The Condor 92:246–247

ALLOPARENTING AT AN EASTERN SCREECH-OWL NEST[1]

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Key words: Eastern Screech-owl; Otus asio; *alloparenting; nest helpers; Connecticut; radio telemetry; Northern Saw-whet Owl; Barn Owl.*

Herein we describe alloparenting by a rehabilitated male Eastern Screech-Owl (*Otus asio*) which provided food for the young of an Eastern Screech-Owl pair nesting in Westport, Connecticut. Key concepts and terminology of alloparenting and cooperative breeding in birds have been described by Brown (1987) who with Skutch (1961) reported all known references to this behavior in birds. Skutch (1987) observed an Eastern Screech-Owl, whose own eggs were destroyed, brooding and attempting to feed a small bird to young Northern Flickers (*Colaptes auratus*) which nested in a cavity in the same tree. No other observations of alloparenting in the order Strigiformes have been published.

The nest helper was a red-morph male Eastern Screech-Owl, which had been struck by an automobile on 25 January 1988 near Wilton, Connecticut, about 12 km from the nest site, and brought to the Nature Center for Environmental Activities in Westport, Connecticut. The owl was in shock, suffering from a concussion and was placed in a warm, quiet environment. After its body temperature stabilized the owl was orally hydrated using a mixture of lactated Ringer's solution and fed Nutri-cal high-protein gel and Avitron bird vitamins. The owl was kept for several weeks, during which time it ate one to two mice per day. On 16 February the owl was banded, fitted with a backpack radio transmitter weighing 5.8 g and released in the evening on the nature center sanctuary. This owl was recaptured on 26 April on the nature center, fitted with a new transmitter and again released. During March and April this owl used at least three daytime cavity roosting sites in trees and an open roost in a white pine, all within 125 m or less of the area where we released it. In mid-May the rehabilitated owl abruptly moved to a cavity roost in a cottonwood located about 25 m from the active nest site.

We discovered the active nest on 28 May when a gray-morph female Eastern Screech-Owl was observed at the entrance to a nest cavity containing two young in a shagbark hickory (*Carya ovata*). The nest site was 350 m north of the nature center and about 450 m from the cavity roost site which had been most frequently used by the rehabilitated screech-owl. On 30 May we captured the female's mate, a red-morph male, using a mist net with a live decoy screech-owl placed about 30 m in back of the nest tree. This owl was banded and fitted with a radio transmitter which operated on a different frequency than the rehabilitated owl's transmitter.

On 31 May activities at the nest were observed from 20:10 to 21:40. The female appeared at the cavity entrance approximately 25 min before darkness and left the nest at 20:31. At 20:49 she briefly visited the nest, left, and was followed by her mate with a food delivery. The next food delivery by a red-morph owl occurred 4 min later. We made a routine transmitter check while this owl was at the nest and discovered that it was the first red-morph male, i.e., the rehabilitated owl. We made observations at the nest on seven nights from 31 May through 12 June and recorded nest visits by the adults from 6–46 min after sunset. Transmitter frequencies were checked at each nest visit by the red-morph males. Generally, the female did not return to the nest for 0.45 hr or more following her evening departure. Both males participated about equally in bringing food to the young. Of 22 nest visits observed, three were by the female, nine by her mate, and seven by the helper, while sex could not be determined for the rest. Time between nest visits ranged from 1–9 min, except once when the nest visits of the two males briefly overlapped. During the day the female usually roosted in the nest cavity with the young while the males roosted in separate trees in a swamp about 65 m from the nest site.

The two young fledged on 10 and 13 June and over the next several nights roosted 9.5–13 m high in trees near the nest tree. We observed care of the fledged young by the three adults over a four-night period. All three adults brought food to the fledged young, often within 3–7 min, but the female was most aggressive towards us in defense of the young. Several times each night the female stooped towards us and gave the screech call. Twice, we observed the three adults and two young together in the upper branches of trees. We did not observe any aggressive behavior amongst the three adults. During days the female and two young roosted in the same tree while the two males roosted separately in nearby trees.

The presence of extra adults in active nesting territories of the Eastern Screech-Owl has previously been noted (Smith and Gilbert 1984). Gelbach (1986) reported that a female had three successive males in the course of a breeding season, as the first two males were killed by traffic. Presumably, the males came from an available pool of unmated adults but the role of these adults, if any, acting as nest helpers was unknown. Although Eastern Screech-Owls may breed when 1 year old (Van Camp and Henny 1975) our observations suggest that the rehabilitated owl acted as a nonbreeding helper at the nest. Specifically, we did not observe the rehabilitated owl in courtship or breeding activities with the female and it was not present in the nest vicinity until well after the young had hatched.

[1] Received 8 May 1989. Final acceptance 2 October 1989.

Of the theoretical models described in Brown (1987) for alloparenting, the possible role of the extra screech-owl in territorial defense as well as helping at the nest seems appropriate (Brown 1987, chapter 8). Although the rehabilitated adult that we introduced in the study area initially occupied parts of two adjacent Eastern Screech-Owl territories, it did not roost near the active nest and was not observed in the vicinity of the nest until late in the breeding season. After it began helping at the active nest the helper's home range equated to most of the nesting pair's home range. On two occasions the helper, as well as the two nesting adults, responded to playback of tape-recorded song, indicating its active participation in defense of the territory.

Two other examples of variations in numbers of adults at owl nests have been noted. In Idaho, polygyny in Saw-whet Owls (*Aegolius acadicus*) has been observed, but the females deserted after the eggs hatched, leaving the male to feed the young at both sites (J. Marks, pers. comm.). In Utah polygyny was observed in the Barn Owl (*Tyto alba*) with two females laying eggs simultaneously in the same nest boxes (C. Marti, pers. comm.). In two cases young were raised by the two females and one male. Such observations suggest that more information is needed about the possible frequency and role of alloparenting in the order Strigiformes.

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The Condor 92:247–248

MALE PHILOPATRY IN MALLARDS[1]

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Key words: Philopatry; Mallards; Anas platyrhynchos; *return rates.*

Most North American ducks (*Anatini*) form pair-bonds on wintering areas or during spring migration (Hochbaum 1944, Rohwer and Anderson 1988). Females generally select new mates each year with males following females homing to their natal areas (Lincoln 1939, Sowls 1955, Johnson and Grier 1988).

Lincoln (1934) first documented female philopatry in dabbling ducks (*Anas* spp.) including Mallards (*A. platyrhynchos*). Beyond observation of a marked Mallard pair returning to the same home range occupied previously (Dwyer et al. 1973) and return of a single adult male Mallard marked by Titman (1983), little information exists on homing by male Mallards.

I present here new information on male philopatry in Mallards. From 1983 through 1987, I captured 225 adult male Mallards with swim-in bait traps (Hunt and Dahlka 1953) and decoy traps (Anderson et al. 1980) in northwestern Wisconsin. I also captured 72 juvenile (hatching year) male Mallards by night-lighting (Cummings and Hewitt 1964) and drive-trapping (Cooch 1953). Adults (yearling and older) were marked individually with color-coded nasal-saddles (Doty and Greenwood 1974) while juveniles received saddles coded only to capture sites.

From 1984 through 1988, six adult males were reobserved on the study area. All but one of these males were thought to be unpaired when originally captured. The return rate (2.7%) compares to 3% (n = 33) reported by Titman (1983) for adult male Mallards.

No juvenile male Mallards returned during this study. Sowls (1955) found no homing in his small sample of 13 juvenile male Mallards. Return rates reported for juvenile male dabbling ducks were lower than those for adults (Poston 1974, Blohm 1978). Lower survival of juvenile males compared to adult males may contribute to lower return rates for juvenile males (Anderson 1975).

Poston (1974), Blohm (1978), and Titman (1983) found that male dabbling ducks homing to previous breeding areas were unpaired. Past familiarity with breeding areas would increase the probability of finding a mate and increase survival (Rohwer and Anderson 1988). Two adult male Mallards that returned in this study were paired when first reobserved and four were

[1] Received 22 May 1989. Final acceptance 21 August 1989.