ROADRUNNER CATCHES HUMMINGBIRD IN FLIGHT

SALLY HOYT SPOFFORD

Published accounts of feeding habits of the Roadrunner (*Geococcyx californianus*) (Zimmerman, Condor 72:475–476, 1970; Binford, Calif. Birds 2:139, 1971) include the fact that the species is known to capture small birds on the ground. A. C. Bent (U.S. Natl. Mus. Bull. 176:45, 1940) briefly mentioned observations of the capture of a swift and a House Sparrow (*Passer domesticus*) in flight by Roadrunners, which leaped into the air from the ground. However, I find no detailed description in the literature of the aerial capture of a bird.

On 28 April 1974, my husband and I were watching and photographing hummingbirds of several species at our window feeders in Portal, Arizona. We became aware that one of our resident pair of Roadrunners was crouched on the roof of a small porch nine feet above ground, just above the hummingbird feeders which hang from wires from the eaves (fig. 1). We had seen it on the ground below the feeders, occasionally leaping into the air in an unsuccessful attempt to catch a bird. Several times the Roadrunner changed position and made tentative passes at the birds. Suddenly it leaped off the roof and snapped up a Black-chinned Hummingbird (*Archilochus alexandri*) in flight, landing on the ground with the bird in its beak. I quickly took one picture and then we followed the bird as it ran off, but shortly lost it in brush. Forty minutes later I noted either this same Roadrunner or another running across the yard with another bird in its beak, this one sparrow-sized. The unusual aspect of this incident is that the Roadrunner attacked its flying prey from an elevated perch rather than the ground.

On 20 June 1974, we saw a Roadrunner pounding something on the ground by our brush pile, where we have several sugar-water feeders for orioles and hummingbirds, hanging from low branches. We approached the Roadrunner, which ran a short distance and dropped its prey—a Black-chinned Hummingbird that died in less than a minute. We speculate that the Roadrunner caught this hummingbird by jumping into the air from the ground.

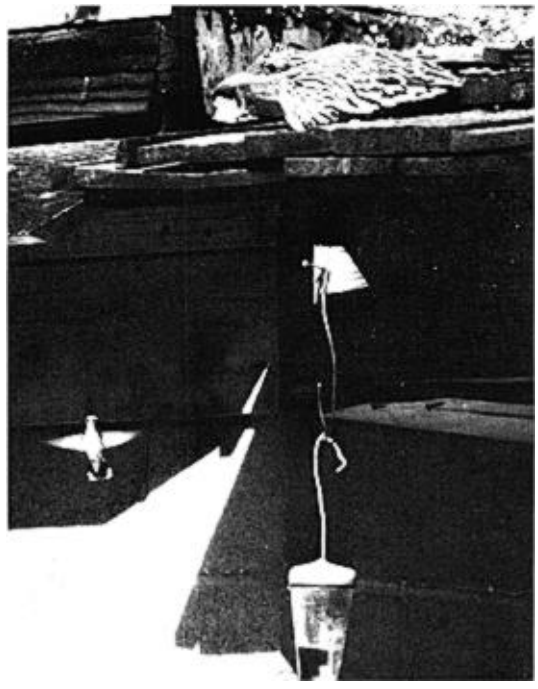

FIGURE 1. Roadrunner crouched on the roof of a porch, above a hummingbird attracted to a hanging feeder.

One week later we found all the tail feathers of a female Blue-throated Hummingbird (*Lampornis clemenciae*) on the ground under our feeders, and later that day saw a tail-less bird. This may well have represented another attempt by the Roadrunner, which this time succeeded in grabbing only the tail of the hummingbird.

I have not found the Roadrunner listed as a predator on hummingbirds, but these observations clearly show that it does catch them occasionally, perhaps when they are feeding on low flowers.

Aguila-Rancho, Portal, Arizona 85632. Accepted for publication 25 March 1975.

FALL DIET OF LESSER PRAIRIE CHICKENS IN WEST TEXAS

JOHN A. CRAWFORD AND ERIC G. BOLEN

The Lesser Prairie Chicken (*Tympanuchus pallidicinctus*) is considered a threatened species (U.S. Fish and Wildlife Serv. 1973:134), yet its populations in west Texas and elswhere are subject to limited hunting. The loss of vast undisturbed prairie habitats, interspersed with patches of shinnery oak (*Quercus Havardii*), has imperilled these birds. Martin et al. (American wildlife and plants—A guide to wildlife food habits, p. 97, McGraw-Hill, New York, 1951), although noting the importance of "oak" as 52% of the birds' diet in Oklahoma, stated that data on food habits of this species were very limited. Other work in Oklahoma described the importance of insects (74%), seeds (20%), and leafy green material (5%) in the October diet (Jones, Southwest. Nat. 9:111–117, 1964). Copelin (Oklahoma Wildl. Conserv. Dept. Tech. Bull. 6, 1963) believed that grain sorghum was taken only when native foods were insufficient. However, virtually no data for the foods of Lesser Prairie Chickens are available for west Texas. Accordingly, we undertook this study, using only birds collected during the hunting season for our sample.

We randomly selected 30 crops each year for three years (1971–1973, inclusive) taken from birds logged at the Lehman Check Station in Cochran County during the two-day mid-October hunting season in west Texas. The 90 crops represented a 10% sample from the legal harvest for the 3-year period; of this sample, 27 crops (30%) later proved empty.

We stored the crops in foil wrappers for later analysis. The materials from each crop were oven-dried at 77° C for 72 hrs, then separated, weighed,

TABLE 1. Fall diet of the Lesser Prairie Chicken in west Texas.[1]

Item	Type	Percent		
		Frequency	Weight	Volume
Plant Foods				
Grain sorghum (*Sorghum vulgare*)	seeds	55.6	62.0	43.4
Shin oak (*Quercus Havardii*)	leaves	8.0	0.1	0.3
	acorns	15.9	7.1	5.0
	galls	39.7	8.0	15.3
Flax (*Linum rigidum*)	seeds	20.6	1.6	2.3
Spurge (*Euphorbia Fendleri*)	leaves & seeds	12.7	0.5	0.8
Rayed palafoxia (*Palafoxia sphacelata*)	leaves & flowers	8.0	1.6	2.1
Sunflower (*Helianthus annuus*)	seeds	4.8	3.3	2.8
Alafalfa (*Medicago sativa*)	leaves	4.8	1.0	1.6
Ratany (*Krameria* spp.)	leaves	4.8	0.5	0.8
Day-flower (*Commelina erecta*)	leaves	4.8	0.1	0.4
Fall witchgrass (*Leptoloma cognatum*)	leaves	4.8	0.0	0.1
Wheat (*Triticum aestivum*)	seeds	3.2	1.7	1.1
Wild buckwheat (*Eriogonum annuum*)	leaves & seeds	3.2	1.0	1.7
Gaura (*Gaura* spp.)	seeds	3.2	0.9	0.6
Flatsedge (*Cyperus* spp.)	leaves	3.2	0.2	0.3
Crabgrass (*Digitaria* spp.)	leaves	3.2	0.1	0.2
Russianthistle (*Salsola Kali*)	leaves	3.2	0.1	0.1
Sand paspalum (*Paspalum setaceum*)	seeds	3.2	0.1	0.1
Doveweed (*Croton* spp.)	leaves & seeds	1.6	0.3	0.5
James Rushpea (*Caesalpinia Jamesii*)	seeds	1.6	0.1	0.7
Greenthread (*Thelesperma* spp.)	leaves	1.6	0.1	0.2
White-top (*Erigeron strigosus*)	flowers	1.6	0.0	0.1
Six-weeds fescue (*Vulpia octoflora*)	leaves	1.6	0.0	0.0
Pigweed (*Amaranthus* spp.)	seeds	1.6	0.0	0.0
Unidentified composite	leaves	9.5	0.1	0.3
Unidentified composite	seeds	8.0	0.1	0.2
Unidentified composite	seeds & flowers	4.8	0.1	0.1
Unidentified Gramineae	leaves & seeds	6.4	0.1	0.2
Unidentified	woody material	1.6	0.0	0.0
Total Plant Material		100.0[2]	89.98	80.97
Animal Foods				
Darkling beetles (Tenebrionidae)		23.8	0.6	1.7
Short-horned grasshoppers (Acrididae)		19.1	5.6	11.9
Ants (Formicidae)		7.9	0.1	0.1
Leaf hoppers (Cicadellidae)		6.4	0.0	0.1
Walkingsticks (Phasmidae)		4.8	1.9	2.2
Wingless long-horned grasshoppers (Gryllacrididae)		3.2	0.7	1.4
Cutworms (Noctuidae)		3.2	0.3	0.7
Ground beetles (Carabidae)		3.2	0.2	0.5
Leaf beetles (Chrysomelidae)		3.2	0.0	0.1
Long-horned beetles (Cerambycidae)		1.6	0.0	0.0
Weevils (Curculionidae)		1.6	0.0	0.0
Broad-headed bugs (Coriscidae)		1.6	0.0	0.0
Scentless plant bugs (Corizidae)		1.6	0.0	0.0
Unidentified insects		3.2	0.0	0.0
Total Animal Material		42.9[2]	10.0	19.0
Grand Total		—	100.0	100.0

[1] These data represent averages for the three years of study.
[2] These totals signify the percentage of total birds ingesting at least one plant or one animal species.

and their volume determined by sand displacement in a graduated cylinder. We determined the taxonomy for food items from standard texts: Correll and Johnston (Manual of the vascular plants of Texas, Texas Res. Found., Renner, 1970) for plants, and Borrer and DeLong (An introduction to the study of insects, Holt, Rinehart and Winston, New York, 1964) for insects. Approximately 1% of the food remained unidentifiable.

Grain sorghum (*Sorghum vulgare*) was of prime importance in the fall diet of Lesser Prairie Chickens during the 3-yr sample period in west Texas (table 1). Oak galls, acorns, and the leaves of shinnery oak also comprised a significant portion of the foods eaten. Flax (*Linum rigidum*) and ratany (*Krameria* spp.) were frequent but minor components of the fall diet. Beetles from three families (Tenebrionidae, Chrysomelidae, and Carabidae), grasshoppers from two families (Acrididae and Gryllacrididae) and ants were the primary animal food items. Insects were the only animal material consumed.

Our study region consisted primarily of sandy or

sandy loam soils largely devoted to cultivation of grain sorghum; the balance was rangeland. Our study (Crawford and Bolen, Texas J. Wildl. Manage. 40: 96–104, 1976) of land use and Lesser Prairie Chicken populations in this area has indicated significant positive correlations, respectively, between the percentage of rangeland, percentage of minimum tillage on the cropland, and the percentage of deep sand soils surrounding lek sites. In fact, lek populations in areas where there was only rangeland were not as large as those where there was some amount of cropland.

Whereas a strong reliance on cultivated crops during the fall in west Texas is indicated, considerable diversity is demonstrated in the diet. Shrubs, forbs, grasses and insects, as well as cultivated crops are important. We found large amounts of grain sorghum in the diet throughout the study. Field observations in the late fall and winter also emphasize the importance of minimum tillage as an agricultural practice favoring winter food availability in areas where grain sorghum is produced.

We wish to emphasize that the importance of cultivated grains in the diet should not overshadow the necessity of sizable tracts of native range needed to support this species. Cultivation, although important for feeding, provides little else regarding the habitat necessary for Lesser Prairie Chickens throughout the year.

We are grateful to the Texas Parks and Wildlife Department biologists who assisted in the procurement of crops. Virginia Riggs, Department of Entomology, Texas Tech University, assisted with insect identifications. Russell D. Pettit, Department of Range and Wildlife Management, Texas Tech University, aided in identifying plant materials. This is Research Note TTU T-9-139, College of Agricultural Sciences, Texas Tech University, Lubbock, Texas.

Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon 97331. Present address of second author: Rob and Bessie Welder Wildlife Foundation, Sinton, Texas 78387. Accepted for publication 20 May 1974.

FAT CONTENT AND FLIGHT RANGE IN SHOREBIRDS SUMMERING ON ENEWETAK ATOLL

OSCAR W. JOHNSON
AND
MARTIN L. MORTON

Many shorebirds (particularly the long-distance migrants) remain on their wintering grounds during the boreal summer. Presumably, this nonbreeding contingent is composed almost exclusively of first-year birds. Literature pertaining to migratory arrest and its possible causative factors was reviewed by McNeil (1970) and Johnson (1973).

The fat cycle of shorebirds has not been examined widely. Major studies are limited to work conducted in the Gulf of St. Lawrence and northeastern Venezuela (McNeil 1969, 1970, McNeil and Cadieux 1972 a,b). The Venezuela research was concerned both with migrants and shorebirds summering on the winter range. Johnston and McFarlane (1967) presented data on lipid content in American Golden Plovers (*Pluvialis dominica fulva*) collected at Wake Island. Their specimens were obtained during the migratory and wintering seasons, and hence do not reflect the lipid status of birds summering in the Pacific. To our knowledge, this paper is the first to consider the latter topic.

Johnson carried out field work at Enewetak Atoll (formerly spelled "Eniwetok") in the northwest Marshall Islands (approximately 11°N, 162°E) during the period from 4 July through 17 July, 1973. Birds were collected on Aomon, Biijiri, Enewetak, and Rojoa islets. The species studied are listed in table 1.

Specimens were weighed immediately upon collection, and skinned several hours later (skins were needed for other research). When skinning, efforts were made to retain as much subcutaneous fat as possible on the carcasses. The latter were then preserved in a 4% aqueous solution of formaldehyde and shipped to Morton for extraction of lipids. In the extraction procedure each carcass was dehydrated in a vacuum oven at 55°C, homogenized, and extracted with petroleum ether in a soxhlet apparatus for 24 hours. Any residual water was taken up with anhydrous sodium sulfate, the extract was filtered and the ether evaporated.

The data obtained are summarized in table 1. Coincident to skinning, some quantity of fat was unavoidably lost from each specimen. Hence, the values shown are minimal relative to actual lipid stores. It is reasonable to assume that the fat lost from each bird was proportional to its total fat content, and that the data are comparable throughout.

Fat levels in the Enewetak specimens (table 1)

TABLE 1. Fat content of summering shorebirds.

	Body wt. (g)[b]	Ether-extractable fat (g)[b]	Fat content as % of body wt.[b]
American Golden Plover (*Pluvialis dominica fulva*) [17][a]	116.9(102.5–129.8)	3.4(1.9 – 5.5)	3.0(1.7– 4.6)
Whimbrel (*Numenius phaeopus*) [2]	401.2(384.5–418.0)	23.9(22.1–25.8)	6.0(5.3– 6.7)
Bristle-thighed Curlew (*Numenius tahitiensis*) [7]	493.9(383.0–585.0)	33.6(12.7–63.1)	6.6(3.3–10.8)
Wandering Tattler (*Heteroscelus incanus*) [3]	115.8(96.5 –132.5)	3.6(2.5 – 4.3)	3.0(2.6– 3.6)
Ruddy Turnstone (*Arenaria interpres*) [6]	97.1(89.1 –108.0)	3.9(2.8 – 4.7)	4.0(2.9– 4.7)

[a] Number of specimens examined.
[b] Figures represent mean and range.