upland area of Illinois shortly after the midwinter Bald Eagle census conducted by the National Wildlife Federation. Since this census covered areas primarily along the Mississippi and Illinois rivers, eagles in upland habitat may not have been counted, resulting in an inaccurate estimate of eagles wintering in Illinois.

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Breeding-season diet of Northern Saw-whet Owls in southwestern Idaho.—The Northern Saw-whet Owl (*Aegolius acadicus*) is a common inhabitant of forested lands from central Canada south to the central United States (Godfrey 1986). Despite its wide range, very little is known of its breeding biology (Cannings 1987). Catling (1972) noted that food habits data from the breeding season are "very meagre." Indeed, we know of only one large sample of Northern Saw-whet Owl food habits from the breeding season (Cannings 1987).

Eight Northern Saw-whet Owl nests (1 in 1986 and 7 in 1987) were found in the Snake River Birds of Prey Area (BOPA) in southwestern Idaho. Unlike typical Northern Saw-whet Owl nesting habitat, the vegetation of the BOPA is shrub-steppe desert dominated by big sagebrush (*Artemisia tridentata*). Trees are scarce and are confined to watercourses and farm settlements. All Northern Saw-whet Owl nests were in nest boxes, either in native riparian willows (*Salix* sp.) or in groves of exotic Russian olives (*Elaeagnus angustifolia*) and black locusts (*Robinia pseudoacacia*). Three of the nesting females in 1987 mated with the same male (Marks et al., unpubl. data).

We present data on diet composition and prey size of these owls during the breeding

TABLE 1

TOTAL PREY FROM SIX NORTHERN SAW-WHET OWL NESTS IN THE SNAKE RIVER BIRDS OF PREY AREA, SOUTHWESTERN IDAHO. COMMON NAMES ARE IN PARENTHESES

Prey	Weight (g)	No. of prey	Percent of total	Total prey biomass (g)	Percent of total
Sorex sp. (shrew)	6	2	0.3	12	0.1
Mus musculus (house mouse)	17	219	30.7	3723	26.2
Reithrodontomys megalotis (harvest mouse)	11	214	30.0	2354	16.6
Peromyscus maniculatus (deer mouse)	19	104	14.6	1976	13.9
Microtus montanus (montane vole)	35	175	24.5	6125	43.2
Total		714	100.1	14,190	100.0

season. We also compare our data with those from the recent studies of Boula (1982), Grove (1985), and Cannings (1987) to characterize the trophic niche of Northern Saw-whet Owls, based on data available from the Pacific Northwest.

After the young left the nest, we collected the mass of broken pellets that had accumulated in the bottom of each nest box (no pellets were recovered from two nests that failed before the eggs hatched). Because male Northern Saw-whet Owls do almost all of the nest provisioning (pers. obs.; R. Cannings, pers. comm.), and because female *Aegolius* owls keep the nest very clean during incubation and early brood-rearing (Korpimäki 1981, Cannings 1987), these prey remains probably represented food brought to the nest by the male during the last half of the nestling period. After searching for feathers, we soaked the pellet material in a weak solution of NaOH to separate bones from the rest of the material. Prey were identified by standard methods (Marti 1987). In most cases, dentaries were the most useful bones for identification of prey species.

TABLE 2

PREY ITEMS (%) AND ESTIMATED MEAN MASS OF MAMMALIAN PREY (MMMP) FROM SIX NORTHERN SAW-WHET OWL NESTS IN THE SNAKE RIVER BIRDS OF PREY AREA, SOUTHWESTERN IDAHO

Prey	Nest sites					
	Strike Camp	Treeline 2	Harris	Bruneau Marsh	Bruneau Marsh S	Boat launch[a]
Sorex sp.	—	—	—	0.6	0.9	—
Mus musculus	56.1	23.5	33.8	3.7	11.6	62.9
Reithrodontomys megalotis	15.1	21.6	15.0	53.4	58.9	5.6
Peromyscus maniculatus	18.0	7.8	14.4	15.3	16.1	10.1
Microtus montanus	10.8	47.1	36.9	27.0	12.5	21.4
Total prey items	139	51	160	163	112	89
MMMP (g)	18.4	24.3	23.0	18.9	15.9	20.7
(SE)	(0.5)	(1.5)	(0.8)	(0.8)	(0.8)	(0.8)

[a] 1986 nest; all other nests from 1987.

TABLE 3

FOOD-NICHE OVERLAPS AMONG SIX NORTHERN SAW-WHET OWL NESTS IN SOUTHWESTERN IDAHO. OVERLAP VALUES MAY RANGE FROM 0 (NO DIETARY OVERLAP) TO 1 (COMPLETE DIETARY OVERLAP)

Nests	Treeline 2	Harris	Bruneau Marsh	Bruneau Marsh S	Boat launch
Strike Camp	0.572	0.740	0.449	0.536	0.826
Treeline 2	—	0.831	0.601	0.535	0.583
Harris		—	0.600	0.534	0.708
Bruneau Marsh			—	0.855	0.408
Bruneau Marsh S				—	0.398

We calculated the following niche metrics: (1) mean body mass of mammalian prey (MMMP, Marks and Marti 1984), (2) food-niche breadth (Levins 1968), (3) dietary evenness (a modification of Hill's [1973] ratio proposed by Alatalo [1981]), and (4) food-niche overlap (Schoener 1968). Estimated mean weights of prey species were obtained from Marti (1976), Steenhof (1983), and Cannings (1987). Food-niche breadth and dietary evenness were calculated using mammalian prey at the generic level of resolution (see Marks 1984).

Breeding Northern Saw-whet Owls in our study area fed exclusively on five species of small mammals, but did not seem to specialize on any one prey species. House mice (*Mus musculus*) and harvest mice (*Reithrodontomys megalotis*) were the most numerous prey by number, whereas montane voles (*Microtus montanus*) contributed the greatest amount of prey biomass (Table 1). Overall, these three species constituted 85.2% of the diet by number and 86.0% by biomass (Table 1). The relative frequencies of prey species in the diets differed significantly among nests ($G = 275.9$, df = 15, $P < 0.0001$). *Mus, Reithrodontomys,* and *Microtus* each were the most common prey at two nests (Table 2). MMMP (±SE) ranged from 15.9 ± 0.8 g to 24.3 ± 1.5 g (Table 2) and differed significantly among nests (one-way Kruskal-Wallis test, $H = 65.8$, df = 5, $P < 0.0001$).

Dietary overlap among nests ranged from 0.398 to 0.855 (Table 3). Nearest-neighbor distances between nests for which we had food habits data ranged from 130 to 400 m. In most cases, the closest nests had the most similar diets. Dietary overlap was significantly negatively correlated with distance between nests ($r_s = -0.78$, N = 15, $P = 0.0005$), suggesting that the owl diets were related to the habitat features (and resultant make-up of the small mammal faunas) in the vicinity of nest sites. Interestingly, prey species composition was significantly different ($G = 31.2$, df = 3, $P < 0.001$) at the two nests of the polygynous male for which we had food data (Strike Camp and Harris). The diets at these nests were more similar to those at other close nests than they were to each other (Table 3). This suggests that either: (1) the male was provisioning the two nests from different areas in his territory, or (2) prey species availability varied temporally. Although these nests were only 130 m apart, their hatching dates differed by 15 days.

Eleven genera of small mammals have been recorded in Northern Saw-whet Owl diets in the Pacific Northwest (Forsman and Maser 1970, Boula 1982, Grove 1985, Cannings 1987, this study). Small mammals constituted 95–100% of the diets in these studies. Individuals wintering in shrub-steppe in north-central Washington fed primarily on *Microtus* (Grove 1985), whereas those breeding in coniferous and deciduous forests in south-central British Columbia (Cannings 1987) and in coniferous forests in northeastern Oregon (Boula 1982)

TABLE 4

TROPHIC PARAMETERS OF NORTHERN SAW-WHET OWLS IN THE PACIFIC NORTHWEST. S IS THE NUMBER OF SMALL MAMMAL GENERA IN THE DIET AT EACH LOCALITY

Location	N	MMMP (SE) (g)	S	Food-niche breadth	Dietary even-ness	Major prey (percent of prey items)	Source
Washington[a]	770	26.7 (0.4)	6	2.69	0.703	*Microtus* (54)	Grove (1985)
British Columbia	584	21.4 (0.3)	6	2.54	0.636	*Peromyscus* (58)[b]	Cannings (1987)
Oregon	77	20.8 (0.8)	7	1.68	0.402	*Peromyscus* (77)	Boula (1982)
Idaho	714	19.9 (0.3)	5	3.77	0.950	*Mus* (31) *Reithrodontomys* (30)	This study

[a] Winter diet; all other studies are breeding diet.
[b] *Peromyscus* made up 84% of the diet in coniferous forest and 36% in deciduous forest.

fed mostly on *Peromyscus* (Table 4). In Idaho, they ate similar proportions of *Mus, Reithrodontomys,* and *Microtus* during the breeding season (Table 1). Dietary differences were also reflected in food-niche breadth and evenness measures. Although the number of prey genera in Northern Saw-whet Owl diets was similar across Pacific Northwest localities, food-niche breadth was 1.5–2 times greater in Idaho than in the other areas (Table 4). Dietary evenness was also much greater in Idaho than in the other areas (Table 4). MMMP ranged from 20 to 27 g (Table 4), and 99% of the mammalian prey items (N = 2092) weighed between 10 and 35 g.

The variation in food habits among nests in southwestern Idaho and among localities in the Pacific Northwest suggests that Northern Saw-whet Owls are opportunistic predators that feed on a wide variety of small mammal species, most of which weigh less than 40 g. Nonmammalian prey apparently are seldom taken by Northern Saw-whet Owls in this region. Geographic differences in the diets of Northern Saw-whet Owls probably reflect differences in the local availability of prey species (see Jaksić 1983, Marks 1984). There is an obvious need for data from additional localities within the Pacific Northwest coupled with measurements of the relative availability of prey species.

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