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**STATUS OF THE BLACK RAIL IN OKLAHOMA,
WITH RECOMMENDATIONS FOR FUTURE RESEARCH**

ERIC BECK¹ and MICHAEL A. PATTEN²

¹*Cameron University, Lawton, Oklahoma 73505 and Sutton Avian Research Center, Bartlesville, Oklahoma 74005; e-mail: brdbrn1979@yahoo.com*

²*Oklahoma Biological Survey and Sutton Avian Research Center, University of Oklahoma, Norman, Oklahoma 73019*

Abstract.—We compiled all records of the Black Rail (*Laterallus jamaicensis*) in Oklahoma to provide an overview of timing and location of occurrences. Most accounts were from published works, but some were from unpublished field notes of ornithologists. To these records we add details of various calling birds in northwestern Oklahoma in spring and summer 2006. Although there is but 1 confirmed breeding record of the Black Rail for Oklahoma, recent records and established populations in southern and central Kansas suggest that the Black Rail may be a rare breeding species in Oklahoma. Intensive and systematic surveys of suitable habitat are needed to clarify this species' status in Oklahoma.

Introduction.—The Black Rail (*Laterallus jamaicensis*) is the smallest of North America's rails. It inhabits fresh and saline marshes and low-lying meadows with shallow standing water and breeds in habitats supporting fine-stemmed emergent plants, particularly grasses, sedges and rushes (Eddleman et al. 1994). There are 2 subspecies in the United States, the nominate *L. j. jamaicensis* of the East Coast and scattered sites inland and the smaller, darker *L. j. coturniculus* of coast of California and desert of southeastern California and western Arizona (Ripley 1977).

Most research on the Black Rail has been conducted in coastal regions of the United States, such as Florida and California (Legare et al. 1999, Legare and Eddleman 2001, Conway et al. 2004). In those states, specific needs of populations are well understood. By contrast, little is known about this species and its status inland, despite possible breeding populations and current records.

No studies have been conducted on the Black Rail in Oklahoma, and most published works that cite Oklahoma records lack detail. Our goal was to compile all known accounts of the Black Rail in Oklahoma and to highlight gaps in our knowledge of this species in the State. Herein we summarize historical and recent accounts of the Black Rail in Oklahoma and make recommendations for future research on the species in the region.

Historical Records (1915–1977).—Between 1915 and 1977 there were 10 reports of the Black Rail in Oklahoma (Table 1, Fig. 1). The State's first record is from 1915 (no specific date was given), when a bird was caught in a garden north of Gate, Beaver County, following a heavy autumn rain (Lewis 1930). The next record is from 16 May 1924, when a bird was collected at Mussel Shoals in Norman, Cleveland County, by C. E.

Table 1. Records of the Black Rail (*Laterallus jamaicensis*) for Oklahoma. Records supported by physical evidence—specimen, photograph, or audio recording—are displayed in bold typeface. Institutional abbreviations for specimens are: OMNH = the Sam Noble Oklahoma Museum of Natural History in Norman; CUMZ = Cameron University’s Museum of Zoology in Lawton.

County	Year	Date	No. Notes
Beaver	1915		1 sight report (Sutton 1967)
Cleveland	1924	16 May	1 specimen (Nice 1931, OMNH 08446)
Greer	1940		1 sight report (Tyler 2005)
Johnston	1951	11 October	1 sight report (Baumgartner 1992)
Johnston	1957	16 September	1 sight report (Baumgartner 1992)
Johnston	1971	23 April	1 sight report (Baumgartner 1992)
Alfalfa	1971	4 May	1 sight report (Baumgartner 1992)
Alfalfa	1971	19 August	1 photograph, breeding record (Sullivan 1976)
Alfalfa	1973	29 August	1 sight report (Sullivan 1976)
Noble	1973	22 September	1 sight report (Bartrush 1975)
Osage	1977	7 June	1 sight report (Baumgartner 1992)
Beaver	1999	14 September	1 specimen (Tyler 2005, CUMZ 1172)
Tillman	1999	26 September	1 sight report (Tyler 2005)
McCurtain	2002	27 August	1 sight report (W. D. Arbour pers. comm.)
Beaver	2006	9 May–14 June	2+ audio recording (E. Beck et al.; Fig. 2)
Woodward	2006	4 June	1 sight report (S. McConnell pers. comm.)
Ellis	2006	26 June–11 July	4+ sight report (S. McConnell pers. comm.)
Woodward	2006	27–30 July	1 sight report (S. McConnell pers. comm.)

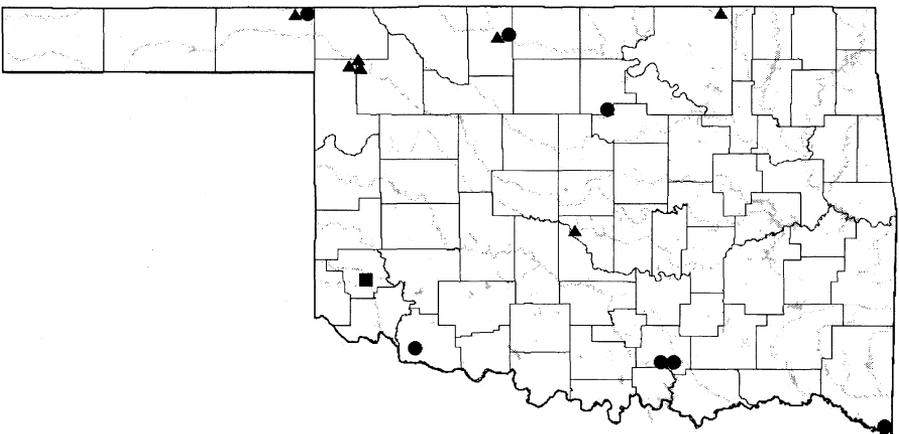


Fig. 1. Black Rail (*Laterallus jamaicensis*) locations in Oklahoma, 1915–2006. Legend: ▲ = spring records (mid-May to mid-June); ● = fall records (late August to mid-October); ■ = date unknown.

Fleming (Sam Noble Oklahoma Museum of Natural History, specimen OMNH 08446). The record from 19 May 1971 provided Oklahoma's single breeding record. A bird too young to fly was captured and photographed; the photo was sent to the National Museum of Natural History at the Smithsonian Institution, where the identification was confirmed by Storrs S. Olson, Richard C. Banks, and John S. Weske as being a juvenile Black Rail (Sullivan 1976).

Recent Records (1999–2006).—There are 5 recent records of the Black Rail in Oklahoma (Table 1, Fig. 1), beginning with 1 in northeastern Beaver County, where a bird was hit by a truck north of Gate on 14 September 1999. The carcass was salvaged by J. D. Tyler and deposited in the Cameron University Museum of Zoology (CUMZ 1172). An adult was “viewed briefly” at Hackberry Flats Wildlife Management Area, Tillman County, on 26 September 1999 by D. J. Farrell and K. N. Dorrell (Tyler 2005). In the southeastern Oklahoma, W. D. Arbour (pers. comm.) flushed an immature Black Rail onto plowed ground while disking a dry wetland unit at the Red Slough Wildlife Management Area, McCurtain County, on 27 August 2002.

Additional records are from different locales in northwestern Oklahoma during spring and summer 2006; it is possible that multiple birds were present in each location. In Ellis and Woodward Counties, S. McConnell (pers. comm.) located various Black Rails, including hearing as many as 4 birds calling on 1 occasion (Table 1).

The senior author located calling birds at a privately owned location north of Gate, near the Cimarron River in northeastern Beaver County, on 9 May 2006. Those birds subsequently were heard with 7 other observers in the early morning or after sunset on 7 separate days between 9 May and 14 June 2006. Three recordings were made from those observations, 2 by the senior author (Fig. 2) and 1 by B. A. Heck. The record, supported by those recordings, was accepted by the Oklahoma Bird Records Committee (Grzybowski et al. 2006).

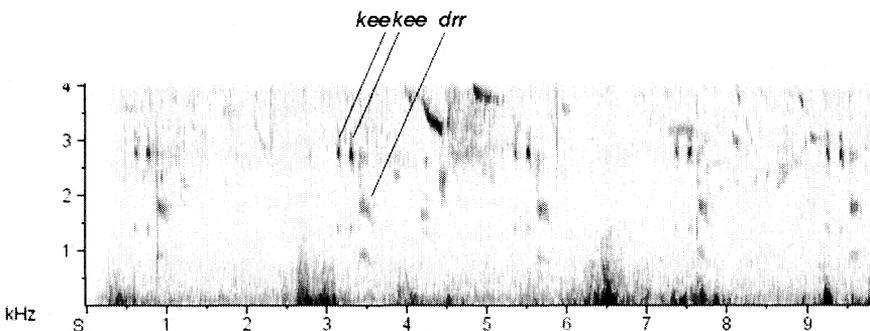


Fig. 2. Sonogram of a calling Black Rail (*Laterallus jamaicensis*) near Gate, Beaver County, Oklahoma, on 9 June 2006. This sonogram was created using Raven Lite 1.0 software (Cornell Laboratory of Ornithology, Ithaca, New York) from a recording taken from a digital video by Eric Beck.

The first location where multiple birds were heard had water 2–10 cm deep. As the summer progressed the area dried completely and no other calling birds were heard. Nearby wetlands were searched and 1 calling individual was located on 7 June 2006 at 0607 h. The area had scattered water-filled depressions that also soon dried; however, a nearby pond 10 m in diameter was surrounded by marsh vegetation held water continually. The 2 locations with calling individuals were in the same marsh complex but were about 150 m apart. Two responses to the taped *kee-kee-drr* calls broadcast at the first location fit the description of a female's *croo-croo-croo* (see Eddleman et al. 1994).

The marsh complex in which these birds were located was 75–100 m south of the Cimarron River. Two wet meadows and about 4 marshes of varying depths were interlocked with one another and were sometimes separated by drier ground. The marsh harboring the rails was the largest of the complex. Dominant plants were of the family *Cyperaceae*; about 80% of the marsh covered by these plants. Remaining cover was cattail (*Typha latifolia*) and miscellaneous aquatic species. Vegetation was dense, and there was a thick understory of dead and dying matter that likely would provide suitable cover for nesting (Eddleman et al. 1988, 1994, Legard and Eddleman 2001).

Records and Breeding Status in Neighboring States.—The Black Rail occurs regularly in Kansas in spring and summer at Cheyenne Bottoms Wildlife Management Area, Barton County, and Quivira National Wildlife Refuge, Stafford County (Thompson and Ely 1989), and the species was located in 5 atlas blocks (Busby and Zimmerman 2001), although breeding remains unconfirmed. One potential breeding site, Coldwater Lake, Comanche County, is only a short distance north of Oklahoma and thus near our Beaver County site.

In other neighboring states, since 1991 Colorado has summering populations in the Arkansas Valley, but breeding is likewise unconfirmed (Kingery 1998); New Mexico added the Black Rail to its state list in 2006, when calling individuals were documented in May and June in Colfax and San Miguel counties (Williams 2006); and Texas has many records for the Gulf Coast (Eddleman et al. 1994) and 5 records for the Panhandle (Seyffert 2001), one each from Carson, Roberts, Hutchinson, and Potter counties and a record of 4 birds at Muleshoe National Wildlife Refuge, Bailey County, on 16 September 1974. Like many of Oklahoma's records, records from the Texas Panhandle are from May–July and September.

Possible Breeding in Oklahoma.—Accumulated spring and summer records (Table 1) hint at the possibility that the Black Rail breeds in Oklahoma. Given that a number of these records are from the same locations but from different years, it is possible that, with further work, small breeding populations may be located (Reinking 2004). For example, there are multiple records from the Salt Plains and Tishomingo national wildlife refuges and from northeastern Beaver County. Dates of observation for many records fall within the breeding season of the eastern subspecies of May–August, with peak egg laying in June (Taylor and van Perlo 1998).

Arbour's sighting at the Red Slough was of a juvenile bird. It is

possible this bird hatched at the Red Slough. The bird's age and the prevalence of good numbers of Yellow (*Coturnicops noveboracensis*) and King (*Rallus elegans*) Rails at Red Slough hints at the possibility of finding a breeding population of the Black Rail there. Moreover, records from spring and summer 2006 featured multiple birds at each location, and S. McConnell (pers. comm.) located birds in Woodward and Ellis counties that he felt were in suitable breeding habitat.

Recommendations for Further Studies.—Little is known about the Black Rail's habits, habitat preferences, and nesting in central North America. Our lack of understanding of this secretive species' status in the southern Great Plains could result in negative consequences for the population. Despite various records from spring and summer, there is but 1 confirmed breeding record for Oklahoma, and that was 35 years ago (Sullivan 1976). A Black Rail nest has yet to be discovered in Oklahoma.

A key first step is a thorough census of all suitable habitats in Oklahoma. Locations with recent or historical records should be surveyed first. Use of broadcast surveys has been successful in identifying populations in other areas (Conway et al. 2004, *cf.* Legare et al. 1999). If breeding populations are located, habitat should be quantified in detail, including a description of water levels and permanence. Habitat quantification should also be conducted at presumptive breeding sites in south and central Kansas.

It is important to identify the habitat requirements, but it is equally important to understand the breeding ecology of the Black Rail at inland sites. Determining nesting requirements, breeding dates, clutch sizes, and sources of nest failure will ensure that this extremely rare component of Oklahoma's avifauna can be managed and conserved.

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Unusually Large Prothonotary Warbler Clutch at Tishomingo National Wildlife Refuge.—Prothonotary Warblers (*Protonotaria citrea*) typically lay 3–7 eggs per clutch throughout their range (Petit 1999). Mean clutch size ranges from 4.31 eggs/nest in Wisconsin (Flaspohler 1996) to 4.98 eggs/nest in Michigan (Walkinshaw 1941). I observed a mean clutch size of 4.6 eggs/nest with a range of 1–6 eggs/nest for Prothonotary Warblers at Tishomingo National Wildlife Refuge (NWR) from 2003 to 2006.

On 19 June 2006, my field technician, Stormy Shoopman, found an unusually large number of Prothonotary Warbler eggs in a nest box at the Tishomingo NWR. She found 8 Prothonotary Warbler eggs in Box

46, located approximately 2 km west of the Refuge Headquarters. The box was previously checked on 12 June and had a nest with a cup, but no eggs. On 26 June, I captured the incubating female from Box 46 and discovered she was already banded (Band No. 1680-50873) and this was her second nest attempt of 2006.

I originally banded her as a second-year (SY) female on 27 May 2003 at Box 33, about 537 m from Box 46. In 2003, this female had 2 successful nests and fledged 8 young. She also was recaptured once in 2004 and twice in 2005, but did not have successful nests in either year. On 22 May 2006, I caught her when she was incubating 5 eggs in Box 45, about 17 m from Box 46. She successfully fledged 5 young on 7 June 2006. After her first nest of 2006 in Box 45, female 1680-50873 moved to Box 46 that was previously occupied by a different female.

As to the outcome of the 8-egg clutch, there were 3 hatchlings and 3 unhatched eggs in the nest on 3 July 2006. It appeared that 2 eggs hatched, but the chicks died soon after hatching and the parents had removed the eggshells. This is fairly common in Prothonotary Warbler nests when brood reduction occurs at hatching. Jona Reasor, the Tishomingo NWR biologist, and I returned on 7 July to band the nestlings. We found 2 unhatched eggs and 2 nestlings which we banded. The nestlings were almost 2 g lighter than typical Prothonotary Warbler nestlings at that stage of development. Of the unhatched eggs, we discovered that 1 was cracked and had no embryo development and a bad odor. The other egg had a well-developed embryo that died just before hatching. This incomplete incubation may have been a result of the large clutch size because the female's brood patch can provide adequate heat distribution only to a smaller clutch. The 2 nestlings successfully fledged on 14 July.

An 8-egg clutch is a rarity (Petit 1999) for this species and the first I have documented during 4 years of research at Tishomingo NWR. The largest clutch I previously documented was 6 eggs. However, 6-egg clutches are routinely found in Prothonotary Warbler nests at Tishomingo NWR. Although there are references to 7–8 egg clutches in the literature (Petit 1999), I was unable to find documentation on the outcome of large Prothonotary Warbler clutches. Charles Blem (pers. comm.) studied Prothonotary Warblers extensively in Virginia, and he documented only 3 8-egg clutches among 2,828 Prothonotary Warbler nests. Those nests had low nestling survival, and some eggs were buried. He suggested that 8-egg clutches were the result of 2 females competing for the box with 1 female ultimately gaining control. He further suggested that the female who gained control of the nest buried her competitor's eggs and only incubated her eggs; however, no eggs were buried in my observation.

There are 2 possible explanations for this unusually large clutch size. The female may have obtained sufficient nutritional resources to lay a large number of eggs in a short period of time. I think this explanation is unlikely for 2 reasons. First, she had recently fledged a 5-egg clutch and it would be difficult for a female to obtain enough calcium and other nutrients to lay 3 more eggs than in her first clutch in such a short period of time. Second,

eggs are typically laid once per day and she would have begun laying the first of 8 eggs just 4 days after fledging her first clutch. This is unlikely to have occurred.

The second, and more likely, explanation is that this clutch was laid by 2 different female warblers and female 1680-50873 usurped the nest from the previous female. Only one female was incubating this nest, so it is possible that she laid the majority of the eggs in the clutch; although I do not have data to support that conclusion. However, it is not unreasonable to speculate that the previous resident of Box 46 or a female from an adjacent territory could have contributed ≥ 1 egg to the clutch. This is known as egg dumping and occurs fairly frequently among avian taxa; however, it has not been documented for Prothonotary Warblers (Petit 1999). Genetic testing of parents and offspring would provide a better understanding of Prothonotary Warbler clutch parentage.

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DOUGLAS R. WOOD, PMB 4068, 1405 North 4th Avenue, Durant, OK 74701-0609, E-mail: dwood@sosu.edu

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