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Postbreeding movements of selected species of birds in Athens, Georgia.—During the postbreeding period individuals of many species leave their breeding habitats to wander considerable distances. This period is, perhaps, the least known and understood portion of the avian life cycle (cf. Greenwood and Harvey 1982). This paucity of data is understandable because in many cases birds stop singing, and become secretive, or leave the study area completely, making study difficult. Here we report on the postbreeding movements of several passerine species at a north Georgia study site.

Study area.—The study was conducted at the Horseshoe Bend Research Area in Athens, Clarke County, Georgia, in the Piedmont region 90 km south of the Appalachian highlands. The topography is gently rolling with slopes generally less than 15° (R. H. Delia and C. M. Morgan, pers. comm.). Climate is mild with a mean daily temperature of 24.5°C in June and average annual rainfall of 127 cm. The site is roughly 13 ha, bounded on 3 sides by the North Oconee River and on the fourth side by a 4-lane highway. It contains both riparian forest and old field habitats (Fig. 1).

Riparian forest comprises a strip 50–100 m in width bordering the river, in which elm (*Ulmus americana*) and red maple (*Acer rubrum*) are the dominant overstory species. Canopy height is 15–20 m. The old field community, which is isolated from other similar habitat by a minimum of 150 m (Fig. 1), is dense herbaceous growth (e.g., *Aster*, *Ambrosia*, and *Cassia*), 1–2 m in height, with emergent saplings (*Acer*, *Ligustrum*) 2–3 m in height taking over parts of the site.

Methods.—Sixteen nylon mist nets (12 m × 2.6 m × 30 mm, 36 mm, and 61 mm mesh) were placed 50 m apart in the forest along a path that roughly paralleled the river (Fig. 1). Seven of these nets were placed on 17 April, 2 on 3 May, and 7 on 10 May. On 16 July, 7 additional nets were placed 50 m apart on a curved line through the old field. Nets were usually run from daybreak until 12:00. Birds were trapped from 17 April to 15 October 1980. All were banded with U.S. Fish and Wildlife Service bands. Date, time, net number, molt, and fat were recorded for each capture. Sex was determined whenever possible by plumage, brood patch, or cloacal protuberance. Age was determined by examination of plumage and degree of skull pneumatization. The amount of subcutaneous fat was characterized as none = no fat in furcular region; very light = traces of fat in the furcular region; light = furcular region filled with fat, traces in the axillary region; moderate = furcular and axillary regions covered with fat, traces in abdominal region; and heavy = abdomen covered with fat. Molt was characterized as none = no pin feathers or sheathing in any tract, light = 1–4 in a given tract, moderate = 5–9, and heavy = 10 or more. Daily notes were kept throughout the study on species observed or heard singing on the site.

Results and discussion.—We captured 374 birds of 55 different species during 4733 net-h. Based on individuals heard singing, nests observed, or observations of young being fed in addition to capture data, we concluded that a minimum of 17 species bred on the Horseshoe Bend study site in 1980 (Table 1). Another 21 species were captured in spring or fall (Table 1). A third group of species does not fit into either of these categories. These birds are known to breed in the state of Georgia, but there was no evidence of their presence on the old field portion of the site until they were captured there in July and August (Table 2). Some of these species are known to breed commonly in the Athens area, but for others there are few or no records as breeding birds in the area.

Thirty-three individuals of 14 species (Table 2) exemplify postbreeding movement. When captured at our old field site, they were either out of their normal habitat, out of their breeding range, or not known to have been nesting on our specific site based on netting and observations.

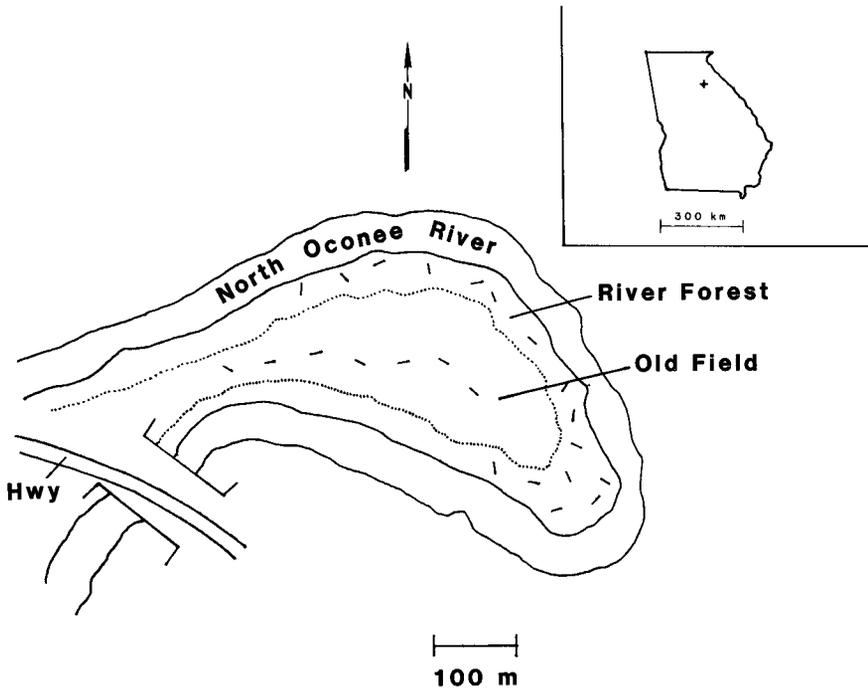


FIG. 1. Location of the river forest and old field study sites at Horseshoe Bend study area. Dashes (-) represent net locations.

We distinguish 4 subgroups based on habitat preferences, breeding range, and seasonal status in Athens (Burleigh 1938, Johnston 1954, Tramer 1968):

Species breeding on the site but not in the old field.—The Wood Thrush (scientific names are in Table 1), the only bird in this category, was a common breeding species in the riparian forest portion of the study area where singing individuals were heard from the beginning of the study (17 April) until 15 July. Although 33 Wood Thrushes were captured in the forest, no Wood Thrush was seen, heard, or captured in old field habitat until 21 July. Thereafter, 4 of these birds were captured in old field habitat during July and August. Two of the 4 individuals showed moderate or heavy molt, little or no fat, and had been eating pokeberries (*Phytolacca americana*). No Wood Thrushes were captured in riparian forest from 30 July until 17 September.

Species breeding in the Athens area in old field habitat, but not found as breeders on our site.—Five species (Yellow-billed Cuckoo, Ruby-throated Hummingbird, Brown Thrasher, Prairie Warbler, and Blue Grosbeak) met these criteria.

Species breeding in the Athens area, but not in old field type habitats.—Two species (Acadian Flycatcher [riparian forest] and Pine Warbler [mature pine forest]) met these criteria.

Species breeding commonly in the north Georgia mountains that are rare or absent as breeders in the Athens area.—Six species (Northern Parula, Black-and-white Warbler, American Redstart, Ovenbird, Canada Warbler, and Scarlet Tanager) met these criteria.

TABLE 1
BREEDING BIRDS, TRANSIENTS, AND WINTER RESIDENTS CAPTURED AT THE HORSESHOE
BEND STUDY SITE

Species	Status ^a	Habitat ^b	Captures	Recaptures
Sharp-shinned Hawk (<i>Accipiter striatus</i>)	WR	RF	1	0
Northern Bobwhite (<i>Colinus virginianus</i>)	PR(B)	OF	1	0
Eastern Screech-Owl (<i>Otus asio</i>)	PR(B)	RF	2	0
Northern Flicker (<i>Colaptes auratus</i>)	WR	RF	1	0
Downy Woodpecker (<i>Picoides pubescens</i>)	PR(B)	RF	2	2
Pileated Woodpecker (<i>Dryocopus pileatus</i>)	PR(B)	RF	2	0
Great Crested Flycatcher (<i>Myiarchus crinitus</i>)	T	RF	1	0
Eastern Wood-Pewee (<i>Contopus virens</i>)	T	RF	1	0
Blue Jay (<i>Cyanocitta cristata</i>)	PR(B)	RF	14	2
Carolina Chickadee (<i>Parus carolinensis</i>)	PR(B)	RF	4	0
Tufted Titmouse (<i>P. bicolor</i>)	PR(B)	RF	17	3
Carolina Wren (<i>Thryothorus ludovicianus</i>)	PR(B)	RF	29	10
House Wren (<i>Troglodytes aedon</i>)	WR	RF	1	0
Veery (<i>Catharus fuscescens</i>)	T	RF	4	0
Gray-cheeked Thrush (<i>C. minimus</i>)	T	RF	1	0
Swainson's Thrush (<i>C. ustulatus</i>)	T	RF	5	0
Wood Thrush (<i>Hylocichla mustelina</i>)	SR(B)	RF	33	17
American Robin (<i>Turdus migratorius</i>)	WR	RF	5	0
Gray Catbird (<i>Dumetella carolinensis</i>)	SR(B)	OF	22	6
White-eyed Vireo (<i>Vireo griseus</i>)	SR(B)	OF	13	6
Yellow-throated Vireo (<i>V. flavifrons</i>)	T	RF	1	0
Red-eyed Vireo (<i>V. olivaceus</i>)	T	RF	5	0
Blue-winged Warbler (<i>Vermivora pinus</i>)	T	OF	1	0
Golden-winged Warbler (<i>V. chrysoptera</i>)	T	OF	1	0
Yellow Warbler (<i>Dendroica petechia</i>)	T	OF	1	0
Chestnut-sided Warbler (<i>D. pensylvanica</i>)	T	OF	2	0
Magnolia Warbler (<i>D. magnolia</i>)	T	OF	5	0
Yellow-rumped Warbler (<i>D. coronata</i>)	T	OF	5	0
Worm-eating Warbler (<i>Helmitheros vermivorus</i>)	T	RF	1	0
Kentucky Warbler (<i>Oporornis formosus</i>)	T	OF	3	0
Common Yellowthroat (<i>Geothlypis trichas</i>)	SR(B)	OF	29	0
Hooded Warbler (<i>Wilsonia citrina</i>)	T	OF	4	0
Yellow-breasted Chat (<i>Icteria virens</i>)	SR(B)	OF	1	0
Northern Cardinal (<i>Cardinalis cardinalis</i>)	PR(B)	RF, OF	27	3
Indigo Bunting (<i>Passerina cyanea</i>)	SR(B)	OF	6	0
Rufous-sided Towhee (<i>Pipilo erythrophthalmus</i>)	PR(B)	RF	4	0
Field Sparrow (<i>Spizella pusilla</i>)	PR(B)	OF	4	0
White-throated Sparrow (<i>Zonotrichia albicollis</i>)	WR	RF	7	0

^a PR = permanent resident; SR = summer resident; WR = winter resident; T = transient; (B) = breeds on the site.

^b RF = riparian forest; OF = old field.

TABLE 2
POSTBREEDING WANDERERS CAPTURED DURING JULY AND AUGUST 1980 IN OLD FIELD
HABITAT OF THE HORSESHOE BEND STUDY AREA

Species	Capture date	Sex ^a	Age ^b	Fat ^c	Molt ^d
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	5 Aug	U	U	Very light	None
Ruby-throated Hummingbird (<i>Archilochus colubris</i>)	23 Jul	U	U	None	Heavy breast
	1 Aug	F	A	None	None
	12 Aug	U	U	Very light	Moderate breast
	31 Aug	M	A	None	Moderate body
Acadian Flycatcher (<i>Empidonax virescens</i>)	12 Aug	F	I	Very light	Moderate body
	14 Aug	U	A	Very light	Light body
	18 Aug	U	A	Very light	Light body
	18 Aug	U	A	Very light	Light body
	19 Aug	U	I	Very light	Light body
Wood Thrush (<i>Hylocichla mustelina</i>)	21 Jul	U	U	None	None
	21 Jul	F	A	Very light	None
	19 Aug	U	I	Light	Heavy body
	28 Aug	U	I	None	Moderate body
Brown Thrasher (<i>Toxostoma rufum</i>)	17 Jul	F	A	None	None
Northern Parula (<i>Parula americana</i>)	21 Jul	U	I	None	Heavy body
	21 Jul	U	I	None	Heavy body
	30 Jul	M	A	None	Heavy body
	8 Aug	U	I	Very light	None
	12 Aug	U	I	Very light	Heavy body
Pine Warbler (<i>Dendroica pinus</i>)	18 Aug	U	I	Very light	None
Prairie Warbler (<i>D. discolor</i>)	26 Jul	U	I	Very light	None
	14 Aug	F	A	Very light	Light breast
Black-and-white Warbler (<i>Mniotilta varia</i>)	17 Jul	U	U	U	U
	31 Aug	F	I	Light	None
American Redstart (<i>Setophaga ruticilla</i>)	8 Aug	F	A	Very light	Light body
Ovenbird (<i>Seiurus aurocapillus</i>)	25 Jul	F	A	None	Heavy body
Canada Warbler (<i>Wilsonia canadensis</i>)	8 Aug	M	I	Heavy	None
Scarlet Tanager (<i>Piranga olivacea</i>)	21 Aug	F	U	Heavy	Moderate body
Blue Grosbeak (<i>Guiraca caerulea</i>)	14 Aug	F	A	Very light	Light breast
	28 Aug	U	I	Very light	None
	28 Aug	U	I	Very light	None
	28 Aug	U	I	Very light	None

^a F = female, M = male, U = unknown.

^b J = juvenile, A = adult, U = unknown.

^c See text for fat class descriptions.

^d See text for molt class descriptions; "body" = molt found in all tracts, except wings and tail.

Although postbreeding movement has often been equated with the beginning of fall migration (Bent 1953, Hahn 1937, Pulich 1976), over half (19 of 33) of the postbreeding wanderers we trapped showed some degree of molt. Though individuals of several species do overlap molt and migration somewhat, such birds usually represent a small percentage of the population (Rappole, unpubl. data). Furthermore, few individuals of any species show heavy body molt during migration, a condition found in 7 of the birds captured in the old field habitat (1 Ruby-throated Hummingbird, 3 Wood Thrushes, 2 Parula Warblers, 1 Ovenbird).

The lack of subcutaneous fat reserves also argues against these birds being in a migratory state. Only 2 of the 33 birds captured, a Canada Warbler and a Scarlet Tanager, showed more than light fat reserves. Also, 5 of the species (Wood Thrush, Brown Thrasher, Ovenbird, Canada Warbler, and Scarlet Tanager) were captured at the site long before early migration dates for the species in north Florida, based on 25 years of TV tower kill data (Crawford 1981).

A southward "drift" is indicated by the fact that several of the species captured breed commonly 100 km or so north of the study area (Burleigh 1958, Denton et al. 1977) but are rare or absent as breeders in Athens or farther south (Burleigh 1958). To call this a migration, however, is not warranted, given the lack of fat reserves and the presence of molt in many cases. Such a drift has been postulated for the Water Pipit (*Anthus spinoletta*) (Verbeek 1970), the Golden-cheeked Warbler (*Dendroica chrysoparia*) (Pulich 1976), and the Ovenbird (Hahn 1937).

Eleven of 14 species in the sample of wanderers (Table 2) are single-brooded, long-distance migrants. We suggest that these birds abandon their breeding territories shortly after completion of breeding and wander in search of abundant food resources that are available in many natural, terrestrial habitats of the southeast during the summer and early fall months. The species that did not disappear from our site were either permanent residents (Tufted Titmouse, Carolina Wren, Northern Carolina) or double-brooded migrants (Gray Catbird, White-eyed Vireo, Common Yellowthroat).

Postbreeding, premigration wandering is supported by the fact that the birds neither sang nor gave call notes. These same species sing and call vigorously in defense of breeding territories, and they average 1–2 min/h in defense of winter feeding territories (Rappole and Warner 1980). Even many transients defend feeding territories, using call notes and displays (Rappole and Warner 1976). The silence of these birds at our study site in July and August, 1980, their lack of site tenacity, and their lax preferences with regard to habitat selection all indicate that food was not limiting, and that intra- and interspecific competition for resources were not particularly stringent during this postbreeding period.

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Spring migration of Long-eared Owls and Northern Saw-whet Owls at Nine Mile Point, New York.—Although Long-eared Owls (*Asio otus*) and Northern Saw-whet Owls (*Aegolius acadicus*) occur in New York State throughout the year, they are observed in greatest numbers during migration and in winter. Although hawk migration in spring has been studied for years along the southern shore of Lake Ontario (Haugh and Cade 1966, Smith and Muir 1978, Moon and Moon 1985), there are no published studies of owl migration there. Here we summarize data collected along the south shore of Lake Ontario on the spring migration of Long-eared Owls and Northern Saw-whet Owls during the springs of 1981 through 1986.

Study area and methods.—The study was conducted on the Richard A. Noyes Wildlife Sanctuary at Nine Mile Point, New Haven, Oswego County, New York, along the southeastern shore of Lake Ontario (Fig. 1). The 90-acre sanctuary is composed of northern hardwood forest (*Acer rubrum*, *Quercus rubra*, *Fagus grandifolia*, *Tsuga canadensis*), red pine (*Pinus resinosa*) plantations, and shrub (*Viburnum dentatum*, *Cornus* spp., *Alnus rugosa*) habitat.

Mist nets (30-114 mm mesh, 5-12 m length) were placed within wooded and shrub areas, across trails, and along ecotones on a total of 117 nights (9, 16, 18, 37, 18, 19; 1981-1986, respectively). The banding station was in operation from early March (weather permitting) until late April or mid-May, when migration appeared to end. The number of nets operated on a given night ranged from 4 to 40, depending upon weather conditions and the number of assistants available. The total effort for all years was 25,023 net-h. Nets were open from before sunset to after sunrise, unless weather conditions forced the closure of all or some of them. Nets were checked at 1 to 2.5 h intervals, depending upon weather conditions. For each owl captured, the date and time (EST), age and sex, location of the capture, and weather