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MIDWINTER BREEDING BY SOME BIRDS IN THE HIGH ANDES OF SOUTHERN PERÚ

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As far as can be gathered from the very scanty information available, most of the land birds of the high Andes of southern Perú breed during or immediately after the summer rains, between November and April. At this season food, both animal and vegetable, is more readily obtained than in the rest of the year which, away from the humid eastern slopes, is characterized by severe drought.

I was therefore surprised recently to obtain proof of midwinter breeding by the three species of birds detailed below. Since little has been published concerning the nesting of these species, I include the details of nest placement.

Rhodopis vesper. Oasis Hummingbird. On 5 July 1979 I found a nest containing two recently hatched young birds near Chiguata (Dept. Arequipa) at an elevation of 2,750 m, close to the uppermost limit of the vertical range of the species in this part of Perú. The nest was placed approximately one meter off the ground in the branches of a bush (*Tessaria integrifolia*) growing near a small stream.

Johnson (The birds of Chile and adjacent regions of Argentina, Bolivia and Perú. Vol. 2. Platt, Buenos Aires. 1967) mentioned September to December as breeding dates for the species in northernmost Chile (Arica and Tarapacá), which coincides with my experience at Mollendo, on the Pacific Coast (Dept. Arequipa). I know of no previous record of midwinter breeding by this species in any part of its restricted range along the coast and west Andean slopes of Perú and northern Chile.

Metallura phoebe. Black Metaltail. On the same date I also found a nest near the top of a steep, moss-covered bank near Chiguata at 2,720 m altitude. The nest was suspended from overhanging vegetation at the top of the bank, kept permanently damp by water filtering down from the agricultural terraces above. Although its contents could not be checked, the female was sitting on the nest when found, and her subsequent behavior, extreme agitation and reluctance to leave the area, indicated that it might have contained eggs or young.

I have been unable to find any previous reports concerning the breeding of this Peruvian endemic.

Phrygilus plebejus. Ash-breasted Sierra-Finch. On 8 July 1979 a nest containing two eggs was found at La Raya Pass, 4,320 m, on the border between the Departments of Puno and Cuzco. It was built inside a tuft of bunch-grass (*Stipa* sp.), approximately 30 cm off the ground. The female was incubating at the time.

Johnson (1967) stated that the species breeds between October and March in the Andes of northern Chile and in the past I have found nests near the city of Cuzco (3,500 m) in March and April. Midwinter breeding at La Raya Pass is noteworthy in view of the bitterly cold night temperatures there at that time of year, when minima of −10°C are commonplace. Roe and Rees (Auk 96:475–482, 1979) found the species breeding in June at Checayani (Dept. Puno) where conditions are only slightly less severe.

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FOOD HABITS OF THE BALD EAGLE IN NORTH-CENTRAL FLORIDA

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Food habit information for Bald Eagles (*Haliaeetus leucocephalus*) in the northern U.S. is available (Wright 1953, Imler and Kalmbach 1955, Dunstan and Harper 1975), and many anecdotal reports have been published for eagles in the southern U.S. (e.g., Fargo 1926, Bent 1937, Broley 1947, Hebard 1948, Noell 1948). We present the first quantified data on this subject from the southern United States, drawing on a larger sample than previously published reports for this species outside of Alaska (Imler and Kalmbach 1955, Lincer et al. 1979). As a part of a study of nesting ecology of the Bald Eagle (McEwan 1977), we collected animal remains from 16 productive nests after young had fledged in 1975 and 1976. Remains were taken from nests and from the ground beneath nests. The nests were in the vicinity of Lake George, Orange Lake, and Newnans Lake in north-central Florida. This area supports a large (at least 40 active nests) and productive population of Bald Eagles (McEwan and Hirth 1979).

METHODS

Nest trees were climbed using Swedish ladders to avoid possible damage to the tree from climbing irons. Animal remains were identified by comparison with reference collections. We were unable to distinguish consistently between blue catfish (*Ictalurus furcatus*) and white catfish (*I. catus*) and between eastern cottontails (*Sylvilagus floridanus*) and marsh rabbits (*S. palustris*), but most other remains were identified to species. The weight of each prey species was estimated from values in the literature (Palmer 1962, 1976, Lowery 1974) and specimens in the Florida State Museum, Gainesville. We did not estimate the biomass of four large mammals (opossum, raccoon, hog, cow) that were probably obtained as carrion and thus only partially consumed by eagles (Table 1). Five species of fish that also grow to large size (blue and white catfish, bowfin, redfin pickerel, and Florida gar) were arbitrarily assigned the same weight as the brown bullhead (450 g), for which an accurate estimate was available.

TABLE 1. Animals identified from remains collected from 16 Bald Eagle nests.

	Number of individuals	Percent of prey items[a]	Percent of estimated biomass[a]
FISH			
Brown bullhead (*Ictalurus nebulosus*)	346	43.9	46.1
Blue & white catfish (*I. furcatus, I. catus*)	98	12.4	13.1
Lake chubsucker (*Erimyzon sucetta*)	83	10.5	6.1
Black crappie (*Pomoxis nigromacalatus*)	34	4.3	2.3
Atlantic needlefish (*Strongylura marina*)	33	4.2	tr
Gizzard shad (*Dorosoma cepedianum*)	17	2.2	1.2
Bowfin (*Amia calva*)	3	tr	tr
Redfin pickerel (*Esox americanus*)	2	tr	tr
Florida gar (*Lepisosteus platyrhincus*)	2	tr	tr
Total	618	78.4	70.3
BIRDS			
American Coot (*Fulica americana*)	89	11.3	19.0
Ruddy Duck (*Oxyura jamaicensis*)	14	1.8	2.3
Cattle Egret (*Bubulcus ibis*)	14	1.8	1.6
Lesser Scaup (*Aythya affinis*)	7	tr	1.7
Pied-billed Grebe (*Podilymbus podiceps*)	3	tr	tr
Mottled Duck (*Anas fulvigula*)	2	tr	tr
Blue-winged Teal (*A. discors*)	1	tr	tr
Marsh Hawk (*Circus cyaneus*)	1	tr	tr
Turkey (young) (*Meleagris gallopavo*)	1	tr	tr
Common Gallinule (*Gallinula chloropus*)	1	tr	tr
Common Snipe (*Capella gallinago*)	1	tr	tr
Ring-billed Gull (*Larus delawarensis*)	1	tr	tr
Unknown	1	tr	—
Total	136	17.3	25.8
MAMMALS			
Florida water rat (*Neofiber alleni*)	10	1.3	tr
Eastern cottontail (*Sylvilagus floridanus*) & marsh rabbit (*S. palustris*)	9	1.1	2.4
Rice rat (*Oryzomys palustris*)	2	tr	tr
Cotton rat (*Sigmodon hispidus*)	2	tr	tr
Opossum (*Didelphis virginiana*)	1	tr	—
Raccoon (young) (*Procyon lotor*)	1	tr	—
Hog (young) (*Sus scrofa*)	1	tr	—
Cow (young) (*Bos taurus*)	1	tr	—
Total	27	3.4	3.3
REPTILES			
Greater siren (*Siren lacertina*)	4	tr	tr
Florida red-bellied turtle (*Pseudemys nelsoni*)	2	tr	tr
Black swamp snake (*Seminatrix pygaea*)	1	tr	tr
Total	7	0.9	0.6
TOTAL	788	100.0	100.0

[a] tr = <1%.

RESULTS

At least 788 animals representing 34 species were included in the material collected from the 16 nests. Their total biomass, excluding the four large mammals, was estimated to be 337,295 g. Fish represented the largest portion of this sample, both in number and biomass, followed by birds, mammals, amphibians, and reptiles (Table 1). Three species of freshwater catfish constituted 72% of the 618 fish identified, and 78% of those were brown bullheads. In terms of biomass, catfish, lake chubsucker and black crappie accounted for 96% of all the fish taken by eagles and 67% of their total diet.

American Coots were the second most abundant dietary item (11% of all prey and 19% of total biomass). Four species of ducks made up an additional 18% of bird remains. Cattle Egrets represented 10% of the avian prey of eagles, but Cattle Egrets were collected from only three nests, two of which were situated in pastures. Because of the prevalence of large aquatic birds in our sample, birds constituted a larger portion of prey biomass than prey numbers. More than one-third of the 27 mammals identified were Florida water rats, and rabbits accounted for more than one-half of the 17 remaining individuals.

Because catfish were by far the most abundant prey item found in nests, we attempted to determine the size range of the fish that were taken. Forty-four brown bullheads were purchased from a local fisherman. These fish were weighed, and four skull measurements were taken on each to determine the best predictor of weight. Regression analysis of weight on each of these four measurements—constriction behind the dermethomoid, greatest width of the prefrontal bone, skull

length, and greatest width of the cervical centrum—gave correlation coefficients of 0.85, 0.93, 0.93, and 0.88, respectively. Greatest width of the prefrontal bone was chosen because of its good predictive value and because it could be measured on the greatest number of skulls found in nests. The estimated weights of 102 brown bullheads collected from nests was 446 ± 117 g (range 223–662 g).

DISCUSSION

Most of the animal remains collected probably represented food brought to the nest for nestlings and for that reason may have a seasonal bias. Nestling eagles are present in northern Florida from January through May. However, we saw adult eagles using nests as feeding platforms at all seasons of the year, so these remains were not necessarily from prey taken only during the nesting season.

Our results resembled those by Bent (1937) and Broley (1947) for eagles in Florida. Both authors cited catfish (*Ictalurus* spp.) as the most common prey item, followed by several other species of fish, lesser numbers of aquatic birds, and a few mammals. In fact, our results were remarkably similar to those of two other inland eagle studies in New Brunswick (Wright 1953) and Minnesota (Dunstan and Harper 1975). Catfish are apparently a staple food item for both southern and northern Bald Eagle populations (56% of all prey items in our study, 35% in Minnesota, and 23% in New Brunswick).

Although there is evidence that Bald Eagles prefer fish over birds and mammals (Wright 1953, Retfalvi 1970), they are clearly opportunists. Both Murie (1940) and Wright (1953) reported that eagles take advantage of seasonally abundant bird populations. On San Juan Island, Washington, feral European rabbits (*Oryctolagus cuniculus*), readily available as carrion, comprised the bulk of prey items brought to nests during the summer months (Retfalvi 1970). The opportunistic feeding behavior of Bald Eagles was also apparent in the present study. Substantial numbers of coots winter in Florida, outnumbering any of the wintering waterfowl (Chamberlain 1960), and eagles appeared to take full advantage of their abundance during the nesting season. However, it is likely that a prey sample taken during the summer months, when coots and waterfowl are absent, would show a greater preponderance of fish in both number and biomass.

Bald Eagles have been reported to feed readily on carrion (Murie 1940, Hebard 1948, Southern 1963, Erskine 1968, Sherrod et al. 1975), and our results corroborate this. Both the opossum and the raccoon skulls collected from nests were partially crushed, not merely separated at the sutures, indicating that these animals may have been road kills. The cow vertebra was probably obtained from a dead calf not far from the nest tree. Other smaller food items, such as fish, may have been obtained as carrion as well. Although large animals obtained as carrion are probably underrepresented in food carried back to nests, large carrion does not appear to constitute a significant portion of the diet of Bald Eagles in Florida, in view of the very large amount of fish taken.

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