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Raymond J. Bogiatto
California State University, Chico

John A. Hindley
California State University, Chico

Rebecca L. Surles
California State University, Chico

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NOTES ON THE WINTER DIET OF SHORT-EARED OWLS IN NORTHERN CALIFORNIA

Raymond J. Bongiatto¹, John A. Hindley¹, and Rebecca L. Surles¹

Key words: Short-eared Owl, *Asio flammeus*, winter diet, foraging ecology.

The Short-eared Owl (*Asio flammeus*), a California species of concern, has a wide-spread distribution within open country habitats throughout the state (Zeiner et al. 1990). Although studies of its foraging ecology are numerous (Tomkins 1936, Stegeman 1957, Fisler 1960, Earhart and Johnson 1970, Colvin and Spaulding 1983, Holt 1993, Stone et al. 1994, Hogan et al. 1996, and others), no data currently exist for the Sacramento Valley, a major wintering area for this species in California. As a result of the destruction and fragmentation of Central Valley marshland and grassland habitats as well as grazing in recent decades, owl numbers have declined throughout much of the range (Remsen 1978). This study, which provides data collected from a remnant grassland habitat in the northeastern Sacramento Valley, should provide biologists and land managers with a better understanding of the dietary needs of this species during fall and winter months.

Short-eared Owl pellets were collected from a winter roost site at the Vina Plains Nature Preserve (administered by The Nature Conservancy), Tehama County, California. The Vina Plains site is characterized by a mosaic of open grass-forb habitats in association with numerous vernal pools. The roost site is located in a stand of purple needle-grass (*Nassella pulchra*), a native perennial bunchgrass, with individual owls using hutlike burrows within grass clumps. Between 8 and 14 owls were regularly observed using this site throughout our study.

Pellets were first removed from the site prior to the onset of each field season to be certain of deposition period. Collections were

made every 12–15 days from 15 December through 1 March 1995 and 1996.

Pellets from sympatric Northern Harriers (*Circus cyaneus*) were identified using techniques proposed by Clark (1972) and removed from all samples. We dissected pellets in the lab, separating and removing all osteological materials from both fur and feathers.

Cranial and mandibular remains were identified to the most specific taxonomic level possible by comparison with known specimens from the skull collection in the California State University, Chico (CSUC), Department of Biological Sciences Vertebrate Museum. We identified post-cranial remains using the zooarchaeology comparative collection in the CSUC Department of Anthropology.

In all, we collected 106 pellets during this study. Of 135 prey items, the Botta pocket gopher (*Thomomys bottae*), California vole (*Microtus californicus*), and deer mouse/western harvest mouse (*Peromyscus maniculatus* /*Reithrodontomys megalotis*) were the most common prey items, accounting for 68.1%, 16.3%, and 14.9% of the total prey item sample, respectively (Table 1). Deer and harvest mouse remains extracted from pellets lacking distinguishing cranial or mandibular elements were treated collectively. In addition, bird prey items comprised 0.7% of total prey items.

Our value for percent mammal prey (99.3%) is consistent with values of Stegeman (1957), Colvin and Spaulding (1983), Holt (1993), and Stone et al. (1994), who generated figures of 98.3%, 99.3%, 95.0% (nonbreeding season data), and 99.14%, respectively. However, the presence of pocket gophers (68.1%) is relatively high compared with other studies conducted

¹Department of Biological Sciences, California State University–Chico, Chico, CA 95929-0515.

TABLE 1. Food items in 106 Short-eared Owl pellets collected at the Vina Plains Nature Preserve, Tehama County, California, 1995–1996.

Taxon	Number	Percent of total prey items
Botta pocket gopher (<i>Thomomys bottae</i>)	92	68.1
California vole (<i>Microtus californicus</i>)	22	16.3
Deer mouse (<i>Peromyscus maniculatus</i>)	4	3.0
Deer mouse/Western harvest mouse (<i>Peromyscus/Reithrodontomys</i>)	16	11.9
Unidentified swallow (Hirundinidae)	1	0.7
TOTAL PREY ITEMS	135	100.0

within the geographic range of the family Geomyidae. No pocket gophers occurred in pellets collected by either Fisler (1960) or Hogan et al. (1996), who conducted research in California and Texas, respectively. Stone et al. (1994) reported values for the northern pocket gopher (*T. talpoides*) ranging from 10.3% to 27.6% in Short-eared Owl pellets collected in western Wyoming. Botta pocket gophers range in size from 71 to 250 g compared with 42 to 100 g for the California vole (Burt and Grossenheider 1976). Our findings show that Short-eared Owls will take larger prey items such as gophers when available.

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