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# BALD EAGLES WINTERING ON THE NEOSHO RIVER, OKLAHOMA

By James W. Lish

THE fact that the Bald Eagle (*Haliaeetus leucocephalus*) winters regularly around several of Oklahoma's large reservoirs has not been widely publicized.

**BALD EAGLE**

*An immature bird photographed by James W. Lish along the Neosho River in northeastern Oklahoma on 19 February 1970.*

While Bald Eagles of the large northern race, *H. l. alascanus*, "probably visit Oklahoma from time to time," the very few specimens thus far taken in the state are of the small, southern, nominate race (Sutton, 1967, Oklahoma birds, pp. 117-18), a form that has declined in numbers so rapidly within recent decades that it is now listed as endangered (Office of Sport Fisheries and Wildlife Resource Publication 114). Research on the ecology of Bald Eagles that winter in Oklahoma and in other parts of the Southern Great Plains has been sorely neglected. Learning about the requirements of these wintering birds is an important step toward preserving them.

From October 1968 through November 1971 I made numerous observations of wintering Bald Eagles on the Neosho River Arm of Lake of the Cherokees (Grand Lake) in Ottawa County, northeastern Oklahoma, paying special attention to feeding habits, behavior, and population trends. The study area, located at the confluence of the Neosho River and Sycamore Creek, included 7.5 square miles of mudflats and shallow water. Johnson (1960, Southwest. Nat., 6: 107) observed 65 Bald Eagles at a roost in this area in February 1959. Cooksey (1962, Master of Science Thesis, Kansas State College of Pittsburg) counted 183 eagles at the same roost in January 1962. I estimated that 50 eagles wintered in the area in 1968-69, and probably about the same number were there the following two winters. I observed the eagles with a 7 x 35 binocular and a 20X spotting scope. A 17 ft. long square-sterned canoe with 4 hp. outboard motor gave me excellent mobility. Often I used one of two blinds, each made of driftwood and camouflaged mosquito netting.

I entered one blind or the other before sunrise and spent 6-10 hours per week there, observing the eagles. The birds used certain trees repeatedly for perching and feeding, and under these trees prey remains accumulated. I never saw an eagle feeding except at one of the five widely separated feeding perches,

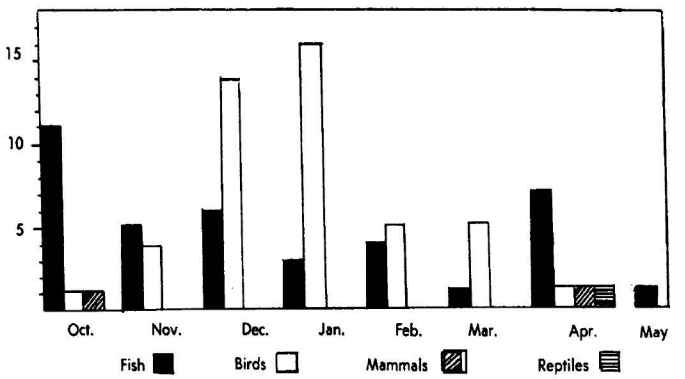


Fig. 2. Prey remains found beneath eagle perches, Neosho River, Oklahoma.

each of which was well above ground. Below these perches I collected prey remains every two or three weeks. Conspicuous unpaired bones (e.g., skulls and sternums) that could be counted as one animal I identified and kept, but other bones I discarded to avoid counting any prey item more than once. Of the 96 prey items found, 56 were birds (mostly waterfowl), 37 fish, 2 mammals, and 1 a reptile (Table I). Two perches that seemed to be especially attractive

Table I
Prey remains found beneath eagle perches, Neosho River, Oklahoma, October-May, 1968-1971.

| | *Perch designation and numbers of prey* | | | | | |
|---|---|---|---|---|---|---|
| Prey Species | A | B | C | D | E | Total |
| Common Merganser *(Mergus merganser)* | 2 | 4 | 13 | 5 | 9 | 33 |
| American Coot *(Fulica americana)* | 1 | 1 | 3 | 1 | 2 | 8 |
| Horned Grebe *(Podiceps auritus)* | | | 11 | 1 | | 12 |
| Snow Goose *(Chen caerulescens)* | | 1 | | | | 1 |
| White Pelican *(Pelecanus erythrorhynchos)* | | | | | 1 | 1 |
| Great Blue Heron *(Ardea herodias)* | | | 1 | | | 1 |
| Channel Catfish *(Ictalurus punctatus)* | 2 | 1 | 7 | 4 | 5 | 19 |
| White Bass *(Roccus chrysops)* | 1 | | 2 | | 1 | 4 |
| Carp *(Cyprinus carpio)* | 2 | 1 | 3 | 2 | 5 | 13 |
| Longnose Gar *(Lepisosteus osseus)* | | | 1 | | | 1 |
| Opossum *(Didelphis marsupialis)* | | | 1 | | | 1 |
| Fox Squirrel *(Sciurus niger)* | | | | | 1 | 1 |
| Common Snapping Turtle *(Chelydra serpentina)* | 1 | | | | | 1 |
| Totals | 9 | 8 | 42 | 13 | 24 | 96 |

to the eagles provided a good view of areas in which hundreds of waterfowl, mostly Common Mergansers *(Mergus merganser)* and American Coots *(Fulica americana)*, used the shallow water and mudflats for feeding and loafing from December through February. The fact that few mammals and reptiles were taken as prey may indicate that these were difficult to find in winter. Sutton *(op. cit.*, p. 116), who stated that the Bald Eagle "probably feeds largely on fish while in Oklahoma," mentioned some mammalian but no avian prey.

Southern (1963, Wilson Bull., 75: 42-55), who found both Bald Eagles and Common Mergansers wintering along the Mississippi River in Illinois, obtained no evidence that the eagles fed on the mergansers. My studies show that significant numbers of fish are eaten by Bald Eagles in northeastern Oklahoma in October, November, and April, but that from December through March waterfowl are the principal prey (Fig. 1). Judging from skeletal size, the carp and catfish eaten weighed from 2 to 4 lbs. each, while the average for birds was probably near 2 lbs. In terms of total pounds consumed, then, fish were the most important food except during the coldest part of the winter, when they may not have been readily available except as carrion. I never saw an eagle capture prey or pick up carrion, though I did observe 24 unsuccessful attempts to capture live prey, mostly fish. Along the Mississippi River in Illinois, Southern (*loc. cit.*, p. 47) noted "several unsuccessful attempts to capture mergansers." It occurs to me that since the water near the mudflats in my study area was nowhere much more than 18 in. deep, some mergansers, grebes, and coots might have been captured while submerged.

There was evidence of an established peck order among the eagles on my study area. When several eagles were in one tree, the highest perch was always occupied by what appeared to be the most aggressive bird. This was true among both immature birds and adults. When several eagles perched in one tree, a typical arrangement from the lowest position upward was an immature bird, a more aggressive immature bird, an adult, and a large, aggressive adult. This system of ranking, which may, admittedly, have varied with the hunger of the birds, was apparent also during feeding activities. When eagles fed on a deer carcass (roadkill) that I set out, the immature birds fed last. I find in the literature no mention of this sort of behavior among Bald Eagles.

On 12 and 13 January 1970 I made a point of plotting the full day's movements of an immature eagle, an individual easily recognized by a large number of light feathers on its body and a missing primary wing feather. On each of the two days the bird left the roost area shortly after daybreak. I watched it until it alighted, then moved the canoe to a location from which I could make further observations. When the bird flew to another perch, I followed in the canoe. All flights were made along the river's course rather than across land. On 12 January it left the roost at 06:25 and flew to Perch A, where it remained until 11:40, when it circled the mudflats and alighted at Perch B (Fig. 2). At 12:15 it flew to Perch C. At 12:25 it flew to Perch D, where it remained until 16:45. At this time it flew toward Perch A where, rather than alighting, it circled and returned to the roost area. During this 10½-hour period the eagle flew a minimum straight-line distance of 13 miles and patrolled a 2-square-mile area without either capturing prey or eating. On 13 January it patrolled the same area, flying about the same total distance and using the same perches,

though in different order, and again without capturing prey. During foodless periods of this sort an eagle presumably subsists on stored fat.

I counted the eagles of the entire study area each week, usually on three days of each week, usually noting where each bird was, whether it was immature or adult, and the time of day in which I saw it. The maximum number of eagles counted at any one time was 38 — on 18 December 1969. On that cold day (at Miami, Oklahoma, minimum air temperature 42° F., maximum

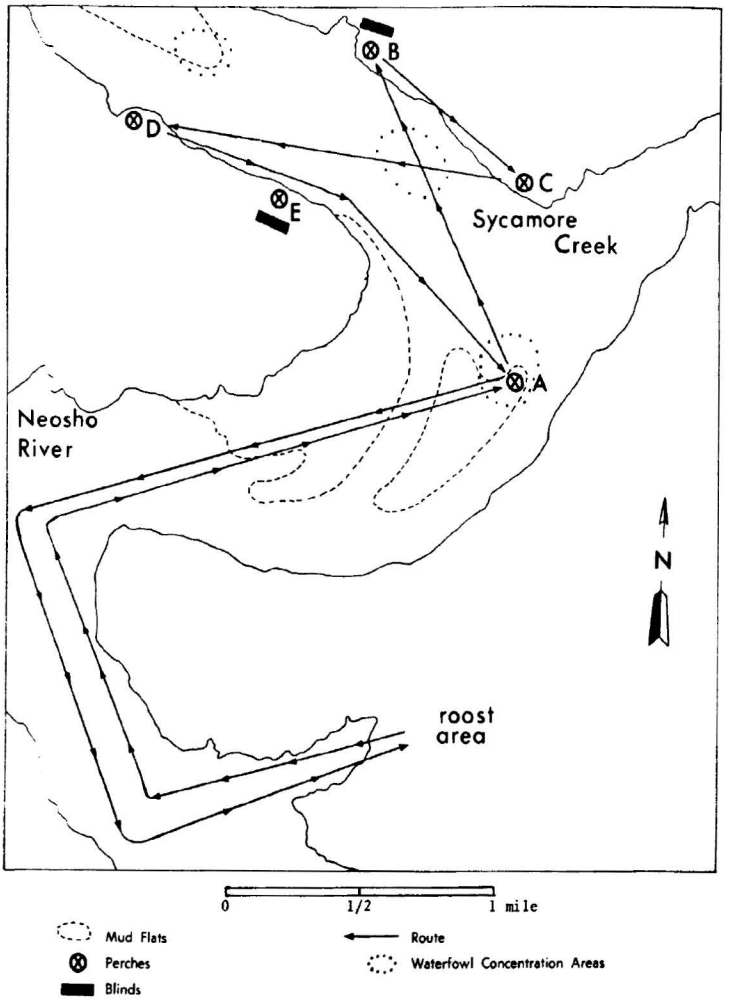


Fig. 1. Route taken by one Bald Eagle during a period of 10½ hours, 12 January 1970.

54° F., lows during five preceding days all below freezing) the birds were in trees and also on the ice. During my systematic censuses from 1968 through 1971 I recorded 316 eagle sightings, 182 (57%) of which were of adult birds, 133 (43%) of immature birds. My earliest date for an eagle was 17 October 1968, my latest date 11 May 1969. Sutton *(op. cit.)* stated that the Bald Eagle is seen in Oklahoma "from October 1 to April 25." My seven May sightings were all of immature birds, and never more than one bird on a given day. The average number of eagle sightings per hour was 0.35 in October, 0.95 in November, 1.5 in December, 1.1 in January, 0.91 in February, 0.50 in March, 0.90 in April, 0.10 in May. The highest population density was reached each winter in December, followed by a steady decline until April, when a slight increase may have indicated that the study area was being used during spring migration as a staging area by eagles that had wintered elsewhere.

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## GENERAL NOTES

**Third specimen of Common Tern for Oklahoma.**—At about 07:00 on 19 October 1971—a mild morning—my husband, A. M. Mery, collected a Common Tern (*Sterna hirundo*) at Hulah Reservoir in Osage County, northeastern Oklahoma. The bird was flying low near a floating duck blind about 350 yards from shore at the north end of the reservoir's northeastern cove; its smallness, graceful flight, and forked tail were noticeable. Not far from the blind were scattered Ring-billed Gulls (*Larus delawarensis*), Franklin's Gulls (*L. pipixcan*), and Bonaparte's Gulls (*L. philadelphia*).

The tern specimen (UOMZ 7246) proved to be a female in complete first winter feather. It is the third specimen of *Sterna hirundo* for Oklahoma. The first, a fully adult male in changing feather (UOMZ old no. 13,871), was taken on 3 July 1929 on the Illinois River near Gore, Sequoyah County (Bird, 1930, Auk, 47: 269; Nice, 1931, Birds of Oklahoma, p. 97; Sutton, 1967, Oklahoma birds, p. 223). The second, a female largely in first winter feather (UOMZ 7197), and a banded bird, was taken on 4 September 1971 at Lake Hefner, Oklahoma County (Roberts, 1973, Bull. Oklahoma Orn. Soc., 6: 21). In this September specimen some of the innermost secondaries and several of the scapulars are juvenal—i.e., tipped with pale grayish brown. In the October specimen these feathers are all without the grayish brown tipping.—Sophia C. Mery, *345 S. E. Boston, Bartlesville, Oklahoma 74003, 20 July 1972.*

**Band-tailed Pigeon in east-central Oklahoma.**—On 3 December 1972, while I was looking for birds along a dirt road in the Sequoyah National Wildlife Refuge in Sequoyah County, east-central Oklahoma, I had a good look at a Band-tailed Pigeon (*Columba fasciata*). When I first saw the bird it was