fe National Forest, past and present Federal, State, private, and other human activities that may affect the owl include: recreational activities; development of recreation sites (campgrounds); issuance of rights-of-way; minerals permits (copper, uranium, pumice); livestock grazing; vegetation manipulations (such as various small sales, fuelwood gathering activities, and prescribed burns), and road construction and maintenance activities. In addition, forest management activities on other adjacent Tribal lands, several private timber harvest projects throughout the area, and fire suppression affect the environmental baseline. Further, the risk of catastrophic habitat loss due to fire is extremely high in the Jemez Mountains. Past fires such as the Dome Fire and the Cerro Grande fire, have modified thousands of ac of suitable habitat and impacted multiple owl territories. For example, it is possible that take may have resulted from suppression activities during the Dome Fire; however, no BA has been provided by the Forest Service and consultation has not been completed.

STATUS OF THE SPECIES (within the Action Area)

The project area is within the Southern Rocky Mountains - New Mexico Recovery Unit (RU). This RU encompasses a large portion of northern New Mexico and contains a small portion (an estimated 4.5 percent) of the known owl sites throughout its range. However, Johnson and Johnson (1985) documented approximately 40 observations (historic sites) of owls throughout northern New Mexico. Current owl sites have been recorded in the Jemez

and Sangre de Cristo Mountains, Bandelier National Monument and areas within and surrounding LANL. Owl sites in these areas are generally described as having deep, narrow, timbered canyons with cool shady places for owls to roost. Many areas within northern New Mexico appear to contain owl nesting and roosting habitat but apparently are unoccupied. It is not clear if this is an artifact of survey efforts not being effective in finding owls or the birds are simply not present. Vegetation within this RU has been modified by past logging, extensive grazing, surface mining, fuelwood gathering, and fire suppression (Williams 1986, Van Hooser *et al.* 1992). Major fire events that have occurred in the past in the action area include the 1954 Water Canyon fire (3,000 ac), the 1977 La Mesa fire (15,300 ac), the 1996 Dome fire (16,000 ac), the 1998 Oso fire (5,300 ac), and the 2000 Cerro Grande fire (43,000 ac).

Little is known about owl habitat within this RU. Owl occurrences within this RU are disjunct and appear to coincide with patchy steep sloped or canyon type habitat. The majority of these records are considered historic (i.e., according to the Recovery Plan, owl sites detected prior to 1989). Johnson and Johnson (1985) documented several owl sites throughout this RU. However, the apparently fragmented owl distribution may be a natural occurrence, the result of past management earlier this century, or the result of inadequate survey efforts. While timber harvest has been dramatically reduced on the Santa Fe National Forest within the last 10 years and the management emphasis has changed to Forest health and smaller diameter logs, continued loss of habitat from catastrophic fire may be the greatest threat to recovering this owl population.

Areas with low densities of owls tend to have a higher likelihood of extirpation due to random chance because of their small size. Owl nesting and roosting habitat appears to exist in the form of disjunct patches in northern New Mexico. Although these patches of habitat may be relatively small, they may be crucial to the connectedness of other habitat patches throughout the owl's range (see Keitt *et al.* 1995). In all metapopulation models, dispersal is a key component. Dispersal acts as a bridge between subpopulations at the metapopulation scale to provide immigrants to otherwise isolated habitat patches. Habitat disturbances (either natural or anthropogenic) may lead to further isolation of owl pairs and, eventually, these populations become "sink" populations.

Unlike the remainder of the RU, the Jemez Mountains have been relatively well surveyed and much more is known about owl nesting and roosting habitat in the area. The Jemez Mountains have the largest concentration of owls known in this RU and the history of owl territorial occupancy in this area is one of the longest known anywhere (Johnson 1996). This includes territories in the Santa Fe National Forest, Bandelier National Monument, and LANL. Johnson (1996) analyzed inventory and monitoring data of all known and historical sites in the Jemez Mountains. According to Johnson (1996), the owl population in the Jemez Mountains may not be characteristic of populations throughout the range of the owl, but as the largest known concentration in northern New Mexico, it is probably representative of this RU. Recent territorial occupancy and productivity in the Jemez Mountains have been low

and this population is vulnerable. Whatever factors (natural or anthropogenic) combine to affect the owl population in the Jemez Mountain, land management actions are the only directly controllable factors that may affect owl reproduction and mortality (Johnson 1996).

Johnson (1988) developed a model to classify nest and roost habitat for Owls in the Jemez Mountains based upon topographic characteristics and vegetative diversity. Where suitable owl habitat was identified, AEIs were established. The location of each owl AEI was identified using habitat models and ground truthing and were developed in consultation with the Service. They differ from PACs, because the majority (5 of 6) have never been occupied and some portions of these AEIs contain marginal habitat (e.g., the lower portion of Pajarito AEI does not provide several components (i.e., large down logs, large diameter trees, and multi-storied vegetation) necessary for suitable nesting/roosting habitat.

The Recovery Plan for the Mexican Spotted Owl (USFWS 1995b) provides guidelines for the designation and implementation of Protected Activity Centers (PACs). An AEI is different from a PAC because a PAC have been historically or currently occupied. A PAC includes a nest site/roosting site activity center surrounded by no less than 600 ac (243 ha) of foraging habitat. Alternatively, AEIs were defined based on a conservative estimate of potential Owl foraging habitat, but may not be indicative of suitable nesting areas. From a management perspective, only an occupied AEI would be comparable to a PAC (Table 2). Nevertheless, a brief discussion of the six AEIs is provided below.

The following six Mexican spotted owl AEIs have been delineated on LANL:

1. Canon de Valle Mexican Spotted Owl AEI - 1355 ha (553.2 ha core and 802.1 ha buffer). This area contains two canyon systems, Canon de Valle and Water Canyon, and several mesas (including Three-Mile Mesa and Mesita del Potrillo). The DOE controls 98% of the lands of the AEI, the National Park Service controls the remaining 2%. Overall, 2.9% of the core and 6.5% of the buffer is developed to support LANL office buildings primarily on the mesa, light industrial areas, and roads. Mexican spotted owls have been documented successfully nesting in this AEI since 1995 (and are thought to have probably been present prior to that date). This AEI contains 80 percent of all explosive detonation sites with the greatest number, frequency, and loudness of explosives testing; yet, owls continue to annually use and reproduce in this area.
2. Pajarito Canyon Mexican Spotted Owl AEI - 791 ha (284.3 ha in the core and 506.6 ha in the buffer). Located within Pajarito Canyon and Two-Mile Canyon with several intervening mesas (Two-Mile, Pajarito, and Three-Mile mesas), controlled in its entirety by DOE. There is 5.5% of the core and 13.1% of the buffer developed. Mexican spotted owls have been detected in the Canyon; however these are the owls nesting in the Canon de Valle AEI.

3. Los Alamos Canyon Mexican Spotted Owl AEI - 3329.9 ha (1653.1 ha in the core and 1676.8 ha in the buffer) This AEI contains one canyon system and the surrounding mesas. It overlaps two other Mexican spotted owl AEIs - Sandia-Mortandad Canyon, and Pueblo Canyon. DOE controls only 27.5% of this AEI. Of that amount, 57.3 ha of the core and 136 ha of the buffer have been developed. During 1995, 1996, 1997, and 2001 owl surveys, no responses were obtained in this AEI.
4. Pueblo Canyon Mexican Spotted Owl AEI - 979.9 ha (423 ha in the core and 556.9 ha in the buffer). The AEI is located in Pueblo, Walnut, and Acid canyons; includes Barranca Mesa, Kwage Mesa, North Mesa, and the mesa supporting the commercial centers of the Town of Los Alamos are located. This AEI also overlaps the Los Alamos Canyon Mexican Spotted Owl AEI. DOE controls only 12% of this AEI, 27.6 ha of the core and 92.1 ha of the buffer. Of this amount, there is 56.5% of the DOE-controlled core and 19.2% of the DOE-controlled buffer developed. During 2001 owl surveys, no responses were obtained in this AEI
5. Sandia-Mortandad Canyon Mexican Spotted Owl AEI - 1033.8 ha (472 ha in the core and 561.8 ha in the buffer) DOE controls 99% of this AEI, located in both the Sandia and Mortandad canyons and the mesa separating them. It overlaps with the Pajarito Canyon and Los Alamos Canyon Mexican Spotted Owl AEIs. Developments occupy 9.6% of the DOE-controlled core and 13.2% of the buffer. During 1998 and 2001 owl surveys, no responses were obtained in this AEI
6. Three-Mile Canyon Mexican Spotted Owl AEI - 510.2 ha (168.8 ha in the core and 341.4 ha in the buffer). This AEI, containing Three-Mile Canyon and several mesas including Three-Mile, Potrillo, and Pajarito mesas) is totally controlled by DOE. Developed area occupy 5.2 ha in the core and 19.9 ha in the buffer, primarily on the mesa tops. During 1996, 1997, and 2001 owl surveys, no responses were obtained in this AEI

LANL lands were surveyed for owls from 1994-2001 as part of project planning under the guidance of the HMP. In combination with habitat modeling, these efforts resulted in the establishment of the six owl AEIs. The current project is located within an occupied AEI, the Canon de Valle, whereas the other five AEIs have not documented owls. Nevertheless, each of the other AEIs has been surveyed for owls during 2001 and in many of the previous six years, but owl presence has not been documented. Canon de Valle was first surveyed for the Owl in 1995 (Keller 1997). Owls were detected and found to be nesting in the canyon at that time. It is not known if Owls nested in Canon de Valle before those initial surveys, but food remains from the 1995 nest investigation suggest it had been used before the 1995 discovery. All subsequent nesting seasons since 1995 have resulted in owl detection and, in most years, successful nesting and chick fledging.

The Mexican spotted owl AEIs were designed to be consistent with the Owl Recovery Plan. Although the Canon de Valle site is not specifically called a PAC, as referred to in the recovery plan, the AEI provides a similar level of protection as a PAC (Table 2). Moreover, the suitable and potential owl habitat on LANL was considered in the development of this BO.

Table 2. Comparison of Protected Activity Centers and Areas of Environmental Interest.			
Characteristic	PAC	AEI	Comparisons
Location	Historical and current Mexican spotted owl sites	All suitable habitat, including all protected areas as defined for the Southern Rocky Mountains-New Mexico recovery unit	AEIs provide protection to all areas at LANL that would be designated as PACs as well as to areas defined as protected steep slopes in the recovery plan
Size	Minimum size of 243 ha.	Total size of AEIs range from 510 ha to 3330 ha. Size of core areas ranges from 168 ha to 1653 ha.	Five of the six AEIs have core areas larger, sometimes considerably larger, than the minimum PAC size. Core areas protect all potential nesting and roosting habitat. All AEIs have a total area larger than the minimum PAC size. The one area at LANL that would qualify as a PAC based on historic or current occupancy has a core area (553 ha) larger than the minimum PAC size.

<p>Shape</p>	<p>Generally circular or oval centered on the activity center (nest/roost area)</p>	<p>Minimum width of core areas is canyon rim to canyon rim + 100 m on each side of the canyon Total width includes core + 400 m on each side of the core. Length is variable along system</p>	<p>By using topographic-vegetation modeling to identify nest/roost areas, and by designating these areas canyon rim to canyon rim + 100 m on each side of the canyon as core areas, the L.A.N.L. A.E.I.s meet the recovery plan goal of protecting nest sites, roost sites, and proximal foraging locations. The buffer areas protect additional foraging habitat.</p>
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<p>Fuels management</p>	<p>No harvest of trees > 22.4 cm. No harvest at all except for the purpose of wildfire risk reduction No treatment within a 40 ha around the activity center. Pre-and post-treatment assessments of habitat and occupancy must be done.</p>	<p>No harvest of trees > 22.4 cm in canyon bottoms, on slopes > 40%, or within 100 m of a canyon rim. Exceptions made within 30 m of a building for fire protection. Occupancy assessments made for most AEIs (including treated AEIs) on annual basis, In historically occupied core areas, fuels treatments may not exceed 10% of the core area, and may not occur at all within 400 m of an activity center.</p>	<p>LANL fuels treatment guidelines protect activity centers and historically occupied core areas from treatments Treatment guidelines follow the recovery plan recommendations for steep slopes and the bottoms of canyons for areas not historically occupied. The only exceptions made are within 30 m of buildings The recovery plan does not consider buildings within PACs</p>
<p>Treatment of developed areas</p>	<p>No guidelines provided. Presumably, developed areas are assumed to be excluded from PACs.</p>	<p>Current activities in developed areas not restricted New activities restricted if they have an impact on undeveloped core areas</p>	<p>LANL AEIs consider the relatively unique situation at LANL of buildings and developed areas located relatively close to suitable spotted owl habitat. This situation is not considered in the recovery plan</p>

Timing of fuels management	Only during nonbreeding season	Only during nonbreeding season in occupied habitats.	Occupied AEs same as PACs
Access	Road or trail building may be allowed in special circumstances	Road or trail building in core areas requires Biological Assessment. Access limited to low levels in occupied areas	AEs provide as much protection as PACs

The Cerro Grande fire burned over 43,000 ac of forest in and around LANL (7,650 and 35,500 ac on LANL and adjacent areas, respectively). Most of the forest habitat occurred within the Sante Fe National Forest; however, adjacent lands (i.e., Los Alamos National Laboratory, Baca Ranch, Bandelier National Monument, San Ildefonso and Santa Clara Pueblos, and private lands) containing mixed conifer and ponderosa pine habitat were also burned. The fire certainly affected Owls within and adjacent to the burned area; however, the amount of affected suitable or potential owl habitat has not yet been quantified. Thus, some of the suitable or potential owl habitat that was unoccupied prior to the Cerro Grande fire may be more likely to be currently occupied because of the habitat changes that have occurred across the landscape.

The recovery plan recognized that the protection of the best owl habitat (e.g., PACs) would be dynamic and not sufficient for long-term owl recovery. Thus, the recovery plan recommended the protection of steep sloped mixed conifer and pine-oak forests as suitable habitat and recommended that specific management guidelines may be judiciously applied to other forest and woodland types, partly to allow for habitat changes that might result from large-scale impacts such as the Cerro Grande fire. For example, some woodland types (i.e., ponderosa pine, pinyon-juniper, etc.) should be managed to meet multiple objectives including owl foraging and dispersal habitat. Therefore, it is our conclusion that the majority of treatments conducted under the WHRP will occur in areas that are important for the survival and recovery of the owl, even though they may not be currently occupied by the species.

EFFECTS OF THE ACTION

Our primary task in developing a biological opinion is to determine whether the proposed action is likely to jeopardize the continued existence of any listed species (51 FR 19962). The jeopardy/non-jeopardy determination is based on an evaluation of: 1) a species' status in the project area and range wide (see above sections); 2) the effects of the proposed action on the survival and recovery of a listed species (including effects of interdependent and interrelated actions); (3) the aggregate effects of other Federal actions on a listed species (e.g., amount of take occurring as a result of Federal actions subject to previous consultations); and (4) the cumulative effects on a listed species (i.e., future non-Federal actions that are reasonably certain to occur in the action area).

LANL estimates that approximately 10,000 ac of forested habitat will be directly affected by the implementation of the WHRP (Table 1). The implementation of the WHRP will likely produce an array of effects, ranging from transient to long-term. For example, modifying the forest structure and understory plant diversity will disturb and remove vegetation and displace a variety of species, including small to medium-sized rodents such as woodrats, peromyscid mice, and microtine voles, which are prey for the owl (USDI 1995; Ward and Block 1995). Additionally, use of treated areas by some bird species may decline on a local basis. Forest thinning and related impacts that are likely to occur as a result of this project

being implemented within the mixed-conifer and possibly the ponderosa pine forest types include a reduction in moderate to high canopy closure; a change in the forest stand structure from a wide range of uneven-age tree sizes to a more even-age structure (e.g., removal of "dog hair thickets"); and removal or disturbance of selected woody vegetation, fallen trees, and low growing limbs, which may affect the prey base of the owl.

Mexican spotted owls in the Jemez Mountains do not consistently occupy suitable breeding habitat and reproduction evidently depends on prey availability (Johnson 1995). Moreover, the proposed action may improve habitat for the great horned owl by providing more open habitat. The presence of great horned owls may increase the likelihood of predation on Owls that are foraging on mesa and ridges away from canyon rims. Thus, the proposed action may effect suitable and potential owl foraging habitat and prey populations within AEIs.

The HMP closely follows the recovery plan for the owl; however, because of the scarcity of available suitable owl habitat on LANL, and indeed on the Pajarito Plateau, it is difficult to reconcile the recovery plan's management guidelines with the current proposal without having a short-term adverse impact on currently or potentially suitable owl habitat. For example, the recovery plan recognizes that wildfire is an imminent threat to the owl, and appropriate treatments are required to abate that risk. The WHRP proposes to implement fuels management treatments to thin approximately 30 percent of the total acreage of mixed conifer on LANL. Fuels management is the manipulation, modification, or reduction of flammable vegetation to meet fire or land management objectives (Society of American Foresters 1984). We believe that a fuels management program may help prevent the occurrence or reduce the size of fires on LANL. This action may likely provide a long-term benefit the owl by reducing the overall risk of catastrophic wildfire on LANL. Nevertheless, because of the scale of the project (i.e., 10,000 ac overall, 30 percent of mixed conifer, etc), and short duration (i.e., projected completion in 2-3 years), it will likely also have short-term adverse impacts to suitable or potential owl habitat.

The "end-state" conditions currently proposed for mixed conifer habitat may reduce the suitability of suitable or potential owl habitat. This is especially important in the context of the amount of habitat affected by the Cerro Grande fire and the scale and duration of implementing the WHRP. For example, the elimination or significant alteration of potential or suitable owl habitat from the Cerro Grande fire has elevated the relative importance of surrounding and adjacent areas for survival and recovery of the Owl in the Jemez Mountains and throughout the Southern Rocky Mountains - New Mexico Recovery Unit. For example, the east flank of the Sierra de los Valles burned by the Cerro Grande fire may have suffered sufficient reduction in potential nesting habitat quality to render it unused by the Owl during this or future breeding seasons. However, no individuals or pairs of owls were observed during protocol surveys conducted during 2001 at LANL, other than the pair observed within the historically occupied core habitat in Canon de Valle.

Thinning activities have the potential to result in limited sound and/or visual disturbances that are detectable to owls. However, we believe much of these disturbances would likely be attenuated by topography, wind, and vegetation, and would be greatly diminished at distances beyond 0.25 miles from thinning activities. Thus, sound and/or visual disturbances are not likely to adversely affect owls on LANL.

Large-scale habitat alterations may fragment habitat and affect dispersing and wintering owls by reducing the spatial extent of habitat (USDI 1995). Owls (particularly juveniles) that have been displaced or forage and/or disperse through disturbed areas may be more vulnerable to predation. Nevertheless, we expect this project to offer long-term benefits to the owl by reducing the severe risk of catastrophic wildfire on LANL. Although 10,000 ac is proposed to be treated, the majority of the treatments will not be located within suitable or potential owl habitat. Further, the alteration of suitable and potential owl habitat is not expected to be long-term. Therefore, sufficient owl habitat would remain for owls to nest, roost, forage, and disperse.

While the Service believes the proposed project has long-term benefits for the owl and its habitat, we believe some short-term adverse effects will result. These effects will be due to the direct and indirect effects of thinning activities within AEIs. However, the potential impacts of the proposed project are not expected to cause avoidance/abandonment or lead to future unoccupancy of the Canon de Valle AEI, nor prohibit occupancy in the other five AEIs. Our rationale for these conclusions includes the following: 1) much of the habitat within the 5 AEIs were defined based on an estimate of potential Owl foraging habitat, and is likely overly conservative on the availability of suitable nesting areas; 2) the owls in Canon de Valle have demonstrated occupancy and reproduction under high levels of disturbance (e.g., explosives detonations); 3) the majority of the project will be conducted in ponderosa pine and pinyon-juniper habitat that may be used for foraging, migration, or dispersal, but are not typically used for nesting or roosting (USDI 1995); and 4) proactive fuels management may decrease the fire risks within ponderosa pine and pinyon-juniper habitat, and may decrease the fire risks to adjoining occupied owl habitat.

We believe that the HMP will assist in the reduction of some of the negative effects to the owl and its habitat. Specifically, measures such as deferring treatments in historically occupied areas and fuels treatments not being allowed within 1,335 (400 m) of the Canon de Valle nest site are consistent with recommendations provided in the owl's recovery plan (USDI 1995). In addition, we believe that treating no more than 20 percent of the unoccupied, undeveloped core areas AEIs and in historically occupied core areas and fuels treatments not exceeding 10 percent of the undeveloped core area will assist in minimizing negative effects to potential or suitable owl habitat and owl prey species caused by the proposed action. We appreciate the development and inclusion of these specific conservation measures by DOE and LANL personnel.

We also must consider indirect effects and the effects of interdependent and interrelated actions of this project to the owl. Indirect effects are those that are caused by, or result from, the proposed action, and are later in time, but are reasonably certain to occur. Interrelated actions are actions that are part of a larger action, and are dependent on the larger action for their justification. Interdependent actions are actions that have no independent utility apart from the action under consideration. The construction of access fire roads, timber salvage, field crews and vehicles in the areas, and fuelwood gathering are considered interrelated and interdependent with the implementation of the WHRP.

In other consultations conducted for forest-management projects (consultation numbers: 2-22-95-F-532, 2-21-94-F-220, and 2-21-98-F-246), we have concluded that owls could be incidentally flushed if they are within the project area. However, the majority of this project will be conducted within habitat that is not usually used for nesting or roosting. Furthermore, owls have been known to remain roosting while field observers are within close proximity (T. Johnson, pers. comm.). Moreover, Delaney *et al.* (1997) reported no substantive evidence that, within specific constraints and distances, helicopter overflights during the nesting season detrimentally affected owl productivity. Finally, the owls in Canon de Valle are likely somewhat habituated to certain disturbances (see discussion above).

When the project is implemented, the area that may be subjected to high levels of disturbance (e.g., noise, lighting, etc.) that could extend beyond the treatment areas into adjacent lands. However, these effects are not expected to be significant given the screening from vegetation and topography (discussed above). The potential for effects from interdependent and interrelated actions from proposed project (noise, disturbance, etc.) are expected to be limited and not likely to cause avoidance/abandonment or lead to future unoccupancy of Canon de Valle or other AEIs. Moreover, adjacent unoccupied areas of suitable or potential owl habitat, are not expected to be altered or indirectly disturbed to the extent that survival and recovery of the owl will be affected.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions on endangered or threatened species or critical habitat that are reasonably certain to occur in the foreseeable future in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Cumulative effects analysis as stated here applies to section 7 of the Act and should not be confused with the broader use of this term in the National Environmental Policy Act or other environmental laws. Because the action area is a national laboratory, activities such as timber sales and livestock grazing are not "reasonably certain" to occur. There are no on-going non-Federal activities on LANL that affect Owls. Therefore, the cumulative effects are an inconsequential factor with regards to the above proposed action and this consultation.

CONCLUSION

The implementation of the proposed project, as described in this biological opinion, has the potential to adversely affect the owl; however, the impacts are not expected to result in "take" of owls in the project area. This conclusion was reached by considering the following: 1) much of the habitat within the project area is unoccupied; 2) the AEIs were defined based on a conservative estimate of potential Owl habitat, but all parts of the AEI core areas may not be indicative of suitable nesting areas; 3) the owls within the Canon de Valle AEI have demonstrated occupancy and reproduction under high levels of disturbance (e.g., explosives detonations); 4) fuels treatments would not be allowed within 1,335 (400 m) of the nest site in Canon de Valle or other nest sites that are detected in the future; 5) no direct owl mortality is expected; 6) significant alteration of nest or roost habitat is not expected and the affects to foraging or dispersal habitat are not expected to affect the behavior (i.e., breeding or foraging) of the owls to the extent that the birds are considered lost as viable members of the population; 7) it is not expected that owls will fail to breed, fail to successfully rear young due to inadequate food supplies available in altered habitat, raise fewer young, raise less fit young, or desert the area because of disturbance when habitat no longer meets the owl's needs; 8) the majority of the project will be conducted in ponderosa pine and pinyon-juniper habitat that are not typically used for nesting or roosting (USDI 1995); and 9) the WHRP may decrease the fire risks within ponderosa pine and pinyon-juniper habitat, and subsequently decrease the fire risks to adjoining occupied owl habitat. The implementation of the proposed action is not be expected to impede the owl's ability to nest, roost, forage, or disperse within the Southern Rocky Mountains - New Mexico Recovery Unit.

After reviewing the current status of the owl, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects and based on the best commercial and scientific data available, it is our biological opinion that the implementation of the wildfire hazard reduction project, Los Alamos National Laboratory, Los Alamos, New Mexico, as proposed, is not likely to jeopardize the continued existence of the owl.

INCIDENTAL TAKE

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any such conduct. Harass is further defined by us as intentional or negligent actions that creates the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Harm is further defined by us to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the

carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of the agency action is not considered a prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered or threatened plants. All prohibitions of section 9(a)(2) of the Act implemented by 50 CFR 17.71 for threatened plants apply. Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plants. However, protection of listed plants is afforded to the extent that the Act requires a Federal permit for the removal or reduction to possession of endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

It is our opinion that the proposed action will not lead to incidental take of owls. This determination is consistent with our final policy for conducting section 7 consultations on Owls and critical habitat dated July 1, 1996, which states that incidental take can be supported when a habitat-altering action compromises the integrity of a PAC or in cases where areas that may support owls have not been adequately surveyed. Our conclusion is also based on the knowledge that owl surveys have been conducted during 2001 and will continue to be conducted annually (i.e., all AEIs will be surveyed every year prior to any fuels management treatments to determine occupancy). If an AEI is found to be occupied or was historically occupied (e.g., Canon de Valle), fuels treatments will not be allowed within 1,335 (400 m) of the nest site. Because we do not anticipate incidental take related to the proposed action, no reasonable and prudent measures are provided. However, if during the course of the action, incidental take occurs, such incidental take would represent new information requiring review of the project's effects. The DOE must immediately provide an explanation of the causes of the taking and review with us the need for possible addition of reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for these species. In order for us to be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species and their habitats, we request notification of the implementation of the conservation

recommendations. We recommend the following conservation recommendations be implemented for the WHRP:

1. LANL should work with the owl recovery team to design and implement a monitoring program to would be beneficial for the management of the owl (e.g., the effects of fuels management on Mexican spotted owl prey items such as woodrats both within and outside of AEIs) (Team leader Dr. William Block; 520-556-2161).
2. LANL should review and reevaluate the Mexican spotted owl habitat model. This information could be used to refine AEI designations and the update the HMP.
3. LANL should initiate a radio telemetry study of the owls in Canon de Valle so that habitat use could be factored into the AEI refinement and the fate and dispersal of fledgling owls could be documented. They type of study should utilize tail-mounted radios.
4. LANL should provide copies of the annual owl AEI surveys to the Service as soon as the data become available or by October 1.

DISPOSITION OF DEAD OR INJURED LISTED ANIMALS

Upon finding a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the nearest Service Law Enforcement Office. In New Mexico, contact (505/346-7828) or the New Mexico Ecological Services State Office (505/346-2525). Written notification must be made within five calender days and include the date, time, and location of the animal, a photograph, and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animals shall be submitted to educational or research institutions holding appropriate State and Federal permits. If such institutions are not available, the information noted above shall be obtained and the carcass left in place.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, we should be contacted regarding the final disposition of the animal.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the implementation of the wildfire hazard reduction project, Los Alamos National Laboratory, Los Alamos, New Mexico. As required by 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and

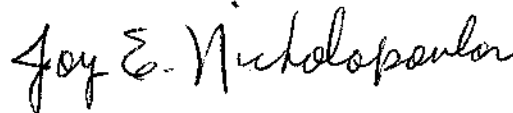
Mr. David A. Gurule

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if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

In future communications regarding this project, please refer to consultation #2-22-01-F-432. If you have any questions or would like to discuss any part of this biological opinion, please contact Eric Hein of my staff at (505) 346-2525, extension 135.

Sincerely,

A handwritten signature in cursive script that reads "Joy E. Nicholopoulos".

Joy E. Nicholopoulos
Field Supervisor

cc:

Field Supervisor, U.S. Fish and Wildlife Service, Arizona Ecological Services Field Office,
Phoenix, Arizona

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