GENERAL NOTES

Ontogeny of Thermoregulation in the Eastern Screech-Owl.—With the exception of the Great Horned Owl (*Bubo virginianus*) (Turner and McClanahan 1981, Comp. Biochem. Physiol. 68A:167–173), little is known about the ontogeny of thermoregulation of owls. I here present the results of a field study of thermoregulation in nestling Eastern Screech-Owls (*Otus asio*) conducted at the Archbold Biological Station, 12 km S of Lake Placid, Highlands County, Florida.

Temperature regulation of 6 nestlings (2 each from 3 nests) ranging from 1 to 16 days of age was studied in May and June 1973. Nestlings were removed from the nest box and their temperatures taken quickly to the nearest .1°C with a Schultheis rapid registering thermometer inserted 10–12 mm into the cloaca. One sibling (always the same on subsequent days) was then placed immediately in a 24 × 16 × 11 cm (inside dimensions) styrofoam chest cooled to 10 ± 1°C with containers of a refreezable gel. The other nestling was kept at ambient temperature, shaded and protected from any wind. Their temperatures were taken 10 and 20 min later. All measurements were taken between 0800–0900.

The results, expressed as change in initial body temperature after 10 and 20 min (Fig. 1), show that the nestling Eastern Screech-Owls achieved temperature regulation by about 14–16 days of age, when there was no longer a difference in the temperatures of the two groups of nestlings. Initial temperatures of nestlings ranged from 35.0°–39.0°C ($\bar{x}$ = 38.6), and those of young of each pair always were the same at the beginning of the test. The mean body temperature of the 14–16-day-old young after 20 min in the cooling chamber

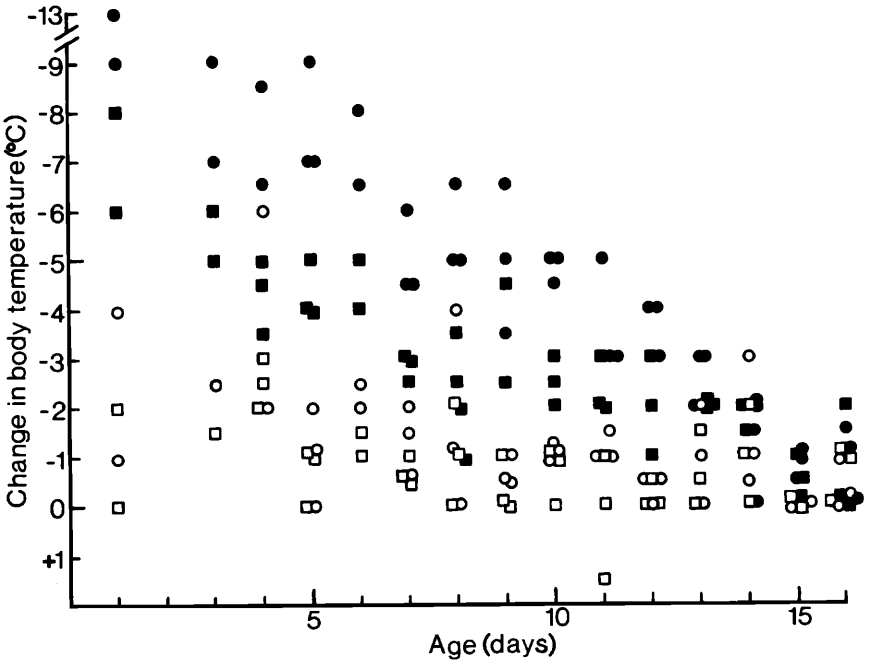

FIGURE 1. Ontogeny of thermoregulation in Florida Screech-Owls. Solid and open symbols indicate nestlings kept at 10°C and at ambient temperatures (19–33°C), respectively. Squares and circles indicate body temperature change after 10 and 20 min.

was 36.3°C (35.0–37.5, n = 9) or only 10% less than the mean body temperature 39.4°C (38.6–40.0, n = 6) of incubating females on the study tract; a situation similar to that in young Great-Horned Owls when they become efficient thermoregulators (Turner and McClanahan 1981). Nestling plumage developments that might affect thermoregulation ability are the unfurling of the prepennaceous down over much of the body beginning at about age 7 days and the unfurling of the tips of the contour feather quills, especially on the wings, scapulars, and dorsal tract, beginning at about age 14 days.

When Florida Screech-Owls achieve temperature regulation at about 14–16 days of age at a mean weight of 72–84 g (n = 15, Lohrer, unpublished data), they are similar in certain aspects of development to California Great Horned Owls that achieve temperature regulation at 28 days of age at a weight of about 700 (♂♂) or 1000 (♀♀) g (Turner and McClanahan 1981). Both species become efficient thermoregulators at about halfway through their respective nestling periods. In addition, both species are close to or have just reached peak nestling weights (*Otus* 80–93%, sexes combined; *Bubo* 95% ♂♂, 100% ♀♀), and both are about ¾ of adult weight (*Otus* 66–75% of 109 g, *O. a. floridanus*, sexes combined, Lohrer, unpublished data; *Bubo* 70% of 991 g ♂♂, 76% of 1312 g ♀♀, *B. v. pacificus*, Earhart and Johnson 1970, Condor 72:251–264). The development of thermoregulation ability at about the same nestling stage in these 2 species of greatly different size suggests that this may be a general pattern for owls. However, more data are needed from intermediate-sized owl species to confirm this suggestion.—Fred E. Lohrer, *Archbold Biological Station, P.O. Box 2057, Lake Placid, Florida 33852.* Received 6 July 1983; accepted 5 Nov. 1984.

First Record of Black Noddy Nesting at Kure Atoll.—During 13–15 July 1982 I visited Green Island, Kure Atoll, to assist with a survey on wildlife status and distribution. I recorded Black Noddies (*Anous minutus*) nesting; this is the first recorded nesting of Black Noddies at Kure Atoll, although they breed on most island groups in the tropical Pacific and nest on most of the leeward Hawaiian Archipelago islands (Berger 1981).

Background.—Kure Atoll is the farthest northwest atoll in the Hawaiian Archipelago. Green Island is the only inhabitable island in Kure Atoll; the other islands of the Atoll are little more than sandbars which vary in size and shape over the years.

Green Island is dominated by the U.S. Coast Guard LORAN Station, built in 1960–1961 and continuously occupied since 1961. The station includes an airplane runway, a 191 m antenna tower, and a variety of support facilities and crew quarters. Prior to this, the only major disturbance by humans was in 1955 when a radar reflector was built on Green Island.

Before 1957, there were only two population estimates for Black Noddies on Green Island; neither reported nesting birds (Woodward 1972). In June 1957, Kenyon and Rice (1958) found "no indication of nesting" although 44 adults were seen.

The most comprehensive seabird inventory at Kure occurred from 1963 to 1969 during the Pacific Ocean Biological Survey Program (POBSP). Black Noddies were then recorded as visitors in all months of the year, although generally absent from late December through mid-March. Peak numbers occurred from May to September, with a maximum estimate of 2000 in June and July of 1967. Although immatures as well as adults were recorded roosting on Green Island, and at least 3 adults were seen molting with bare brood patches in 1967, Woodward (1972) said "No indication that this species bred at Kure was noted during POBSP studies." He further speculated that the Black Noddies at Kure were post-breeding birds from Midway Atoll, where "thousands breed," mainly in the winter.

Various biologists representing the Hawaii State Division of Forestry and Wildlife (DOFAW) have visited Kure Atoll. Nine trip reports and one letter in the files of DOFAW in Honolulu summarize seabird observations from short visits which occurred from 1967 to 1982. No visits were reported from the months of January, August, October, or November during those years. In one or more of the years, Black Noddies were seen in the other months, except for May 1973 when the biologist stated that no Black Noddies were seen. The reports from March 1967, April 1978, and December 1977 (Walker 1977) specifically state that chicks and/or eggs and/or nests were *not* noticed.