

- PALMER, R. S. 1962. Handbook of North American birds. Yale University Press, New Haven, CT.
- RECHER, H. F., AND J. A. RECHER. 1969. Comparative foraging efficiency of adult and immature Little Blue Herons (*Florida caerulea*). Anim. Behav. 17:320-322.
- VERBEEK, N. A. M. 1977. Interactions between Herring and Lesser Black-backed gulls *Larus fuscus*. Ardea 65:35-42.

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COOPERATIVE FEEDING, DEFENSE OF YOUNG, AND FLOCKING IN THE BLACK-FACED GROSBEAK

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The following observations on Black-faced Grosbeaks (*Caryothraustes canadensis polioaster*) made in a Costa Rican rainforest extend those made by Skutch ten years previously (Skutch 1972). My findings, although limited and dealing with unmarked birds, serve to affirm the likelihood that these birds breed cooperatively and to suggest the possibility of a complex social organization differing from that reported for other cooperative breeders (cf. Brown 1978).

On 3 and 4 July 1978, small, noisy, monospecific flocks of Black-faced Grosbeaks periodically visited a pejibaye (*Bactris gasipaes*) grove at the Organization for Tropical Studies field station, Finca La Selva. At each visit the birds flew together from tree to tree uttering "chu-weet" call notes for several minutes and then left together, flying out of earshot.

On July 4th I saw four adult grosbeaks land on the dried flowering stalk of a bromeliad attached about 6 m above the ground to the trunk of a pejibaye palm. One by one the birds then flew about 1 m down to an open nest in the top of another bromeliad on the same trunk. Each of the four birds fed two young in the nest; each flew away before the next bird descended. Afterwards, the entire flock of grosbeaks left the grove.

On July 5th, J. Dillon also saw four adult grosbeaks feed young at the nest. Later the same day, I saw a flock of six grosbeaks enter the grove but observed only four adults visiting the nest. This time only one perched on the dead flowering stalk before approaching the nest. The other three flew directly to the nest from nearby trees.

Two days later I witnessed group defense of newly fledged young. By 7 July one young had left the nest and was perched less than 1 m above the ground in a low bush. Two or more adults flew near the fledgling, perched next to it and fed it. When I approached within 30 m of the fledgling, the adults flew to a perch about 5 m above me calling loudly (presumably a mobbing call), following which the flock departed.

After many minutes six grosbeaks returned, the bills of several being filled with food. They all perched about 6 m above me, near the nest tree calling loudly ("chu-weet" call). A second fledgling then fluttered down, accidentally colliding with me, at which time the adults' calls increased in intensity. For the next several minutes I captured and released the fluttering

fledgling several times. During this period, four and only four of the adults flew to within 3 m of the ground, giving loud "seet-seet" calls incessantly and flying back and forth within 2 to 3 m of me on both sides. These four birds flew close together and in the same direction.

The last time I captured the fledgling it uttered a harsh squeak. The four adults immediately uttered harsh rasping notes not previously heard and flew to within 1 to 2 m of me. One adult, perched 2 m away and about 1.5 m above the ground, spread and vibrated "drooping" wings as for a broken wing display or as if to simulate begging behavior of a young bird. When I released the fledgling the adults resumed their "seet-seet" alarm notes.

When I retreated, the adults approached the fledgling, touching it when I was over 60 m away. During the mobbing I observed one adult at 3 m and noted several pea-sized yellow fruits in its bill, presumably intended for the fledgling. The other two adults participating in the initial mobbing calls had not been evident during the defense of the second fledgling. I interpret these observations of the feeding and defense of young by at least four adult-plumaged birds together with the observations by Skutch (1972) as sufficient evidence for the existence in this species of cooperative breeding as defined by Lack (1968; see also the review by Brown 1978).

Three specific points noted during the observations suggest that monospecific flocks of this species may be complex, composed of breeders, helpers, and a variable number of "hangers-on": 1) the size of the groups coming near the nest was variable, including eight or more individuals; 2) despite the presence of six to eight birds near the nest, I never saw more than four different birds feed the young during a single visit; and 3) only four adults of the six present defended the young. The defense of young by a subset of the birds was particularly important in suggesting that only they were actually involved with the breeding, as either breeders or helpers. Even though the birds were not marked, I was able to determine with certainty that during the defense and the occasions when adults fed the young, four individuals were involved. In each case all four birds were visible simultaneously and did not fly out of my sight during the episodes described. I cannot say whether these four birds were the same on each occasion, but I think the possibility is likely. Skutch (1972) described a pattern similar to that noted in points 1) and 2).

Two other observations are relevant to the pattern suggested above. The groups of grosbeaks visiting the nest to feed the young did so periodically with relatively long absences between visits. Flocks of grosbeaks that I saw elsewhere at La Selva during the same

period consisted of assemblages of thirty or more birds. Such large foraging flocks appear typical for the species (Slud 1964).

I suggest that the following social organization may occur in these grosbeaks. Raising of young appears to be accomplished by a core group consisting of a mated pair and one or two adult helpers, perhaps offspring from a previous season, as is the case in cooperative breeders that have been studied (Brown 1978). Feeding units may consist of the core group with or without additional, less closely related members. The large feeding and/or roosting assemblages may be composed of varying numbers of feeding units.

Skutch's observations and the participation of only four birds in the high-intensity defense of young in my observations are consistent with the notion of a core breeding group. The variable size of the flocks arriving at the nest may be due to changeable membership in feeding units. Perhaps these non-core members are non-breeders or birds who bred earlier or will breed later in the season. Skutch's birds fledged in mid-May in contrast to mine in early July. A similar pattern has been suggested for the Turquoise Tanager (*Tangara mexicana*) with a similar feeding ecology (Snow and Collins 1962).

These observations were made while I was assisting in an Organization for Tropical Studies field ecology course. I thank J. S. Denslow and M. Balph for comments on the manuscript and J. Dillon for her observations.

LITERATURE CITED

- BROWN, J. L. 1978. Avian communal breeding systems. *Annu. Rev. Ecol. Syst.* 9:123-155.
 LACK, D. 1968. Ecological adaptations for breeding in birds. Methuen, London.
 SKUTCH, A. F. 1972. Studies of tropical American birds. *Publ. Nuttall Ornithol. Club* No. 10.
 SLUD, P. 1964. The birds of Costa Rica: distribution and ecology. *Bull. Am. Mus. Nat. Hist.* 128.
 SNOW, D. W., AND C. T. COLLINS. 1962. Social breeding behavior of the Mexican Tanager. *Condor* 64:161.

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FIRST DESCRIPTION OF THE NEST, EGGS, AND YOUNG OF THE TUMBES SPARROW (*AIMOPHILA [RHYNCHOSPIZA] STOLZMANNI*)

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Tumbes Sparrows (*Aimophila [Rhynchospiza] stolzmanni*) live only in the region along the western slope of the Andes in extreme southwestern Ecuador and northwestern Peru. To the best of my knowledge, their nests, eggs, and young have not been previously described.

In May 1978 I found two nests of this species in the northern part of the Department of Lambayeque, Peru, 3.5 km north of the village of Naupe on a plain bordering the dry bed of the Río de Naupe (5° 34' 20"S; 79° 54' 35"W; elevation 150 m). This area lies on the eastern edge of the Desierto de Sechura where it meets the western foothills of the Andes. The landscape is characterized by dunes that rise to about 10 m above the sandy plains. Clumps of shrubs and occasional low trees and cacti are rather evenly spaced over the whole area, and grass sparsely covers most of the ground around them. The *Mapa Ecológico del Perú: Guía Explicativa* (Oficina Nacional de Evaluación de Recursos Naturales, Lima, 1976) gives the following plants as characteristic of these arid regions: the deciduous trees and shrubs *Prosopis juliflora*, *Capparis angulata*, *C. ovalifolia*, *Cordia rotundifolia*, and *Acacia* sp., and the cacti *Cereus* sp. and *Opuntia* sp. Herds of cattle graze and browse here. Although the dry season had just begun in this region, a light rain fell on the morning of 27 May.

On 27 May I flushed an incubating Tumbes Sparrow from a nest placed 20 cm above the ground among the branches of a fallen cactus (Fig. 1). The single egg was bluish-white, immaculate, without gloss, and mea-

sured 21.8 × 16.6 mm. Apparently there had been at least one other egg since yolk was smeared over the nest and remaining egg.

On 30 May, a single warm egg was present, and an adult was near the nest. On 1 June I collected the egg, which did not contain a visible embryo; it is now in the collection of the Louisiana State University Museum of Zoology (MDW #1506).

The branches of the cactus formed such an integral part of this nest that the structure fell apart when I chopped the branches away. The nest was composed mostly of grasses and a few coarser sticks, and included one hair and one feather in the lining.



FIGURE 1. Nest of the Tumbes Sparrow amid the branches of a fallen cactus, Dept. of Lambayeque, Peru.