

Nesting Willow Flycatchers Discovered at Harrison, Arkansas

William C. Holimon*
Arkansas Natural Heritage Commission
1500 Tower Building, 323 Center Street
Little Rock, AR 72201

Douglas A. James
Department of Biological Sciences
University of Arkansas
Fayetteville, AR 72701

*Corresponding Author

Abstract

The Willow Flycatcher, *Empidonax traillii* (Audubon), was a newly discovered species when John James Audubon found it at Arkansas Post in 1822. The bird was fairly common in summer in prairie-scrub habitat around Arkansas at least until the 1950s. Thereafter numbers declined until one or two individuals were found occasionally at a single site in Benton County in the late 1980s through 1990s. We found a population consisting of three nesting territories on Baker Prairie Natural Area in Harrison, Boone County, Arkansas. This represents the first confirmed nesting since 1990 and only the second since 1969. A nest with eggs was located 10 July 2002; fledglings were being fed by parents in two territories on 6 August, and only an empty nest was found in the third territory. Baker Prairie is protected by the Arkansas Natural Heritage Commission and The Nature Conservancy. The habitat, tallgrass prairie fringed with woody scrub vegetation, will be managed to benefit the flycatcher.

Introduction

The Willow Flycatcher, *Empidonax trailli* (Audubon), was a newly discovered species when John James Audubon found it at "Fort of Arkansas" in 1822, now called Arkansas Post (Audubon, 1831, 1839; Arthur, 1937). This is the only bird species newly described for science based on a discovery in Arkansas. Audubon found the bird on 17 April 1822 and characterized it as residing "in the skirts of the woods along the prairie lands of the Arkansas River," which describes the southern end of the Arkansas Grand Prairie region. A female bird he collected was listed as having "five pea sized eggs" developing in the ovary.

There has always been consternation concerning Audubon's date because in recent times the summer resident Willow Flycatcher, a late migrant, does not reach Arkansas until May, often well into May (James and Neal, 1986; White, 1995). To investigate this puzzle, Thomas Foti and the late Jane Stern organized a team of observers to monitor Willow Flycatcher activity periodically in 1969 at the last known nesting area in the Grand Prairie area (Foti, 1971), a site now preserved as the Konecny Grove Natural Area at Slovak in Prairie County, Arkansas. Investigators visited the site at frequent intervals from early April into July. The first Willow Flycatchers arrived in early May, nesting occurred in late May into June, and young birds were fledged in late June into July (James and Neal, 1986). Brooke Meanley had earlier also made frequent visits (Meanley, 1952) to a Grand Prairie site. The first pair of flycatchers he found arrived 10 May, nests were built by 28 May, and the first eggs were found in nests 31 May. All this evidence suggests that Audubon may have stated the wrong

month for his female specimen. Perhaps the more likely date was 17 May, not 17 April, because May would be more appropriate for females having developing eggs nearly ready for nest deposition given the documented nesting chronology for this species. However, this species has arrived unusually early in two nearby states. The earliest known arrival date is 20 April in Oklahoma (Sutton, 1967) and 24 April in Indiana (Mumford and Keller, 1984).

Aldrich (1951) further complicated this situation by concluding that Audubon's museum type specimen for the Willow Flycatcher was actually a long winged dark northern form probably migrating northward when Audubon collected it. According to present taxonomy (American Ornithologists' Union, 1998), if Aldrich was correct this would make the specimen a different species, the present Alder Flycatcher now named *Empidonax alnorum* (Brewster, 1895) rather than the Willow Flycatcher, *Empidonax traillii* (Audubon). However, Browning (1993) concluded that the specimen Aldrich inspected was not the same one Audubon collected from Arkansas in 1822. Browning stated that measurements of the specimen did not conform to those given by Audubon and that the specimen's worn plumage suggests that it was collected much later than April. Browning further concluded that the actual type of the Willow Flycatcher collected by Audubon was lost and that the alleged type USNM 1865 did not meet criteria to be a type specimen. In addition, Browning speculated that because birds do not migrate with developing eggs and because the Alder Flycatcher is not known to nest in Arkansas, that the bird Audubon observed and described in 1822 was a Willow Flycatcher that arrived and nested early. Moreover, because the Willow Flycatcher is the only species

that resembles Audubon's illustration and breeds in Arkansas, Browning concluded that nomenclature stability was best served by retaining the name *traillii* Audubon as the specific name for this species.

The American Ornithologists' Union (1973), following the opinion of Eisenmann (committee chairman), reached the same conclusion as Browning using similar reasons when it divided *Empidonax traillii* into two species and retained *traillii* Audubon as the specific name for the Willow Flycatcher (Banks, pers. comm.). However, Eisenmann did not subsequently publish on this opinion. The work by Browning (1993) is therefore considered the authority on this subject (Banks, pers. comm.). The type specimen USNM 1865 of the Willow Flycatcher was refuted by the American Museum of Natural History based on Browning's work (Dean, pers. comm.). Because the only other two type specimens for this species were collected in Oregon and represent *E. t. brewsteri*, the illustration from Arkansas in Audubon's elephant portfolio now serves as the type specimen for the subspecies *E. t. traillii* (Browning, 1993).

Regardless of the date puzzle, this present paper is devoted to documenting the recolonization of the Willow Flycatcher as a nesting bird in Arkansas after its apparent disappearance or near disappearance for about 30 years from around the 1970s to the 2000s. The species probably was abundant in Arkansas when Audubon discovered it because it was subsequently reported to be numerous in suitable habitat around the state until the 1950s (James and Neal, 1986). After which, a rapid decrease followed (James, 1974; James and Neal, 1986).

Methods

We conducted field investigations at Baker Prairie Natural Area, a 71-acre nature preserve co-owned and managed by the Arkansas Natural Heritage Commission and The Nature Conservancy, located in Harrison, Boone County, in northern Arkansas. This site protects a small remnant of tallgrass prairie, which was part of the Osage Prairie that historically covered a large portion of Boone County (Marsh, 1978; Arkansas Natural Heritage Commission, 2001), but now is mostly converted to other land uses. In addition to tallgrass prairie, various shrubs, saplings, and trees grow along a fencerow that borders a pasture adjacent to the western side of the prairie and along an abandoned fencerow within the western half of the Natural Area.

We used territory mapping (Bibby et al., 1997) to determine the number of Willow Flycatcher territories. Males engaged in territorial behavior (song, courtship, and defense) were noted and their locations marked on a study-area map. Locations of adults provisioning nestlings or young juveniles also were mapped. Territorial mapping was conducted between 21 June and 29 August 2002 with

resulting territories delineated using the total mapping technique (Lancia et al., 1994).

We searched for and monitored nests between 27 June and 29 August 2002 to determine nesting success and productivity. These searches were accomplished by following adults carrying food or nesting material and by inspecting habitat suitable for nest sites. Once a nest was discovered, we minimized nest disturbance by making only a limited number of subsequent nest visits, about once a week. A hand-held vanity mirror was used to check nest contents for nest heights above eye level. We checked nests for number of eggs and nestlings, brood parasitism, signs of predation, with type of substrate and nest height also noted. Nests were considered successful if at least one young fledged. To confirm nest success, we made observations of adults feeding young fledglings within territories.

Results

At least six Willow Flycatchers representing three active territories were found on Baker Prairie (Fig. 1). Nests were located in two of the territories, and fledglings being fed were seen in the third one. All three territories produced young birds that successfully fledged. Territory sizes were estimated as 0.64 ha, 1.41 ha, and 0.80 ha for an overall average of $0.95 \text{ ha} \pm 0.40 \text{ SD}$. These territory-size estimates were consistent with those reported from the literature for other Willow Flycatcher populations (Sedgwick, 2000). The center of territory A ran north-south along the interior fencerow within the western half of the natural area and was 284 m northeast of the center of territory B. Territory B was located in the southwestern corner of the natural area with much of the territory running north-south along the western fencerow. The center of territory C was 240 m east of the center of territory B and ran east-west along a fencerow until it intersected a second fencerow, at which point it turned south. The center of territory C was 233 m south of the center of territory A. For all territories, mean distance from the center of one territory to the other was estimated as $252.3 \text{ m} \pm 27.6 \text{ SD}$.

One active nest with four flycatcher eggs and no Brown-headed Cowbird (*Moluthrus ater*) eggs was found in territory A on 10 July 2002. The nest was approximately 3.0 m above the ground in the lowest crotch of the main stem in the upper portion of a smooth sumac (*Rhus glabra*). Nest dimensions were 3.18 cm for inner height, 5.72 cm for outer height, 5.93 cm for inner diameter, and 6.79 cm for outer diameter. On 6 August 2002 three fledglings were seen being provisioned by parent birds within a few meters of this nest. The fledglings on this date had a tail length about 2/3 that of an adult, a clearly visible juvenile gape, and flicked their tails much like adults. No Willow Flycatcher fledglings or adults were observed in this territory on 29 August 2002.

Although no nests were found in territory B, we observed adults provisioning at least three fledglings there on 6 August 2002. These fledglings had a tail length approximately 3/4 that of an adult and a barely visible juvenile gape. The fledglings constantly followed the adults, but were never observed being fed by them. Two Willow Flycatchers were observed in this territory on 29 August 2002, but we could not determine if they were juveniles or adults. No juvenile cowbirds were observed in this territory, though two cowbird eggs were found on 27 June 2002 in a Bell's Vireo (*Vireo bellii*) nest located within the flycatcher territory.

A second flycatcher nest, already abandoned, was discovered on 6 August 2002 in territory C. The nest was approximately 1.27 m above the ground in a crotch of the upper portion of a smooth sumac. Nest dimensions were not measured. A pair of adult Willow Flycatchers was observed in this territory, but was never seen provisioning fledglings. On 29 August 2002, a single Willow Flycatcher fledgling was seen foraging in the vicinity of one of the adults.

Discussion

Our observations show that the Willow Flycatcher is again nesting in Arkansas after being assumed extirpated since the early 1980s (James and Neal, 1986), though sporadic observations have been reported at Lake Bentonville near Rogers, Arkansas (Arkansas Audubon Society Bird Record Files). The bird once was a common breeder across much of Arkansas, particularly in patchy, shrubby areas of prairies and other open habitats. Unfortunately, this species began to decline rapidly in the mid-1900s and by the early 1970s was considered to be endangered in Arkansas (James, 1974). The Arkansas Natural Heritage Commission, based on input from ornithologists across the state, lists the breeding populations of the Willow Flycatcher in Arkansas as extremely rare and especially vulnerable to extirpation. Though occasional sightings of singing males have occurred over the last two decades, the last known definite nesting success in Arkansas was in 1969 at the Konecny Grove Natural Area, near Slovak in Prairie County (James and Neal, 1986). A few birds lingered there through 1982, but no nest searching was performed after 1969, and no birds were found after 1982 (James and Neal, 1986; Foti, pers. comm.). In addition, Mike Mlodinow observed one to two pair of Willow Flycatchers in the nesting season at a site near Rogers, Benton County, Arkansas (Lake Bentonville area) from 1986-1999, and Jimmy Woodard found a nest with nestlings there in 1990 (Arkansas Audubon Society Bird Record Files). The nest was not monitored subsequently, so its fate is unknown.

Our data, combined with anecdotal evidence from the

prior two years, suggest that Willow Flycatchers have become fairly well established at Baker Prairie. At least three pair attempted to nest in 2002 and all three were successful. The site of territory B, where there was confirmed breeding in 2002, was found to have birds in 2001 (Stewart, pers. comm.) and in 2000 (Holimon, pers. obs.). It therefore seems that the Willow Flycatcher has been established at Baker Prairie for at least three years. Bird watchers and ornithologists often visit the prairie but did not find Willow Flycatchers there until 2000.

Chief threats to the Willow Flycatcher are habitat loss, brood parasitism by brown-headed cowbirds, and predation. These threats led to the listing of the southwestern subspecies of this bird as federally endangered (U.S. Fish and Wildlife Service, 1995). In contrast, eastern populations, with the exception of those in Arkansas, are relatively stable and have shown only a slight trend in population declines over the past three decades (Sauer et al., 2001). Eastern populations are not as greatly impacted by cowbird parasitism compared to the southwestern subspecies (Sedgwick, 2000). Habitat loss may be the primary factor leading to the extirpation of the flycatcher in Arkansas. For example, less than 1% of the tallgrass prairie remains in the Grand Prairie Natural Division (Heitmeyer et al., 2000) where Audubon found the bird (Audubon, 1831, 1839; Arthur, 1937). Most of the area now is converted to agricultural fields (Heitmeyer et al., 2000). Willow Flycatchers were common in the Grand Prairie and in other places in the state until the mid-1950s (Howell, 1911; Wheeler, 1924; Baerg, 1951; Meanley, 1952; James and Neal, 1986). However, since then nearly all suitable breeding habitat has been gradually converted for other land uses, and no breeding on the Grand Prairie has been observed since 1969, although some birds lingered at the last nesting site, Konecny Grove Natural Area, until 1982 (James and Neal, 1986). One nest near Rogers, Arkansas, (Arkansas Audubon Society Bird Records File) is the only nest found between 1969 and the present study in 2002. This present study therefore represents the re-discovery of nesting Willow Flycatchers, which were thought to have disappeared or nearly so, as successful nesting birds in Arkansas after 1969.

In addition to habitat loss due to agriculture, general habitat degradation also strongly influenced the extirpation of the Willow Flycatchers from Arkansas. Fire suppression has led to shrubby areas succeeding to more mature woody habitat with structure not suitable for flycatcher nesting. Excessively frequent fire is a problem also. Willow Flycatchers nest in shrubby habitat bordering fallow fields and prairie patches (Sedgwick, 2000). Prairie preserves are regularly burned to manage against invasion of woody vegetation. These fires often sweep through the fringing shrubby vegetation that the flycatcher seeks. Nearby

standing or flowing water is also a commonly-found component of the bird's nesting habitat (Sedgwick, 2000). Land drainage projects have adversely affected these conditions.

Our documentation of the presence of this species will help shape conservation efforts at Baker Prairie. The Arkansas Natural Heritage Commission and The Nature Conservancy have built fire lines around the sites of Willow Flycatcher territories so that habitat would not be lost during prescribed burns in 2003. In addition, woody vegetation along fencerows that is too tall (> 2.5 m) for the flycatchers will be burned or mechanically removed. These actions should help maintain Willow Flycatcher habitat and help create additional habitat (Sedgwick, pers. comm.). Habitat in existing territories will be burned in a few years to avoid succession that would lead to unsuitable breeding habitat.

We will continue to monitor the Willow Flycatcher population at Baker Prairie to determine population trends. In addition, it is possible that the area will begin to act as a source population for colonizing shrubby areas along fencerows in adjacent pasture lands. More thorough surveys will be conducted in these areas over the next few years to determine if colonization by the flycatcher occurs. Though the current numbers are small, there may be enough suitable habitat to eventually support 10 or more breeding pair in this area, which could be adequate for a stable population (Sedgwick, pers. comm.).

We believe that our study could indicate that the eastern population of the Willow Flycatcher is expanding southward and/or that small, isolated remnant populations in Arkansas have gone undetected. More intensive monitoring needs to be conducted at the Lake Bentonville area near Rogers, Arkansas, to determine occurrence, breeding success, frequency of use, potential for population growth, and needed management strategies. Further, habitat in extreme northeast Arkansas needs to be investigated for nesting Willow Flycatchers. Indeed, three Willow Flycatchers with brood patches were captured in Craighead County in the summer of 2003 suggesting that a small breeding population of that species likely occurs there (Bednarz, pers. comm.). Finally, the Buffalo National River, because its hydrologic processes are largely intact, should also be more closely surveyed in areas where seasonal floods create open shrubby habitat.

ACKNOWLEDGMENTS.—We thank Jack Stewart, Max Parker, Martha Milburne, and Sally Jo Gibson for monitoring efforts that helped in determining when to begin the field season and where to look for the flycatchers. Comments and suggestions by W. Baltosser and J. Bednarz greatly improved the manuscript. We also thank Tom Foti, Joe Neal, Scott Simon, Mike Mlodinow, and Theo Witsell for their input.

Literature Cited

- Aldrich, J. W.** 1951. A review of the races of the Traill's flycatcher. *Wilson Bull.* 63:193-194.
- American Ornithologists' Union.** 1973. Thirty-second supplement to the American Ornithologist' Union checklist of North American birds. *Auk* 90:411-419.
- American Ornithologists' Union.** 1998. Check-list of North American birds, 7th ed. Am. Ornithologists' Union, Washington, D.C.
- Arkansas Natural Heritage Commission.** 2001. Annu. Rept. 2001. 190 pp.
- Arthur, S. C.** 1937. Audubon, an intimate life of the American woodsman. Harmanson Publ., New Orleans.
- Audubon, J. J.** 1831. *Ornithological Biography*. Vol. 1. A. & C. Black, Edinburgh.
- Audubon, J. J.** 1839. *Ornithological Biography*. Vol. 5. A. & C. Black, Edinburgh.
- Baerg, W. J.** 1951. Birds of Arkansas. *Univ. Arkansas Agric. Exp. Sta., Bull. No. 258 (rev.)*, 188 pp.
- Bibby, C. J., N. D. Burgess, and D. A. Hill.** 1997. Bird census techniques. Academic Press, Inc., San Diego, California.
- Brewster, W.** 1895. Notes on certain flycatchers of the genus *Empidonax*. *Auk* 12:157-163.
- Browning, M. R.** 1993. Comments on the taxonomy of *Empidonax traillii* (willow flycatcher). *West. Birds* 24:241-257.
- Foti, T.** 1971. The Grand Prairie. *Ozark Soc. Bull.* 4:6-11.
- Heitmeyer, M. E., L. H. Fredrickson, and S. King.** 2000. An evaluation of ecosystem restoration for the Grand Prairie of Arkansas. A Report Prepared for: U.S. Army Corps of Engineers, Memphis District. 72 pp.
- Howell, A. H.** 1911. Birds of Arkansas. U.S. Dept. Agric., Biol. Surv. Bull. No. 38, 100 pp.
- James, D. A., and J. C. Neal.** 1986. Arkansas birds, their distribution and abundance. Univ. Arkansas Press, Fayetteville, Arkansas.
- James, F. C.** 1974. Threatened native birds of Arkansas, Pp. 107-122 *In* Arkansas Natural Area Plan. Arkansas Dept. Planning, Little Rock, Arkansas.
- Lancia, R. A., J. D. Nichols, and K. H. Pollock.** 1994. Estimating the number of animals in wildlife populations. Pp. 215-253 *In* T.A. Bookout, ed. Research and management techniques for wildlife ad habitats. Fifth ed. The Wildl. Soc., Bethesda, Maryland.
- Marsh, M.** 1978. Baker Prairie, Critical habitat for Grasshopper Sparrow and Ornate Box Turtle. *Ozark Soc. Bull.* 12:10-11.
- Meanley, B.** 1952. Notes on nesting Traill's Flycatcher in eastern Arkansas. *Wilson Bull.* 64:111-112.
- Mumford, R. E., and Keller, C. E.** 1984. The birds of Indiana. Ind. Univ. Press, Bloomington, Indiana.

Sauer, J. R., J. E. Hines, and J. Fallon. 2001. The North American Breeding Bird Survey, Results and Analysis 1966 - 2000. Version 2001.2, USGS Patuxent Wildlife Research Center, Laurel, Maryland. (<http://www.mbr-pwrc.usgs.gov/bbs/bbs.html>)

Sedgwick, J. A. 2000. Willow Flycatcher (*Empidonax traillii*). In *The Birds of North America*, No. 533 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, Pennsylvania.

Sutton, G. M. 1967. *Oklahoma birds*. Univ. Okla. Press, Norman, Oklahoma.

U.S. Fish and Wildlife Service. 1995. Final rule determining endangered status for the Southwestern Willow Flycatcher. Fed. Reg. 60:10694-10715 (February 27, 1995).

Wheeler, H. E. 1924. *The birds of Arkansas*. Ark. Bureau Mines, Manufacturers, Agric., Little Rock, 177 pp.

White, M. 1995. *A Birder's Guide to Arkansas*. Am. Birding Assoc., Inc., Colorado Springs, Colorado.

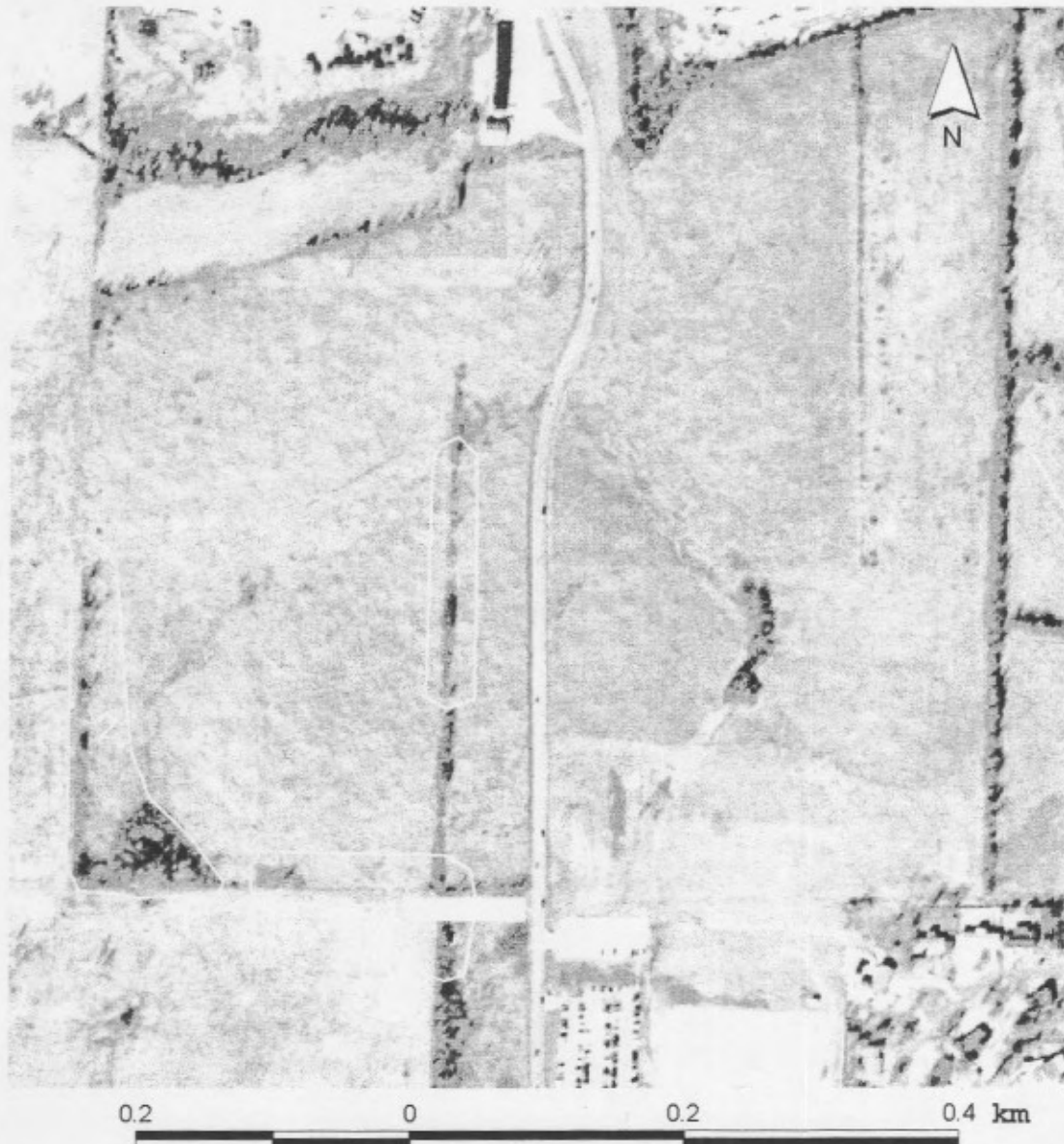


Fig. 1. Aerial photo of Harrison shows the location of three Willow Flycatcher territories at Baker Prairie Natural Area in 2002. Goblin Drive bisects the area from north to south.