

California Department of Fish and Game
Job Final Report

Project Number: W-65-R-4 Project Title: Nongame Wildlife Investigations

Job Number: II-3 Job Title: Owl Nest Territory Monitoring Program

Period Covered: July 1, 1986 - June 30, 1987

SUMMARY:

During FY 1986-87 and the first half of FY 1987-88, reports of Spotted Owls found at 179 new sites were sent to the Department and entered into files which now contain records of 1,647 sites in 41 counties. These new sites fill out parts of the known range in the central and southern Sierra Nevada and southern California. Not all 1,647 sites are believed to contain breeding pairs and many sites may now be inactive due to habitat alterations since the presence of the owls was last verified.

The Department was involved in three contracts for field work on Spotted Owls. The studies are investigating density, composition, turnover, and occupancy rates of local Spotted Owl populations. One study in eastern Humboldt County, now in its fourth year, supports 28 to 32 pairs and three to seven individual owls for a crude density of about 0.22 owls per square kilometer. Reproductive rates have been relatively stable with about 35 percent of the pairs producing young each year at a rate of 1.55 young per successful pair. Mortality has varied by age class; adult owls show an annual survival rate of about 92 percent, subadults of about 78 percent, and young of six to 18 percent.

A similar study in Placer County, now in its third year, supports 18 or 19 pairs and six to 12 territorial individuals. A crude density of 0.13 to 0.20 owls per square kilometer is less than that recorded in the Humboldt County study. Reproductive rates have been more variable, from half to twice the rates noted in the Humboldt County study. However, the averages of both study areas are similar. In the third study, in San Bernardino County, 33 pairs and at least nine different individuals were located and 45 adult and 12 juvenile owls were banded. Seventy-four percent of the pairs checked attempted to nest.

The Department conducted surveys of Spotted Owls on the four National Forests in southern California during 1987. Spotted Owls were located at 74 sites in 51 of 85 areas surveyed. There were previous records for 53 sites on 41 of the areas; Spotted Owls were found at 30 of the previously known sites. Twelve new sites were found on eight areas where Spotted Owls were previously known. Forty-four areas were checked for the first time and 31 new sites were found in 20 of these areas. There was some reduction in the size of the perceived gaps between the eight southern California populations of Spotted Owls. However, the regional population still remains severely fragmented and half of the fragments may contain effective populations of less than ten pairs.

Coordination work with the U.S. Forest Service on Spotted Owls continued. The Department provided assistance in: 1) evaluating of Spotted Owl networks and compliance with Regional management guidelines on individual national forests; 2) planning survey and inventorying needs; 3) planning and coordinating research of PSW; 4) producing a handbook for inventorying and monitoring; 5) producing standards to be employed in all field research on Spotted Owls and analysis of data gathered; and 6) providing data for Region 6's SEIS on Spotted Owls.

No current results are available from the National Park Service study of Great Gray Owls in Yosemite National Park.

Five year status reviews were prepared for both the Great Gray Owl and the Elf Owl.

A population survey of Elf Owls was conducted during the 1987 breeding season along the lower Colorado River. Fifty-two sites were checked and an estimated total of 17 to 24 Elf Owls was found at 10 sites. Only seven to nine of the sites are believed to support breeding and the population represented by the responding birds is 15 to 18 pairs. It's likely that the state's total population of Elf Owls does not exceed 25 pairs.

BACKGROUND:

The understudied nature of owls in California was best demonstrated at the 1979 National Audubon Symposium "Owls of the West" and in the Department's "Bird Species of Special Concern in California." At the symposium the only recent studies of owls in California consisted of single studies each on Barn Owls, Burrowing Owls, Flammulated Owls, and Elf Owls and a small number of studies on Spotted Owls. The purpose of the Department's special concern list was to draw attention to those species whose status was unknown and whose populations may be in trouble. Of the 14 species of owls found in California, six species are on this list. Additionally, two species, the Elf Owl and the Great Gray Owl, are listed as Endangered by the state; of the eight remaining species, one is an irregular winter visitor, one a recent colonizer, the status of three is virtually unknown, and the status of another in part of the state is in doubt.

Since 1979 the only research on owls in California has been on the two Endangered species, the politically and economically important Spotted Owl, its ecological rival, the Barred Owl, and the Short-eared Owl. The survival of the first three species is closely associated with the preservation of old-growth and mature forest habitats while the latter is dependent on marshes and seasonal wetlands.

Because of the concern for the future of Spotted, Great Gray, and Elf Owls, monitoring of the breeding territories of these species and the Barred Owl is to be done on an annual basis after baseline studies have established the species' general range and abundance. This has been done for the Spotted Owl since 1974 and sporadically for the Elf, Great Gray, and Barred Owls.

Research on Short-eared Owls is ongoing and has been covered under Job II-13 for the last three years.

OBJECTIVES:

1. Monitor the status of Spotted Owl, Barred Owl, Great Gray Owl, and Elf Owl populations through tracking ongoing research and information generated on these species' distribution, abundance, reproductive success and mortality.
2. Determine the current status of all species of owls on the list of bird species of special concern.

PROCEDURES:

The vast majority of the reports of new and re-checked Spotted Owl sites comes from U.S. Forest Service personnel. Additional sightings are made by field ornithologists and Department personnel. All sighting reports obtained are checked for validity and catalogued by species. Histories of each site are maintained listing the date and location of the observation, number of owls observed and the name of the observer. Updated lists of Spotted Owl sightings have been provided to agency wildlife and land managers for management purposes on an annual basis, except for the most recent year. Information on the status of Great Gray Owls is compiled by Jon Winter, a field ornithologist who has studied Great Gray Owls for the Department, U.S. Forest Service and National Park Service. Reports for Great Gray and Elf Owls are filed and histories of each site are maintained.

All sighting reports are entered into the Section's computer-based data files. In addition to sighting locations and productivity data for the four species being monitored, data on Spotted Owls also describe habitat, land ownership, and information on land management activities at each territory. Also, sighting files for Great Gray Owls and Elf Owls are maintained by the Department's California Natural Diversity Data Base (CNDDB). These files are accessed by the Department, other agencies and private companies involved in the environmental impact report and review process.

Research is most often conducted through contracts with state universities and colleges and experienced field ornithologists. Three Spotted Owl contracts were awarded to Humboldt State University for the continuation of demographic studies in the three major portions of the species' range. Stephen Laymon was awarded a contract on bid basis to resurvey the known range of the Elf Owl in California and provide an update on this species' status.

RESULTS:

SPOTTED OWL

Surveys

At the end of 1977 we were aware of 1,647 sites where the presence of Spotted Owls had been verified by either the Department or the U.S. Forest Service since 1973 (Table 1). Of these, 788 are in the range of the Northern Spotted Owl (*Strix occidentalis caurina*), 672 are in the Sierra Nevada portion of the range of the California Spotted Owl (*S. o. occidentalis*), and 187 are in the south coastal portion of the range of the California Spotted Owl.

In the year and a half since the end of the 1985-86 fiscal year, reports of 179 new Spotted Owl sites have been accessed into Department files. Fifty-one of these were found previous to the current reporting period and not reported until this report period. These new sites were reported from 32 of the 41 counties where Spotted Owls had been found previously, and 73 of these sites were found in south coastal California. Of the 179 new sites, 87 came from U.S. Forest Service sources, 56 from Department employees, and 36 from contract and other field ornithologists.

The 179 sites first recorded since July 1, 1986 do not represent a gain of 179 sites from the 1,488 reported by mid-1986. Continued work with forest biologists has led to some consolidation of sightings previously reported as separate sites (i.e. a reduction of 19 sites in Siskiyou County). This correction process provides for a better understanding of the local distribution of Spotted Owls but results in eliminating some sites each year.

The newly reported sites filled in the distribution within the already known range of Spotted Owls in the central and southern Sierra Nevada and particularly in southern California.

It is very important to emphasize that the current list of 1,647 sites where Spotted Owls have been found over the last decade and a half is not a list of active sites. Some sites have not been checked for over 10 years, did not necessarily represent territories of breeding pairs, or may no longer be occupied do to habitat alterations. This list serves as a historical base of the areas that have been capable of supporting Spotted Owls, their recent distribution, and their recent abundance.

During the report period, new sighting observations or updates through new information or consolidation of sites were made for many sites throughout the state. Our data base contains approximately 5,200 records of site visitations for the 1,647 sites known to have supported Spotted Owls. The number of sightings per site ranges from one, in most cases, to as many as 40. These records provide a valuable site history which can be related to habitat stability or changes to help determine the potential impacts of land management on Spotted Owls.

Table 1. Known distribtuion of Spotted Owls in California, October 23, 1987.

County	Present Number of Known Known Sites	Number of Northern Spotted Owl Sites	Number of California Spotted Owl Sites	
			Sierra Nevada	South Coast
Alpine	4		4	
Amador	6		21	
Butte	22		22	
Calaveras	18		18	
Colusa	3	3		
Del Norte	44	44		
El Dorado	83		83	
Fresno	49		49	
Glenn	15	15		
Humboldt	143	143		
Kern	23		16	7
Lake	21	21		
Lassen	12		12	
Los Angeles	26			26
Madera	32		32	
Marin	20	20		
Mariposa	35		35	
Mendocino	44	44		
Modoc	1	1		
Mono	1		1	
Monterey	13			13
Napa	6	6		
Nevada	20		20	
Orange	2			2
Placer	58		58	
Plumas	97		97	
Riverside	7			7
San Bernardino	62			62
San Diego	24			24
San Luis Obispo	10			10
Santa Barbara	23			23
Shasta	44	27	17	
Sierra	43		43	
Siskiyou	239	239		
Sonoma	5	5		
Tehama	59	46	13	
Trinity	174	174		
Tulare	64		64	
Tuolumne	72		72	
Ventura	13			13
Yuba	10		10	
TOTALS	1647	788	672	187

During the report period staff biologists surveyed for Spotted Owls on the Shasta-Trinity, Plumas, Lassen, Tahoe, and Sequoia National Forests. Surveys were aimed at verifying owl presence on selected network Spotted Owl Habitat Areas (SOHAs) on these forests. Forty previously known sites were checked for presence and owls were found at 20. Additionally, other areas where Spotted Owls had not been found before were checked for presence and 14 new sites were discovered.

Department Research

The Department is conducting two similar studies, both under contract with Dr. Ralph Gutierrez of Humboldt State University, on the demography of Spotted Owls. For the third year Alan Franklin monitored a population of Spotted Owls in a designated study area in Humboldt County, determining the distribution and density of the study area population, their reproduction and mortality rates, the site fidelity of individuals, and the rates of territory abandonment and re-occupation. The study is based on a 108 square mile area on the Six Rivers National Forest and contains about 35 territories of pairs or single individuals. A major effort has been made to capture and band all adults and as many young as possible in the study area each year and to continue the study for a minimum of five seasons. The results from the 1986 season are contained in the following, appended report:

Franklin, A., J. P. Ward and R. J. Gutierrez. 1987. Population Ecology of the Northern Spotted Owl (Strix occidentalis caurina) in Northwest California: Preliminary Results, 1986. Calif. Dept. of Fish and Game, Nongame Wildl. Invest., Job Progress Report, Project W-65-R-3 (554), Job II-3. 37 pp. + appen.

A report on the 1987 field work is cited below but is in draft form and will not be available until May 1, 1988:

Franklin, A. B. and R. J. Gutierrez. DRAFT-1988. Population Ecology of the Northern Spotted Owl (Strix occidentalis caurina) in Northwest California: Preliminary Results, 1987. Calif. Dept. of Fish and Game, Nongame Wildl. Invest., Job Final Report, Project W-65-R-4 (554), Job II-3. 22 pp. + append.

The second contract is for a study of similar biological parameters of the California Spotted Owl on a 134 square mile study on the Eldorado National Forest, Placer County. This study of Spotted Owls in the Sierra Nevada portion of their range is being conducted by Michael Bias and two years of field work has been completed. The results of the first year of field work, 1986, are reported in the following appended paper:

Bias, M. A. and R. J. Gutierrez. 1987. Population Ecology of the California Spotted Owl in the Central Sierra Nevada: Preliminary Results, 1986. Calif. Dept. of Fish and Game, Nongame Bird and Mammal Section, Endangered Species Income Tax Check-off Program. 27 pp.

A report on the 1987 field work is cited below but is in draft form and will not be available until May 1, 1988:

Bias, M. A. and R. J. Gutierrez. DRAFT-1988. Population Ecology of the California Spotted Owl in the Central Sierra Nevada: Preliminary Results, 1987. Calif. Dept. of Fish and Game, Nongame Bird and Mammal Section, Endangered Species Income Tax Check-off Program. 17 pp.

A third study of a similar nature to the two demographic studies referenced above was initiated on the Big Bear and San Geronio Ranger Districts of the San Bernardino National Forest. Although we supported this study through Dr. Gutierrez of Humboldt State University, major funding also came from Snow Summit Ski Area with support from the San Bernardino National Forest. Bill LaHaye is the project leader. The major objective of the study is to determine home range size and habitat use through the use of radiotelemetry. However, an opportunity arose to investigate the density, reproductive and mortality rates and rates of site abandonment in a 180 square mile study area centered in the Big Bear Lake area. A report on the 1987 field work is cited below but is in draft form and will not be available until May 1, 1988:

LaHaye, W. S. and R. J. Gutierrez. DRAFT-1988. Big Bear Spotted Owl Study, 1987. Calif. Dept. of Fish and Game, Nongame Wildl. Invest., Job Final Report, Project W-65-R-4 (554), Job II-3. 10 pp. + append.

During the 1987 field season the Department conducted a survey of Spotted Owls on the four National Forests in southern California to further determine the species range, its abundance, and the fragmentation of the southern California portion of the range of the subspecies S. o. occidentalis. A report on these surveys is appended and cited below:

Gould, G. I., Jr., K. Roberts and C. Roberts. 1987. Southern California Spotted Owl Survey, 1987. Calif. Dept. of Fish and Game, Nongame Bird and Mammal Section, Job Final Report, Project W-65-R-4 (554), Job II-3, and California Environmental License Plate Fund. 13 pp.

U.S. Forest Service Coordination

Guideline Compliance -- In FY 1984-85, we realized that the guidelines for the preservation of a viable population of Spotted Owls, provided by the Region 5 Office, U.S. Forest Service, to the individual forests, didn't encompass all of our concerns. Furthermore, many concerns couldn't be addressed with current information. Also, the Land Management Plan process for Region 5 was at various stages depending on the situation on each forest. Therefore, some forests were strongly moving forward in preserving Spotted Owls according to the guidelines and some forests were just beginning the process to implement the guidelines.

After discussions with the Wildlife Staff of the Region 5 Office, we agreed to work toward long-term research to resolve deficiencies in the guidelines. In the short-term we are concentrating on improving the implementation of plans to preserve Spotted Owls at the forest level and assuring compliance with the Regional guidelines. With the assistance of the Region 5 Office, we reviewed Spotted Owl networks on the Six Rivers, Plumas, Tahoe, Eldorado, Sierra, and Sequoia National Forests.

Inventory and Monitoring -- During the 1987 fiscal year Region 5 of the U.S. Forest Service received \$500,000 for inventorying and monitoring Spotted Owls and their designated network territories on the 11 northwestern California and Sierra Nevada National Forests. Staff was asked to participate in the decisions on what particular activities would be performed, how they would be performed, and how the effort would be allocated between the various forests. In addition to this planning, Staff also was involved in workshops to write an inventory and monitoring handbook (USDA Forest Service 1987, 1988) that would be used by all U.S. Forest Service Spotted Owl programs in Washington, Oregon and California and in acting as an instructor in two sessions to train U.S. Forest Service employees in the proper inventory and monitoring techniques.

Research -- During the 1987 fiscal year Region 5 of the U.S. Forest Service received \$500,000 for research on Spotted Owls. Staff was asked to be involved in and participated in the evaluation and selection of research projects throughout the Region so that proper coordination between federal and state research on Spotted Owls would provide complimentary products. In addition to this planning, Staff also participated in a workshop on and provided input into guidelines for Spotted Owls research. This document will be used by all U.S. Forest Service and hopefully all other researchers working on Spotted Owls to standardize procedures and analyses. This will provide comparable data sets from the many different researchers.

Region 6 SEIS -- Information was provided to Region 6, U.S. Forest Service, on Spotted Owl populations, distribution, habitat quantities and capabilities, and land ownership in California. This information is being used in the Region 6's Supplemental Environmental Impact Statement on Spotted Owls.

GREAT GRAY OWL

During the 1987 breeding season the National Park Service continued to study Great Gray Owls in Yosemite National Park. The research is investigating the daily and annual activity and movement patterns of the owls and at potential, human caused disturbances. A "Five Year Status Report" was prepared on the Great Gray Owl as part of the Department's obligation under the California Endangered Species Act. This report reviews the current status of the species and incorporates recently gathered research information. This report, cited below, is appended:

Gould, G. I., Jr. 1987. Five Year Status Report, Great Gray Owl.
Calif. Dept. of Fish and Game, Wildl. Manage. Div., Project
W-54-R-4 (554), Job II-3. 7 pp.

ELF OWL

During the 1987 breeding season Mary Halterman and Stephen Laymon surveyed 52 sites along the lower Colorado River and in the Colorado Desert for Elf Owls. This was a resurvey of Cardiff's (1978, 1980) previous work and updated the status of the species in California. Elf Owls were found at 10 sites, seven to nine of which may support breeding. The 17 to 24 individuals located represent 15 to 18 pairs of Elf Owls and total population probably does not exceed 25 pairs. A report on these surveys is appended and cited below:

Halterman, M. D., S. A. Laymon and M. J. Whitfield. 1987. Population Assessment of the Elf Owl in California. Calif. Dept. of Fish and Game, Nongame Bird and Mammal Section, Calif. Endangered Species Tax Check-off Program. 8 pp. + append.

A "Five Year Status Report" was prepared on the Elf Owl as part of the Department's obligation under the California Endangered Species Act. This report reviews the current status of the species and incorporates recently gathered research information. This report, cited below, is appended:

Gould, G. I., Jr. 1987. Five Year Status Report, Elf Owl. Calif. Dept. of Fish and Game, Wildl. Manage. Div., Project W-54-R-4 (554), Job II-3. 7 pp.

ANALYSIS:

Region 5 of the U.S. Forest Service has shown significant interest in seeing that Spotted Owl management is implemented on the 11 northern, timber-harvesting forests before the actual acceptance and implementation of formal Land Management Plans. This willingness already has resulted in greater cooperation with the Department in assessing the degree of implementation of Spotted Owl management on each forest and the consistency with which the regional guidelines are being applied. There has been greater coordination and a more uniform implementation of the guidelines.

This hasn't been without some drawbacks, however, as certain pressures exerted at the regional level are enforced through the guidelines. The number of network territories has been reduced on a few forests as some previous networks did not fully stretch the guidelines to their maximum interpretation and did not reduce the potential impact on timber production to the lowest level. This has resulted in the potential loss of what little existing buffer existed on these forests. On the other hand, the Region began to take a stronger stand on including the highest quality land for replacement habitat for network territories and to fully inventory network territories and implement a sound monitoring procedure. The complete inventory of network sites, assuring that each supports a pair (preferably a breeding pair), will provide the necessary basis for the monitoring so that any change noted will be relatable to a known base.

Because of the possible deficiencies in the guidelines, future research on Spotted Owls should be directed to correcting these deficiencies. The major needs are to assess the species' population dynamics, actual quantities of specific habitat used, and its prey base. The coordinated effort by the Department and the Forest Service's research section has used monies available to both agencies to handle these needs.

The long-term demographic studies on the Six Rivers and Eldorado National Forests are beginning to show their value. Information on the study area in the Six Rivers National Forest has shown some variation in population size, a fairly stable reproductive rate, and a slight variation in annual survival rates. However, the study on the Eldorado National Forest has shown a considerably greater annual fluctuation in reproductive rates, possibly suggesting a fairly substantial geographic difference. We intend to continue our funding of these studies for a total of five years on the Six Rivers National Forest and for four years on the Eldorado National Forest. Our ability to support these as long-term studies can't be guaranteed since our funding is on a year to year basis.

The survey of Spotted Owls in southern California and the contract study on the San Bernardino National Forest disclosed that there are more Spotted Owls present than previously known. This was not unexpected because there had been few previous surveys. However, it appears that the current population is still quite fragmented, exchange of individuals between most populations is at best limited, and most fragments are composed of very small effective populations.

Except for the interest generated by the study on the San Bernardino National Forest, little local and regional interest has been shown in the south coastal California population by the U.S. Forest Service in spite of the fact that current Forest Service policy requires that all known territories will be preserved. Complete surveys of the species' range and evaluation of the distribution of suitable habitat in southern California haven't been done. This means that all sites probably are not being maintained, since many are unknown, and each individual territory is important because of the fragmented distribution and small population size of the fragments.

The Elf Owl survey covered more potential sites than previously had been surveyed. While the increase in the number of sites where Elf Owls were located provided hope that more pairs exist along the lower Colorado River than previously known, a number of sites only had birds early in the season when the owls still may have been migrating, and the total number of owls implied by the survey is still exceedingly small. The population at Soto Ranch, north of Needles, still remains the most important site in supporting this species in California.

RECOMMENDATIONS:

1. Continue our involvement in the U.S. Forest Service's region-wide land management planning process involving Spotted Owls, particularly with the Land Management Plans and Spotted Owl Plans on each forest, and with the development of SOMA management plans.
2. Continue to work with the Region 5 Office, U.S. Forest Service, to evaluate the compliance of individual forests with the Regional guidelines for Spotted Owl management.
3. Conduct long-term research to determine normal breeding and mortality rates of Spotted Owls, the effects of timber harvest and habitat quality on those rates, and the factors which cause variations in the rates.
4. Determine the degree of genetic variation between and among the three geographically separate populations of Spotted Owls in California.
5. Write a Spotted Owl Management Plan which summarizes the known information on the species and recommend management guidelines which could be used instead of current guidelines. The document also should contain a statement of policy regarding Spotted Owls and the maintenance of old-growth forest habitat.
6. Establish a monitoring program and schedule for Elf, Great Gray, Spotted and Barred Owl populations as part of a management scheme for owls in California.
7. Survey additional areas of suitable habitat for all four species of owls and encourage the U.S. Forest Service to complete basic inventories for Spotted and Great Gray Owls on all forests in California.
8. Preserve the Elf Owl population north of Needles, San Bernardino County, through direct land purchase.
9. Increase Department involvement and expertise in the management of owls through Department conducted surveys and research.


LITERATURE CITED

- Cardiff, S. W. 1978. Status of the Elf Owl in California. Calif. Dept. of Fish and Game, Nongame Wild. Invest., Project W-54-R 10, Job III-1. 10 pp. + append.
- Cardiff, S. W. 1980. Status and Distribution of Elf Owls in California, 1979. Calif. Dept. of Fish and Game, Nongame Wildl. Invest. Project E-W-3, Job IV-1. 7 pp.


USDA Forest Service. DRAFT-1987. Spotted Owl Inventory and Monitoring Handbook. D. M. Solis, W. F. Laudenslayer, Jr., J. P. Ward, B. G. Marcot, F. Samson, J. Verner, Eds. USDA Forest Service, Region 6, Portland, OR. 36 pp.

USDA Forest Service. 1988. Spotted Owl Inventory and Monitoring Handbook. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Olympia, WA. 12 pp. + append.

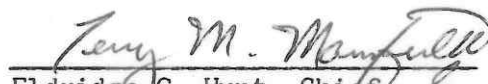
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