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### A HISTORY OF SUCCESSFUL BALD EAGLE NESTING IN KANSAS

by

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#### INTRODUCTION

There were five documented Bald Eagle (*Haliaeetus leucocephalus*) nests in Kansas in 1994 from which 12 juvenile eagles were successfully fledged. That was twice the number of Bald Eagles fledged in 1993, and includes young from two new nest sites. Since documentation of the first Bald Eagle nest five years ago, 34 eaglets have been hatched and fledged in the state (Table 1). Each year the U.S. Fish and Wildlife Service (FWS) has attempted to band the eaglets and/or adults. Some eagles have been banded with standard FWS aluminum leg bands and purple visual identification leg bands with silver letters or alphanumeric characters. Information obtained on the subsequent nesting of known individual eagles in Kansas, provided important insight into Bald Eagle behavior, nest site tenacity, and population growth in newly exploited habitats.



**Photograph 1.** Three eaglets in the nest at Clinton Lake, 1993. Photography by Craig Bircell.

#### NESTING SITES

**CLINTON LAKE.** In 1989, a pair of Bald Eagles established the first successful nest site in Kansas. Although historic records indicate the species probably nested here before 1900, there is no confirmed documentation (Schwilling, et. al., 1989). The nest was constructed in a

dead Bur Oak (*Quercus macrocarpa*), located in a grove of flooded timber on the Rock Creek arm of Clinton Lake, Douglas County. Clinton Lake is a 2,833 ha Army Corps of Engineers (COE) water resources development project. The lake was designed for flood control, water supply storage and recreation.

**TABLE 1. Bald Eagle Nests In Kansas**

NEST LOCATION	NUMBER OF EAGLETS FLEDGED						
	1989	1990	1991	1992	1993	1994	TOTAL
Clinton Lake	2	3	3	3	3	3	17
Holgeman County	—	1	2	2	2	3	10
Hillsdale Lake	—	—	—	—	1	2	3
Perry Lake	—	—	—	—	—	2	2
Wolf Creek Lake	—	—	—	—	—	2	2
<b>TOTAL</b>	<b>2</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>6</b>	<b>12</b>	<b>34</b>

The eagles began incubating eggs on 30 March 1989. One adult disappeared from the nest site on 15 April and was not seen again during the nesting season. The eggs were hatched approximately 22 days later and the eaglets were successfully raised by the remaining adult. On 16 July, the two eaglets fledged from the nest and were trapped and banded on 23 July (Schwilling, et. al., 1989). Routine measurements taken at the time of the banding indicated that both were males.

The remaining adult was observed numerous times perching with the two fledglings. Judging from the size of the adult, as compared to the two juvenile males, it is likely that the parent which remained was a male (M. Lockhart, pers. comm.).

In addition, three photographic slides of the adult and the fledged juvenile eagles taken in July 1989 were used to compare the relative sizes of the birds. In all cases, the eagles were perched on tree branches oriented perpendicular to the photographer. The adult and juveniles were approximately 0.6 to 0.9 m apart and equidistant from the focal plain of the camera. The slides were projected so that the adult measured 86 cm from the top of the head to the tip of the tail. The average head to tail measurement for the juvenile males was 89 cm. Although eagles in their first year of life are skeletally as large as their parents, their tail and wing feathers are much larger (Gerrard 1988). In all three slides, the fledgling juveniles appeared to be the same size or slightly larger than the remaining adult. This reinforces the assumption that the adult male remained to raise the young.

A pair of eagles has returned and used the nest every year since 1989. After six years of construction, it is the largest active Bald Eagle nest in the state. It is approximately 1.8 m in diameter and 1.2 m deep. The nest is approximately 8 m above the normal lake water elevation. A total of 17 young have been fledged from the nest over the past six years (Table 2). The average number of eaglets fledged annually is 2.8, compared to the national average of 1.6 (Stalmaster 1987). During the 1960's and 1970's, only 2% of nearly 4,000 North American Bald Eagle nests produced three young (ibid), yet the Clinton nest has achieved this production rate in all but its first year of occupancy.

From 1989 to 1991 four juveniles and an adult male were trapped and banded by a biologist with the FWS. The first eaglets fledged from the nest were fitted with purple leg bands A and B (Schwilling, et. al., 1989). They left Clinton Lake on 9 August 1989 and were not reported for several years.

The adult male was banded in 1991. He carried a purple band with the silver letter E on the left leg. This bird has returned to the nest site every year since the band was attached. It is assumed that the same female has returned each year, but this cannot be confirmed since she has not been banded and has no identifying marks. Bald Eagles are monogamous and form lifelong pair-bonds (Palmer 1988). If a mate is lost, a replacement will be obtained (Stokes 1989).

In 1990 and 1991, two juveniles and the adult male were fitted with transmitters. The trans-

mitters were attached to the shaft of a tail feather and weighed 30 grams, or less than one percent of the bird's total body weight. Signals were transmitted for approximately 260 days and depending on terrain, could be received up to 15 miles away. The transmitters were shed when the eagles molted their feathers the following year. Valuable data was collected about their feeding, perching, roosting and nesting habits.

In 1993 and 1994, a climbing instructor was recruited to climb the nest tree. He lowered the juvenile eagles to biologists who banded the birds when they were approximately six weeks old. Six juveniles were successfully banded.

**TABLE 2. Bald Eagle Nesting Data, Clinton Lake**

EAGLE ACTIVITIES	1989	1990	1991	1992	1993	1994
First observation at nest site	03/15/89	01/15/90	11/10/90	09/29/91	11/16/92	11/09/93
Incubation begins	March 30	Feb. 19	March 02	Feb. 15	Feb. 04	Feb. 01
Eggs hatch	May 07	April 01	April 07	March 22	March 14	March 12
Days of incubation	38	41	36	35	38	39
Eaglets fledged	July 16	June 17	June 27	June 05	May 31	May 28
Fledgling age (days)	71	78	81	75	78	76
No. of young fledged	2	3	3	3	3	3
Banding dates	July 23	June 24	July 29	—	April 29	May 4
No. of eagles banded	2*	2*	1*	—	3*	3*
Band identification used	A,B	C,D	E	—	G,H,K	M,N,2A
Last observation within nest territory	Aug. 09	July 27	Aug. 04	Aug. 25	July 16	July 10

\*Juvenile birds    \*\*Adult male

**HODGEMAN COUNTY.** The second confirmed Bald Eagle nest was located in Hodgeman County, western Kansas. It was first reported in 1989, but no fledgling juveniles were observed until 1990. The nest is located about 10 m high in a live Cottonwood (*Populus deltoides*) tree in a non-continuous riparian corridor, adjacent to an intermittent creek. There is a small spring fed pond within 52 m of the nest site. The pond is approximately 0.6 ha in size and is a reliable source of water even during severe droughts. The surrounding area is primarily cropland and rangeland and appears more typical of Golden Eagle (*Aquila chrysaetos*) habitat. An investigation in and around the nest revealed the remains of a variety of prey, including Common Carp (*Cyprinus carpio*), bullhead (*Ictalurus* sp), unidentified catfish, Green-winged Teal (*Anas crecca*), American Coot (*Fulica americana*), Great Blue Heron (*Ardea herodias*), Ring-necked Pheasant (*Phasianus colchicus*), Red-tailed Hawk (*Buteo jamaicensis*), Black-tailed Prairie Dog (*Cynomys ludovicianus*), Yellow-faced Pocket Gopher (*Pappogeomys castanops*), Black-tailed Jackrabbit (*Lepus californicus*), and Eastern Cottontail (*Sylvilagus floridanus*).

A pair of adult eagles has returned to the nest every year since 1990. They have fledged ten eaglets over the past five years, including their largest brood of three in 1994. Detailed data on their nesting activity are not available due to the remote location of the nest site. A banding attempt on 14 May 1994 revealed that the nest could not be entered safely due to poor supporting branches. Despite this, one of the three eaglets was captured and banded with a purple band engraved in silver with the designation 2B.

On or about 2 June 1994, a storm dislodged the nest and it along with two eaglets fell to the ground. The other eaglet remained on a branch in the nest tree. The eaglets were approximately eight weeks old and very agile. On 4 June, the grounded eagles were in good condition and could flap and glide short distances. The adults were present and attentive, so no attempt was made to return them to the tree. By 12 June, only one fledged eaglet and one adult were observed in the nest vicinity. There was no sign of the other two juveniles, but it is presumed they successfully fledged.

**HILLSDALE LAKE.** An eagle that originally fledged from the Clinton Lake nest in 1989 was

observed and positively identified on 2 April 1993 at a nest site in the Bull Creek arm of Hillsdale Lake, Miami County. The eagle carried the purple visual identification band inscribed with the letter B. Hillsdale Lake is located 45 km southeast of Clinton Lake. It is a COE impoundment approximately 371 ha in size. The nest was constructed in a dead bur oak tree nearly 17 m above the water in a small grove of flooded timber. The setting was similar to that of the Clinton Lake nest site.

The mate to eagle B wore a standard FWS aluminum band on one leg and a white visual identification band inscribed in black with the designation E-27 on the other. This female came from an egg taken from a nest in Osceola County, Florida, in January 1990. She hatched on 16 January at the G.M. Sutton Avian Research Center in Bartlesville, Oklahoma. On 8 April 1990, she fledged from a hack tower at Eufaula Lake in east-central Oklahoma, approximately 345 km south of the Hillsdale nest (Mulhern, et. al., 1994).

The Hillsdale pair began incubating in early March 1993 and fledged one eaglet in late June. They returned to the same nest in 1994 and were positively identified by their bands. The pair began incubating in late February and successfully fledged two young (Table 3). An attempt to band the eaglets on 26 May 1994 was unsuccessful. The climber was unable to get into the nest as the support branches were unstable.

In 1993, the female eagle, E-27, exhibited the typical plumage of a three year old (Palmer 1988). The head was light brownish or tan, the throat was largely whitish and it had a dark eye stripe. The breast and belly were a brownish olive with white mottling. The tail was mostly white proximally with brown flecking, with the distal third primarily brownish. The wing lining was mostly white. This is one of very few documented cases where a known three year old eagle has successfully raised and fledged young (Mulhern, et. al., 1994).

In 1993, the male, eagle B, exhibited typical four year old plumage (Palmer 1988). The head was white with brown flecking on the crown and forehead. The body feathering was dark brown and the tail was mostly white with brown tips and a scattering of brown flecks on the distal third. Eagle B closely matched Stalmaster's (1987) description of subadult plumage E, while the female, eagle E-27, resembled his description of subadult plumage D.

By 1994, eagle E-27's plumage had developed characteristic adult patterns. The head was white but retained a small dark brown spot above the eye. There was also a larger brown spot directly behind the eye in approximately the center of the side of the head. The tail was white and the body feathering was dark brown. The plumage of eagle B had developed to that of an adult. The head and tail were white with a dark brown body and wings.

**TABLE 3. Bald Eagle Nesting Data, Hillsdale Lake**

<b>EAGLE ACTIVITIES</b>	<b>1993</b>	<b>1994</b>
Incubation begins (estimated)	March 07	Feb. 23
Incubation begins (observed)	March 25	March 02
Eggs hatch	April 14	April 02
Days of incubation	38	38
Eaglets fledged	June 27	June 18
Fledgling age (days)	73	77
No. of young fledged	1	2
Last observation within nesting territory	July 17	Aug. 18

**TABLE 4. Bald Eagle Nesting Data, 1994**

<b>EAGLE ACTIVITIES</b>	<b>Perry Lake</b>	<b>Wolf Creek Lake</b>
First observation at nest site	March 06	March 08
Incubation begins	March 15	April 26
Eggs hatch	April 23	April 26
Days of incubation	39	36
Date eaglets fledged	July 04	July 11
Fledgling age (days)	72	77
Banding dates	—	June 06
No. of eagles banded (juveniles)	—	2
Band identification used	—	2C, 2D
No. of young fledged	2	2
Last observation within nesting territory	S.A.Y.*	S.A.Y.*

\*S.A.Y.: Eagles Stayed in the nesting territory All Year.

**PERRY LAKE:** The Clinton Lake eagle that was trapped in 1989 and fitted with the purple band inscribed with the letter A, was discovered on 15 March 1994 at a nest site in the Big Slough Creek arm of Perry Lake, Jefferson County. Perry Lake is located 24 km northwest of Clinton Lake. It is also a COE water resources development project. The lake is 4514 ha in size. The nest was constructed approximately 18 m high in a live American Sycamore (*Plantanus occidentalis*) approximately 9 m landward from the edge of the normal lake elevation. This nest was less than 0.9 m in diameter and was the smallest of the five successful Bald Eagle nests in the state.

The pair hatched and raised two young in 1994. A banding attempt was made on 6 June, but was aborted due to the precarious location of the nest. Two juveniles fledged in early July. (Table 4).

The dark purple band on eagle A has faded to a pink or rose color. A record search at the FWS's Bird Banding Laboratory in Laurel, Maryland eliminated any other possibilities and confirmed this was the eagle banded at Clinton in 1989. It is noteworthy as the band on eagle B has not faded and remains dark purple. The Perry Lake female does not have any leg bands or other identifying marks.

In 1994, eagle A exhibited what could be considered subadult plumage even though it had reached 5 years of age. The white head still had a relatively slender stripe of brown flecking through the forehead and crown. The tail was white and the body and wings were dark brown. It appeared similar in coloration to the plumage exhibited by its sibling, eagle B, the previous year. The Perry Lake female also exhibited plumage characteristics of a subadult. Her head was white with a relatively wide band of brown flecking through the forehead and crown. The tail was white and the body and wings were dark brown.

**WOLF CREEK:** Another first year nest was discovered in 1994 among some flooded timber in Hess' Cove of the cooling lake at the Wolf Creek Generating Station, Coffey County. The nest was constructed approximately 6 m above the water in what was believed to be a dead Black Locust (*Robinia pseudoacacia*) tree. The nest site had similar characteristics to the Clinton and Hillsdale nest locations. The Wolf Creek Cooling Lake is 2061 ha in size and was constructed by the owners of the Wolf Creek Generating Station. The lake was designed to cool the generating plant. The cove of the lake where the nest was located is not greatly affected by the heated discharge from the generating station.

The adult male had a standard FWS aluminum band on his right leg and the adult female had a standard FWS aluminum band on her left leg. Neither bird had any additional identifying markers so cannot be traced to their origins without being trapped. The eagles were either banded in the wild, released as part of another state's Bald Eagle re-introduction program or rehabilitated at an animal care unit. According to the FWS's Bird Banding Laboratory, many states including Missouri, Montana, Nebraska, North and South Dakota, Oklahoma, Texas, Wisconsin, and Wyoming have banded numerous Bald Eagles with only standard FWS aluminum leg bands. In addition, nine rehabilitated Bald Eagles have been banded and released in Kansas since 1972 without colored, visual identification bands.

Both eagles exhibited typical plumage of mature adults. The pair raised two eaglets which were banded on 6 June. The juveniles fledged in mid-July (Table 4).

## DISCUSSION

The Hillsdale female's place of origin, Florida, distinguishes her as belonging to the southern subspecies of Bald Eagle (*H. l. leucocephalus*). The Clinton birds, which produced the Hillsdale male, had been presumed to be the northern subspecies (*H. l. alascanus*). However, a re-evaluation of measurements taken on the Clinton male and several juveniles calls into question their subspecific classification. A final determination of this question has not yet been reached. The development of a pure white head and tail does not necessarily coincide with sexual maturity. The Hillsdale and Perry Lake birds were reproductive prior to obtaining their "adult" plumage. In areas with adequate, unoccupied nesting territories, Bald Eagles may breed as subadults (Palmer 1988). This is to be expected when there are no other breeders present to inhibit them (ibid).

It is expected that the Bald Eagle population in Kansas and throughout the midwest will

continue to expand. It is likely that the original nesting pair at Clinton Lake and their offspring will serve as a source for additional nesting eagles to help fill habitat voids in the region. Data from seventeen hatched eagles in New York showed that males established nests an average of 58 km from their release sites, while females nested an average of 161 km from where they were fledged (Nye 1990).

The increase in Bald Eagle numbers nationwide has resulted in the FWS's recent proposal to reclassify the species from an endangered status to threatened in most of its range. Bald Eagles are returning and nesting in regions of the country including Iowa, Missouri, Nebraska and Oklahoma, that were apparently abandoned over a hundred years ago. They seem to be taking advantage of new habitat provided by the construction of large water impoundments. As a result, new nesting populations are expanding into large lake and reservoir areas rather than in traditional habitats along river and stream corridors.

The utilization of habitats created by large man made water impoundments has created unique conflicts between nesting eagles and other authorized lake purposes. Clinton, Hillsdale and Perry Lakes receive hundreds of thousands of recreational visitors annually. Buffer zones have been established around the nest sites to minimize the disturbance from human activity. Individual eagle tolerance of human presence and activity varies greatly (Palmer 1988). The protected distance from the nest tree varies in Kansas from a minimum of 140 m for relatively tolerant eagles, to 270 m for a relatively sensitive pair.

The potential for flooding during high water events is another concern as the three COE lakes were built primarily for flood control. The rainy season occurs during the spring at the peak of the nesting season. During the spring of 1993, a Bald Eagle practice nest was destroyed by high water at Tuttle Creek Lake, 5 km north of Manhattan, Kansas. In 1994, high water at Truman Lake in Warsaw, Missouri inundated the lower 0.5 m of a Bald Eagle nest leaving approximately 1.3 m of free board. The nest contained three eaglets that were approximately seven weeks old. Biologists were prepared to transfer them to an artificial, floating nest structure but the water level crested and receded before this became necessary. The nest was constructed 9 meters above normal lake elevation. The adults remained attentive and continued feeding the juveniles during the flood event.

Three of the Kansas nests were constructed in dead, decaying trees that were flooded when the lakes were originally impounded. The durability of these decaying trees and the longevity of this habitat type appears relatively limited. Bald Eagle nests are usually constructed below the top of the crown in a live tree, where young are sheltered from the elements and the parents have adequate aerial access (Palmer 1988). In Alaska, the average life expectancy of a nest is about twenty years (Gordon 1991). Most nest trees collapse under the weight of the Bald Eagle's nest, usually during strong winds (*ibid*).

The Bald Eagles at Wolf Creek and Perry Lakes were sighted within their nesting territory the entire year. These are the first eagles documented as year long residents in Kansas. Bald Eagles that have nested, tend to stay on or near their nesting locality the year round if food is available and the weather is bearable (Palmer 1988). The eagles at Clinton and Hillsdale Lakes have historically left the area during mid-summer. It is presumed that they migrate to avoid the severe heat of July and August. The summer of 1994 was relatively mild. If the Wolf Creek and Perry Lake eagles nest again in 1995, they will be monitored closely to document any migration patterns during a "typical" Kansas summer.

#### ACKNOWLEDGEMENTS

We thank the personnel of the U.S. Army Corps of Engineers at Clinton, Hillsdale, and Perry Lakes, and the staff at the Wolf Creek Generating Station for their assistance and dedication in gathering critical nesting data. We appreciate the documentation of significant eagle activities provided by Dr. John Foyal, Dodge City Community College and Mantel Torrez, Fort Hays State University.

We also thank Mike Lockhart who trapped the eagles from 1989 to 1991 and Craig Birrell who climbed the nest trees in 1993 and 1994.

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**King Rail Impaled on Barbed Wire Fence.** On 14 May 1993, while driving north on U.S. highway 75, we spotted a bird hanging from the second wire from the top of a five-wire barbed wire fence. After stopping to examine and photograph the bird, it was identified as a King Rail (*Rallus elegans*) that was impaled through the patagium of the right wing, an apparent result of colliding with the fence. The sighting took place approximately 10 miles south of Yates Center, Woodson County, Kansas, along an east-west section of the highway. The rail appeared to have been dead for no more than two or three days, and had not decomposed much.

As reported by Wolfe (1993), bird-fence collisions are undoubtedly more common than the few published records indicate. Allen and Ramirez (1990), Braun et al. (1978), Knight et al. (1980, and Wolfe (1993) give some reviews of birds colliding with or being impaled on fences, but none report such a fate for King Rails. The only record we could locate on King Rails colliding with a fence was Pettingill (1946), who found a King Rail close to death, caught on a barbed wire fence in Texas.

Although fence collisions can probably not be considered a major cause of mortality for birds, it is worth documenting, and may in some cases be a correctable problem where rare or endangered species might be at risk.

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**Early Fall Chipping Sparrow for Meade County, Kansas.** Chipping Sparrows (*Spizella passerina*) are a common spring and rare fall transient through Meade County with normal dates of 16 April through 13 May and 28 September through 26 October.

While mist netting near the north hatchery ponds at Meade State Lake on 26 August 1994, I captured five juvenile Chipping Sparrows in riparian woodland habitat. The five birds showed heavy streaking, indicative of juvenile birds.

This record, although not unique for Kansas, is a full month early for Meade County, and may represent an early record for southwestern Kansas.

Thomas L. Flowers, P. O. Box 87, Meade, KS 67864-0087.

**1993 Report of the Kansas Bird Records Committee.** This report summarizes records received and evaluated by the committee for the calendar year 1993, as well as any decisions pending from the previous year. A total of 27 submissions were received by the committee and 12 were circulated for evaluation.

#### RECORDS ACCEPTED

Clark's Grebe (*Aechmophorus clarkii*): 93-28; 1: 20 Nov 1991; Perry Lake, Jefferson Co.; Galen Pittman.

White Ibis (*Eudocimus albus*): 93-21; 1; 8 August 1993; Marias des Cygnus Wildlife Area, Linn Co.; JoAnn Garrett.

Little Gull (*Larus minutus*): 93-24; 1; 14 Oct 1993; Hillsdale Lake, Miami Co.; Lloyd Moore.

Inca Dove (*Columbina inca*): 93-09; 1; 24 April 1993; near Thayer, Neosho Co.; Richard Rucker.

White-throated Swift (*Aeronautes saxatalis*): 93-19; 1; 8 April 1993; Arkansas City, Cowley Co.; Gerald Wiens; photograph. Fifth state record.

Costa's Hummingbird (*Calypte costae*): 93-22; 1; circa summer 1990; near Sharon Springs, Wallace Co.; J. D. Dick and J. D. Rising; specimen. First verified state record.

Virginia's Warbler (*Vermivora virginiae*): 93-11; 1; 9 May 1993; Overland Park, Johnson Co.; Barbara Buehler.

Phainopepla (*Phainopepla nitens*): 93-25; 1; 8-9 Sept 1993; Garden City, Finney Co.; Leonard Rich. First verified state record.

Golden-crowned Sparrow (*Zonotrichia atricapilla*): 93-02; 1; 22 Dec 1993; near Perry, Jefferson Co.; Richard Rucker.

#### RECORDS REJECTED

White-winged Dove (*Zenaida asiatica*): 93-20; 2; 14 Sept 1993; near Colby, Thomas Co.; Identification questionable; insufficient details to eliminate similar species.

Cordilleran Flycatcher (*Empidonax occidentalis*): 92-18; 1; 5 Sept 1993; Cimarron River, Morton Co.; Identification questionable; insufficient details to eliminate similar species.

Black-chinned Sparrow (*Spizella atrogularis*): 93-06; 2; 6 May 1993; Cimarron River, Morton Co.; Identification questionable; insufficient details to eliminate similar species.

Galen L. Pittman, KBRC Secretary.