

# A History of Bald Eagle Nesting Activity in Oklahoma

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## INTRODUCTION

The state of Oklahoma is well known as a wintering area for Bald Eagles (*Haliaeetus leucocephalus*). In recent years however, the first authenticated reports of Bald Eagle nesting activity have appeared and attracted a great deal of attention from conservationists. To help put this activity into perspective we present a review of historical and recent Bald Eagle nesting activity in Oklahoma and discuss former status, possible causes of disappearance, and problems related to current Bald Eagle productivity in Oklahoma.

## REVIEW OF HISTORICAL REFERENCES

James (1) reported that while on the Little North Fork of the Canadian River on September 5, 1820 "the Bald Eagle, Turkey Buzzard, and Black Vulture, Raven and Crow were seen swarming like blowing flies, about any spot where a bison, an elk, or a deer had fallen prey to the hunter". This reference to Bald Eagles is unusual because the date is too early for wintering Northern Bald Eagles to be in this area. It is possible that these Bald Eagles were residents.

Samuel Washington Woodhouse conducted extensive natural history observations in Indian Territory during the middle of the last century. In spite of the fact that Woodhouse was an accomplished naturalist and traveled through Indian Territory along some of its major rivers (i.e., Arkansas and Cimarron) he did not report seeing any Bald Eagle nests. However, in Sitgreaves and Woodruff (2) Woodhouse listed the Bald Eagle as a species observed in Indian Territory and since he was in the area from May to October it may be assumed that any Bald Eagles observed could have been residents. A later review of Woodhouse's Indian Territory collections and diaries has shown that he did not collect a specimen of the Bald Eagle nor did he record the actual dates of his observations of the species in any of his writings (3).

Lieutenant C.A.H. McCauley was a U.S. Army officer who made natural history observations while accompanying a Corps of Engineers' exploration of the Red River during 1876. In a report on the ornithology of the area (4) he stated that in the canyon of the Red River along a tributary (Mulberry Creek, in the Texas panhandle near Palo Duro Canyon) he encountered the Bald Eagle several times, and on June 17 a nest of this species containing two young about a week old was found. If McCauley was correct in his identification of this species then it is also likely that the Bald Eagle nested along the Red River in Oklahoma. Correct identification may be a factor in evaluating the reliability of McCauley's record because Palo Duro Canyon is well known as a nesting area for Golden Eagles (*Aquila chrysaetos*) and early naturalists often confused the two eagle species.

A more specific reference to Bald Eagle nesting activity within the state was given by Carter and Trenton (5) in 1908. They stated that the Bald Eagle was more common in the eastern portion of the state and that no nests had been found in Woods County. The authors also stated of this species "Said to nest in Osage County along the Arkansas River".

In 1912 a tentative list of birds to be found in Oklahoma was reported by Stevens (6). He listed the Bald Eagle as a resident but gave no additional information. In 1917 Shannon and Cross (7) also reported the Bald Eagle as a resident of Oklahoma in a

list that was prepared only from "authentic published records or personal experience". Also in 1923 Tate (8) listed the Bald Eagle as rare, but stated that it was once a year-round resident. In 1924 Nice and Nice (9) listed the Bald Eagle as an "uncommon resident". In 1929 Force (10) classified the Bald Eagle as a rare resident and Nice (11) in 1931 listed the Southern Bald Eagle as a rare resident formerly common. Henderson (12) in 1933 reported that in Las Animas County, Colorado (near the Black Mesa area of Cimarron County, Oklahoma) during the summer of 1928 some Bald Eagles were seen "flying about their nests on rocky cliffs, uttering a sharp whistle". As with McCauley (4) the possibility of confusion with Golden Eagles exists with Henderson's report. However, it is notable that Henderson mentions vocalizing by the nesting eagles in Las Animas County because Golden Eagles are typically silent near their nests when humans are present.

Historical records of Bald Eagle nesting activity are similarly limited for Kansas, a state sharing five ecological regions with Oklahoma (13) but containing fewer large rivers. Like Oklahoma references, several from Kansas mention Bald Eagles as being former rare residents but unlike any Oklahoma records, Goss (14) in 1891 gave nesting dates for this species (i.e. "Begin laying about the middle of March").

In Texas historical nest records are sparse for most of the state but are more numerous from the Texas Gulf Coast area (15), and in Louisiana Bald Eagles were reported as common residents over most of the state but particularly in the southern portion (16). Missouri records are most numerous from the area near the Mississippi River (17).

### RECENT NESTING ACTIVITY OF BALD EAGLES IN OKLAHOMA

In the mid-1940's reservoir construction began in Oklahoma on a large scale and at present only one free-flowing river remains in the state. In the last 50 years in Oklahoma, approximately one-half million surface acres of water have been created as a result of reservoir construction. This activity plus the construction of many state and federal wildlife refuges has provided a great deal of wintering habitat for Bald Eagles (18) as well as what appears to be excellent nesting habitat. The potential value of these newly created wetlands as eagle nesting habitat, however, has not been evaluated.

Records of eagle nesting activity on new impoundments in Oklahoma began to appear in the early 1950's. In 1950 a pair of adult Bald Eagles spent the summer in the upper Spavinaw (Lake Eucha) area in Delaware County but did not nest (19). Also in 1950 a pair of adult Bald Eagles built a nest in the top of a large sycamore (*Platanus occidentalis*) on Ft. Gibson Reservoir in Wagoner County (location a., Fig. 1), but did not raise young (19).

During the spring of 1976 the first detailed observations of Bald Eagles attempting to nest in Oklahoma were made (20). The nesting attempt occurred along San Bois Creek in east-central Haskell County about 2 miles west of the town of Keota (location b, Figure 1). Although an adult Bald Eagle was observed on the nest several times from April 30 to May 7 and appeared to be either incubating or brooding young, the contents of the nest during this period were never ascertained. After becoming convinced that the eagles had abandoned the nesting attempt, U.S. Army Corps of Engineers personnel examined the nest from a helicopter on June 3 and found it empty. Strong wind and heavy rain during the first week of May were given as pos-

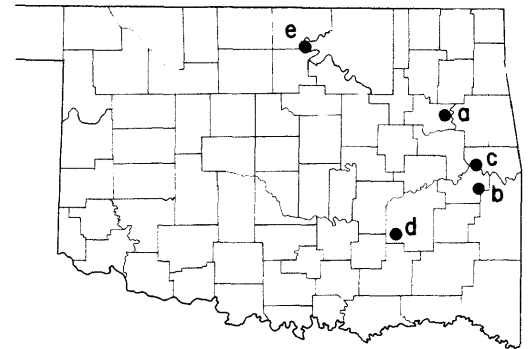


FIGURE 1. Locations in Oklahoma where Bald Eagles have constructed nests since 1950. a) Ft. Gibson Reservoir nest site; b) Keota nest site; c) Sequoyah National Wildlife Refuge nest site; d) McAlester Army Ammunition Depot nest site; e) Arkansas River nest site.

sible reasons for abandonment by the eagles. During spring 1978 a pair of adult Bald Eagles (assumed to be the same pair) again attempted to nest along San Bois Creek not far from where the 1976 attempt occurred. One eaglet was fledged from the nest on July 9. Given a 10-week period from hatching to fledging and a 35-day incubation period, the approximate date of egg laying for this pair of eagles would be during the last week of March. This was the first recorded successful nesting of Bald Eagles in Oklahoma (21). The eagles were again seen in the nest area during early spring 1980 and showed signs of nesting but later abandoned the attempt. Another young was fledged from this nest in 1981 (22). During 1984 the adults again showed signs of nesting but abandoned the attempt later in the season. During February and March 1985 personnel from the Oklahoma Cooperative Wildlife Research Unit and the George Miksch Sutton Avian Research Center conducted extensive behavioral observations at the Keota nest. Observations began on February 19. Throughout the observation period the male brought most of the nest material to the nest tree. Nest material consisted of sticks and clumps of grass. Only when the nest was virtually complete and most construction efforts were focused primarily on the nest cup did the female take an active interest in the nest. The male was also responsible for approximately one-half of the pre-incubation process of laying in the nest to form the cup and preparing it for eggs. This preparation lasted approximately four days. Also during this period the male eagle was observed bringing two prey items to the nest. These included an unidentified species of waterfowl and a lagomorph assumed to be an eastern cottontail rabbit (*Sylvilagus floridanus*). The rabbit was captured near the nest site.

These eagles appeared to have a strong pair bond as well as a strong attachment to the nest site. At least one member of the pair was usually at the nest during the day and both birds roosted in the nest tree from the beginning of the observation period. The female generally roosted in the nest. The pair copulated numerous times on branches in the nest tree and on surrounding snags.

When routine observations began on March 4 the male eagle was not observed in the area and was never seen again during the remainder of the observation period. During the first few days after the male eagle disappeared from the nest area the remaining eagle appeared very agitated. It often peered into the sky and surrounding area as if it were searching for its missing mate. Occasionally it made short erratic flights over water around the nest tree. An intensive search of the area by automobile and aircraft did not yield any clues as to the whereabouts of the missing eagle. The remaining eagle gradually spent less time at the nest until finally it used the tree only as a night roost. It was last observed in the area on March 19. This was the period when most northern migrants also left the area. We were never able to determine if eggs were actually laid at the Keota nest. The nest tree is very old and may not be able to hold the additional weight of a human.

Nesting attempts by a pair of adult Bald Eagles were made during three consecutive seasons in an area known as Sandtown Bottoms on the Sequoyah National Wildlife Refuge in Sequoyah County (location c, Figure 1). During the spring of 1983 a nest was built by this pair but the nest tree was blown over by wind later in the season. During 1984 the eagles built a new nest near the same location and showed signs of nesting but later disappeared from the area. During February, 1985, what we assume to be the same pair of eagles were again active at the nest at Sandtown Bottoms and also built another nest near the mouth of Hezakiah Creek on the refuge approximately 1 km from the first nest. Although copulation and other nesting behaviors by this pair were observed during 1985 we believe that no eggs were ever laid. The pair disappeared during March when most other eagles in the area migrated.

At McAlester Army Ammunition Depot, Pittsburg County (location d, Figure 1), a pair of eagles successfully nested and fledged two young during the spring of 1982. The pair tried to nest again during 1983 but, as with the eagles in other areas, they abandoned the nesting attempt later in

the season. We checked with biologists at the Army Ammunition Depot (also a state game management area) twice during the spring of 1985 but they reported no eagle nesting activity in the area of the former nest sites.

During the annual winter eagle count (1984), while conducting an aerial survey, Oklahoma Department of Wildlife Conservation personnel located an eagle's nest near the confluence of the Salt Fork and Arkansas Rivers in Osage County (location e, Figure 1). On March 9, 1984, Mike O'Meleia, biologist with the Oklahoma Department of Wildlife Conservation, and the senior author checked the nest from the ground and confirmed that it was a Bald Eagle nest. The nest was situated in the top of a large eastern cottonwood (*Populus deltoides*) about 200 m from the river. Remains of a large carp (*Cyprinus carpio*) and a softshell turtle (*Trionix* sp.) were found beneath the nest. No Bald Eagles were seen in the area and the nest did not appear to be in use. This is the first time a Bald Eagle's nest has been officially recorded in this region of the state although Bald Eagles were reported to have nested here historically (5). This nest was checked twice during the spring of 1985. It was found to be in bad repair and no eagles were seen in the area.

## SUMMARY AND DISCUSSION

A number of historical references list Bald Eagles as being former residents of Oklahoma and provide circumstantial evidence that some Bald Eagles nested here. However, unlike records from some neighboring states, there are no detailed nest descriptions or records of young or eggs collected and very little other evidence that could give us insight into the former nesting ecology of this species in Oklahoma. There are several possible reasons for this dearth of information. It is known that French traders were very active in the area now known as Oklahoma much earlier (i.e. late 1700's) than any known naturalist. The fact that they possessed firearms, traveled through the territory via its major rivers, and traded with the Indians who highly prized the feathers of this species may have contributed to the demise of Bald Eagles using the most conspicuous nests along the large waterways. The habitation of Indian Territory (now Oklahoma) by the five civilized Indian tribes translocated here from the southeastern United States and very familiar with the ways of Europeans (including the use of firearms) could also have had an impact on nesting eagles.

If any nesting Bald Eagles survived in Oklahoma until the end of Indian occupation (which ended shortly after the Civil War) it is doubtful that many could have survived the biological disasters that were to come at the turn of the century. These were the land rush, the widespread deforestation that subsequently occurred, and the well documented poisoning, trapping, and general extermination of predators by settlers. Few, if any other, states have had such widespread ecological destruction occur over such a short period of time. In 1912 Barde (23) wrote that the opening of Oklahoma "to homestead settlement was as though the lightnings of heaven had fallen upon its wild life. Fires swept the country in all directions; armies of horsemen penetrated to remote places; wagons rumbled over the hills and down the valleys; there was a tumult of shouting and the roar of guns, and violence reigned, where until that day had been the peace of a primeval solitude. The slaughter had begun". It is no surprise therefore that little evidence of Oklahoma's original nesting Bald Eagle population has been preserved.

On the basis of the sketchy historical evidence available from Oklahoma, a knowledge of current Bald Eagle distribution, and historical records from adjacent states, we believe that Oklahoma has probably always been at the periphery of the nesting range of Bald Eagles, which in the southeastern United States is generally coastal, and along the Mississippi River and its larger tributaries. We also believe that the eastern half of the state is the area most likely to have been used by nesting Bald Eagles because: a) it contains large rivers many of which are major tributaries of the Mississippi; b) it is the area of the state that was most heavily forested; and c) the southeastern portion lies on the Gulf Coastal Plain and has a climate similar to that of some southern states. Limited nesting

TABLE 1. Outcomes of 13 reproductive attempts by Bald Eagles in Oklahoma since 1950.

Nest Designation	Year	Outcome
San Bois Creek	1976	Nest destroyed by wind.
San Bois Creek	1978	Successful nesting (one young).
San Bois Creek	1980	Adults abandon nesting attempt.
San Bois Creek	1981	Successful nesting (one young).
San Bois Creek	1984	Adults abandon nesting attempt.
San Bois Creek	1985	Adults abandon nesting attempt.
Sequoyah	1983	Nest destroyed by wind.
Sequoyah	1984	Adults abandon nesting attempt.
Sequoyah	1985	Adults abandon nesting attempt.
McAlester	1982	Successful nesting (two young).
McAlester	1984	Adults abandon nesting attempt.
Ft. Gibson	1950	Active near nest all season (no young).

activity by Bald Eagles may have occurred in the western portion of the state.

It is probable that the recent (after 1950) nesting activity by Bald Eagles in Oklahoma has been by Northern Bald Eagles. We believe this because: a) all of the known nest sites in Oklahoma are in areas where wintering eagles concentrate; b) the eagles at Sequoyah and Keota disappeared from their nest area during the period when most wintering eagles migrated; and c) nest building by Northern Bald Eagles on their wintering grounds has been well documented in Kansas.

It is difficult to compare the reproductive performance of Oklahoma's nesting Bald Eagles with those of other states because: a) few notes have been recorded on nesting Bald Eagles in Oklahoma, and there have been no detailed studies; b) important reproductive parameters are not available (for example, in almost every case in which the reproductive attempt failed it is not even known if the birds actually laid eggs); c) there is a very small sample size; and d) there are few similar ecological regions in other states for comparison.

In total, we know of 13 incidents where pairs of adult Bald Eagles have been observed in Oklahoma and have constructed nests or have stayed past the normal wintering period (Table 1). These incidents can be referred to as "reproductive attempts", and the outcomes can be placed in four categories: a) pairs successfully nested and young fledged, b) nests were destroyed by wind, c) adults abandoned the reproductive attempt and left the nest area, and d) pairs stayed all summer but raised no young. Only three reproductive attempts have been successful. Such a success rate can be considered low by almost any measure. Most failures are a result of abandonment.

In the past two decades aborted reproductive attempts have also been reported from neighboring states. Unsuccessful reproductive attempts were recorded for three consecutive seasons on the Lake of the Ozarks in Missouri. A pair of adult Bald Eagles attempted unsuccessfully to nest near Tunnel Dam near Camdenton, Missouri for six consecutive years (17). Similar attempts have also occurred in Kansas (24). It is evident that few Bald Eagles are reproducing in the wetlands of the south-central United States, and since these wetlands are within the historical range and are seemingly suitable, questions arise as to the explanations of this lack of success.

The causes of the low reproductive success of nesting Bald Eagles in Oklahoma are not known but should be determined. Some possible explanations are: a) chemical contamination, b) inadequate food source, and c) human disturbance. It is also possible that some of these attempts result from our wintering Bald Eagles being very stimulated to breed by increasing photoperiod, warm weather, high-quality and abundant food, or some other environmental factor that causes them to exhibit various degrees of reproductive behavior on their wintering grounds. Some may be so stimulated that they nest. Others, less stimulated, may only show beginning stages of reproductive behavior (such as territorial acquisition and nest building) but leave the area and return north to breed later in the season.

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