

found in 1970. Harvest mice were present each year and were most numerous in 1970. Other items taken were two *Dipodomys*, one *Perognathus*, one bird (unidentified), and one grasshopper.

Kites are dependent on a prey whose numbers fluctuate markedly from year to year. During periods of low vole density, kites must select other prey, move to areas of higher vole density, or continue to prey on voles by increasing their hunting effort (Stendell, unpubl. data). At the Hastings Reservation there is no other small, diurnal mammal to replace the vole during periods of low vole density. Trapping and observations of small mammal signs suggest that the vole populations fluctuate in synchrony over the entire Reservation. Furthermore, kites were observed hunting the same fields during all 3 years. The fact that voles constitute a high, relatively constant percentage of the pellet contents indicates

that the kite strategy at the Hastings Reservation is to remain and to spend more time per mouse capture.

Pearson (J. Mammal. 52:41, 1971) has suggested that carnivores are an important factor in generating microtine cycles by continuing to prey on declining vole populations even after the population has reached its lowest density. Our data suggest that White-Tailed Kite predation may operate on *Microtus* populations in this manner.

We thank O. P. Pearson, C. A. Pearson, N. Verbeek, and L. Myers for their assistance. We gratefully acknowledge the use of the facilities of the Frances Simes Hastings Reservation and the Museum of Vertebrate Zoology, University of California, Berkeley.

Philip Myers is supported by an NSF Graduate Fellowship.

Accepted for publication 9 May 1972.

## BREEDING OF SAY'S PHOEBE IN ARCTIC ALASKA

TOM J. CADE

Section of Ecology and Systematics  
Cornell University  
Ithaca, New York 14850

AND

CLAYTON M. WHITE

Department of Zoology  
Brigham Young University  
Provo, Utah 84601

The flycatchers of the family Tyrannidae, basically a Neotropical group, have evidently spread into North America from a tropical center of origin (Mayr, Proc. Natl. Acad. Sci., 51:280, 1964). Of the some 30 species breeding north of the Rio Grande River, Texas (8.2% of the total of 365 species), only 7 species (23.3% of the North American breeders and 1.9% of the total species) migrate to breed as far north as Alaska, and only one species, Say's Phoebe (*Sayornis saya*), is known to breed north of the spruce forest in arctic Alaska. We believe Say's Phoebe is a recent arrival in the nonforested regions from the Brooks Range north into the foothills of the Arctic Slope, where we found the species breeding in considerable numbers on the cliffs of the Colville River between 1967 and 1971.

Gabrielson obtained the first Arctic Slope record of this species on the Colville in 1951. He saw a single individual fly up to what he thought was a nest on a bluff near the mouth of the Killik River (see Kessel and Cade, Biol. Pap. Univ. Alaska, No. 2, 1958). Cade, however, did not see the species during his travels on that river in 1952, 1956, 1957, or 1958, even though he was engaged in a study of falcons at the time and thus paid especial attention to the avian inhabitants of river cliffs and bluffs, where this phoebe is conspicuous and most likely to be encountered. In 1959, however, Cade did see phoebes once on bluffs between the mouths of the Oolamnagavik and Killik Rivers (a distance of about 8 miles). In 1964, White found parent birds carrying food in their beaks on three separate cliffs in the vicinity of the Killik's confluence with the Colville (West and White, Condor, 68:302, 1966) and found adults on two cliffs along the Killik.

In 1967 we found one to three pairs of phoebes on all the main cliffs of the Colville (about 20 total cliffs) from the mouth of the Etivluk River (about 50 miles upriver from the Killik) to the mouth of the Anaktuvuk River, a distance of some 130 miles. A similar distribution has occurred in subsequent years. Phoebes have not been seen below the Anaktuvuk. We believe that they have essentially reached their limit of northward distribution in the Colville drainage because of the nature of the changes in the rock near the mouth of the Anaktuvuk; the cracks, crevices, and crannies necessary for nest placement no longer exist.

Typical situations for nests are illustrated by two records in 1967: 28 June, ca. 14 miles downriver from mouth of Etivluk, six recently hatched young in nest of sphagnum moss held together with spider web and lined with white ptarmigan (*Lagopus* sp.) feathers, placed in crack under an overhanging slab of shale about 6 ft above talus, 15 ft above river, and 10 ft below a brushy brink, 80 ft diagonally below a Gyrfalcon (*Falco rusticolus*) aerie; 12 July, near the mouth of the Killik, young covered with body feathers and wing quills still in sheaths about 20 mm long in a nest of sphagnum moss lined with caribou hair and Rough-legged Hawk (*Buteo lagopus*) feathers, placed under a loose slab of projecting sandstone. fledging data are provided by the following: On 27 July 1967 about 10 miles below the Etivluk, we saw four young recently out of the nest and flying; on 27 July 1969, near the Killik, we found three young about a day or two out of the nest.

Irving (U.S. Natl. Mus. Bull., No. 217, 1960) stated that in both 1950 and 1951 one family of phoebes was seen in the Killik valley and one in the Anaktuvuk Pass region. In 1952 he found them at additional places in both regions. Irving was surprised that the Anaktuvuk Pass Eskimos did not know the bird, nor did they recall having seen it, for the phoebe has conspicuous and distinctive habits. He did not know why these astute natives were unaware of such a conspicuous bird, but Irving believed that the phoebes were nonetheless not newcomers to the Brooks Range.

The available data suggest to us that Say's Phoebe has entered the foothills of the Arctic Slope from the Brooks Range by following down the valleys of the Killik and Etivluk rivers and then rather suddenly spreading up and down the Colville, occupying most of the suitable nesting cliffs within a few years (essentially since 1960). This is the most diagram-

matic example of a trend that has been noted for several other species, which have either increased the density of peripheral breeding populations or have expanded northward on the Arctic Slope in recent years: Spotted Sandpiper (*Actitis macularia*), Yellow Warbler (*Dendroica petechia*), Gray-cheeked Thrush (*Catharus minima*), Northern Shrike (*Lanius excubitor*), Arctic Warbler (*Phylloscopus borealis*), Gray Jay (*Perisoreus canadensis*), and Wheatear (*Oenanthe oenanthe*). Conspicuous avenues of dispersal for most of these species would be up the south-flowing John or Alatna rivers, across low passes to the adjacent headwaters of the north-flowing Killik, and/or up the south-flowing Aniak River to the adjacent headwaters of the north-flowing Etivluk.

The northern limits of the phoebe as a breeding bird are closely associated with the northern distributional limits of solid, relatively stable, shale or sandstone-limestone cliff structure, approximately at 69° N. In the western part of arctic Alaska, Williamson et al. (Pp. 437-480 in: N. J. Wilimovsky and J. N. Wolfe, Environment of the Cape Thompson region, Alaska, U.S. Atomic Energy Commission, Div. of Tech. Inform., PNE-481, 1966) found a nest on a sea cliff at Cape Thompson, ca. 68°08' N; and Childs (Biol. Pap. Univ. Alaska, No. 10, 1969) found one on the Pitmegea River at ca. 68°50' N in 1959. In 1970, the northernmost pair on the Sagavanirktok River was near the confluence with Lupine River, ca. 69°05' N (White and J. Streater, unpubl. data), and the northernmost pair on the Canning River, was on the east-central part of the slope, ca. 69°45' N (White and W. R. Spofford, unpubl. data). Eastward from the Canning River, mountains and foothills

with firm rocky faces extend farther north, and we would expect to find phoebes as far north as the appropriate cliff structure permits. Cade (unpubl. data) found phoebes nesting several times around Lake Peters at 69°20' N between 1959 and 1963.

Of the three members of the genus *Sayornis*, the Eastern Phoebe (*Sayornis phoebe*) occurs in the deciduous forests and temperate climate of eastern and central North America, the Black Phoebe (*S. nigricans*) is essentially a low temperate to subtropical species occurring as far south as northwestern Argentina, and the Say's Phoebe seemingly occupies the widest range of habitats from the xeric regions of northwestern México to the Arctic tundras. Mayr (1964, op. cit.) has suggested that the family Tyrannidae represents what he terms an "expanding South American" group that has become geographically widespread after having probably originated in tropical Central or South America. The genus *Sayornis* (seemingly of a subtemperate to subtropical origin) expresses the "expanding" nature or colonizing and dispersing abilities of the group through the species *saya*.

Say's Phoebe may have been able to establish itself in the arctic tundras, with their periodic spells of freezing summer weather, for two reasons: the presence of cliffs that provide the essentials of the nesting habitat; and its habit of foraging frequently on the ground and on the talus slopes of the river banks for invertebrates (e.g., spiders or sluggish insects) during freezing and snowy spells when the flying insects most utilized by the flycatchers are scarce.

Accepted for publication 26 May 1972.

## A REVIEW OF THE WHITE-BREASTED WOODWRENS OF MÉXICO AND CENTRAL AMERICA

ROBERT W. DICKERMAN

Department of Microbiology  
Cornell University Medical College  
1300 York Avenue  
New York, New York 10021

The White-breasted Wood Wren (*Henicorhina leucosticta*) inhabits the undergrowth of semi-humid to wet tropical forests from México south to Colombia and Brazil. The populations of México and Central America have been divided into three forms: *H. l. prosthaleuca* (Sclater) of eastern México, British Honduras, and all but easternmost Guatemala; *H. l. tropaea* (Bangs and Peters) of the Caribbean coastal areas of easternmost Guatemala through Honduras, Nicaragua, and most of Costa Rica; and *H. l. pittieri* (Cherrie) which occurs in the Golfo Dulce region of Costa Rica and on the Pacific slopes of Panamá, eastward to the Canal Zone (ranges as presented by Paynter 1960). Russell (1964) found much individual variation within the birds of Belize (British Honduras), but considered them to belong to *H. l. prosthaleuca*. Land (1970) summarized the ranges: "*H. l. prosthaleuca*, Mexico to Belice; [in Guatemala] in the Petén only; *H. l. tropaea*, lowlands of Chiapas to Panama. . . ." Monroe (1968), while noting that the

southern populations averaged more rufescent above, could see no differences in the crown stripes between Mexican and Costa Rican individuals and considered *tropaea* to be a synonym of *prosthaleuca*. He did not state the museum age of the specimens examined, nor whether he realized the extent of foxing in this species.

Recently, while labeling a specimen from Son-tecomapan, Veracruz, and one from near Flores, Peten, Guatemala, I was amazed at the dramatic differences in dorsal coloration, the Veracruz bird being deep brown and the Peten specimen a paler grayish brown. On assembling additional recently taken material, I found that the Peten population represents an undescribed subspecies and that to make the systematics of the species consistent in Central America another form from Costa Rica must be described. The Mexican and Central American forms of the White-breasted Wood Wren, based on relatively unfoxed specimens collected in the last 20 years, are summarized below. There are no differences in extent of white ventral coloration.

### *Henicorhina leucosticta prosthaleuca*

*Scytalopus prosthaleucus* Sclater ("1856")

*Type locality.* Cordoba, Veracruz, México.

*Diagnosis.* Brownest (grayer, less rufous) dorsally and on crown of Central American forms.

*Range.* Tropical moist forests of México extending across the southern Peten of Guatemala into Belice. Intergrading with *tropaea* in eastern Guatemala