

such behavior may be of ritualistic value designed to obtain the partner's full cooperation. It would normally precede copulation and perhaps continue after it had fulfilled this role (Hauser 1959, Kilham 1961). A similar interpretation may be applied to cases of reverse mounting following nest failure. After failure, the male's interest may wane somewhat. Reverse mounting may be an unambiguous signal to re-stimulate him for a replacement nest, and as such, would have an adaptive value. Nuechterlein and Storer (1982) have also suggested that the behavior not be treated as aberrant.

The age, and hence experience of the male, may play a role here too. The North-western Crow first breeds at 2 years of age, although I have never seen a first-time breeder successful. Thompson and Lanyon (1979) note the male involved in their case of reverse mounting was a yearling. It may be that younger inexperienced males need stronger-than-usual signals to facilitate cooperation.

I thank the B. C. Parks Branch for permission to conduct research on Mitlenatch, and Dr. N. A. M. Verbeek for his supervision.

LITERATURE CITED

- BEACH, F. A. 1948. Hormones and behavior. Hoeber, New York.
- BRACKBILL, H. 1969. Reverse mounting by the Red-headed Woodpecker. *Bird-Banding* 40:255-256.
- COOMBS, F. 1978. The crows, a study of the corvids of Europe. Batsford, London.
- FICKEN, M. S. 1963. Courtship of the American Redstart. *Auk* 80:307-317.
- GLICK, B. 1954. Reverse mounting in the Starling (*Sturnus vulgaris*). *Auk* 71:204.
- HAUSER, D. C. 1959. Reverse mounting in Red-bellied Woodpeckers. *Auk* 76:361.
- KILHAM, L. 1958. Pair formation, mutual tapping and nest hole selection of Red-bellied Woodpeckers. *Auk* 75:318-329.
- . 1961. Reproductive behavior of Red-bellied Woodpeckers. *Wilson Bull.* 73:237-254.
- LAWRENCE, L. DE K. 1966. A comparative life-history study of four species of woodpeckers. *Ornithol. Monogr.* No. 5.
- MORRIS, D. 1954. The reproductive behaviour of the Zebra Finch (*Poephila guttata*) with special reference to pseudofemale behaviour and displacement activities. *Behaviour* 6:271-322.
- . 1955. The causation of pseudofemale and pseudomale behaviour: a further comment. *Behaviour* 8:46-56.
- NOLAN, V., JR. 1978. The ecology and behavior of the Prairie Warbler (*Dendroica discolor*). *Ornithol. Monogr.* No. 26.
- NUECHTERLEIN, G. L., AND R. W. STORER. 1982. Who's on top?—Reverse mounting in Grebes and other monomorphic birds. Poster No. 249. Abs. 100th A.O.U. meeting, Chicago.
- SHALLENBERGER, R. J. 1973. Breeding biology, homing behavior, and communication patterns of the Wedge-tailed Shearwater, *Puffinus pacificus*. Ph.D. dissertation. University of California, Los Angeles.
- THOMPSON, C. F., AND S. M. LANYON. 1979. Reverse mounting in the Painted Bunting. *Auk* 96:417-418.
- VAN TETS, G. F. 1965. A comparative study of some communication patterns in the Pelecaniformes. *Ornithol. Monogr.* No. 2.
- PAUL C. JAMES, *Dept. Biological Sciences, Simon Fraser University, Burnaby, B.C., Canada.* Present address: *Edward Grey Institute of Field Ornithology, Zoology Dept., South Parks Rd., Oxford OX1 3PS, U.K.* Received 13 Sept. 1982; accepted 29 Aug. 1983.

Observations on Roosting Sites of Screech-Owls.—The Eastern Screech-Owl (*Otus asio*) is common to many parts of North America. However, because of the species' nocturnal habits and small size, data on its movements and habitat use are limited. Van Camp and Henny (North Am. Fauna No. 71, 1975) and McCombs and Noble (J. Wildl. Manage. 45:93, 1981) supplied data on diurnal use of natural and artificial cavities by Screech-

TABLE 1. Descriptions of Screech-Owls and their roost sites and distances between roost sites.

	Owls		
	1	2	3
Descriptions			
Sex	Male	Female	Unknown
Age	Unknown	Unknown	Unknown
Body Wt.	153 g	170 g	170 g
Color phase	Gray	Red	Red
Types of sites			
Cavity	38%	81%	60%
Open limb	33%	4%	27%
Tangle or thicket	14%	15%	13%
Conifer	14%	0%	0%
	(n = 22) ^a	(n = 27)	(n = 15)
Distances (m)			
Max. between observed roost sites	1500	860	1500
Mean between consecutive roosts	529 ± 447 ^b (n = 7)	116 ± 90 (n = 14)	481 ± 489 (n = 9)
Range between consecutive roosts	19-1125	0-300 ^c	0-1500 ^c

^a One roost site was a farm shed (excluded from the percentages).

^b Mean ± SD.

^c Zero denotes the same roost site used on consecutive days.

Owls, but use of other habitats and roost site selection have not been intensively studied. In this note we describe the location and characteristics of roosting sites of Screech-Owls located by radio telemetry.

The study area was located in the Blue Ridge Mountains in Warren County, Virginia. Included among the habitat types present were mixed hardwood forest, apple and peach orchards, grassland, crops, and bushy bottomland thickets.

Screech-Owls were captured in mist nets and fitted with radio transmitters (MPB-1220-LDA, Wildlife Materials, Inc., Carbondale, Illinois) attached with a harness in a back-pack arrangement. The harness and transmitter together weighed 11-12 g. Owls were located over a 6-week period using a hand-held yagi antenna and portable receiver. Locations were made once per day from 1135 to 1725. Owls were not located each day, but each location attempt was successful. Each roost site was marked, notes taken as to its physical characteristics, and then located on an aerial photograph using standard surveying techniques.

Three Screech-Owls, identified as owls 1, 2, and 3, were captured on 20 Oct., 27 Oct., and 7 Nov. 1980, respectively. The owls roosted primarily in mixed hardwood forest, but also used thickets of pine (*Pinus virginianus*), honeysuckle (*Lonicera japonica*), and cherry (*Prunus* spp.), red cedar trees (*Juniperus virginiana*), and a farm shed. The owls most often roosted in cavities, but also used open limbs (Table 1). Cavities in both live and dead trees were used by the owls and were .3 to 9 m above the ground. There did not appear to be a relationship between prevailing weather conditions and cavity use. Owls were observed outside cavities during both fair and inclement weather.

Each owl used a variety of roost sites. Owl 1 was observed at 22, owl 2 at 11, and owl 3 at 3 different roost sites. The owls sometimes used the same roost site on consecutive days, but also roosted up to 1500 m from the previous day's site (Table 1). Owl 2 moved

the least between roosts which reflected this bird's partiality to a particular roost. In 56% of the observations made, owl 2 was in the same cavity.

The owls became habituated to the observers and allowed them to approach within 2 m. Owls flushed from roosts only twice during the study and, if in the open, usually assumed a cryptic posture when approached.

All owls were recovered. Owl 3 was found dead in a mutilated condition on 2 Dec. 1980. Owls 1 and 2 were captured by hand from roosts on 15 Dec. 1980. Both owls appeared to be in good condition. Each had a small callus between the scapulae where the transmitter had rested, but no signs of excessive irritation were present.

Partial support of this research by U.S. Department of Interior and I.C.I. Americas, Inc. is acknowledged. Thanks to Dr. O. O. Van Deusen, E. Hickerson, and U.S. Customs Service for permission to enter their lands.—M. H. MERSON, L. D. LETA, AND R. E. BYERS, *Winchester Fruit Research Laboratory, Virginia Polytechnic Institute and State University, Winchester, Virginia 22601*. Received 2 Nov. 1982; accepted 8 Aug. 1983.

Bill-shoving Feeding Behavior in Darwin's Finches.—Both interspecific and intraspecific morphological radiations of Darwin's finches may be associated with ecological differences in food and foraging behavior (Lack 1947, Bowman 1961, Grant et al. 1976). The usual foraging techniques of the ground-feeding finches include hopping, scratching in the soil, picking up, tossing, turning, or flicking objects, and using their bill as a hoe (DeBenedictis 1966, P. R. Grant and R. I. Bowman pers. comm.). Use of the bill as a brace while scratching has been described in one species (DeBenedictis 1966) and subsequently seen in others (P. R. Grant and R. I. Bowman pers. comm.). Bill-brace feeding, in which a finch places its culmen against a rock and scratches and kicks gravel to expose seeds (DeBenedictis 1966), has been of interest because of its complexity, the environmental correlates of its use, and its possible value as a taxonomic character. Harrison (1967), Greenlaw (1976), and Clark (1971) have discussed behavioral, taxonomic, and ecological aspects of the use of feet and bill in other finches. In January 1979, I observed Darwin's finches using an unreported foraging behavior, which I called bill-shoving. Here I briefly describe this behavior as a contribution to the more complete documentation of the feeding methods of Darwin's finches and seasonal patterns in the use of such behaviors.

I studied the finches in the open park-like arid zone 1 km inland from James Bay on Isla Santiago, Galapagos, at the end of the cool-dry season. The ground between the trees and bushes was covered by a several centimeter-thick layer of litter of leaves, twigs, dry herbaceous material, and small rocks. Finches foraged near each other in loose groups including Small Ground Finches (*Geospiza fuliginosa*), Medium Ground Finches (*G. fortis*), Galapagos Doves (*Zenaidra galapagoensis*), Yellow Warblers (*Dendroica petechia*), and Large-billed flycatchers (*Myiarchus magnirostris*).

The ground finches fed primarily by hopping and pecking and also by scratching. Some finches shoved the litter out of the way using their bills to uncover seeds on the ground below. In doing so, a finch placed its closed bill, tip downward, into the top of the material and, by pushing and lifting, moved a wad of material up and forward. Doing this several times, with or without removing and reinserting the bill, the finches uncovered areas 3–5 cm in diameter, where they then fed by pecking and scratching, but without bracing the bill. Other birds use their bill to expose food, one of the most widespread behaviors being bill sweeping, a lateral bill movement (Clark 1971), which may be used with scratching (Clark 1983).

The bill-shove feeding technique was used on Santiago primarily by Medium Ground Finches, including both smaller- and larger-billed individuals. Small Ground Finches used it less frequently, and less effectively, as was also noted by DeBenedictis (1966) for bill-bracing. The lighter- and smaller-billed Small Ground Finch is apparently less adept than the Medium Ground Finch at using a feeding behavior requiring bill and body strength (Abbott et al. 1977).

Excavating behaviors such as bill-shoving may be particularly useful in the dry season when most plants are dormant, the previous year's growth of herbaceous ground cover is dried out, and easily accessible seed sources are rare. These conditions on Santiago