

**Michael De Lasaux's Small-Parcel Fuel Treatment and Utilization Demonstration
Thinning Project: Wildlife Evaluation
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Summary:

This evaluation predicts no biologically significant nor measurable negative impacts to wild vertebrates as a result of hazardous fuel reduction treatments to the demonstration sites. A cumulative impact analysis considers the potential effects of all the sites together and finds no cumulative impact. The essence of this project is to extend knowledge by demonstrating new technology for reducing fire hazard around homes. The primary adoptive future use of the technology will depend on other federal and state projects designed to implement fire hazard reduction. Cumulative effects of adoption and extension of the technology should therefore be covered in environmental assessments of those projects.

Project Description:

The project is ancillary to state and federal projects that encourage private landowners to remove fuel ladders and fuel accumulations from around homes in forested wildland-urban interface areas.

The proximate purpose of the project is to demonstrate new technology for on-site cutting, chipping, and milling for personal use of non-commercial sizes of under story trees. The broad purpose of the project is to encourage people to manage forest stands around homes on small residential parcels so as to reduce the fuel hazard and threat of wildfire reaching their buildings, and to facilitate control of fires started accidentally along rural roads and around home sites. Because of the already increased human use of the sites, the likelihood of a wildfire starting on one of these sites is greater than in more extensive non-residential forest tracts. The sites were chosen because they were examples of locations where fuel buildup and fuel ladders contribute to the danger of fires burning into tree crowns around the homes and because the landowners were interested in collaborating in this demonstration.

Environmental Setting:

All of the sites to be treated are already in areas developed by humans for habitation. In all cases, houses exist and some vegetation alteration has previously occurred. In some cases this prior treatment has been intensive. In all cases, roads have been constructed and people use the sites frequently. In other words, wildlife impacts already have occurred and impacts attributed to under story vegetation removal will likely be less than those estimated by models.

Project sites occur at 14 locations from Shingletown and Viola in Shasta County southward through the middle elevations of the Sierra Nevada to Northstar, near Lake Tahoe, in Placer County. Both east and west aspects of the Sierra Nevada are included. California Wildlife Habitat Relationships (CWHR) habitats and stages represented on the different sites are identified below.

CWHR Habitat	CWHR Stage
Jeffrey Pine	4M/3S
Sierran Mixed Conifer	4D/3D/2P; 6D; 4M/3D; 4D; 4P/3D
Ponderosa Pine	4D/3P; 4D/3P/2D; 3D; 2D
White Fir	4M

There are 16 project sites, but at 2 locations (both in Plumas County) they are on adjacent parcels, so 14 locations are to be treated. Total acreage to be treated is approximately 49 acres or 0.0765 square miles. The proposed treated area on each site ranges from 1 to 5 acres, but on those sites that are adjacent to one another the combined acreages are 6 and 5 for each location. Thus, 14 locations occur in an area approximately 120 miles long and 60 miles wide, or 7,200 square miles. The ratio of treated to total area is $0.0765/7200 = 0.0000106$, or 0.00106 percent. The sites are neither randomly nor evenly distributed, but tend to be in areas of rural homesite development. Except for the 2 groups of 2 adjacent parcels, 10 sites are in clusters with 1.75 to 13 miles between sites, and 2 sites are not associated with clusters.

Consideration and Discussion of Environmental Impacts:

Methods

Treatment areas range from 1 to 5 acres. On each site, one one-tenth acre plot per acre was located, so 1 to 5 plots of 1/10 acre each were measured, including canopy cover and tree diameter. The diameters were aggregated according to CWHR size classes and quadratic mean diameters calculated for each size class, each tree species, and the total stand, all for trees greater than 5 inches in diameter (DBH). Summary tables provided the stand data for each demonstration site for trees per acre, basal area per acre, and average stand diameter for the existing stand, for trees to be removed, and for trees to be left. These tables were provided to me for the wildlife analysis.

I examined the stand tables for a few representative stands and classified them into CWHR types and stages prior to going to the field in order to anticipate items of particular interest to note while in the field. I then went to each site with UC Cooperative Extension Advisor Michael De Lasaux (RPF # 2321) to observe conditions, revise the CWHR types and stages based on

personal examination along with the stand tables and on-site estimates of layer-specific canopy coverage. Where layers were complex or the canopy estimates uncertain, we measured canopy coverage with a SIGHTING TUBE. We used the field forms for wooded plots from pages D-13, D-14 in the "Training Manual for the California Wildlife Habitat Relationships System CWHR Database Version 5.2," as well as an additional form I developed myself. While in the field, we also used the stand tables for cut and remaining trees, and our ocular evaluation of the site to estimate the post-project parameters and CWHR type and stage. We took note of habitat elements present or absent, and those that would change as a result of the treatment. I also noted more subtle differences, such as tree spacing and shrub and ground cover attributes, that could influence some forms of wildlife. Some elements that were absent on the property to be treated, were noted, or anticipated, to exist in the general vicinity, and were treated as present. Examples of these were intermittent streams and transmission lines on the Plumas 2 and 3 sites, and carrion on all parcels except the Plumas 2 and 3 sites, where a roaming dog was known to remove dead animals (There is a dog on Plumas 4 and 5 as well and possibly others but it is not known to roam and eat all the dead animals). On the remainder of the sites, we took stand tables to the field with us and used them interactively with our on-site survey to arrive at the proper CWHR types and stages.

I did not survey for the presence of animals. Instead, I accepted the CWHR output and nearby Rarefind locations as though all animals were present except those modifications described below. Field surveys for animals on sites as small as these would have been 1) not cost-effective, and 2) invalid because of errors of omission due to random absences of species.

Following the field checks, I re-did the CWHR analyses for the first few sites, using both Version 7.0 (the current and legal version at the beginning of the analysis) and the beta-test version 8.0. As version 8 was released during the analysis, I continued to use it for the remainder of the analysis. I also completed CWHR analyses for all other sites that had not previously been done. Results of the two CWHR versions were checked against each other, and any discrepancies were resolved by additional examination and analysis based on information in the two versions, in the printed manuals, and personal knowledge and experience. During this process, I employed both Rarefind 2 and documents on the web site for the Habitat Conservation and Planning Branch of the California Department of Fish and Game. For each animal that seemed unusual or problematical, I checked the habitat requirements based on my own knowledge and descriptive information in the CWHR system and the documents above, and compared these findings with the on-site habitat conditions, to evaluate the accuracy of the computer analysis. Annotations were made on the CWHR printouts and in tables below for variances from the output.

I also searched the California Natural Diversity Data-base (CNDDDB) Rarefind2 Version 2.1.2 database (01/25/2000) for records of plants and animals known to exist in the vicinity of each property. Each animal that was identified by CWHR or Rarefind as a listed or sensitive species was listed separately, and a separate evaluation of the impact of the project was made for each of these animals. For the California spotted owl, I obtained known locations near our sites from Gordon Gould, Habitat Planning and Conservation Branch (HPCB), California Department of Fish and Game. All listed and sensitive species were verified on the July, 2002 "Special animals" list, California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch (WHDAB), CNDDDB, and the July, 2002 "State and Federally Listed Endangered and Threatened Animals of California" list, from the same source.

Applying CWHR to this project required some special considerations. First, CWHR is designed for larger, homogenous areas. The project sites are much too small to model accurately. Second, CWHR is not designed to model under story vegetation removal. We have to use the system creatively to get results for this type of modification, and the results are somewhat inaccurate, requiring inspection of each result to assure biological appropriateness of the result. Thus, considerable interpretation of the CWHR output was necessary. I attempted to document the procedures and variances from computer output so that the process could be appropriately reviewed.

I identified all the listed and sensitive species predicted by CWHR to occur at each location. I then removed the species that were listed or sensitive because of a subspecies that did not occur on the site. For each remaining species for which a loss or reduction in habitat value was predicted, I examined the internal calculation of CWHR to detect errors that arise in CWHR because of the way the program handles multiple stages and the way it averages zero values. Once these errors were corrected, I identified the species for which a decline in habitat was still predicted, determined whether the species was likely to actually occur on the site, whether current human activities (not modeled by CWHR) would influence species presence, and the magnitude of any residual effect. This procedure was followed for each site separately. I then examined all of the site-specific results in context of location across the entire project area to determine any cumulative effects.

Results.

The CWHR model projects results only for entire species on a statewide basis, and then screens for those species located in specific areas. If a subspecies is listed or sensitive, CWHR applies that information to the whole species in the model output. Because of this, the species identified as being listed must be examined to determine whether they are listed or sensitive where they occur on the project site. In Table 1, I identify those species that CWHR notes as being listed or sensitive, which are only so designated in areas outside the project site. During the following analyses, these species were not included in tables of listed or sensitive species.

Table 1. Species in the project area whose listed or sensitive subspecies occur only elsewhere.

Species	Listing Status on Project Site
California newt	No status. Special concern only south of Monterey County.
Ensatina	No status. Special concern only in So. and Central California.
Western skink	No status. Special concern only in So. California.
Rubber boa	No status. Listed only in So. California.
Gopher snake	No status. Special concern ssp. occurs only elsewhere.
CA mtn. kingsnake	No status. Special concern ssp. occurs only elsewhere.
Common garter snake	No status. Listed ssp. occurs only elsewhere.

Species	Listing Status on Project Site
Western aquatic garter snake	No status. Listed ssp. occurs only elsewhere.
Ringneck snake	No status. Sensitive ssp. occurs only in So. California.
Striped racer	No status. Listed ssp. only in Bay area and San Joaquin Valley.
Northern flicker	No status. Listed ssp. occurs only in So. California.
Loggerhead shrike	Special concern. Listed ssp. occurs only in So. California..
Western scrub-jay	No status. Special concern ssp. occurs only elsewhere.
Spotted towhee	No status. Special concern only in So. California.
California towhee	No status. Listed ssp. occurs only in Inyo County.
Dark-eyed junco	No status. Special concern only in So. California.
Song sparrow	No status. Special concern ssp. occurs only elsewhere.
Broad-footed mole	No status. Special concern ssp. occurs only elsewhere.
Vagrant shrew	No status. Special concern ssp. occurs only elsewhere.
Ornate shrew	No status. Listed ssp. occurs only elsewhere.
Black-tailed jackrabbit	No status. Special concern ssp. occurs only in So. California.
Northern flying squirrel	No status. Special concern ssp. occurs only in So. California.
Lodgepole chipmunk	No status. Sensitive ssp. occurs only in Central Coastal California.
Deer mouse	No status. Special concern ssp. occurs only in So. California.
Dusky-footed woodrat	No status. Listed ssp. occurs only elsewhere.
Mountain lion	No status. Special concern ssp. occurs only in So. California.

Following removal of species in Table 1 from consideration as listed or sensitive species, the remaining listed and sensitive species likely to be found on project sites are tallied in Table 2.

Table 2. Number of listed and sensitive species and change predicted by CWHR¹ for each site.

Site	Decrease	No Change	Improve ment	Total
Butte 1	3	13	7	23
Butte 2	4	8	13	25
Nevada 1	0	23	0	23
Nevada 2	0	23	0	23
Placer 1	0	22	0	22

Site	Decrease	No Change	Improve ment	Total
Plumas 1	6	12	5	23
Plumas 2	1	17	4	22
Plumas 3	1	17	6	24
Plumas 4, 5	0	22	0	22
Shasta 1	1	23	4	28
Shasta 2	1	17	7	25
Shasta 3	3	20	4	27
Sierra 1	0	16	5	21
Yuba 1a	0	12	9	21
Yuba 1b	0	11	8	19
Yuba 2	0	21	0	21
Totals	20	277	72	369
Percentage	5.4	75.1	19.5	100

¹ I did not count listed or sensitive subspecies that occur only in other parts of the state (Table 1).

I summarized in Table 3 the CWHR predictions for those listed species for which CWHR predicted a reduction in habitat value, or a loss of habitat for either reproduction, feeding, or cover, or any combination.

Table 3a. Listed and sensitive species predicted by CWHR to decline, and cause of prediction.

Location	No.	Cooper's hawk	Northern goshawk	Spotted owl	Golden eagle	Prairie falcon (nesting)
Butte 1	3	n/a	n/a	2 stages in cond. 1 = high and low-med. values; 1 stage in cond. 2 = high value	Predicts reduction in feeding value.	Predicts reduction in feeding value.
Butte 2	4	n/a	From low for reproduction to none; other values remain.	From low for feeding and cover only to none.	n/a	n/a
Plumas 1	6	Eliminate nesting habitat	Eliminate nesting habitat; degrades cover, feeding	Is low all categories; degrades to zero repro., cover, low feeding.	n/a	n/a

Table 3b. Listed and sensitive species predicted by CWHR to decline, and cause of prediction.

Location	No.	Fisher	Mountain beaver	Merlin (winter)
Shasta 1	1	May be slight loss of cover	n/a	n/a
Shasta 2	1	Reduction in breeding, cover.	n/a	n/a
Shasta 3	3	May be slight loss of cover	Cond. 1, 2 = 2 stages each; 1 = 0, H; 2 = M, H.	Cond. 1, 2 = 2 stages each; 1 = 0,0,0 & 0,M,M; Cond 2 = 0,L,L & 0,M,M.

Table 3c. Listed and sensitive species predicted by CWHR to decline, and cause of prediction.

Location	No.	Sharp-shinned hawk	Long-eared owl (nesting)	American marten	White-tailed jackrabbit	Sierra Nevada red fox
Butte 2	4	Reduced nesting habitat.	Reproduction, cover decline from M to L; feeding improves from L to M.	n/a	n/a	n/a
Plumas 1	6	Loss of nesting	n/a	Degrades repro., feeding, cover from M to L	2 stages in cond. 1 = L & 0; 1 stage in cond 2 = 0.	n/a
Plumas 2	1	n/a	n/a	n/a	n/a	Present site low for repro., cover and 0 for feeding; degrades to 0 for all.
Plumas 3	1	n/a	n/a	Minor reduction in feeding cover	n/a	n/a

Each of the situations in Table 3 was examined as mentioned in the Methods section. My comments following that examination are included in Table 4, with respect to the effect of the project at each site on the species.

Table 4. Comments regarding CWHR output from biologist analysis.

Species	Site	Comments
Cooper's hawk	Plu 1	Reduced density eliminates nesting habitat; probably no effect because site is in developed housing area.
Northern goshawk	Butte 2	Only change = loss nesting habitat; developed housing site; no impact from project.

Species	Site	Comments
Cooper's hawk	Plu 1	Reduced density eliminates nesting habitat; probably no effect because site is in developed housing area.
Northern goshawk	Butte 2	Only change = loss nesting habitat; developed housing site; no impact from project.
Northern goshawk	Plu 1	Loss of nesting habitat has no impact because site is in developed housing area. Some reduction of cover and feeding habitat is valid prediction, but effect of moderate reduction on 2 acres within extensive forest is not biologically meaningful. No effect.
Spotted owl	Butte 1	Anomaly of CWHR calc. method; should be no effect.
Spotted owl	Butte 2	Low value for feeding and cover, none for nesting; probably little if any impact from reducing density. May actually improve woodrat habitat and owl feeding opportunity. No effect.
Spotted owl	Plu 1	Low density, small trees, poor habitat prior to project; human use not included in CWHR; not expected to occur here.
Golden eagle	Butte 1	Feeding value actually should improve with lower density.
Prairie falcon	Butte 1	Feeding value actually should improve with lower density.
Great blue heron	Shasta 1	No rookery on site. No impact predicted by CWHR.
Fisher	Shasta 1	Only slight decline predicted; overstated because under story is calculated separately in CWHR. Combined with current active human presence, probably no impact.
Fisher	Shasta 2	Reduced reproductive habitat and cover, but probably not present because of active human presence. No effect.
Fisher	Shasta 3	Only slight decline predicted; overstated because under story is calculated separately in CWHR. Combined with current active human presence, probably no impact.
Mountain beaver	Shasta 3	error in CWHR 8 calculation; should improve; however, no water and soil depth is questionable. Likely not to occur here.
Merlin	Shasta 3	error in CWHR 8 calculation; likes less dense areas, should improve; top of elev. range.
Sharp-shinned hawk	Butte 2	Site is outside breeding range; loss of breeding habitat has no effect.
Sharp-shinned hawk	Plu 1	Site is outside breeding range; loss of breeding habitat has no effect.
Long-eared owl	Butte 2	Repro., cover decline; feeding improves. Probably no effect because current human use will already have limited reproduction and use of cover.
American marten	Plu 1	Crown closure too low, too much human presence; not expected to occur here.

Species	Site	Comments
Cooper's hawk	Plu 1	Reduced density eliminates nesting habitat; probably no effect because site is in developed housing area.
Northern goshawk	Butte 2	Only change = loss nesting habitat; developed housing site; no impact from project.
American marten	Plu 3	Requires limited human use; site is developed housing, roaming dog in area; marten not expected to occur here.
White-tailed jackrabbit	Plu 1	Anomaly of CWHR calc. method; insufficient brush, present site not suitable.
Sierra Nevada red fox	Plu 2	Probably not here to begin with because of 0 feeding value and low breeding and cover values..

The Rarefind 2 database includes records of actual occurrences of listed and sensitive species, including fish (which CWHR does not model). I searched the Rarefind 2 database for vertebrates located near each of the project sites. I also obtained information from the HPCB regarding California spotted owl locations near project sites. These records are reflected in Table 5 with my comments concerning each of them.

Table 5. Listed and sensitive species within 2 miles of each site according to Rarefind 2 and the spotted owl database, California Department of Fish and Game, Habitat Conservation Planning Branch.

Site	Rarefind 2 or Owl Database Occurrence	Distance, Direction from Site	Comments
Butte 1	Bald eagle nest	2 mi E	4 mi. to Lake Oroville, 1-acre site in hollow between church and highway. Not suitable for eagle nest or hunting. No effect.
Butte 2	Bald eagle nest	1.5-2 mi. NW	1.3 mi. to Lake Oroville, small, even-aged stand (PPN3D to PPN3P), 20% shrub cover, not suitable for nesting. No effect.
Nevada 1	None		
Nevada 2	Spotted owl nest, observation	1 mi. SSE	CWHR predicts no effect; 4 acres under story thinning around and downslope from homesite in large forest matrix. Large hardwood and conifer retained. 85% overstory canopy cover retained; 40% under story canopy reduced to 30%. May improve woodrat density.
Placer 1	Lahontan cutthroat trout	1.5 mi. W; 1.5 mi. NE	Extirpated 1993 No longer present; No effect from project.
Plumas 1	None		
Plumas 2	None		

Site	Rarefind 2 or Owl Database Occurrence	Distance, Direction from Site	Comments
Plumas 3	None		
Plumas 4, 5	Spotted owl nest Spotted owl obs.	1 mi. N Adjacent Section	CWHR predicts no effect because no change in type or stage. Probably on site also. 5-acre treatment area with 90% canopy cover, which will remain; 30% under story canopy will be reduced to 10%-15%. Large snags and logs retained.
Shasta 1	Spring-run chinook salmon	N. Fork Battle Cr.	Project will have no effect on stream or salmon; overstory not changed. No debris discharge into stream. Project will not enter streambed or meander zone within cut banks.
Shasta 1	Osprey nest	1 mi. NNW	Site is 1.9 mi. from McCumber Reservoir. Overstory not affected. Stream too small for osprey feeding near site. No effect.
Shasta 1	Sierra Nevada red fox observation	Adjacent, N	CWHR indicates no effect. To the extent that under story thinning increases rodents, may be beneficial.
Shasta 2	Spring-run chinook salmon	Battle Creek in adjacent Township.	Site not near creek. No effect.
Shasta 3	Osprey nest.	1 mi. N.	Site is in 5-acre-lot development adjacent to highway, 2 mi. from McCumber Reservoir. Overstory not affected. Osprey not present on site. No effect.
Sierra 1	None		
Yuba 1a	None		
Yuba 1b	None		
Yuba 2	None		

Cumulative Effects

CWHR predicted negative effects for 5 percent of the listed or sensitive species on the various sites. For various reasons, biologist appraisal of these results showed that none of the 5 percent would be negatively affected on the specific sites where they occurred. However, in one case (northern goshawk, Plumas 1) the analysis relied on the size of the parcel in relation to the surrounding matrix of forest. Because the parcel size was a factor in the analysis of only one site, there is no cumulation of effect.

Significant Environmental Impacts

Based on the foregoing analysis, I conclude that there will be no biologically significant or measurable negative effect on wild animals arising from the project.

Mitigation Measures Proposed to Minimize Significant Effects

Because no effects were found to be significant, no mitigation measures are proposed.

Alternatives to the Proposed Project

No Project Alternative

Wildfires have become much more intense than they probably were historically because of the accumulation of fuels and fuel ladders arising from many years of fire protection. These intense wildfires were not evolutionary forces for California's native wildlife, at least in the forested areas of northern California. For this reason, such fires are very destructive to wildlife habitat. They form a major threat to listed and sensitive species such as the California spotted owl. Measures taken to prevent wildfires from starting, or to make them more easily controlled will help preserve habitat for listed and sensitive species. The current project is very small, having a cumulative total of 46 acres of treatment spread over 7,200 square miles of forest. It has been shown to have no significant impact on wild vertebrates, but if it prevents or reduces the size of even one wildfire, it would have a positive impact far beyond the treated acreage. To fail to accomplish the project would be a negative impact to wildlife of the same magnitude as the positive benefit mentioned in the previous sentence. In other words, the "no project" alternative would have a negative impact on wild vertebrates.

Alternative Locations

Because no negative impacts were identified at the present locations, no alternatives were considered.

Effects Not Found to be Significant

Effects not found to be significant are mentioned in Tables 4 and 5. The only one of note is the slight negative effect predicted by CWHR on the northern goshawk at the Plumas 1 site. Some reduction in cover and feeding habitat will occur on 2 acres within an extensive forest matrix. This effect was deemed to be neither biologically significant nor measurable, if it is an effect at all. The under story thinning proposed probably will create stand conditions within the normal range of variation of the forest stand, and probably will have no impact at all.

Discussion of Cumulative Impacts

The analysis above detected no project-specific cumulative impact attributed to similar impacts among various sites within the project. Another kind of cumulation would result from adoption of the demonstrated practice by other landowners. Similar kinds of thinning around homes have been promoted and encouraged by the California Department of Forestry and the U. S. Forest Service for at least 15 years and there has been plenty of time for adoption to occur. The new aspect of the current demonstration is a technology that will allow landowners to recover some lumber from the smaller trees taken from 6 inch - 11 inch DBH class in the under story. The lumber recovered may not be sufficient to cover the cost of the thinning, and landowners are still likely to rely on state or federal funding to defray the cost of such thinning. As such, any effects arising from additional applications beyond the current project sites would be direct effects of those funded projects and would be included in environmental documents as required for such funding programs.

Economic and Social Effects

To the extent that the project prevents devastating wildfire or facilitates its control it will have beneficial social and economic effects far beyond the acreage and cost of the project. I can detect no negative economic or social effects arising from project effects on wild vertebrates.

Appendix

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