

recovered in the i 'th year with weight losses between 0 and 35%. This yielded expected numbers of bands in various weight-loss intervals (35–40%, 40–45%, 45–50%, etc.), which were compared with the observed numbers in these intervals. This calculation was repeated for each year from year 5 to year 14. The first two lines of Table 2 give the total numbers of bands observed and expected in successive weight-loss intervals. The third line of Table 2 gives the ratio of observed to expected bands, weighting the numbers of bands in each year in proportion to the number of bands observed in that year with weight losses between 0 and 35%. Observed and expected numbers were similar through 50% weight loss, but there was a significant shortfall of bands in the weight-loss interval 50–60%. No band was recovered with weight loss greater than 59%. These data suggest that size 2 bands are lost by Common Terns after losing between 50% and 59% of their original weights. This contrasts with our earlier estimate that size 3 bands were progressively lost after losing 32–62% of their original weights; the difference between the estimated distributions is highly significant (Kolmogorov-Smirnov two-sample test, $P < .01$).

To compute a survivorship curve for size 2 bands, we used the methods of Hatch and Nisbet (1983). For each of the 207 bands recovered in years 2–9, we selected a random number between 41 and 50% as the fall-off weight, and computed the age at which the band would have fallen off, assuming that its rate of weight loss would have remained constant. The calculation was repeated 3 times for each band, to generate 621 estimates of age at the time of loss. Figure 1 presents the computed survivorship curve for size 2 bands and compares it with the curve for size 3 bands presented by Hatch and Nisbet (1983: Figure 1). The first size 2 bands are expected to be lost during the seventh year, and losses are expected to reach 5% by year 8, 25% by year 11, 50% by year 13, 75% by year 16, and 95% by year 23. On average, size 2 bands are expected to last about 5 yr longer than size 3 bands; the difference between the survivorship curves is highly significant (Kolmogorov-Smirnov two-sample test, $P < .01$).

Size 2 bands last longer than size 3 bands for two reasons. They wear less rapidly (mean $4.07 \pm .08\%/yr$, versus $5.42 \pm .18\%/yr$, $P < .001$) and they fall off at a lower average percentage of their initial weight (44.5% versus 53%, $P < .01$). Ludwig (1981) similarly found that smaller bands wore less rapidly than larger bands on Caspian Terns (*S. caspia*). Smaller bands probably wear less rapidly because they fit more closely to the leg, so that there is less abrasion by sand grains inside the band. Larger bands may be lost at a higher percentage of their original weights because they can slip over the terns' feet more easily.

In spite of the greater expectation of life of size 2 aluminum bands on Common Terns, band loss appears to be significant by year 8 or 9 after banding. We repeat our recommendation that the more durable incoloy bands should be used for any study in which age of banded birds is an important parameter.

We thank Jane M. Winchell and Anne E. Heise for help in trapping terns, Jeanne Kelly for help in weighing bands, and the Bird-Banding Laboratory for loan of archive bands.—IAN C. T. NISBET, 6208 Lakeview Drive, Falls Church, Virginia 22041, and JEREMY J. HATCH, Department of Biology, University of Massachusetts, Boston, Massachusetts 02125. Received 21 May 1984; accepted 6 Feb. 1985.

Yearling Male Long-eared Owls Breed Near Natal Nest.—During a study of nesting Long-eared Owls (*Asio otus*), I found that some yearling males breed near their natal nest. Here I present my findings and discuss their implications.

I studied a population of Long-eared Owls that nested along a 115-km stretch of the Snake River and its tributaries in the Snake River Birds of Prey Area (SRBPA) in southwestern Idaho. In 1980 and 1981, I banded 92 and 97 nestlings that fledged. Three banded adults were observed and netted near their nest in 1981 and one in 1982.

Breeding females have a well-developed incubation patch (pers. obs.). Males do not incubate or brood (Wijnandts 1984) and have no incubation patch (Drent 1971). Each of the 4 banded adults was a yearling male that nested successfully within 1.5 km of its natal

nest. Distances between birthplace and breeding place were .05, 1.01, 1.19, and 1.50 km ($\bar{x} \pm SD = .94 \pm .62$ km).

I observed no banded females, perhaps because most of them dispersed from the study area. In most bird species, natal philopatry is more common among males than females (Greenwood 1980). In theory, males are best able to establish a territory in a familiar area, such as near a natal home range, whereas females should disperse to search for a male that has a territory of high quality (Greenwood 1980).

Long-eared Owls sometimes nest in loose colonies of 3 to 4 pairs (Bent 1938, Trap-Lind 1965 in Mikkola 1983). In the SRBPA, I observed 3 colonies of 4 pairs each. The closest nests were only 16 m apart. If natal philopatry is widespread among Long-eared Owls, it could result in increased relatedness among close-nesting pairs, either through inbreeding or from nonsexual association of offspring and parents, or siblings. Increased relatedness could lead to the evolution of cooperative traits through kin selection. Redmond and Jenni (1982) detected male-biased natal philopatry in Long-billed Curlews (*Numenius americanus*) and they speculated that cooperative mobbing by males evolved through kin selection among philopatric individuals. Poole (1982) observed adult Ospreys (*Pandion haliaetus*) feed banded fledglings that were not their own, and he suggested that kin selection among natively philopatric birds was responsible for the behavior.

Close-nesting Long-eared Owls cooperated in nest defense, with members of 2 to 3 pairs performing distraction displays near the same nest. In addition, adults may have fed young that were not their own. Fledglings from different nests became intermixed in nesting colonies, and I observed newly-fledged young from 3 different nests roosting in the same tree. In one case, a banded fledgling intruded into a nearby nest that contained unfledged young. It is not known if owls can recognize their offspring. However, if adjacent pairs are likely to be related, and if food is not in short supply, then there may be no selection against Long-eared Owls that feed neighboring fledglings.

The study was part of the Snake River Birds of Prey Research Project, Boise District, Bureau of Land Management. Additional support was provided by the New Jersey Raptor Association. I thank C. S. Houston, H. Källander, P. Kerlinger, C. D. Marti, B. R. McClelland, and R. L. Redmond for their comments on an earlier draft. E. Yensen, L. R. Powers, and J. Martin provided trapping equipment.

LITERATURE CITED

- BENT, A. C. 1938. Life histories of North American birds of prey (part 2). U.S. Natl. Mus. Bull. 170.
- DRENT, R. 1971. Incubation. Pp. 333-420, in *Avian biology*, D. S. Farner and J. R. King, eds. Academic Press, New York.
- GREENWOOD, P. J. 1980. Mating systems, philopatry and dispersal in birds and mammals. *Anim. Behav.* 28:1140-1162.
- MIKKOLA, H. 1983. *Owls of Europe*. Buteo Books, Vermillion, South Dakota.
- POOLE, A. 1982. Breeding Ospreys feed fledglings that are not their own. *Auk* 99:781-784.
- REDMOND, R. L., AND D. A. JENNI. 1982. Natal philopatry and breeding area fidelity of Long-billed Curlews (*Numenius americanus*): patterns and evolutionary consequences. *Behav. Ecol. Sociobiol.* 10:277-279.
- WIJNANDTS, H. 1984. Ecological energetics of the Long-eared Owl (*Asio otus*). *Ardea* 72: 1-92.
- JEFFREY S. MARKS, *Montana Cooperative Wildlife Research Unit, University of Montana, Missoula, Montana 59812*. (Present address: U.S. Bureau of Land Management, Boise District, 3948 Development Avenue, Boise, Idaho 83705.) Received 13 Aug. 1984; accepted 28 Jan. 1985.

Neckband a Handicap in an Aggressive Encounter between Tundra Swans.—Neckbands are used in North American studies of geese and swans, and while the impact of neckbands on bird behavior is poorly understood it is assumed of little consequence