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Breeding Ospreys Feed Fledglings That Are Not Their Own

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Many species of birds are known to have "helpers at the nest," i.e. individuals that do not breed but instead help others (often kin) tend young (Brown 1978, Emlen 1978). Examples of breeding birds that similarly accept parental duties for nonoffspring are far rarer, however. Where one member of a nesting pair has been experimentally removed, replacement mates (consorts) rarely feed young (Power 1981). Among nidicolous communal nesters like the Groove-billed Ani (*Crotophaga sulcirostris*) and the Mexican Jay (*Aphelocoma ultramarina*), several females will share in the feeding of young not necessarily theirs (Veherencamp 1977, Brown 1972), but, among species that do not share nests, such natural "adoption," necessarily confined to mobile fledglings, seldom occurs. Bitterbaum and Brown (1981) report that Purple Martins (*Progne subis*) with young of their own will feed other fledglings that intrude into their nests. Here, I report observations of nesting Ospreys (*Pandion haliaetus*) likewise adopting and providing food for fledglings from nearby nests. While other workers (Fernandez and Fernandez 1977, Judge 1981) have also noted occasional nest-switching by fledgling Ospreys, no one has described this behavior in detail or considered it in an evolutionary context.

The Ospreys under study were part of a population of 19 active pairs that nested in the Westport River estuaries of southeastern coastal Massachusetts in 1980. All five nests observed were located on 4–7-m-high artificial platforms in open salt marsh habitat, and all were within sight of at least two other nests. Using a 15–60× telescope, I identified fledged young by numbered plastic leg bands. Adults were similarly marked and/or were identified by their fidelity to a particular nest site. At a distance, adults were distinguished from fledglings by plumage. Observations spanned the period 16–23 July 1980 and averaged 3 h per day. Most young Westport Ospreys fledge about mid-July; Ospreys are fully fledged at about 50 days of age (Stinson 1977).

I first observed nest-switching among Westport Osprey fledglings on 16 July 1980, when nest H1,

where only one young (J11) had been present previously, contained two young. The H1 female fed both young on fish, which the male had delivered to the nest. The intruder fledgling (F81) was from HCT nest, 150 m distant from H1, and was the smallest of the three young that had been in HCT before 16 July. F81 was about 52 days old on 16 July, while J11 was only 44 days old and could not fly.

On 17 July, I again saw fledgling F81 at nest H1; the female fed both young on two different fish deliveries. The female did not appear to discriminate between young, as both were fed roughly equal amounts. On 19 July at 0610 I saw F81 feed itself at nest H1 while J11 rested beside it. When F81 had slowed in its feeding, J11 approached F81, took the remaining fish from it, and began to feed. During this entire feeding the adult female remained perched at the nest edge while the male perched below the nest; neither interfered in any way with the feeding young. At 0650 F81, disturbed by a passing canoe, flew to nest H2, 100 m from H1; H2 contained three young at this time. The H2 female, perched below the nest, made no attempt to drive away F81 as it flew in. At 0707, the H2 male delivered a fish to its nest, and one young (not F81) began to feed itself. At 0900 F81, which had not fed at H2, flew back to H1, evoking no response from the H1 adults, although they did chase an intruding adult, which had followed F81 toward the nest. F81 remained in the vicinity of nests H1 and H2 until the watch ended at 1000. F81 was also seen perched and feeding sporadically at H1 on both 17 and 18 July, but it was never observed back at its natal nest, HCT, after first being seen at H1.

At nest SGI, containing three young, a fourth fledgling (F87 hatched in nest SS 90 m away) was present on 22 July and was seen to beg from the adult SGI male, which had no food. F87, the smallest SS chick, was 5–9 days older than the young in the SGI nest. On 23 July I saw F87 at another nest (PI, 20 m from SGI), where it fed itself for 10 min on food delivered by the PI male after two of the three PI young had fed on the same prey. F87 did not appear at its natal nest on either 22 or 23 July.

A final example demonstrates how fluid these fledgling assemblages at Osprey nests can be. At nest RH (3 young prefledging), 5 young were present on 23 July at 1545; at 1620 only 1 fledgling was still at the nest, and 2 others were perched in a nearby tree (the other 2 had disappeared). At 1640 2 young were in the RH nest, 2 were in the tree, and 1 had disappeared; at 1915, 1 young was in the nest, 2 were in the tree, and 2 had disappeared. Unfortunately, I could not read the bands of these young, so I could not identify individuals; it is obvious, however, that not all were RH young. No feeding was seen during this time, however.

Few studies have followed Ospreys during the postfledgling period. Stinson (1977) showed that Osprey family units remain intact for 12–50 days after fledging occurs; he recorded no nest shifts at 11 nests watched during this period. Judge (1981), however, did note two brief nest shifts by Osprey fledglings, and intruding young were fed in both cases. Fernandez and Fernandez (1977) saw one nestling switch nests on two separate occasions, but they did not report any feeding of this young. These observations, together with my own, suggest that Osprey families can be considerably more fluid after fledging than Stinson's (1977) study indicated.

Why might such nest-switching occur? It is easy to see that subordinate fledglings from large broods could improve their food intake and thus their probability of survival if they could become the dominant fledgling at a nest with younger birds. Both vagrant young (F81 and F87) identified in this study came from large broods where they were the smallest (and presumably the subordinate) young, and both were substantially older and better at flying than acquired nest mates. In addition, all intruder fledglings moved to nests within sight of their natal nest, suggesting that proximity was also a factor in this behavior, perhaps because of the stimulus of neighboring food deliveries that could be easily seen.

While it is not difficult to understand why subordinate Osprey fledglings might benefit from switching nests, it is harder to explain why breeding adults that tolerate and feed strange young would not be selected against. Vagrant young could reduce the food available to a pair's own fledglings, thus potentially lowering that pair's fitness. If parasitic young are detrimental to parental fitness, adult Ospreys should be able to distinguish young, as many colonial birds are capable of doing (Beer 1971). Stinson (1976) suggests that Ospreys do have the ability to recognize offspring, but the evidence he cites (parents returning to a fledgling that had been removed from a nest site for several days and then put back) could just as well indicate nest-site fidelity as recognition of offspring. Ospreys do appear capable of making fine visual distinctions, however: they tolerate mates but not other adults that approach their nests, and they distinguish the "familiar" boat of a researcher from other boats, defending nests at a far greater distance against the former than the latter (Stinson 1976; pers. obs.). Judge (1981) suggested that, although adult Ospreys may recognize individual young, they feed immatures on the nest regardless of relationship. Thus, it seems likely that Ospreys are able to tell fledglings apart, but convincing data on this question are still needed.

Assuming that Ospreys can recognize their own recently fledged young, there are several hypotheses that might explain why they would feed strange nestlings that arrive at their nests. Some might argue that the construction of artificial nesting platforms has created unnaturally dense Osprey colonies, facilitating recent development of this nest-switching

behavior among fledglings. Bitterbaum and Brown (1981) have used a similar argument to explain the feeding of intruder young by adult Purple Martins nesting in man-made martin Houses. Ospreys, however, often nested historically in very dense natural colonies, with nests less than 20 m apart (Abbott 1911, Allen 1892). Thus, adult intolerance of roving fledglings should have evolved had this improved the fitness of breeders.

Another factor that might explain the altruistic feeding of nonoffspring by adult Ospreys is kin selection (Wilson 1975: 117). Ospreys in the northeastern coastal U.S. currently show great fidelity to their natal site when returning to breed (73% of males and 36% of females settle in or near (<10 km) their natal colony; Spitzer et al. in press), and preliminary data on adults in the Westport colony indicate that relatedness among breeders is high (average $r = 0.04$; Poole unpubl. data). If intruder fledglings are likely to be close kin to neighboring adults, then the inclusive fitness (Hamilton 1964) of adults that temporarily adopt fledglings could be potentially raised, assuming adequate food is available. It is unlikely that polygamy, observed sporadically among Westport Ospreys in the early 1970's (Fernandez and Fernandez 1977), is generally a factor influencing the relatedness of adult Ospreys to vagrant young, however. No other studies, including three recent years (1979–1981) of my own field work in the Westport colony, have found Ospreys to be polygamous. Cuckoldry likewise seems to be of negligible importance in Osprey breeding (pers. obs.). It thus appears that the fidelity of breeders to their natal area is an adequate explanation of a high degree of relatedness among Ospreys nesting in colonies, which in turn could help select for the altruistic feeding of vagrant fledglings.

Alternatively, if wandering young were common enough in Osprey colonies, it might not be energetically efficient for adults to chase each one, especially in years or areas of food abundance where switchers would be of little threat to the survival of the parents' offspring. If so, one might predict that in years and/or areas of low food availability parents would be less tolerant of intruding fledglings. Judge (1981) and Fernandez and Fernandez (1977) have each reported an instance of an adult Osprey chasing a vagrant fledgling; food abundance during Judge's study appears to have been generally lower than during my own (Poole unpubl. data).

It is also possible that resident fledglings themselves may recognize intruders and discourage them from remaining at nests. Judge (1981) noted that a resident fledgling postured aggressively and "screamed" at an intruder until the latter flew away; such behavior did not occur among siblings. I never witnessed similar aggressive responses to intruders during my study, however.

Obviously, much work remains to be done on Osprey family units after fledgling in order to determine the frequency of fledgling nest-switching, how long intruder young remain adopted at any one nest, whether dominant or subordinate young are more likely to switch, how well intruder young are fed compared to residents, and the responses of resident young and adults to vagrants. Answers to such questions, coupled with more thorough data on the relatedness of Ospreys breeding in colonies, would allow one to judge better whether or not the altruistic adoption of fledglings is an evolved and integral part of Osprey reproductive tactics or merely an occasional chance occurence as fledglings learn flight skills in crowded colonies.

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Notes on the Breeding of the Chestnut-bellied Heron (*Agamia agami*) in Venezuela

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Although some information on the breeding of the Chestnut-bellied Heron (*Agamia agami*) in other countries has been published (Michener et al. 1964, Haverschmidt 1968, J. Hancock and H. Elliot 1978), no previous breeding records have been reported for Venezuela. On 26 July 1980, we located three nests of this heron, each with two nestlings, in a seasonal marsh surrounded by forest close to the village of Santa Rosa, Estado Barinas. The surface area of the marsh was about 2 ha, and its depth was 60 cm. The vegetation was dominated by *Rhandia aculeata* (Rubiac.), a shrub about 3 m high, and by *Thalia geniculata* (Maranth.), a typical marsh perennial. A number of small trees under 6 m tall were sparsely distributed over the marsh. The nests were found in a small area containing *R. aculeata* and were approximately 1.5–2 m above the water level.

At our second visit on 31 July, we discovered six nests, each with two downy chicks. There were nine adults in the immediate area. In later observations at the same site, we found no more nests or nestlings, and thus we believe that there were but six breeding pairs. Each nest was placed in a separate bush.

In this same heronry we also found active nests of Black-crowned Night-Herons (*Nycticorax nycticorax*), Yellow-crowned Night-Herons (*Nyctanassa violacea*), Boat-billed Herons (*Cochlearius cochlearius*), and Bare-faced Ibis (*Phimosus infuscatus*). When the Chestnut-bellied Herons abandoned the colony, it was occupied by breeding Cattle Egrets (*Bubulcus ibis*). This small colony (80 breeding pairs) was about 75 m from a much larger heronry (2,000 pairs) that contained the following breeding species: Great Egret (*Casmerodius albus*), Snowy Egret (*Egretta thula*), Little Blue Heron (*Florida caerulea*), Cattle Egret, and Bare-faced Ibis. Michener et al. (1964) found a colony of *Agamia agami* with about 12 nests in Veracruz, México near some nests of Great Egrets and Anhingas (*Anhinga anhinga*).

On 9 August the young Chestnut-bellied Herons were able to climb into the branches of their nest bushes, and on 18 September they were completely feathered and found in the canopy of the bushes. Our last visit to the colony was on 23 September, at which time we were not able to find any *Agamia agami*. Therefore, the period of nesting at this site in Venezuela was from June to September, the time of maximum annual rainfall in this area.

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Nesting by One-year-old Black-crowned Night Herons on Hope Island, Rhode Island

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There have been few consistent reports concerning the frequency and success of nesting attempts by immature night herons of the genus *Nycticorax*. One-year-old Black-crowned Night Herons (*Nycticorax*