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Front Cover: Green Heron preening. Photo by Jerome A. Jackson.

TIMING OF WOOD WARBLER MIGRATION IN WESTERN MISSISSIPPI AS DOCUMENTED BY BIRD BANDING

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Since 1983 I have systematically netted and banded songbirds during migration in my back yard at 930 S. Washington Ave., Greenville, Washington County, Mississippi (Lat: 33 degrees 23 minutes; Long: 91 degrees 03 minutes). This site is located approximately 4 miles east of the Mississippi River. This article summarizes data gathered on the timing of the migration of wood warblers (Parulinae) in western Mississippi as evidenced by my banding activities. Between 1 March and 31 May, and also between Labor Day and Thanksgiving, I routinely have mist-netted birds on weekends from dawn to dark, and occasionally at other times during the week. Inclement weather and occasional personal business, as well as other activities, especially in the fall, have limited my banding somewhat. During the ten-year period from March, 1983 through November, 1992, I operated up to three 12- meter, 30-mm mesh mist nets on 573 days (8278 net-hours) in spring, and on 168 days (2944 net-hours) in the fall.

The habitat in the neighborhood includes mature hardwood trees with abundant shrubbery and a "hedge" of cane along the rear and sides of my yard. Predominant trees and shrub species include: pin oak (*Quercus palustris*), water oak (*Quercus nigra*), pecan (*Carya illinoensis*), sugarberry (*Celtis laevigata*), Atlantic White Cedar (*Chamaecyparis thyoides*), hawthorne (*Crataegus* sp.), and privet (*Ligustrum*).

Table 1 indicates the timing of my banding efforts by month and year during the ten-year period. Tables 2 and 3 summarize the timing of the capture of the 19 species of warblers that I have netted and banded during the study period. Table 4 suggests the annual concentration of migrating warblers based on banding efforts during the period.

Table 1. Timing of Banding Activities. Number of days (net-hours) of banding effort.

| Year | March | April | May | Sept. | Oct. | Nov. |
|--------|---------------|---------------|---------------|--------------|-------------|-------------|
| 1983 | 23(222) | 28(448) | 22(226) | 11(214) | 12(214) | 9(208) |
| 1984 | 24(346) | 27(411) | 19(218) | 12(137) | 17(211) | 7(115) |
| 1985 | 21(288) | 25(280) | 10(96) | 0 | 0 | 0 |
| 1986 | 25(344) | 25(318) | 22(341) | 17(279) | 6(139) | 9(178) |
| 1987 | 0 | 21(352) | 17(300) | 21(373) | 10(177) | 4(75) |
| 1988 | 17(188) | 28(421) | 20(340) | 0 | 0 | 0 |
| 1989 | 11(211) | 27(455) | 21(434) | 6(66) | 5(72) | 13(316) |
| 1990 | 6(111) | 17(222) | 12(240) | 0 | 0 | 0 |
| 1991 | 24(295) | 23(304) | 18(280) | 0 | 0 | 0 |
| 1992 | 12(130) | 17(252) | 11(205) | 0 | 7(161) | 2(26) |
| Totals | 163 (2135) | 238 (3463) | 172 (2680) | 67 (1069) | 57 (957) | 44 (918) |

Table 2. Timing of the Capture of Spring Migrant Wood Warblers
in Western Mississippi (1983 through 1992).

| FREQUENCY OF CAPTURE BY WEEK | | | | | | | | | | | | | |
|--|-------|----|----|----|-------|----|---|---|-----|---|---|---|---|
| Species/Week | March | | | | April | | | | May | | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | |
| Orange-crowned Warbler (<i>Vermivora celata</i>) Unknown sex | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tennessee Warbler (<i>Vermivora peregrina</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Tennessee Warbler Females | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 |
| Unknown sex | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 |
| Northern Parula (<i>Parula americana</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Magnolia Warbler (<i>Dendroica magnolia</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 4 | 0 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 1 | 0 | 0 |
| Yellow-rumped Warbler (<i>Dendroica coronata</i>) Males | 5 | 10 | 15 | 39 | 9 | 15 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Females | 3 | 12 | 12 | 22 | 4 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Unknown | 2 | 8 | 5 | 13 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| Species/Week | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prairie Warbler (<i>Dendroica discolor</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bay-breasted Warbler (<i>Dendroica castanea</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black-and-white Warbler (<i>Mniotilta varia</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| American Redstart (<i>Setophaga ruticilla</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worm-eating Warbler (<i>Helmitheros vermivorus</i>) Unknown sex | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 |
| Ovenbird (<i>Seiurus aurocapillus</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 4 | 9 | 0 | 0 |
| Unknown sex | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 9 | 4 | 7 | 4 | 0 |
| Louisiana Waterthrush (<i>Seiurus motacilla</i>) Unknown sex | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| Species/Week | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|--|---|---|---|---|---|---|---|---|---|---|---|---|
| Kentucky Warbler (<i>Oporornis formosus</i>) Males | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 2 | 2 | 1 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 3 | 0 | 0 | 0 |
| Unknown sex | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 3 | 0 | 0 | 0 |
| Mourning Warbler (<i>Oporornis philadelphia</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Common Yellowthroat (<i>Geothlypis trichas</i>) Males | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 3 | 4 | 0 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 3 | 2 | 0 | 0 |
| Hooded Warbler (<i>Wilsonia citrina</i>) Males | 0 | 0 | 0 | 1 | 5 | 4 | 0 | 1 | 0 | 1 | 0 | 0 |
| Females | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 4 | 0 | 1 | 0 | 0 |
| Wilson's Warbler (<i>Wilsonia pusilla</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Canada Warbler (<i>Wilsonia canadensis</i>) Males | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 3 | 0 |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 |
| Sex unknown | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |

| Species/Week | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|----|----|----|----|----|----|----|----|----|----|---|---|
| Yellow-breasted Chat (<i>Icteria virens</i>) | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 |
| Males | | | | | | | | | | | | |
| Females | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sex unknown | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 2 | 0 | 0 |
| Spring Totals: Winter residents | 10 | 30 | 32 | 74 | 15 | 18 | 5 | 1 | 0 | 0 | 0 | 0 |
| Summer residents & transients | 0 | 0 | 0 | 2 | 2 | 16 | 28 | 48 | 37 | 31 | 6 | 0 |

Table 3. Timing of the Capture of Fall Migrant Wood Warblers in Western Mississippi (1983 through 1992).

| FREQUENCY OF CAPTURE BY WEEK | | | | | | | | | | | | | |
|---|-------|---|---|---|------|---|---|---|------|---|---|---|---|
| Species/Week | Sept. | | | | Oct. | | | | Nov. | | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | |
| Tennessee Warbler Male (AHY =After Hatching Year) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Northern Parula Male (U=Unknown age) | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Magnolia Warbler Male (AHY) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Yellow-rumped Warbler Male (AHY) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

| Species/Week | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black-and-white Warbler Female (HY = Hatching Year) | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ovenbird Unknown sex (AHY) | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kentucky Warbler Male (AHY) | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Female (U) | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hooded Warbler Male (HY) | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Yellow-breasted Chat Unknown sex (AHY) | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fall Totals: Winter residents/transients | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 |
| Summer residents | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 4. Migrant Warblers Captured Per 500 Net Hours.

SPRING^a

| | March | April | May | Year Totals |
|------|-------|-------|------|-------------|
| 1983 | 0 | 24.5 | 33.2 | 57.7 |
| 1984 | 0 | 24.3 | 23.0 | 47.3 |
| 1985 | 1.7 | 8.9 | 15.6 | 26.2 |
| 1986 | 0 | 26.7 | 14.6 | 41.3 |
| 1987 | b | 7.1 | 15.0 | 22.1 |

| | March | April | May | Year Totals |
|------|-------|-------|------|-------------|
| 1988 | 0 | 7.1 | 19.1 | 26.2 |
| 1989 | 0 | 4.4 | 15.0 | 19.4 |
| 1990 | 0 | 20.3 | 25.0 | 45.3 |
| 1991 | 1.7 | 13.2 | 10.7 | 25.6 |
| 1992 | 3.9 | 13.9 | 12.2 | 30.0 |

FALL

| | Sept. | Oct. | Nov. | Year Totals |
|------|-------|------|------|-------------|
| 1983 | 2.3 | 2.5 | 0 | 4.8 |
| 1984 | 7.3 | 0 | 0 | 7.3 |
| 1985 | b | b | b | b |
| 1986 | 0 | 3.6 | 2.8 | 6.4 |
| 1987 | 0 | 0 | 0 | 0 |
| 1988 | b | b | b | b |
| 1989 | 0 | 7.0 | 0 | 7.0 |
| 1990 | b | b | b | b |
| 1991 | b | b | b | b |
| 1992 | 0 | 0 | 0 | 0 |

^a Spring totals exclude local winter residents (Yellow-rumped Warbler);
Fall totals exclude local summer residents (Northern Parula, Kentucky
Warbler, Yellow-breasted Chat).

^b Nets were not opened during these months.

CONCLUSIONS:

In reviewing the data accumulated, several questions can be considered:

- (1) Can a general statement be made as to the peak arrival dates of migrating warblers in western Mississippi?
- (2) Do males and females migrate together or separately?
- (3) Much has been published concerning the demise of songbirds due to winter habitat destruction. What are our observations concerning this problem?
- (4) Do we have enough data to arrive at any conclusions regarding fall migration?

Although the data set presented spans ten years and represents thousands of hours of effort, the numbers of individuals captured limit the conclusions that can be drawn from the data. Nonetheless, some generalizations might be made:

- (1) **Peak Spring Arrival Dates:** A general statement can be made that most migrating warblers arrive at our location in late April and early May. The arrival/departure dates in the fall are non-conclusive due to either inadequate effort, or a paucity of fall migrants (see Tables 3 and 4).
- (2) **Male-Female Spring Arrival Dates:** A general conclusion can be made that, for those species with adequate sample sizes, males tend to arrive about a week before females). Using warblers representing 15 or more banded per species:

Magnolia: males: 1st wk in May; females: 2nd wk in May

Ovenbird: males: 3rd wk in April; females: 4th wk in April

Kentucky: males and females arrive at same time.

Yellowthroat: males: 3rd wk in April; females 4th wk in April

Hooded: males: 1st wk in April; females: 3rd wk in April

Canada: males 1st wk in May; females: 2nd wk in May

(3) Is there a trend (either negative or positive) in the overall numbers of spring migrating warblers over the ten-year period? Except for the initial year of 1983, the numbers of migrants banded suggest that the migration of warblers in this area has changed little (see Table 4).

(4) Fall Data: My data are inadequate for fall migration to arrive at any conclusions. I suspect that we have far fewer migrants in the fall than in the spring.

When I initiated this project, I had envisioned capturing many more migrants than I actually have captured. My reasoning was based on the location so close to the Mississippi River, the center of the Mississippi flyway, as well as the fact that very little was known at the time as to the timing and quantities of migrants in this area. Although the results have been somewhat disappointing, the project has added to the present available information regarding migrant movements. I hope to continue for another ten or so years and to intensify efforts in the fall.

LAZULI BUNTING IN OXFORD, MISSISSIPPI

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A Lazuli Bunting (*Passerina amoena*) was first sighted in our backyard on 18 March 1988. The bird was noted visiting a large feeder filled with mixed bird seed and crumbled cookies. The feeder was hanging from a tree branch about 8 m (25 ft) from the house. On subsequent days the bunting fed regularly in early morning (about 8:00 a.m.) and late afternoon (about 4:00 p.m.), staying for about 45 minutes at the feeder or in an adjacent flowering dogwood (*Cornus florida*). On some days it did not appear. The last day it was seen was 28 March 1988. I came to the feeder at #:55, again from 4:15 to 4:30 when it was also observed by Gene and Shannon Knight, Benton Brewer, and Jean Allen Young. Gene Knight tentatively identified the plumage as being that of a first spring male. The bunting was last seen at the feeder at 6:00 p.m. on that day.

This is the first report for the Lazuli Bunting from Mississippi, although it has been found in nine other states east of the Mississippi River (DeSante and Pyle, 1986, Distributional Checklist of North American Birds, Artemesia Press, Lee Vining, CA). This record is similar to the sole record for Arkansas (James and Neal, 1986, Arkansas Birds -- Their Distribution and Abundance, Univ. Arkansas Press, Fayetteville, AR). A single Lazuli Bunting was identified at a feeder in Little Rock by several observers on 15 March 1980.

NORTHERN ROUGH-WINGED SWALLOWS EXCAVATING AT HOLES AMONG THE ROOTS OF UPTURNED TREES

Jerome A. Jackson

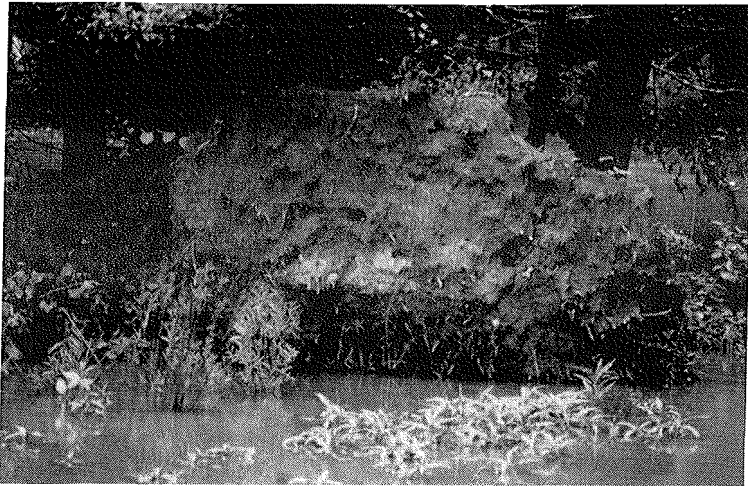
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On 16 and 18 May 1989, I observed Northern Rough-winged Swallows (*Stelgidopteryx serripennis*) excavating at holes in the dirt adhering to the roots of trees that had been blown over at and adjacent to Noxubee National Wildlife Refuge, Oktibbeha County, Mississippi. While rough-wings rarely, if ever, excavate a burrow completely on their own (Gaunt 1963, Lunk 1962), they will readily use or modify existing holes such as old kingfisher burrows or even drainage pipes. The Northern Rough-winged Swallows I observed were entering holes created when large roots broke and pulled out of the adhering dirt as the tree fell. One hole that they investigated was possibly initiated by a Belted Kingfisher (*Ceryle alcyon*). The swallows were persistent in their efforts, deviating from the straight path of their burrow when a root was reached and excavating until their tunnel broke through on the opposite side, approximately, a distance of about 0.4 m. At that point they followed another root hole. Four tunnels were present among the roots of one upturned sweetgum (*Liquidambar styraciflua*) on the refuge. Three were present among the roots of a water oak in a pasture approximately 5 km away. The first site was in a flooded area and the dirt adhering to the roots appeared much as a bank would appear along a stream (Figure 1). The pasture site, however, was not associated with water.

The literature provides varied reports as to the depth of normal Northern Rough-winged Swallow nests. Howe (1900) suggested that nests were usually placed at "arm's depth" -- no doubt learned by egg collecting. Blake 1953:107 measured the depth of two nests as 20 and 28 inches (51 and 71 cm) deep. The most interesting study of the placement of these birds' nests was done by Hill (1988), and involved precise measurement of the depth of nests placed in uniformly long plastic drainage pipes. Hill found that 44 nests averaged 82.4

cm (32.45 in) from the entrance and ranged in depth from 53 to 117 cm (21-46 in). The dirt around the roots of these upturned trees didn't quite reach the minimum depth suggested by these studies. However, it is conceivable that dirt associated with the roots of larger downed trees might have provided nest sites for this species along coastal plain streams in the past.

Figure 1. Windblown sweetgum with root holes enlarged by Northern Rough-winged Swallows.



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