CHANGES IN DISTRIBUTION OF OWL SPECIES SUBSEQUENT TO HABITAT ALTERATION BY FIRE

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Information on the effects of major habitat change on the distribution of owls is generally lacking. The result may be that marked changes in density or local distribution go unnoticed. I have compiled records and subjective impressions from several observers near China Camp Forest Service campground during a period interrupted by a major forest fire. This information is particularly valuable when it pertains to the California Spotted Owl (*Strix occidentalis occidentalis*), a subspecies which is under study by the California Department of Fish and Game and the U.S. Forest Service because of concern for its status.

China Camp, a U.S. Forest Service campground at the head of Miller Canyon, is 3.4 km south of Chew's Ridge summit on the Tassajara Hot Springs Road in the Los Padres National Forest, Monterey County, California. This area has enjoyed a reputation among local observers for the variety and abundance of its fauna. Eight species of owls have been recorded here (Table 1). Of great attraction to most observers have been the Spotted Owls, which have been easily studied here due to their prompt response to imitated or taped calls. In contrast, Western Screech-Owls were seldom noted about this location prior to the fire, although they could always be found throughout the year at lower elevations in the riparian, encinal and oak-savannah habitat a few kilometers north of Chew's Ridge in Carmel Valley.

The occurrence of various owl species in the study area may be summarized as follows: two or more pairs of Spotted Owls were noted in the vicinity of China Camp each year between June 1972 and July 1979 (Table 2). Definite evidence of local breeding was secured in 1977 prior to the fire, when a family of Spotted Owls (two adults and at least two young-of-the-year) were present. In contrast, I observed only one Western Screech-Owl near China Camp in 1973 and 1974 respectively; two may have been there in 1976 but no screech-owl was noted in the spring of 1977 prior to the fire. Northern Saw-whet Owls with two young-of-the-year were observed there on a June visit in 1977 and Roberson suspected breeding by this species in the same location in 1976 (Don Roberson pers. comm.).

In August 1977, the second largest forest fire in California history (the 77,000 HA Marble-Cone fire) effected large scale habitat changes about Chew's Ridge. The fire burned almost all the understory of the area and effectively denuded most foliage from various live oak species (*Quercus* spp.) and Tanoaks (*Lithocarpus densiflora*). The Tanoak stands on north-facing slopes had been noted as a favorite local Spotted Owl habitat.

The fire pattern limited crowning in the larger Douglas-firs (*Pseudotsuga menziesii*) in the Chew's Ridge area. Flammulated Owl habitat (as described by Marcot and Hill 1980) apparently was not markedly affected. Flammulated Owls have been almost as abundant since the conflagration as they were previously.

Table 1. Owl species and their status near the China Camp campground, Monterey County, California.

Common Barn-Owl *Tyto alba*	-vagrant (or very scarce resident)
Western Screech-Owl *Otus kennicottii*	-see text
Flammulated Owl *Otus flammeolus*	-local summer resident (19 April to August)
Great Horned Owl *Bubo virginianus*	-resident (at least two pairs)
Northern Pygmy-Owl *Glaucidium gnoma*	-resident (two singing birds)
Spotted Owl *Strix occidentalis*	-probably resident (high count: 2 pairs plus young)
Northern Saw-whet Owl *Aegolius acadicus*	-possibly resident (bred in 1977; present also in 1976 and 1981)
Long-eared Owl *Asio otus*	-one male on territory 21 May 1967 at China Camp; another heard briefly in 1977

Such was not the case with Spotted Owls—during the spring 1978 survey, only Flammulated, Northern Pygmy- and Great Horned owls were recorded. In the 1979 and 1980 breeding seasons, the latter species assemblage was noted, plus one Western Screech-Owl. In spring 1981, Spotted Owls again were detected, but the calls were all from unburned areas of Miller Canyon at lower elevations well below China Camp. One was heard here on 16 and 25 April, and two were heard on 27 June. Certainly, since the fire, the vegetation type offered no semblance of the foliage types postulated to be prime habitat for Spotted Owls (Grinnell and Miller 1974, Small 1974, Gould 1977, Barrows and Barrows 1978, Marcot and Gardetta 1980, Barrows 1981).

Also during spring 1981, a marked increase in the total number of Western Screech-Owls in the burn area was observed. Roberson noted five screech-owls near China Camp in April. During three survey nights between 2 May and 22 June, I encountered numerous individual singing screech-owls along a 2-mile survey route centered on China Camp (2 May, 4 birds; 16 June, 5 birds; 22 June, 6-7 birds). Vocalizations indicated fledged young-of-the-year soliciting feeding.

Perhaps the most significant factor influencing the apparent increased occurrence of screech-owls was the copious sprouting from the trunks and limbs of fire-blackened oaks in the spring of 1981, following three better-than-average precipitation years in the Santa Lucia Range. Sprouting occurred at middle canopy and crown height for live oaks and from the basal section of the main trunks of Tanoaks. Prior to spring 1981, most of these trees appeared moribund. Marshall (1967) noted in his discussion of the genus *Otus* in the American Southwest that periodic burning of appropriate habitat for screech-owls seemed to enhance populations.

Table 2. Number of Spotted Owls and Western Screech-Owls reported near China Camp U.S. Forest Service campground between 1972 and 1981. (Marble-Cone fire occurred in August 1977.)

	Spotted Owls		*Western Screech-Owls*	
1972		4		-
1973		4		1
1974		4 (+2?)		1
1975		4		-
1976		4		2
1977		4 (+2)		-
1978		-		-
1979		-		1
1980		-		1
1981	25 April	1 (a)*	25 April	5
			2 May	4
			16 June	5
	27 June	2 (a)*	22 June	6-7

*Reported by Roberson (pers. comm.)
(a) Birds calling from lower elevations in Miller Canyon

It must be emphasized that the methodology employed to gather the data was not a systematic uniform census, but rather a series of informal surveys by several independent observers employing heterogeneous methods. Also, Roberson's taped or imitated calls stressed owl species (Spotted, Flammulated, Northern Saw-whet) other than Western Screech-Owls; the latter could conceivably have been present and non-respondent during some or all of these field sessions.

Notwithstanding the latter caveat, the evidence still indicates that Spotted Owls abandoned their former habitat, occupied prior to the Marble-Cone fire, and shifted their distribution downslope into unburned areas near the bottom of Miller Canyon. Whether or not Spotted Owls occurred regularly in the latter area prior to the fire is unknown.

The data also suggest that the apparent increase in numbers of Western Screech-Owls in 1981 resulted from a significant increase in appropriate habitat. The seral development of an incipient oak canopy provided the appropriate niche to accommodate Western Screech-Owls in an area previously inhabited by Spotted Owls.

ACKNOWLEDGMENTS

I thank the following individuals for sharing their records and recollections of owl data from the study area: Alan Baldridge, Ronald Branson, Bill Clow, Debra Love Shearwater, William Reese, Don Roberson and Dennis Serdehely. Baldridge, Roberson, Jon Winter, Gordon Gould, Rich Stallcup and Cameron Barrows reviewed one or more drafts of the manuscript and

provided useful comment and discussion. I also thank Mary Elliott and Gail Nolan Presley for assistance in the field. I wish to dedicate this paper to the memory of the late George M. Sutton in thanks for his kind advice on a matter of mutual interest.

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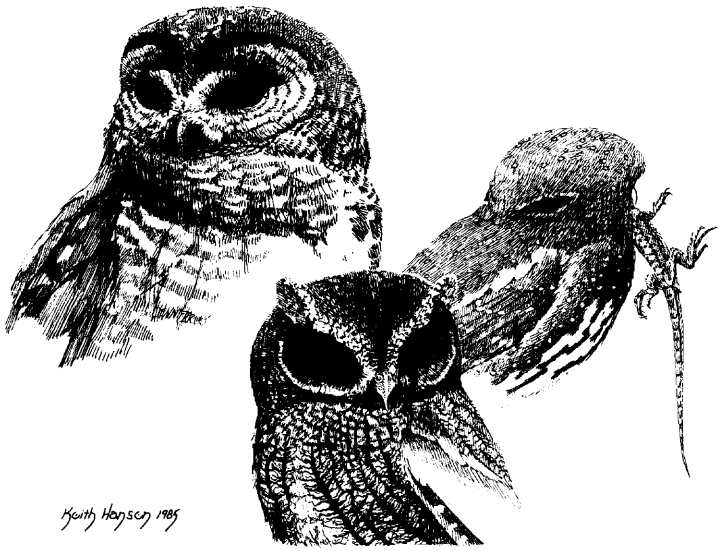
Accepted 26 November 1983



Spotted, Flammulated and Pygmy Owls *Sketch by Keith Hansen*