

California Department of Fish and Game
Job Final Report

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

Job Number: II-13 Job Title: Short-eared Owl Breeding Survey

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

Summary:

Thirty-nine Short-eared Owl (*Asio flammeus*) nests were found at Grizzly Island Wildlife Area during the spring of 1987. Elsewhere in the state, one nest was found at Mendota Wildlife Area, five were found at Ash Creek Wildlife Area, and two were found at Honey Lake Wildlife Area. Nests and owls were found in the course of surveying managed and unmanaged upland habitat for waterfowl nests.

At Grizzly Island Wildlife Area, the Short-eared Owl nesting density during the spring of 1987 was 7.0 nests per 100 acres in managed fields, as opposed to 3.8 nests per 100 acres in unmanaged uplands. Overall, based on a total of 4000 acres of upland habitat at Grizzly Island Wildlife Area, the estimated density of nests was 4.1 per 100 acres, or 163 possible nests.

The phenomenal increase in the number of Short-eared Owl nests at Grizzly Island, over the three to six found in essentially identical surveys conducted in past two years, was associated with experimental upland management of grassland for waterfowl nesting. Upland management appeared to result in increases in the populations of California voles (*Microtus californicus*) and harvest mice (*Reithrodontomys* sp.), and appeared to provide preferred nesting habitat. These results suggest that Short-eared Owls are opportunistic in their breeding behavior, and are able to take advantage of high prey abundance and increases in optimal nesting habitat.

Background:

Prompted by numerous reports that a number of bird species in California were declining, the Department contracted with J. V. Remsen, Jr. to work with field ornithologists in the state and create a prioritized list of species that may be facing extirpation. Remsen's "Bird Species of Special Concern in California" (1978) listed 61 species in one of three priority groups. Four species of owls are on this list, and are categorized as definitely declining but still having substantially large populations so that extirpation is not imminent.

The Short-eared Owl was one of the four species placed on the list. It was included because then current information indicated it had vanished as a breeding bird from the southern coastal area, perhaps from the San Joaquin Valley, was a very rare nester in the Sacramento Valley, and was known to nest at only four sites along the central coast. Additionally a few pairs were presumed nesting in northeastern California. The cause for its decline in

wintering numbers as well as in breeders was due to the decline in marsh and tall grassland habitat. This has been caused by agricultural conversion, marsh reclamation, and grazing.

Objectives:

1. Determine the distribution and number of breeding Short-eared Owls throughout the state.
2. More fully determine habitat requirements, and if necessary, utilize this knowledge to design a plan to protect and enhance the California population of this raptor species.

Procedures:

For several consecutive years, systematic field surveys have been conducted at the Grizzly Island Wildlife Area under the direction of M. Robert McLandress of the California Waterfowl Association in a joint effort with the Department of Fish and Game to monitor duck nesting activity in experimentally managed and natural upland grassland habitat. The surveys, made during mid-March to mid-June, employed the use of a drag rope to flush birds from their nests. This is also a very efficient method for searching areas for Short-eared Owls, and additional effort was expended by project personnel to collect data on this important nongame species. Once nests were found their locations were marked and they were monitored on a regular basis until the end of the summer. Similar surveys were conducted at the Mendota Wildlife Area and Sacramento National Wildlife Refuge in the Central Valley, and at Ash Creek and Honey Lake Wildlife Refuges in northeastern California.

Preliminary results, including numbers and densities of nests found and dominant vegetation of fields surveyed, have been provided by the California Waterfowl Association and are included in this report (Table 1). More detailed analysis of the data collected this spring is continuing and results will be provided as they become available.

Findings:

Field surveys of 692 acres at Grizzly Island Wildlife Area resulted in the discovery of 39 Short-eared Owl nests during spring 1987. Additionally, a single nest was found at Mendota Wildlife Area, five were found at Ash Creek, two were found at Honey Lake, and none were found at Sacramento National Wildlife Refuge, for an overall total of 47 nests. In spring 1986, only six nests were found at Grizzly Island, and one pair was flushed at the Colusa National Wildlife Area, but no nest was found. In spring 1985 only three nests were found at Grizzly Island. Thus, the phenomenal increase in the number of Short-eared Owl nests at Grizzly Island this spring, needless to say, was surprising.

Preliminary analysis indicates that the density of Short-eared Owl nests was higher in experimentally managed upland grassland fields than in natural upland fields (Table 1), particularly in those fields managed during 1985, two years ago. This high nesting density in the 1985 experimental fields occurred

regardless of whether annuals or perennials had been planted. In unmanaged fields, Short-eared Owls nested more densely in idle grassland/shrub fields than in fields with other dominant vegetation, such as pickleweed, mustard, rush or bulrush. The overall density in managed fields, including both years, was 7.0 nests per 100 acres, as opposed to 3.8 nests per 100 acres in unmanaged upland. An overall estimate of 163 nests can be calculated for the 400 acres of managed and 3600 acres of unmanaged upland habitat available at Grizzly Island during spring 1987, with an overall estimated density of 4.1 nests per 100 acres, or about one nest per 25 acres.

Table 1. Nesting densities of Short-eared Owls in sampled upland fields at the Grizzly Island Wildlife Area in spring, 1987.

Field Number	Dominant Vegetation	Acres	Number of Nests	Density (Nests/100 ac)
13-D	Idle grass/shrub	34	2	5.9
13-H	Idle grass/shrub	39	2	5.1
13-K	Idle grass/shrub	34	0	.0
14-D	Idle grass/shrub	68	6	8.8
14-H*	Grass planted in 1986*	65	1	1.5
14-I*	Grass planted in 1986*	68	3	4.4
14-J*	Grass planted in 1986*	44	1	2.3
14-L*	Grass (annuals) 1985*	57	9	15.8
14-M*	Grass (perennials) 1985	56	6	10.7
14-N*	Grass (annuals) 1985	55	3	5.5
14-O*	Grass (perennials) 1985%	54	5	9.3
14-P	Pickleweed	51	0	.0
II-R	Mustard	37	0	.0
12-B	Pickleweed	11	0	.0
3-E	Baltic Rush	11	0	.0
J0-1	Hardstem Bulrush	8	1	12.5
Totals		692	39	5.6
ANALYSIS	*Managed fields	399	28	
	Perennials-1985 only	110	11	10.0
	Annuals-1985 only	112	12	10.7
	"Natural" upland	293	11	3.8
ESTIMATED TOTAL NESTS		4000	163	4.1
(based on 4000 ac of upland: 400 ac managed, 3600 ac natural)				

Analysis:

Short-eared Owls are apparently opportunistic breeders, and during spring 1987 it appears that prior upland management directed at enhancing waterfowl nesting at Grizzly Island Wildlife Area also could have resulted in a highly advantageous situation for these ground nesting owls. Fields that were disked and planted with either annuals or perennials during 1985 experienced very lush growth during the wet winter of 1985-86. This lush undisturbed vegetation left a very heavy residual cover of dried vegetation, and it was enhanced by an additional year's fresh regrowth during the winter of 1986-87. This situation appeared to result in an increase of voles and harvest mice, principle prey species for Short-eared Owls, and in addition seemed to provide ideal conditions in which to nest. However, since voles and harvest mice undergo normal population cycling, and density figures are unavailable, the actual effect of upland management on these prey populations remains unknown, and is only inferred in this case.

The breeding behavior of Short-eared Owls allowed them to take full advantage of this situation. Nests were built on the ground next to and partly under large clumps of residual vegetation. They were partially covered from above, mostly closed around three sides, but opened from the side opposite the clump, presumably to allow a landing and take-off area for the adults. Eggs were laid and incubated continuously, so that at any one time there would be large, medium-sized, and just-hatched nestlings along with pipping, half-incubated, and fresh eggs, all in one nest. When a nestling grew large and strong enough to walk, it left the nest by tunneling under the residual vegetation, usually out the back (closed side) of the nest. In one case a large individual nestling, banded in the nest several days earlier and still covered with down, was found sitting quietly at a rounded-out end of one of these tunnels, about ten feet away from the nest. On several other occasions, exhaustive searches of well used tunnels and trails, starting out the back and sides of a nest, radiating in all directions, and continuing for up to a radius of about 100 feet, revealed no nestlings, but places where they had remained for a while were evident by trampled areas and collections of pellets and droppings. Reportedly the male continues feeding these dispersed nestlings, while the female apparently continues laying, incubating, and caring for remaining young at the nest.

The female sits quite tightly on the nest, and can be approached very closely before she flushes. Her coloration blends well with the dried residual grass, and she is very difficult to see. Females can be captured on the nest using the same method used for capturing hen mallards, by using stealth, surprise, and a large fish net over the nest. However, when considering that dispersed nestlings may be in the vicinity of the nest, this method should not be employed after the first eggs hatch, and when nests are rechecked researchers should proceed with caution. Short-eared Owl nests sometimes were quite close together, 25 to 50 feet, and were often similarly close to Mallard and Northern Harrier nests.

Apparently some upland grassland management strategies designed to increase waterfowl nesting also benefit other ground-nesting marsh inhabitants, such as Short-eared Owls. In fact, at Grizzly Island, the experimental fields with the highest densities of duck nests also appeared to have the highest densities of Short-eared Owl nests. Although the preliminary data from this

year's nesting season cannot yet address other important considerations, such as nest success, failure, predation, number of young produced, length of nest attendance, and duration of nesting season, ongoing analyses of the data will add significantly to these preliminary results.

Ongoing studies of this sort are valuable. For example, it will be important to find out if the same management strategy will benefit Short-eared Owls next spring. Since last winter (1986-87) was considerably drier than the previous one (1985-86)) when the phenomenal growth of vegetation occurred, there may not be as large a population of voles next spring to support as large a population of nesting Short-eared Owls as existed this year.

The intriguing result of this year's waterfowl nest survey underscores the importance of continuing this research in future years. Remsen (1978) makes it clear that the exact status of the Short-eared Owl in California must be determined. Since the status of the habitat for this species generally is not improving, it is apparent that this study should be carried out at the earliest opportunity. The survey methods employed by the waterfowl nesting survey and its continuation and extension into other parts of the state in future years may provide a perfect opportunity to carry out this study and at the same time experimentally determine appropriate upland management strategies needed to enhance Short-eared Owl populations. The Department of Fish and Game should continue cooperation with, and increase support for the California Waterfowl Association's ongoing waterfowl survey so that valuable information can continue to be collected on the Short-eared Owl and other nongame species associated with upland marsh habitat.

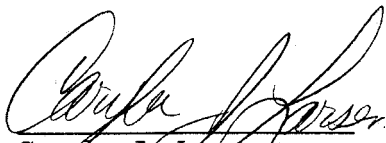
Recommendations:

1. The Short-eared Owl should remain listed as a Bird Species of Special Concern.
2. Adequate support should be provided to allow the California Waterfowl Association to continue collecting and analyzing information on nests of Short-eared Owls, and other nongame upland nesting birds, in conjunction with the ongoing waterfowl nesting survey being conducted in cooperation with the California Department of Fish and Game.
3. Management plans devised to increase nesting opportunities for waterfowl on state-operated wildlife areas should include provisions for enhancement of habitat for upland ground-nesting nongame birds, especially for Species of Special Concern, such as the Short-eared Owl.
4. A method should be devised to accurately determine the status of the Short-eared Owl in California.

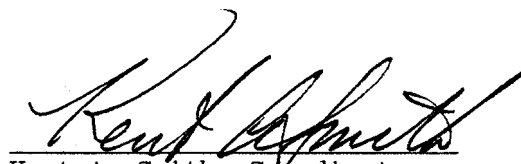
Literature Cited:

- Remsen, J. V., Jr. 1978. Bird species of special concern in California. Calif. Dept. Fish and Game, Wildl. Mgmt. Branch, Admin. Report No. 78-1, 54 pp.

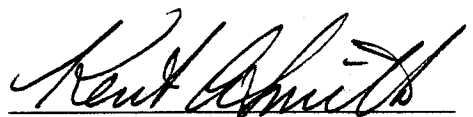
Prepared by:


Caryla J. Larsen
Wildlife Biologist

Approved by:


Kent A. Smith, Coordinator
Nongame Bird and Mammal
Section

Approved by:


Eldridge G. Hunt, Chief
Wildlife Management Division
California Department of Fish
and Game

Date:

 9/30/87