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DIET, POPULATION SIZE, AND HIGH-USE AREAS OF BALD EAGLES WINTERING AT GRAND LAKE, OKLAHOMA

By James W. Lish

INTRODUCTION

Grand Lake (Lake O' the Cherokees) in Ottawa and Delaware counties has long been recognized as an important wintering area for Bald Eagles (*Haliaeetus leucocephalus*) in Oklahoma. The first systematic observations of Bald Eagles in this area were made by Cooksey (1962). He investigated the ecology, behavior, and roosting habits of eagles at a communal night roost during a five month period from 1 November 1960 to 1 April 1961. During four winters from 1968 through 1971, Lish (1973) studied eagles in the upper Grand Lake area just down river from Twin Bridges State Park. That study focused on food habits and diurnal behavior. Lish (1975) made further observations of Bald Eagles on Grand Lake as part of a statewide study and estimated the population size on 11 February 1974. He concluded that approximately 50 Bald Eagles wintered at Grand Lake that year.

The study presented here represents the most detailed research to date of wintering Bald Eagles at Grand Lake and was conducted from January to March 1987. The primary objective was to identify high-use areas. Two secondary objectives were to estimate the size of the wintering population and identify important prey species. This study differs from all previous studies in the Grand Lake area in its intensive use of aerial surveys and synchronized roost counts. These provided accurate identification of high-use areas and winter population size estimates.

METHODS

The size of the wintering Bald Eagle population at Grand Lake was determined by regularly counting the number of eagles using a large communal night roost near Twin Bridges State Park. Roost counts began at 1500 and continued until dark. A pair of 7 power binoculars and a 15 power spotting scope were used to determine age categories during low light conditions. This roost lies on a small island on the boundary of sections 29 and 30 between SH 60 and the Burlington Northern Railroad in

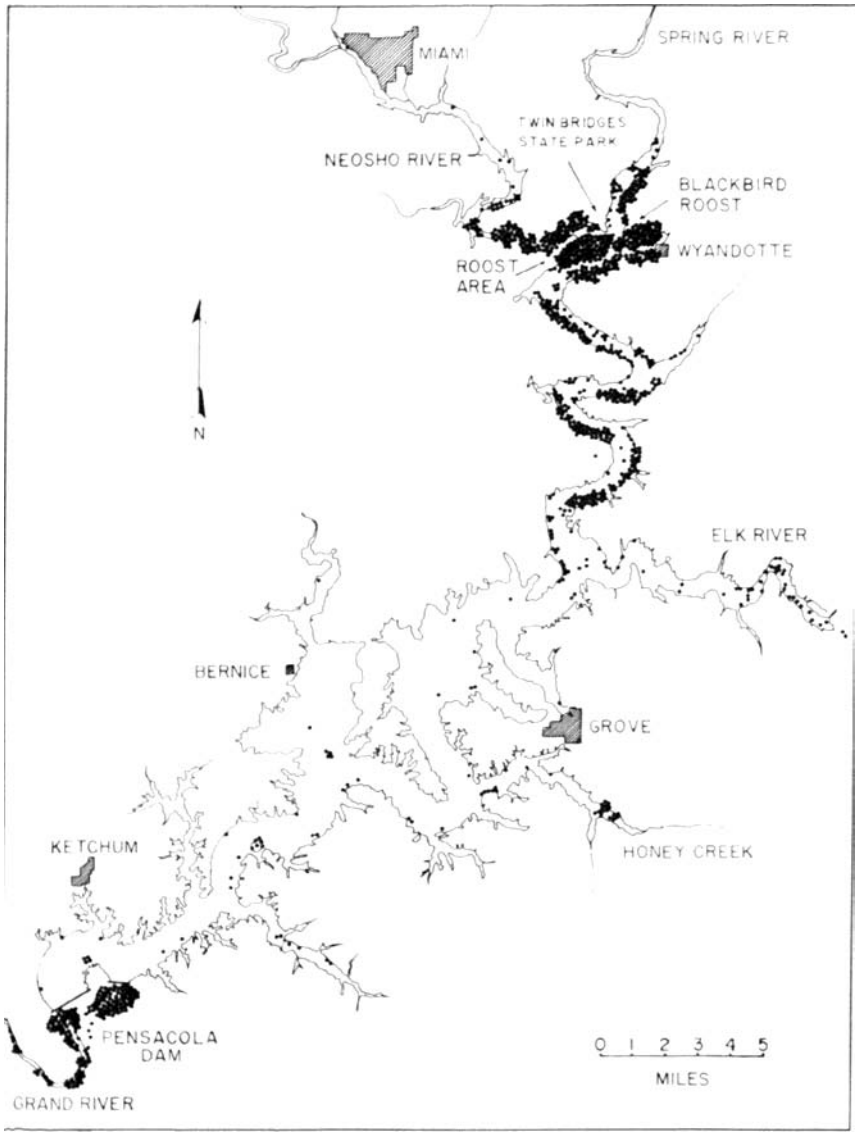

Fig. 1 Distribution of 1056 Bald Eagle sightings during 13 aerial surveys from 19 January to 5 March 1987 at Grand Lake, Oklahoma. Each dot represents one eagle sighting.

Table 1. Number of Bald Eagles counted at the communal night roost at Twin Bridges State Park, 1987.

Date	Adults	Immatures	Age Unknown	Total
19 January	24	29	8	61
20 January	32	39	8	79
23 January	38	26	23	87
30 January	19	17	21	57
2 February	34	39	9	82
9 February	29	27	7	63
16 February	20	24	10	54
19 February	12	17	7	36
21 February	11	18	0	29
24 February	5	7	0	12
27 February	6	2	0	8
2 March	4	1	0	5
5 March	1	0	0	1

Wyandotte Township, Ottawa County.

Aerial surveys were used to identify areas used by Bald Eagles for feeding and perching during the day. At least one aerial survey of the entire lake was conducted each week, but sometimes surveys were done up to three times per week. A total of 13 aerial surveys were accomplished. Surveys were conducted in the mornings, usually between 0800 and 1130. A small two-seated light aircraft was used. Only one person counted during each survey. The lake was surveyed from the north end on the Neosho River side south to Pensacola Dam. The area immediately below the dam was searched, and on the return trip the opposite side of the lake was covered. Each survey took approximately 3.5 h. The Neosho River was surveyed starting at Miami, Oklahoma and the Spring River arm to approximately 2 km north of Twin Bridges State Park. The locations of all eagles sighted were plotted on lake maps, and the high-use areas were identified. We did aerial surveys as often as weather and funding permitted.

No single method is entirely satisfactory for determining the food habits of birds of prey (Errington 1932). Pellet castings, for example, are not always reliable because some prey items (such as fish) do not show up consistently in pellets. Collecting prey remains at feeding perches is subject to error because some remains are difficult to find, and others are carried off by scavengers. Direct observations of feeding also have problems such as the difficulty in identifying certain prey remains at a dis-

Table 2. Prey items of Bald Eagles identified from direct observation, remains from beneath perches, and pellet castings at Grand Lake during January, February, and March, 1987.

Direct Observations

Species	Number	Percentage
Blackbirds*	26	47.3
Gizzard shad	20	36.4
White crappie	3	5.4
Freshwater drum	3	5.4
Carp	1	1.8
Unidentified fish	2	3.6

Remains

Species	Number	Percentage
Freshwater drum	6	33.3
Carp	5	27.8
Blackbirds*	3	16.7
Gizzard shad	2	11.1
White bass	1	5.6
Unidentified duck	1	5.6

Pellets

Species	Number	Percentage
Blackbirds*	11	100

*Includes Red-winged Blackbird *(Agelaius phoeniceus)*, Brown-headed Cowbird *(Molothrus ater)*, Common Grackle *(Quiscalus quiscula)*, and Brewer's Blackbird *(Euphagus cyanocephalus)*.

tance. Because of the potential error in each method, we used all three methods to determine the main prey species. Observations of feeding eagles were made from a vehicle using a 15 power spotting scope. Most eagles observed feeding were within 0.5 km from the observer.

RESULTS

As with wintering Bald Eagle populations in most areas of similar latitude, the population at Grand Lake exhibited fluctuations throughout the winter (Table 1). The highest number of eagles recorded at the roost was 87 on 23 January. Counts from aerial surveys were not considered reliable indicators of population size because of error caused by double counting. However, the number of eagles counted during most aerial surveys approximated the number at the night roost. Most of the Bald Eagles wintering at Grand Lake were apparently using this roost during January 1987.

I made a total of 1056 Bald Eagle sightings between 19 January and 5 March (Fig. 1). The most important high-use area on Grand Lake during

that time period was at Twin Bridges State Park near the confluence of the Neosho and Spring Rivers and along Grand River south to its confluence with Elk River. Moderate use occurred along the Elk River arm of the lake and the White River cove on Honey Creek. With the exception of the latter two locations, Bald Eagle use of the main body of the lake was low. Another area of high-use occurred just below the main spillway of the Pensacola Dam and the east spillway.

Food habit analysis of wintering Bald Eagles at Grand Lake shows a high frequency of occurrence of blackbirds (Table 2). They comprised 47.3 and 100% of the samples taken by direct observations and pellets, respectively. Fish comprised 52.7 and 77.8% by frequency of the samples taken by direct observation and prey remains, respectively (Table 2). Gizzard shad (*Dorosoma cepedianum*), carp (*Cyprinus carpio*), freshwater drum (*Aplodinotus grunniens*), white crappie (*Pomoxis annularis*), and white bass (*Morone chrysops*) are the most important species used by eagles. It is important to note that these percentages are based on the frequency–not mass–of the prey recorded. Large fish probably provide more food value than smaller species that may have occurred at higher frequencies.

DISCUSSION

There is little doubt about the importance of Twin Bridges State Park as a communal roosting and feeding area for Bald Eagles at Grand Lake. Communal night roosts do not occur in all areas of North America where Bald Eagles winter (Steenhof 1978). They typically form only near a stable food source such as the blackbird roost and the favored fishing areas near Twin Bridges State Park. However, the exact function of communal roosting in Bald Eagles is not well understood. We noted that the eagles roosting and feeding in the Twin Bridges area showed tolerance for human activity, but during weekends when human activity was high, eagles did not utilize the area for feeding or roosting. When human activity declined, eagles returned to the area. Most of the high-use areas on the main body of Grand Lake are used primarily for resting and soaring during the daylight hours. These areas (Fig. 1) occur primarily along high bluffs on the outside curves of the river. At Grand Lake and at most man-made lakes, the area directly below the spillway is an important feeding area because of the availability of fish which are either injured or disoriented after passing through the turbines in the dam and are thus easily captured.

A large blackbird roost near Twin Bridges State Park provided an important source of food for Bald Eagles. Several million blackbirds probably used the roost, but exact numbers have not been determined.

Blackbirds began arriving from several directions at approximately 1530 and continued until dark. The columns of birds arriving at the roost were up to 1 km wide and extended from the roost to the horizon. The blackbird roost was at least a kilometer long and was situated in the riparian zone on the east side of Spring River. It was used only in the winter months. Based on direct observations of eagles capturing blackbirds at Twin Bridges, it was evident that crippled or dead birds were most often taken. These birds were ones shot by local residents at the roost in the evenings. We could not determine if blackbirds would have been a significant food source for eagles without shooting at the roost.

ACKNOWLEDGMENTS

I thank the Benham-Holway Power Group of Oklahoma City and Tulsa for generous financial support throughout this study. Dennis O'Mellia served as field technician and did a superb job in collecting data. Perry Knight of Miami, Oklahoma, was pilot. Always ready to fly at short notice and during less than ideal weather conditions, he deserves special thanks. The personnel of the Oklahoma Cooperative Fish and Wildlife Research Unit provided vehicles and other logistical support. I am grateful to them for their help.

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OKLAHOMA COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT, 404 LIFE SCIENCES WEST, OKLAHOMA STATE UNIVERSITY, STILLWATER, OK 74078-2007. Accepted 17 March 1997.

STATUS OF THE CRESTED CARACARA IN OKLAHOMA

By Joseph A. Grzybowski

The status of the Crested Caracara (*Polyborus plancus*) in Oklahoma has been based on two sight records, one in the early spring of 1944 in Pontotoc County, and a second on 7 February 1965 in Garfield County (Sutton 1967). Because no specimen or photograph existed, Sutton (1967) designated the species as hypothetical, indicating that its occurrence in Oklahoma was unconfirmed.

Since 1990, the Oklahoma Bird Records Committee (OBRC) has examined a number of old records, including those for the caracara, using a structured set of criteria and procedures (Oklahoma Bird Records Committee 1988). This process evaluates the validity of each record's supportive documentation (i.e., specimens, photographs, written description, or other material). Because no written details of the early caracara observations exist (Sutton 1982), the OBRC withdrew the hypothetical status of Crested Caracara in Oklahoma and removed the species from the state list (Grzybowski *et al.* 1992).

Two additional records of Crested Caracara for Oklahoma have recently been put forward. One bird was reported for the Salt Plains National Wildlife Refuge from 24 September to 1 October 1990 (Beierman 1993); however, no descriptive details of these observations were presented in the note or were available from the observer (Beierman, pers. comm.), leaving the record without support for future reference. A second recent report for a bird observed near the Atoka-Bryan county line on 19 May 1993 was evaluated by the OBRC. The brief description was considered insufficient to support the record as the first acceptably documented for Oklahoma.

Could the Crested Caracara occur or have occurred in Oklahoma? In Texas, the caracara is characteristic of south Texas brush country and coastal grasslands, breeding northward in a continuous but narrow band of blackland prairie to Navarro and Kaufman counties just southeast of Dallas (Pulich 1988). Caracaras are rare to uncommon residents in these counties, but regular enough that birds have also been sighted in bordering Hunt, Rains, Rockwall and Van Zandt counties, and in areas just south of Dallas-Fort Worth. Nearer the Oklahoma border, pre-1962 records exist for Grayson County (bordering the Red River) and Baylor and Young counties (Oberholser 1974), with a more recent sighting on 30 August 1974 in Collin County (just south of Grayson County; Keating 1975).

The Crested Caracara apparently is not prone to wander widely as few records occur for individuals far from potential breeding areas, and

some of these have limited verifying details. The species is widespread in open country of Mexico (Howell and Webb 1995). Its breeding range extends northward from western Mexico into south-central Arizona, and from eastern Mexico into Texas (see above) and southwestern Louisiana (rarely); a declining population occurs in south-central Florida (Lowery 1974, Oberholser 1974, Palmer 1988). Excluding likely escapees (Palmer 1988), extralimital records include a small number along the Rio Grande River in western Texas and southwestern New Mexico, with an exceptional record of nesting just south of Albuquerque (Oberholser 1974, Palmer 1988). Three records exist for the Texas panhandle; occasional records for the Edwards Plateau (central Texas) include that of a nesting in Concho County during 1881 (Oberholser 1974). Several vagrants are known for southeastern Louisiana (Lowery 1974), with one verified in Mississippi (Palmer 1988), and another for Charleston, South Carolina (Potter et al. 1980). The most exceptional of these (outside Oklahoma) are for the Texas panhandle, New Mexico, Mississippi, and South Carolina.

The appearance of the Crested Caracara in south-central Oklahoma, just 110-190 km from the northern limit of its breeding range, is within the purview of only occasional wandering recorded in central and southwestern Texas (Oberholser 1974). However, given the caracara's rarity in north central Texas (Pulich 1988), its occurrence in south central Oklahoma would still be very unusual. Records from other parts of Oklahoma would be exceptional. Thus, all future Oklahoma observations of Crested Caracaras should be thoroughly documented, and birds photographed or collected if possible.

This manuscript benefited greatly from review by Charles R. Brown, Jeff Cox, Darrell Pogue, and Gary Schnell. Darrell Pogue acted as special editor in processing this manuscript.

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GENERAL NOTE

Yellow Rail in downtown Tulsa, Oklahoma.- At 0930 on 9 April 1994 while walking along Third Street, just east of the Main Mall in downtown Tulsa, I was surprised to find a Yellow Rail (*Coturnicops noveboracensis*) sitting in an alcove of the Parker Drilling Building. The night before had been overcast with a low ceiling, intermittent light drizzle, and a light south wind, ideal conditions for attracting and trapping migrants to the artificial lights of cities (Verheijen, F.J., 1985, *Exp. Biol.* 44:1-18). The rail was alert, observant, and did not appear to be injured. After observing the bird for approximately 5 min, I approached to within 2 m at which time it flew approximately 90 m down the Main Mall, landing in a 3 by 9 m raised concrete planter. As the bird flew I saw the white patch in the secondaries and the dangling legs. I searched the sparse vegetation of the planter and found it hiding behind a small clump of English ivy (*Hedera helix*). At that time I reached down and captured it.

I took the bird to my house and called John S. Tomer to help photograph it. Tomer and I took several photographs, and one is on file with the Oklahoma Bird Records Committee and the Tulsa Audubon Society. After photographing the bird, I took it to a marsh in south Tulsa County at approximately 1400 and released it. When I placed it on the ground it slowly walked away into the vegetation. Even when I approached it to within a few cm, it would sneak around and through the vegetation by

stretching out its neck and elongating its body, sometimes crossing over my boot. The bird finally flew across the marsh and lit next to the water's edge on a mud flat where it remained motionless.

Jo Loyd went to the marsh around 1635 looking for the bird. She found it where I had last seen it at 1400. She observed it for approximately 10 min. The bird was not found the next day when Loyd and Pat Seibert returned to look for it.

The first record in Oklahoma was by Lieutenant William Eustis on 7 March 1842 when he collected a specimen (now UOMZ 5361) at Fort Wayne in Delaware County (Tomer, J.S., 1959, *Auk* 76:94-95; Brodhead M.J., 1984, *Bull. Okla. Ornithol. Soc.* 17:28-29). Three specimens were collected by James L. Norman under the KTUL TV tower in Wagoner County on 27 September 1976, 3 October 1976 and 16 September 1982 (Norman, J.L., 1987 *Bull. Okla. Ornithol. Soc.* 20:17-22). A single bird was observed by Delores Scott at a farm pond in Payne County on 23 April 1975 (Scott, D., 1978, *Bull. Okla. Ornithol. Soc.* 11:14). At a television tower near Topeka in Shawnee County, Kansas, two individuals were collected in 1985, 34 in 1986 and 5 in 1994, suggesting that this species is a regular, and possibly even numerous, migrant in the state (Ball, L.G., K. Zyskowski, and G. Escalona-Segura, 1995, *Bull. Kansas Ornithol. Soc.* 46:33-36): My observation of a Yellow Rail in an urban location suggests that this seldom seen rail may also be widespread in Oklahoma.–James W. Arterburn, *5806 E. 78th Place, Tulsa, Oklahoma* 74136. Accepted 24 February 1997.

Errata: During the editorial process, a number of errors were introduced in the note: "First breeding record and summer records for the White-eyed Vireo in the Wichita Mountains, Oklahoma" (Grzybowski, J.A., 1994, *Bull. Okla. Ornithol. Soc.* 27:7-8). The conceptual errors follow: The last paragraph before the Addendum states that the unseen member of the White-eyed Vireo pair "may at that moment have been attending a young cowbird elsewhere." The author submitted the statement that a "cowbird fledgling attended by the second adult or an already independent cowbird were also possibilities." Because cowbirds can become independent of their foster parents before host young, this change misrepresented the potential circumstances.

In the second paragraph, the only published record of White-eyed Vireo "known" for Comanche County should have read "identified" for Comanche County. Other records were known, as later indicated in the note, but unspecified in publication. In the third paragraph of the note, the author (Grzybowski) was incorrectly credited with all observations of White-eyed Vireos in the Wichita Mountains from 1986-91. However, some of these were made by his field assistants.

In the fifth paragraph "eagerly soliciting young" was originally written as "quickly soliciting young;" the former introduces an anthropogenic interpretation rather than a strictly observational comment. Also in the fifth paragraph, "its yellow lores and spectacles" should be "the yellow lores of its spectacles;" lores are part of the spectacles, and the portion of the spectacles around the adult's eye were emerging only as pin feathers with no distinguished color. By the same token, in the fourth paragraph "spectacles around the eyes" should simply read "spectacles." — Darrell Pogue and J.A. Grzybowski.

Erratum: A comment introduced during the editorial process in the note "Carolina Wrens fledge Brown-headed Cowbird chick" (Grzybowski, J.A., 1995, *Bull. Okla. Ornithol. Soc.* 28:6-7) needs to be corrected. The last sentence in the note indicated that Smith (1981, *Bull. Okla. Ornithol. Soc.* 14:15-16) observed wrens attending a fledged cowbird. Instead, however, Smith observed a cowbird in a wren nest, then later observed the nest with only wren young. He presumed the cowbird had fledged, but he could not locate it even though he tried. The cowbird young may have gone undetected, but it may also have succumbed before or after fledging. Because the cowbird young noted by Smith was never seen outside the wren nest, the account by Gryzbowski is the first observation of Carolina Wrens attending a fledged cowbird for Oklahoma.—Darrell Pogue and J.A. Grzybowski.

EDITORIAL

In March 1975, Jack D. Tyler became Editor of the *Bulletin of the Oklahoma Ornithological Society*. For 22 years, Jack served the Oklahoma Ornithological Society, devoting much time and effort to this publication. I am sure that all members of the Society join with me in thanking him for his long-term service. As the new Editor, I can already appreciate the time and energy Jack had to invest to insure timely publication of each issue, and that he did it for over two decades is remarkable.

State ornithological journals serve important functions in documenting unusual bird records, summarizing regional statuses of species, and recording facets of bird behavior, ecology, and natural history that may be unknown at the local level. The *Bulletin of the Oklahoma Ornithological Society* has a distinguished history, dating from its founding in 1968 by George M. Sutton, and has been regarded by many as one of the better state ornithological journals. We can maintain that reputation only through publication of high-quality manuscripts and active support by members of the Oklahoma Ornithological Society. It is through the

Bulletin that members may make lasting contributions to Oklahoma ornithology, and all submissions are encouraged. The *Bulletin* seeks especially articles dealing with species status within the state, summaries and syntheses of major bird banding programs, invasions or extirpations, documented population changes, historical events associated with Oklahoma ornithology, identification of confusing species or plumages, unusual date or occurrence records, and systematic studies of any aspect of avian natural history. The *Bulletin* encourages publication by nonprofessional ornithologists.

I look forward to working with members of the Oklahoma Ornithological Society and other ornithologists in the production of the *Bulletin*. As editor, my overriding priority will be to publish high-quality manuscripts. To assist me in that quest, I have appointed an Editorial Board consisting of Mary Bomberger Brown, Vicki Byre, Jeff Cox, Joe Grzybowski, James Hoffman, Douglas Mock, Gary Schnell, and John Tomer. All submitted manuscripts will be peer-reviewed by one or more members of this board or by other ornithologists with appropriate expertise, and authors always will see and approve any editorial changes to manuscripts. I will not cut corners in the editorial process in the interest of expediency and making deadlines. The best way to insure timely publication of the *Bulletin* is for everyone to contribute to it.—Charles R. Brown

THE BULLETIN, the official organ of the Oklahoma Orinthological Society, is published quarterly in March, June, September, and December, at Norman, Oklahoma. Subscription is by membership in the OOS: $5 student, $7.50 regular, $10 family, $15 or more sustaining, per year. Life membership $125. Treasurer, Marty Kamp, 6422 Indianapolis PL., Tulsa, OK 74136. Editor, Charles R. Brown, Department of Biological Sciences, University of Tulsa, 600 S. College Ave., Tulsa, OK. 74104-3189; Editorial Board, Mary Bomberger Brown, Vicki Byre, Jeff Cox, Joseph Grzybowski, James Hoffman, Douglas Mock, Gary Schnell, and John Tomer. Questions regarding subscription, replacement copies, back issues or payment of dues should be directed to: Mickle Duggan, OOS Membership/Circulation chairman, P.O. Box 65, Ada, Oklahoma 74821-0065. ISSN 0474-0750