

NEST-SITE CHARACTERISTICS AND REPRODUCTIVE SUCCESS OF LONG-EARED OWLS IN SOUTHWESTERN IDAHO

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ABSTRACT.—In 1980 and 1981, I determined the outcome of 112 nesting attempts by 104 pairs of Long-eared Owls (*Asio otus*) in the Snake River Birds of Prey Area in southwestern Idaho. All nests were in trees in stick nests built by corvids. Owls used nests in clumps of trees and avoided nests in solitary trees and single rows of trees. Discriminant function analysis revealed that nests selected by owls tended to be wider than unused nests. Nesting success was 34% in 1980 and 51% in 1981. The minimum number of young fledged per successful nest was 3.4 in 1980 and 4.0 in 1981. Predators, probably raccoons (*Procyon lotor*), caused most nesting failures. Unsuccessful nests tended to be closer to water than were successful nests. Young owls left the nest about 2 weeks before they could fly and “branched” in the tree canopy surrounding the nest. “Branchers” had high survival, and branching may reduce nest predation. The number of nesting pairs in the study area declined 35% from 1980 to 1981. Nesting sites were more likely to have been reoccupied in 1981 if they had been successful in 1980. Received 6 Dec. 1985, accepted 8 Apr. 1986.

Long-eared Owls (*Asio otus*) inhabit temperate latitudes across North America and Eurasia (Burton 1973). Literature on their food habits is extensive (e.g., Marti 1976, Marks 1984). Because Long-eared Owls are almost strictly nocturnal and typically nest and roost in dense vegetation, much less is known about their breeding biology.

Breeding studies in Europe include Glue (1977), Nilsson (1981), Village (1981), Mikkola (1983), and Wijnandts (1984). The most extensive North American studies are from Arizona (6 nests, Stophlet 1959) and Idaho (20 nests, Craig and Trost 1979; 18 nests, Marks and Yensen 1980; 24 nests, Thurow and White 1984). Aside from Marks and Yensen (1980), I am not aware of any study that has assessed the influence of nest-site characteristics on nesting success.

Here, I report on nest-site characteristics and reproductive success of 104 Long-eared Owl pairs during 2 nesting seasons in the Snake River Birds of Prey Area (SRBPA) in southwestern Idaho. My main objectives were to (1) examine whether Long-eared Owls choose nest sites randomly, (2) determine if nest-site characteristics influence nesting success, and (3) present productivity data on nests that were followed from incubation until the young were capable of sustained flight.

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STUDY AREA

The SRBPA comprises 338,778 ha of shrubsteppe desert in Ada, Canyon, Elmore, and Owyhee counties, southwestern Idaho. About 19% of the area is irrigated farmland. The native vegetation is dominated by big sagebrush (*Artemisia tridentata*) associations. Trees are confined primarily to riparian areas and farm settlements. Most of the native riparian trees are willows (*Salix* spp.). Russian olive (*Elaeagnus angustifolia*), black locust (*Robinia pseudoacacia*), and cottonwoods (*Populus* spp.) are the common exotics. Elevation at Long-eared Owl nests ranged from 740–875 m. A detailed description of the climate, vegetation, and topography of the SRBPA is available in U.S.D.I. (1979).

METHODS

Field work began in late March each year and ended in late July in 1980 and in late August in 1981. I searched for owls along 115 km of the Snake River and 34 km of perennial tributaries. I also visited 5 tree groves that were isolated from the river. I used 9 × 35 binoculars to examine stick nests of Black-billed Magpies (*Pica pica*) and American Crows (*Corvus brachyrhynchos*) for the presence of owls. To minimize disturbance, I observed nests at a distance (usually >25 m) and tried to avoid flushing adults at nests. I obtained no data on clutch size or hatching success.

I considered a pair as breeding if I saw eggs, young, or a female owl in an incubation posture in a stick nest. A nest was considered disturbed if my presence caused a female to leave the nest.

Young Long-eared Owls leave the nest about 3 weeks after hatching to “branch” in the tree canopy near the nest (Craig and Trost 1979, Wijnandts 1984, pers. obs.). Owlets are flightless for about 2 weeks after leaving the nest. At about 5 weeks they begin to fly, at which time I considered them fledged. I defined a successful nest as one that fledged at least one young. When the nestlings were near branching age (again, based on my observations from a distance), I climbed to the nest to count and band them. I revisited the nest area repeatedly to search for branchers and ultimately to determine the number of fledglings produced.

I found some nests after the young had hatched. Data from these nests can inflate estimates of nesting success and productivity if early nesting failures are not detected (see Mayfield 1961). Thus, in addition to using all nesting attempts, I analyzed nesting success using (1) only the nests found during incubation, and (2) the Mayfield method (Mayfield 1961, 1975). I used a single estimate of success that combined the incubation and nestling periods (total of 56 exposure days) because survival rates did not differ between the 2 periods in either year (χ^2 tests, $P > 0.30$; after Dow 1978).

I measured the following variables for each Long-eared Owl nest: (1) height (± 0.1 m) of nest above ground, (2) height of nest relative to height of nest tree, (3) depth (± 1 mm) of nest cup, (4) diameter (± 1 mm) of nest cup at rim, (5) distance (± 0.1 m) from nest to tree grove perimeter, (6) width (± 0.1 m) of tree grove at nest, (7) distance (± 1 m) to agriculture, (8) distance (± 1 m) to road, and (9) distance (± 1 m) to permanent water. I also measured nest height, nest depth, nest diameter, and distance to perimeter for each unused but apparently suitable corvid nest within 50 m of an occupied Long-eared Owl nest. Magpie nests with a complete canopy were considered unavailable to Long-eared Owls. I subjected variables from the 2 groups (occupied vs unused nests) to a stepwise discriminant function analysis (DFA) that maximized the Mahalanobis distance between groups (see Clark et al. 1983). This comparison provided a test of whether the physical characteristics of nests chosen by Long-eared Owls differed from those of nearby, unused nests. Owl nests that had no unused nests within 50 m were omitted from the analysis. I also used stepwise DFA to

compare the characteristics of successful vs unsuccessful Long-eared Owl nests. I used 2-tailed *t*-tests and pooled-sample variance estimates unless population variances were unequal.

RESULTS

Nesting density and clutch initiation.—I found 63 nesting pairs in 1980 and 41 pairs in 1981. Although I probably did not find every nesting pair, I searched the study area with the same intensity each year.

Nesting densities were 0.42 pairs/km in 1980 and 0.28 pairs/km in 1981. The distance between adjacent owl nests ranged from 14 to 19,080 m ($\bar{x} = 1480 \pm 2885$ m [SD]). Perhaps because there were more nesting pairs, occupied nests were closer to one another in 1980 ($\bar{x} = 1253 \pm 2598$ m) than in 1981 ($\bar{x} = 1805 \pm 3255$ m), but the difference was not significant (*t*-test, $P = 0.32$). In 3 cases owls nested in colonies of 4 pairs; the closest nests were 16 m apart. One pair and 3 single birds that were not breeding occupied suitable nesting areas for about 2 weeks before moving elsewhere.

By backdating from estimated ages of nestlings and branchers, and by observations during the laying period, I estimated the initiation date for 85 clutches. Egg laying peaked during the last half of March in 1980 and during the first half of March in 1981 (Fig. 1). Seven of 18 clutches started after mid-April appeared to be renesting attempts (i.e., a pair was present at a nest site after loss of a clutch, and subsequently was observed with a new clutch). One pair renested twice. Most young fledged by late May in 1980 and by mid-May in 1981. I found no evidence that owls attempted to renest after a failure during brood-rearing.

Nest-site characteristics.—I recorded 112 nesting attempts including 8 re-nests. Seventy-nine nests were in old magpie nests and 33 were in old crow nests. Ninety-seven nests (87%) were in willow; the remainder were in Russian olive, black locust, black cottonwood (*Populus trichocarpa*), squawbush (*Rhus trilobata*), serviceberry (*Amelanchier alnifolia*), and tamarisk (*Tamarix chinensis*). At 50 sites, only open nests (i.e., crow nests or topless magpie nests) were available within 50 m of an owl nest. At the remaining 54 sites, one or more magpie nests with a partial canopy were present, and the numbers of open nests and partially-canopied nests were similar (79 vs 74, respectively). Owls nested in magpie nests with a partial canopy at 36 of these 54 sites (67%; proportion significantly >48%, *z*-test, $P = 0.01$).

Owl nests were usually near midheight in the nest tree and less than 4 m above ground (Table 1). Higher nests were not available at 8 of 14 sites where nests were <2 m above ground. Six nests were above 5 m. Owls did not nest in isolated trees or in single rows of trees, but only in clumps

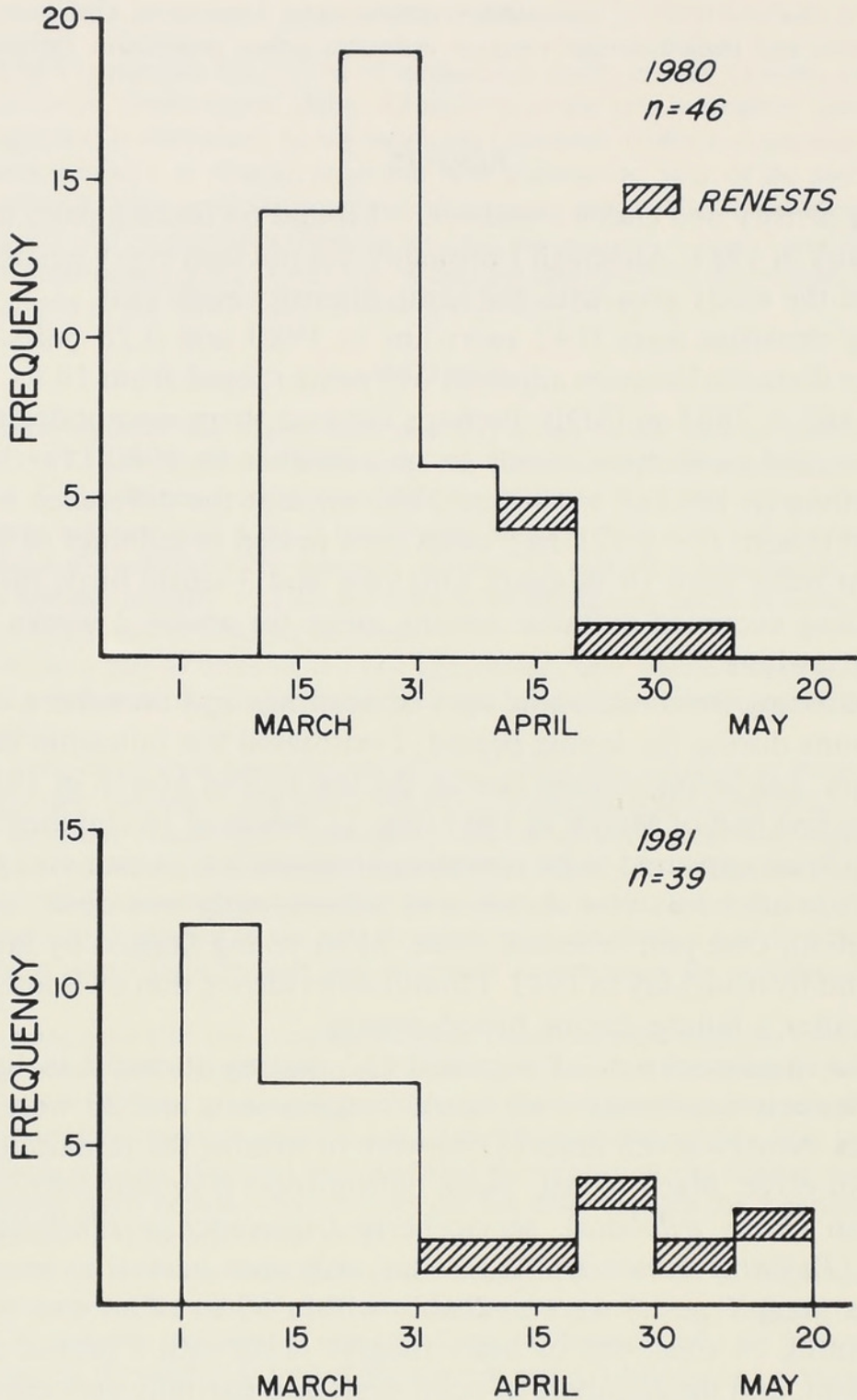


FIG. 1. Estimated date of initiation of Long-eared Owl clutches in the Snake River Birds of Prey Area, 1980–1981.

of trees. Eighty-six percent of all owl nests were in groves wider than 10 m. Owls often nested on the edge of clumps of trees, however, and 55% of the owl nests were within 5 m of the perimeter. The distances to roads and agriculture were highly variable (Table 1). Most trees grew near wet

TABLE 1

LONG-EARED OWL NEST-SITE CHARACTERISTICS IN THE SNAKE RIVER BIRDS OF PREY AREA, 1980–1981^a (N = 112)

| | Mean \pm SD | Range |
|-----------------------------|-------------------|-----------|
| Nest height (m) | 3.1 \pm 1.2 | 1.3–8.1 |
| Relative height (%) | 49.4 \pm 13.4 | 20.7–82.2 |
| Nest depth (mm) | 66.0 \pm 31.0 | 5.0–180 |
| Nest diameter (mm) | 223.0 \pm 32.0 | 152.0–302 |
| Distance to perimeter (m) | 6.6 \pm 6.0 | 0.0–38.1 |
| Grove width (m) | 24.6 \pm 19.5 | 5.0–99.0 |
| Distance to agriculture (m) | 651.0 \pm 632.0 | 5.0–2240 |
| Distance to road (m) | 552.0 \pm 630.0 | 4.0–2000 |
| Distance to water (m) | 143.0 \pm 430.0 | 0.0–1900 |

^a There was no significant difference in any nest-site characteristic between 1980 and 1981 (*t*-tests, *P* > 0.05).

areas, and 70% of the owl nests were within 25 m of permanent water. The large mean distance to water (143 m; Table 1) resulted from 6 nests in an isolated tree grove 1900 m from water. If these 6 nests are omitted, mean distance to water was 43 m.

Nest diameter, nest height, and nest depth contributed significantly in discriminating between owl nests and unused corvid nests within 50 m of an owl nest (Table 2). Group centroids were significantly different (*F*-test, *P* < 0.001), and the discriminant function classified 67.2% of the nests correctly. Corvid nests used by Long-eared Owls tended to be wider and slightly higher above ground than unused nests (Table 3) (Fig. 2). Unused nests were deeper than used nests. To test if nest depth was influenced by the presence of nestling owls (which may have trampled the nest), I compared mean nest depth of successful and unsuccessful nests. Successful nests were shallower than unsuccessful nests, but the difference was not significant (*t*-test, *P* = 0.42).

Nesting success and productivity.—Overall, nesting success was 40.9% in 1980 (N = 66) and 54.3% in 1981 (N = 46). Estimates of success based on nests found during incubation were about 5% lower, and, based on the Mayfield method, 10% lower than the overall estimates (Table 4). Steenhof and Kochert (1982) cautioned that the Mayfield method underestimates success if most of the unsuccessful nests are found. I found nearly 90% of the nests during the incubation period and determined the outcome of each nesting attempt. Thus, the figures obtained from nests found during incubation are probably the best estimates of nesting success.

The number of nestlings leaving the nest (branchers) was the same each

TABLE 2
DISCRIMINANT FUNCTION ANALYSIS COMPARING CORVID NESTS USED BY LONG-EARED OWLS AND UNUSED, SUITABLE NESTS

| Step | Variable entered ^a | Coefficient ^b | P |
|------|-------------------------------|--------------------------|-------|
| 1 | Nest diameter | 0.989 | 0.001 |
| 2 | Nest height | 0.344 | 0.001 |
| 3 | Nest depth | -0.189 | 0.001 |

^a Distance to perimeter was not entered into the model.

^b Standardized canonical discriminant function coefficient.

year (Table 5), but the fledging rate was higher in 1981 than in 1980. The number of young fledged per successful nest (both minimum and maximum) did not differ significantly between years (*t*-tests, $P > 0.10$). Most young that left the nest survived the 2-week branching period to become fledglings, and 96.3% of the nests with branchers were successful. Thirty-three (63%) of the successful nests fledged either 4 or 5 young, 2 nests fledged 6 young, and one nest fledged 7.

Of 60 nest failures, 58.3% occurred during incubation, 38.3% during brood-rearing, and only 2 nests (3.3%) failed after the young branched. The proportion of nests failing before or after hatching did not differ significantly between years (χ^2 test, $P = 0.90$). Most failures appeared to be caused by predation. I found broken eggshells or partially eaten young at 33 nests. Eggs or young disappeared at 20 nests and were presumed depredated. Adults (probably females) were killed on the nest and nest contents destroyed in 3 cases. Two nests were abandoned, one clutch failed to hatch (Marks 1983), and one nest fell from the nest tree.

TABLE 3
MEANS FOR CHARACTERISTICS OF LONG-EARED OWL NESTS (N = 81) AND UNUSED, SUITABLE NESTS (N = 154) WITHIN 50 M OF AN OWL NEST

| | Nest site | | P ^a |
|---------------------------|------------------------|--------------|----------------|
| | Used by owl | Not used | |
| Nest height (m) | 3.2 ± 1.2 ^b | 2.9 ± 1.6 | 0.14 |
| Nest depth (mm) | 64.0 ± 28.6 | 67.0 ± 31.0 | 0.30 |
| Nest diameter (mm) | 223.0 ± 32.9 | 197.0 ± 29.1 | 0.001 |
| Distance to perimeter (m) | 6.4 ± 6.3 | 6.4 ± 6.4 | 0.98 |

^a *t*-tests.

^b Mean ± SD.

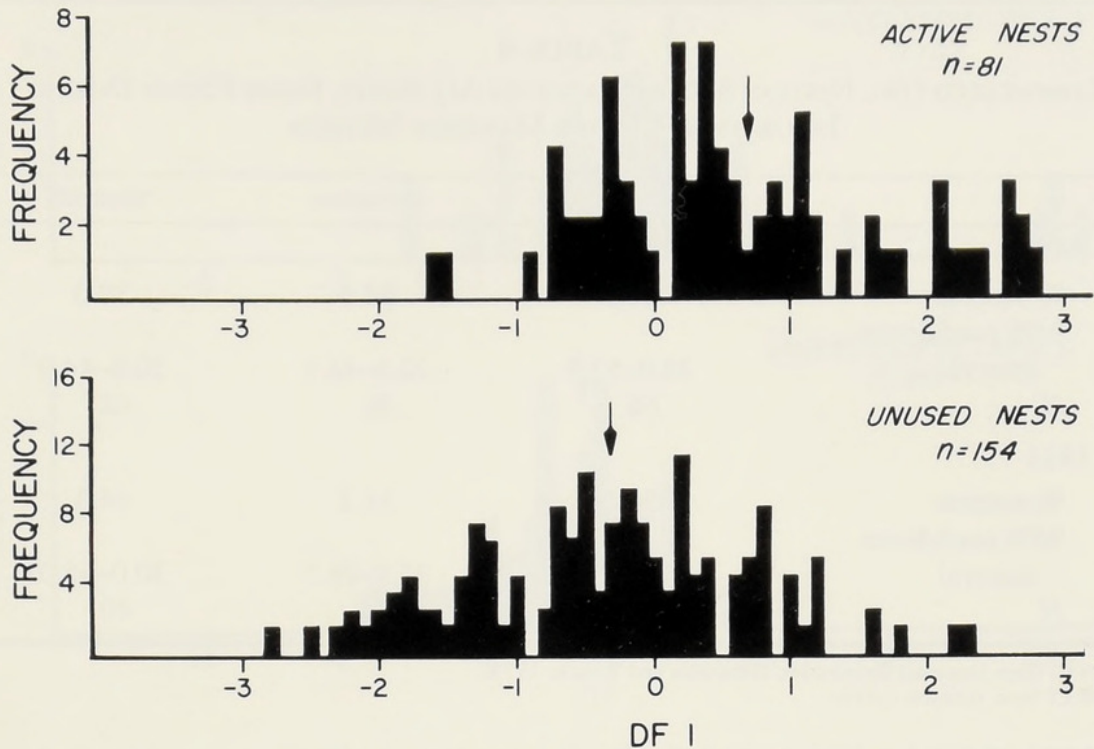


FIG. 2. Frequency distribution of scores for the first discriminant function comparing Long-eared Owl nests and nearby unused, apparently suitable nests. Arrows indicate group centroids. DF 1 is primarily a nest diameter-nest height axis. Owl nests are wider and slightly higher above ground than unused nests.

I believe that raccoons (*Procyon lotor*) were the major predators of Long-eared Owl nests in the SRBPA. I found raccoon tracks near several plundered nests and at one nest where an adult was killed. The remains of the other 2 adults were very similar to those attributed to raccoon predation. Other potential mammalian predators were either primarily terrestrial (e.g., canids and mustelids) or were rare in the area (e.g., bobcat [*Felis rufus*]). Great Horned Owls (*Bubo virginianus*) nested within 400 m of at least 6 Long-eared Owl nests, but I found no indication that they preyed on Long-eared Owls, nor have Long-eared Owls been found in samples of Great Horned Owl foods in the SRBPA (N = 796 prey items, unpubl. data). Amstrup and McEneaney (1980) saw a bull snake (*Pituophis melanoleucus*) kill and attempt to eat Long-eared Owl nestlings. These snakes are common in the SRBPA but feed almost exclusively on small mammals (Diller and Johnson 1982).

Successful nests were significantly farther from water ($\bar{x} = 247 \pm 559$ m) than were unsuccessful nests ($\bar{x} = 52 \pm 244$ m) (t -test, $P = 0.02$). The height of successful nests ($\bar{x} = 3.2 \pm 1.2$ m) was nearly identical to that of unsuccessful nests ($\bar{x} = 3.1 \pm 1.1$ m).

Distance to water, nest diameter, and nest depth contributed signifi-

TABLE 4
LONG-EARED OWL NESTING SUCCESS BASED ON ALL NESTS, NESTS FOUND DURING
INCUBATION, AND THE MAYFIELD METHOD

| | All nests ^a | Incubation ^a | Mayfield ^b |
|-------------------------|------------------------|-------------------------|-----------------------|
| 1980 | | | |
| % success | 40.9 | 34.5 | 30.0 |
| 95% confidence interval | 29.0–52.8 | 22.3–46.7 | 20.0–44.0 |
| N | 66 | 58 | 62 |
| 1981 | | | |
| % success | 54.3 | 51.2 | 44.3 |
| 95% confidence interval | 39.9–68.7 | 35.9–66.5 | 30.0–65.0 |
| N | 46 | 41 | 40 |

^a 95% CI from binomial distribution (Mosteller and Rourke 1973).

^b 95% CI from Johnson (1979).

cantly in discriminating between successful and unsuccessful nests (Table 6) (Fig. 3). The group centroids were significantly different (F -test, $P < 0.05$), and the discriminant function classified 67.0% of the nests correctly.

Human disturbance.—During the incubation and early brood-rearing periods, female Long-eared Owls were on the nest every time I visited a nest during daylight hours. When disturbed by my approach, the female

TABLE 5
LONG-EARED OWL PRODUCTIVITY IN THE SNAKE RIVER BIRDS OF PREY AREA

| | 1980 | 1981 | Both years |
|--------------------------------------|-------|-------|------------|
| No. nesting attempts | 66 | 46 | 112 |
| No. successful nests | 27 | 25 | 52 |
| No. branching young | 113 | 113 | 226 |
| No. branchers known dead | 5 | 5 | 10 |
| Min. no. fledglings ^a | 93 | 101 | 194 |
| Min. fledglings/successful nest | 3.44 | 4.04 | 3.73 |
| Min. fledglings/attempt ^b | 1.19 | 2.07 | 1.54 |
| Max. no. fledglings ^c | 108 | 108 | 216 |
| Max. fledglings/successful nest | 4.00 | 4.32 | 4.15 |
| Max. fledglings/attempt ^b | 1.38 | 2.21 | 1.72 |
| Min.–Max. % branchers fledged | 82–96 | 89–96 | 86–96 |

^a Total number counted.

^b Based on success rates of nests found during incubation.

^c Includes missing branchers.

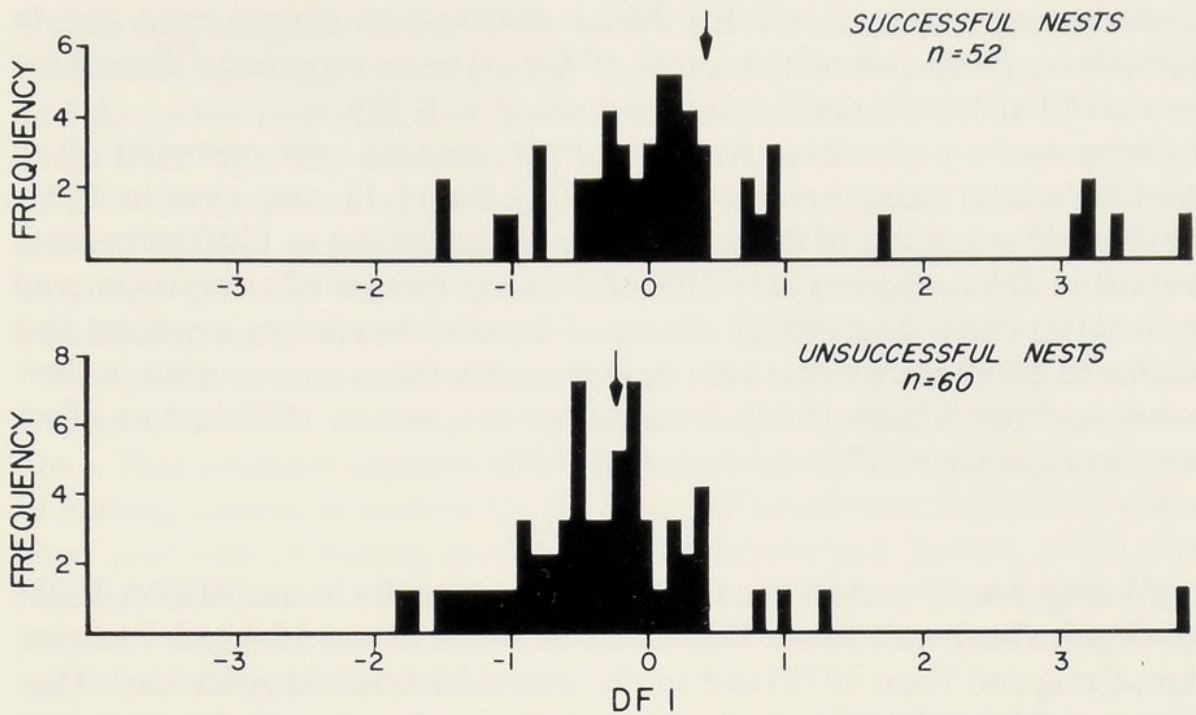


FIG. 3. Frequency distribution of scores for the first discriminant function comparing successful and unsuccessful Long-eared Owl nests. Arrows indicate group centroids. DF 1 is primarily a distance to water-nest diameter axis. Successful nests are farther from water and wider than unsuccessful nests.

usually resettled within 10 min after I left. Twice, I watched magpies remove eggs or hatchlings when I disturbed a nest at hatching. Sixty-five percent of the owl nests had at least one occupied corvid nest within 50 m; however, I never saw a corvid approach an owl nest when adults were present, and undisturbed nests probably were not vulnerable to corvid predation.

Although disturbed nests had lower success than undisturbed ones (31% vs 46%, respectively), nesting success was statistically independent of

TABLE 6
DISCRIMINANT FUNCTION ANALYSIS COMPARING SUCCESSFUL AND UNSUCCESSFUL
LONG-EARED OWL NESTS

| Step | Variable entered | Coefficient ^a | P |
|------|--------------------------|--------------------------|-------|
| 1 | Distance to water | 0.749 | 0.016 |
| 2 | Nest height ^b | — | — |
| 3 | Nest diameter | 0.507 | 0.037 |
| 4 | Nest depth | -0.461 | 0.050 |

^a Standardized canonical discriminant function coefficient.

^b Nest height was removed at step 5.

disturbance (χ^2 test, $P > 0.10$). Mean distances to nearest road and to agriculture (both potential sources of disturbance) were not different for successful and unsuccessful nests (t -tests, $P > 0.50$).

Reoccupation of nesting sites.—In 1981, nesting owls occupied 30 of 63 sites (48%) that were used in 1980. I found 11 new sites in 1981. Seventy-four percent of the nests that were successful in 1980 were reoccupied in 1981, whereas only 28% of the nests that failed were reoccupied in 1981 (χ^2 test, $P < 0.001$). Three of 4 males banded as nestlings and captured as breeders a year later nested at sites that were occupied in their natal year (see Marks 1985). Disturbance at a nest in 1980 had no effect on reoccupancy in 1981 (χ^2 test, $P > 0.20$).

DISCUSSION

Nesting density and chronology.—Nesting densities in the SRBPA (0.28–0.42 pairs/km) were lower than those in southeastern Idaho (0.64 pairs/km, Craig and Trost 1979) and south-central Idaho (1.55 pairs/km², Thurow and White 1984) but higher than densities elsewhere in North America (e.g., Craighead and Craighead 1956, Stophlet 1959, Smith and Murphy 1973, Knight and Erickson 1977) or in Europe (Wijnandts 1984:12). Nesting densities are not always comparable among study areas owing to differences in availability of suitable nesting habitat. For example, much of the riparian zone in the SRBPA was treeless, whereas in south-central Idaho, Long-eared Owls nested in a continuous block of sagebrush-juniper ecotone (Thurow and White 1984). My data support those of Craig and Trost (1979) and Thurow and White (1984) in showing that Long-eared Owls are common in the shrubsteppe desert of southern Idaho.

On average, owls laid eggs a month earlier in the SRBPA than in southeastern or south-central Idaho, where all eggs were laid in April or May (Craig and Trost 1979, Thurow and White 1984). Both of these latter study areas were at higher elevations than the SRBPA.

Nest sites and reproductive success.—Throughout their range, Long-eared Owls nest in stick nests in trees (Burton 1973). Occasionally, they nest in tree cavities (Craighead and Craighead 1956), cliffs (Marks and Yensen 1980), and on the ground (Bent 1938, Mikkola 1983). I found no evidence that Long-eared Owls construct new nests or modify old ones (see Glue 1977, Craig and Trost 1979).

Long-eared Owls are cryptically colored, have well-developed ear tufts (see Perrone 1981), and typically remain still when potential predators approach. Camouflage is probably their primary means of avoiding predators, and owls may enhance their crypticity through nest-site selection. Owls clearly did not select nests at random. Owls nested in clumps of trees that provided more cover for nesting and roosting adults, and for

branching young than would have been available in solitary trees or single rows of trees. Nests with a partial canopy offer additional concealment, and they were preferred over open nests in the SRBPA and in Craig and Trost's (1979) study area. Owls also preferred wide nests, which seemed to provide ample room for eggs or nestlings and would probably help conceal females from ground-based predators. The tendency for owls to nest near the edge vs the center of clumps of trees probably reflected availability, as most corvid nests were near the periphery of a tree grove.

Raccoons obtain most of their food from wetlands (Fritzell 1978, Greenwood 1982), and in arid areas they frequent riparian habitat (pers. obs.). This probably explains why distance to water was the best predictor of nesting success of owls in the SRBPA. Although nest height was not a good predictor of nesting success (but see Marks and Yensen 1980), the highest nests (those > 5 m) never were destroyed by predators, and there may be a height threshold above which Long-eared Owl nests are relatively safe from mammalian predators.

Compared with data from other studies, nesting success appeared to be low in the SRBPA (34.5–51.2%). Nesting success was 83.3% in Arizona (Stophlet 1959), 84.2% in southeastern Idaho (Craig and Trost 1979), and 100% in south-central Idaho (Thurrow and White 1984). The number of young fledged per successful nest was similar among study areas. Long-eared Owls nesting in the SRBPA apparently were more vulnerable to nest predators than were owls in the other study areas. Nests in Arizona were high above ground (5–16 m), and those in south-central Idaho were in junipers on upland sites. These nests would have been less vulnerable to raccoons than were nests in the SRBPA. Nests in southeastern Idaho were close to the ground (\bar{x} = 2.2 m) and near a river, but raccoons were not observed in the study area (T. H. Craig, pers. comm.).

The adaptive significance of branching.—Many observers have noted that Long-eared Owl young leave the nest long before they can fly (e.g., Whitman 1924, Sumner 1929, Armstrong 1958). Sumner (1929) believed that branching was a liability because it exposed young owls to predators. Survival of branchers was high in the SRBPA, however, and all but 2 nests with branchers were successful. I suggest that branching acts to reduce predation. Werschkul (1979) argued that the escape response of nestling Little Blue Herons (*Egretta caerulea*) reduced their vulnerability to predators. Trees refoliated in the SRBPA at about the same time that the first branchers appeared. Branchers were solitary and well-concealed by foliage. Even a single nestling would benefit from branching because occupied nests might serve as visual or olfactory cues to mammalian predators.

Fidelity to nesting sites.—In parts of Europe, Long-eared Owl popula-

tions fluctuate with microtine rodent cycles (Hagen 1965, Källander 1977, Lundberg 1979, Village 1981). The Long-eared Owl-microtine relationship has not been documented in North America, although Marti (1974) and Craig and Trost (1979) considered Long-eared Owls to be nomadic on their study areas in Colorado and Idaho, respectively. Craig and Trost (1979) suggested that weather influenced breeding, with fewer pairs nesting during a cool, wet spring. The 35% decline in the number of nesting pairs from 1980 to 1981 in the SRBPA cannot be explained by either of the above mechanisms. Long-eared Owls in the SRBPA fed primarily on noncyclic rodents (i.e., cricetids and heteromyids), and food habits were very similar in the 2 years (Marks 1984). The spring of 1981 was wetter than in 1980, but owls nested almost 2 weeks earlier in 1981 than in 1980.

For a variety of nonpasserines, studies of marked individuals have shown that nesting sites are more likely to be reoccupied in years following successful nesting attempts and abandoned after nesting failures (e.g., Newton and Marquiss 1982, Picozzi 1984). If nomadism occurs in Long-eared Owls, it may be related to nest predation rather than to food availability or weather. Sonerud (1985) came to a similar conclusion in explaining nest-hole shifts in Tengmalm's Owls (*Aegolius funereus*) in Norway.

ACKNOWLEDGMENTS

This study was funded primarily by the Snake River Birds of Prey Research Project, U.S. Bureau of Land Management. Additional support was provided by the New Jersey Raptor Association. V. S. Marks, J. H. Doremus, and S. Waltcher provided valuable assistance in the field. B. R. McClelland, H. Zuuring, I. J. Ball, D. Glue, M. R. Lein, R. Conner, T. H. Craig, K. Bildstein, and C. D. Marti commented on the manuscript. D. Edge and K. Steenhof provided statistical advice, and D. Williams drew the figures. I thank them all.

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1987 ANNUAL MEETING

The WILSON ORNITHOLOGICAL SOCIETY will hold its 68th annual meeting at Utica College of Syracuse University from 27 to 31 May 1987. The event will be a joint meeting with the Eastern Bird Banding Association and will be hosted by Utica College together with the Kirkland and Oneida Bird Clubs. JUDITH W. MCINTYRE, Utica College, Utica, New York 13502, is chairing the Local Committee. JON C. BARLOW, Department of Ornithology, Royal Ontario Museum, 100 Queen's Park, Toronto, Canada M5S 2C6, is chairing the Program Committee and invites suggestions for symposia.

There will be two special exhibits: (1) a reception will be given on Friday night by the Munson-William-Proctor Institute of Utica for their special exhibit of Birds in Art, and (2) Karen Allaben-Confer, winner of the first George Miksch Sutton Award from the Wilson Ornithological Society will exhibit her most recent work in the Barrett Art Gallery at Utica College.

Field trips planned include a trip to a bog, local birding, a mushroom walk, and a journey to the Oneida Community. Sunday field trips will include the Adirondack Park and a surprise birding adventure led by Susan Drennan, author of "Where to Find Birds in New York State." A circular of information and a call for papers will be distributed shortly.



Marks, Jeffrey S. 1986. "Nest-Site Characteristics and Reproductive Success of Long-Eared Owls in Southwestern Idaho." *The Wilson bulletin* 98(4), 547-560.

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