



5-18-2006

Successful nesting by a Bald Eagle pair in prairie grasslands of the Texas Panhandle

Clint W. Boal

USGS Texas Cooperative Fish and Wildlife Research Unit, Texas Tech University, Lubbock, Texas

Matthew D. Giovanni

Texas Tech University, Lubbock, Texas

Blake N. Beall

Texas Tech University, Lubbock, Texas

Follow this and additional works at: <https://scholarsarchive.byu.edu/wnan>

Recommended Citation

Boal, Clint W.; Giovanni, Matthew D.; and Beall, Blake N. (2006) "Successful nesting by a Bald Eagle pair in prairie grasslands of the Texas Panhandle," *Western North American Naturalist*. Vol. 66 : No. 2 , Article 11. Available at: <https://scholarsarchive.byu.edu/wnan/vol66/iss2/11>

This Article is brought to you for free and open access by the Western North American Naturalist Publications at BYU ScholarsArchive. It has been accepted for inclusion in Western North American Naturalist by an authorized editor of BYU ScholarsArchive. For more information, please contact scholarsarchive@byu.edu, ellen_amatangelo@byu.edu.

SUCCESSFUL NESTING BY A BALD EAGLE PAIR IN PRAIRIE GRASSLANDS OF THE TEXAS PANHANDLE

Clint W. Boal¹, Matthew D. Giovanni², Blake N. Beall²

ABSTRACT.—We observed a breeding Bald Eagle (*Haliaeetus leucocephalus*) pair nesting in a short-grass prairie and agricultural community on the southern Great Plains of the Texas Panhandle in 2004 and 2005. The nesting eagles produced 1 fledgling in 2004 and 2 fledglings in 2005. Our assessment of landcover types within a 5-km radius of the nest indicated that grasslands accounted for most of the area (90%), followed by agricultural lands (8%). Black-tailed prairie dog (*Cynomys ludovicianus*) colonies occupied 2.5% of the area, and single human residences with associated structures (i.e., barns) occupied <1%. The nearest source of permanent surface water >2.5 ha in surface area was 51 km from the nest. An analysis of regurgitated castings collected near the nest revealed a mammalian-dominated, breeding-season diet with black-tailed prairie dogs occurring in 80.9% of the castings. Other identified prey included cottontails (*Sylvilagus* spp., 15.9%), black-tailed jackrabbits (*Lepus californicus*, 3.2%), pronghorn (*Antilocapra americana*, 3.2%), and plains pocket gopher (*Geomys bursarius*, 1.6%). Bird remains were also present in 34.9% of the castings. This is the first reported successful nesting of Bald Eagles in the panhandle region of Texas since 1916; the nest is particularly unique because of its distance from any substantial body of water.

Key words: Bald Eagle, grassland, *Haliaeetus leucocephalus*, prairie, prairie dog, Texas.

Through much of the 1900s, Bald Eagle (*Haliaeetus leucocephalus*) populations experienced dramatic declines across their range due to bounties, habitat loss, persecution, and environmental contaminants (Buehler 2000). Following legal protection (e.g., Bald and Golden Eagle Protection Act, Endangered Species Act) and conservation efforts, eagle numbers have increased across their range, which includes Texas (Campbell 1995, Buehler 2000, Ortego 2003). However, increases of nesting eagles in Texas generally have been limited to areas adjacent to large expanses of permanent surface water (e.g., lakes, reservoirs, rivers; Ortego 2003). Although Bald Eagles will scavenge carrion, pirate prey from other species, and capture mammals and birds (Swenson et al. 1986), the importance of aquatic systems to Bald Eagles is due to their preference for fish as prey (Stalmaster 1987, DeLong 1990, Knight et al. 1990), even in desert regions (Brown et al. 1991, Grubb 1995). This pattern of prey use would explain the strong association of Bald Eagles with aquatic systems and the species' tendency to select nest sites adjacent to or near (within 2 km) large bodies of water (Buehler 2000).

There is little information on the occurrence of breeding Bald Eagles in the grasslands of the southern Great Plains (Buehler 2000), an arid region with little available permanent surface water. Currently, known nest locations of Bald Eagles in the southern Great Plains are associated with permanent water sources such as the Arkansas River in Colorado and Kansas (B. Bibles, Colorado Division of Wildlife, personal communication). Although Bald Eagles are not currently reported as breeding in the arid panhandle region of Texas (Campbell 1995, Buehler 2000), 2 historical nesting records exist for the species in the Texas Panhandle. McCauley (1877) reported a Bald Eagle nest containing 2 young by a tributary of the Red River near Palo Duro Canyon in Texas. However, Lish and Sherrod (1986) suggest McCauley may have misidentified what was actually a Golden Eagle (*Aquila chrysaetos*) nest and nestlings. More definitively, E.W. Gates collected 1 Bald Eagle clutch in Potter County in 1916, the last and only confirmed nesting by Bald Eagles in the panhandle of Texas (Oberholser and Kincaid 1974, Seyffert 2001). Both the report from McCauley (1877) and the clutch collected by Gates in 1916 were from the Palo

¹U.S. Geological Survey Texas Cooperative Fish and Wildlife Research Unit, Department of Range, Wildlife, and Fisheries Management, Texas Tech University, Lubbock, TX 79409-2120.

²Department of Range, Wildlife, and Fisheries Management, Texas Tech University, Lubbock, TX 79409-2120.

Duro Canyon complex, which, at the time, had permanent surface water. Here we report on the occurrence, successful nesting, and prey use of a pair of Bald Eagles nesting in arid prairie grasslands with negligible surface water in the Texas Panhandle. To our knowledge this is the first confirmed nesting by the species in the region since 1916.

STUDY AREA AND METHODS

These observations were made on privately owned land adjacent to the Rita Blanca National Grasslands in Dallam County, Texas. The county is a mosaic of native short- and mixed-grass prairie, Conservation Reserve Program parcels, and fields in agricultural production (e.g., corn and wheat). The landscape is generally level to gently undulating. Trees are sparse and consist primarily of elm (*Ulmus pumila*), cottonwood (*Populus* spp.), and mesquite (*Prosopis glandulosa*), which usually occur as single trees near stock tanks or in clumps as windbreaks adjacent to occupied or vacant houses. Other than in the rural communities of Dalhart, Texas (population 7243), and Texline, Texas (population 511), most human activity is associated with crop fields and ranch houses, the latter occurring at low density across the county. Surface water, and thus aquatic prey, are lacking in the study area. Lake Rita Blanca was the nearest existing surface water (defined as >2.5 ha) to the nest and is over 50 km south near Dalhart, Texas, in the south central part of the county.

We made periodic observations of the Bald Eagle nest (hereafter the Dallam nest) from the time we first located it on 6 May 2004 until the nestling of that year fledged, and also from 6 February 2005 until both nestlings of that year fledged. Following the 2004 fledging, we measured diameter at breast height (dbh) of the nest tree with a dbh tape and heights of the nest and nest tree with a clinometer. Because the nest was in a snag that was unsafe to climb, we estimated nest dimensions from the ground. We plotted the nest site on a digital map composed of a series of digital orthogonalized quarter quadrants. We generated a 5-km-radius circular plot (78 km²) centered on the eagle nest using ArcView 3.2, digitized 4 landcover types (residence, agriculture field, grassland, prairie dog colony) within the plot, and calculated proportions of each land type.

Each year we collected regurgitated castings from below the nest and below adjacent perch trees to assess prey use by the Bald Eagles. We stored each casting at 0°C prior to dissection and analysis. We used a dissecting scope and a microscope to identify hair, skeletal materials, and feathers in the castings (Marti 1987) to the lowest possible taxonomic level based on information provided in guides (Moore et al. 1974, Jones and Manning 1992) and comparison with voucher specimens at the Museum of Texas Tech University. Identifying prey species from skeletal and keratinous tissues in castings is a common method for raptor food habit assessment (Marti 1987). However, the method is imprecise because more than 1 individual prey animal may be represented in a single casting, 1 prey animal may be represented in multiple castings, casting contents do not provide information on ages or size classes of some prey, and the manner of prey acquisition (i.e., captured or scavenged) is unknown (e.g., Marti 1987). Therefore, we take a conservative approach and present food habits based on frequency of occurrence only.

RESULTS

As part of a study of sympatric grassland raptors, at 0920 hours (CDT) on 6 May 2004 we checked a large nest that had been unoccupied during the summers of 2001–2003. The nest was on private land, and the closest accessible observation point was 0.8 km away. We observed the nest with binoculars and a spotting scope and identified an adult Bald Eagle (definitive plumage as described in Wheeler 2003) in an apparent brooding position. We obtained landowner permission to access the property and visited the nest site on 14 May 2004 to confirm the presence of a nestling and to collect regurgitated castings. Two adult Bald Eagles were perched in the nest tree and a large nestling was visible on the nest. We visited on 2 June 2004 to estimate the nestling's age and to determine if either adult was banded. Based on a Bald Eagle nestling age guide (D. Meinke and G. Meinke unpublished data), we estimated the single nestling to be 50–55 days old on 2 June 2004. Although we observed both adult eagles closely, we were unable to see any leg band.

We monitored the nest by making periodic visits throughout the summer. The nestling was first observed perching on branches away from

the nest on 21 June. On 14 July we observed the fledgling leave the nest in level, controlled flight. On 17 July we observed, presumably, the same fledgling eagle perched on a telephone pole approximately 3 km from the nest. During our last visit to the nest on 13 August 2004, the fledgling was perched on the nest but took flight upon our approach, gained altitude to a soar, and then flew beyond view. Presumably the same eagle pair nested in the same nest in 2005 and produced 2 young. Similar to 2004, in 2005 we made periodic observations from 6 February until both nestlings fledged in July.

The eagle nest was in a dead cottonwood or elm tree (identification not possible) that measured 14.6 m tall and 86.4 cm dbh. The nest was 13.1 m above ground and was approximately 1.5 m from bottom to top. Our assessment of landcover types within the 7811-ha area around the nest indicated that grasslands accounted for the majority of the area (7020 ha, 90%), followed by agriculture (592 ha, 8%). Black-tailed prairie dog (*Cynomys ludovicianus*) colonies occupied 196 ha (2%) of the area, and single human residences and associated structures (i.e., barns) occupied 2 ha (<1%).

We collected a total of 112 regurgitated castings in 2004 ($n = 63$) and 2005 ($n = 49$). Each casting contained an average of 1.45 ± 0.05 (s , range 1–3) prey species. Analysis of casting contents revealed that the diet of these eagles was relatively narrow with 6 mammalian species. Black-tailed prairie dog remains occurred in 81.2% of the castings, indicating that the species was the primary prey used by the eagles. Cottontails (*Sylvilagus* spp.) were the 2nd most frequently occurring mammalian prey (15.2%), followed by black-tailed jackrabbit (*Lepus californicus*, 4.5%), plains pocket gopher (*Geomys bursarius*, 3.6%), and pronghorn (*Antilocapra americana*, 1.8%). Black-crowned Night-Herons (*Nycticorax nycticorax*) were present in 4.5% of castings, while other bird remains (32.1%) could not be identified. Grasshoppers were incidental in occurrence (0.9%). No reptilian, amphibian, or fish remains were present in the castings, suggesting that if such prey were used by the eagles, it was infrequent during the nesting period.

DISCUSSION

The Dallam nest is unique in comparison to typical Bald Eagle nest sites, including the 2

historical records of nest sites in the panhandle of Texas, both of which were associated with rivers (McCauley 1877, Gates 1916 in Oberholser and Kincaid 1974). The Dallam nest was in open, gently undulating short-grass prairie. Other than stock tanks, the nearest surface water was Lake Rita Blanca, a 61-ha lake located over 50 km away. This suggests that eagles on the Dallam nest subsisted on species other than fish and were able to acquire sufficient prey to attain a reproductive state and successfully raise young. Our data indicated that the eagles subsisted primarily on mammalian prey, most of which were black-tailed prairie dogs and rabbits. Although Bald Eagles normally use prey associated with aquatic systems (see Buehler 2000) and wetlands (Mabie et al. 1995), they are capable of capturing a wide variety of prey (Edwards 1969, Todd et al. 1982, Kozie and Anderson 1991, Folk 1992, Mabie et al. 1995, Ricca et al. 2004). They also will scavenge aquatic and terrestrial animal carrion (Retfalvi 1970, Lish 1975, Swenson et al. 1986) and usurp prey from other raptors (Sabine and Gardner 1987, Stolen 1996). Typically mammals appear to constitute only a small proportion of Bald Eagle diets. In a review of 10 diet studies and their own data, Mabie et al. (1995) found that the highest proportion of mammals in diets of Bald Eagles was 17%, reported by Swenson et al. (1986). However, mammalian prey occurred in 60% of the pellets collected from a Bald Eagle winter roost in Oklahoma, with cottontails (*Sylvilagus* spp.) accounting for 30% of the mammalian prey (Lish 1975). Furthermore, Lish (1975) observed Bald Eagles wintering “far from any rivers or impoundments” and scavenging cattle and lamb carcasses. Although wintering Bald Eagles in the Great Plains region are frequently associated with prairie dog colonies (Kotliar et al. 1999), our data are the first indicating that prairie dogs are the primary prey used by nesting Bald Eagles. Watkins et al. (1994) reported a Bald Eagle nest in Hodgeman County, west Kansas, occupied for at least 6 years, that was adjacent to a 0.6-ha pond but in a landscape otherwise dominated by cropland and rangeland (Watkins et al. 1994) and similar to the Dallam nest. Prey remains collected from the Hodgeman nest included common carp (*Cyprinus carpio*), bullhead (*Ictalurus* spp.), unidentified catfish, several bird species, black-tailed prairie dogs, yellow-faced pocket gophers (*Pappogeomys castanops*), and rabbits

(Watkins et al. 1994). Watkins et al. (1994) did not provide frequency-of-occurrence data, so we are unable to compare the diet with that at our Dallam nest. However, even in the range-land setting, fish were still among the prey used by the Hodgeman eagle pair, unlike the eagles at the Dallam nest site, whose diet consisted of only mammals and birds.

Known Bald Eagle breeding pairs in Texas have increased from 7 pairs in 1971 to over 150 pairs in 2003, primarily in the eastern part of the state and along the central coastal region (Ortego 2003). Though the increased number of nest locations could, in part, be a consequence of increased survey effort, it is more likely due to real increases in the Bald Eagle population in Texas. For example, survey efforts have not increased over the last 5 years during which time the known eagle population has doubled (B. Ortego, Texas Parks and Wildlife Department, personal communication). However, while the Dallam nest is in step with the distribution-wide increase in Bald Eagles, we do not know if that is a result of population growth in the eastern and southern areas of Texas or growth elsewhere (e.g., Colorado, Kansas).

A remaining question is whether this nest is an anomalous occurrence, e.g., an expansion of Bald Eagles into an environment previously unused for breeding or an expansion of eagles back into areas used historically prior to European settlement. We suspect this is not an anomalous occurrence. First, a Bald Eagle nest occupied for 6 years in western Kansas (Watkins et al. 1994) was in a similar setting to the nest we report. Second, the Dallam nest was used, and successfully fledged young, in both 2004 and 2005. Also, the Dallam nest was present, though unoccupied by breeding eagles, for at least 5 years prior to these observations (Boal unpublished data). Discussions with the landowner and existence of the nest prior to 2001 lead us to believe Bald Eagles had used the nest previously. Finally, circumstantial evidence indicates that Bald Eagles may have historically nested in the area: Tate (1923) suggested Bald Eagles were once year-round residents and likely nested in Cimarron County, Oklahoma, which is adjacent and immediately north of Dallam County, Texas. More recently, Bald Eagles have been reported nest-building, but not nesting, at Buffalo Lake National Wildlife Refuge, 172 km south of the Dallam nest.

However, the Buffalo Lake nest is adjacent to a large lake and is quite different in setting from the Dallam nest.

ACKNOWLEDGMENTS

We thank the private-land owner for allowing access to his property to collect pellets and conduct nest site measurement, C. Taylor for assisting with monitoring, and the Texas Tech University Natural Science Research Lab for access to voucher specimens. We made these observations while conducting a study of grass-land raptors funded by the Texas Parks and Wildlife Department, the USDA Rita Blanca—Kiowa National Grasslands, and the U.S. Geological Survey Texas Cooperative Fish and Wildlife Research Unit. This manuscript benefitted from the thoughtful reviews of J. Hudon, B. Ortego, H. Whitlaw, and 2 anonymous reviewers.

LITERATURE CITED

- BROWN, B.T., W.C. LEIBFRIED, T.R. HUELS, AND J.A. OLIVERA. 1991. Prey remains from Bald Eagle nests in Sonora, Mexico. *Southwestern Naturalist* 36:259–262.
- BUEHLER, D.A. 2000. Bald eagle (*Haliaeetus leucocephalus*). In: A. Poole and F. Gill, editors, *The birds of North America*, No. 506. The Birds of North America, Inc., Philadelphia, PA.
- CAMPBELL, L. 1995. Endangered and threatened animals of Texas. Texas Parks and Wildlife Department, Austin, TX.
- DELONG, D.C., JR. 1990. Effects of food on Bald Eagle distribution and abundance on the northern Chesapeake Bay: an experimental approach. Master's thesis, Virginia Polytechnic Institute and State University, Blacksburg.
- EDWARDS, C.C. 1969. Winter behavior and population dynamics of American eagles in Utah. Doctoral dissertation, Brigham Young University, Provo, UT.
- FOLK, M.J. 1992. Cooperative hunting of avian prey by a pair of Bald Eagles. *Florida Field Naturalist* 20: 110–112.
- GRUBB, T.G. 1995. Food habits of Bald Eagles breeding in the Arizona desert. *Wilson Bulletin* 107:258–274.
- JONES, J.K., AND R.W. MANNING. 1992. Illustrated key to skulls of genera of North American mammals. Texas Tech University Press, Lubbock.
- KNIGHT, R.L., P.J. RANDOLPH, G.T. ALLEN, L.S. YOUNG, AND R.J. WIGEN. 1990. Diets of nesting Bald Eagles, *Haliaeetus leucocephalus*, in western Washington. *Canadian Field-Naturalist* 104:545–551.
- KOTLIAR, N.B., B.W. BAKER, A.D. WHICKER, AND G. PLUMB. 1999. A critical review of assumptions about the prairie dogs as a keystone species. *Environmental Management* 24:177–192.
- KOZIE, K.D., AND R.K. ANDERSON. 1991. Productivity, diet, and environmental contaminants in Bald Eagles

- nesting near the Wisconsin shoreline of Lake Superior. Archives Environmental Contamination and Toxicology 20:41–48.
- LISH, J.W. 1975. Status and ecology of Bald Eagles and nesting Golden Eagles in Oklahoma. Master's thesis, Oklahoma State University, Stillwater.
- LISH, J.W., AND S.K. SHERROD. 1986. A history of Bald Eagle nesting activity in Oklahoma. Proceedings Oklahoma Academy of Science 66:15–20.
- MABIE, D.W., M.T. MERENDINO, AND D.H. REID. 1995. Prey of nesting Bald Eagles in Texas. Journal of Raptor Research 29:10–14.
- MARTI, C.D. 1987. Raptor food habits studies. Pages 67–80 in B.A. Giron Pendelton, B.A. Millsap, K.W. Cline, and D.M. Bird, editors, Raptor management techniques manual. National Wildlife Federation, Washington, DC.
- MCCAULEY, C.A.H. 1877. Notes on the ornithology of the region about the source of the Red River of Texas, from observations made during the exploration conducted by Lieut. E.H. Ruffner, Corps of Engineers, USA. Bulletin. U.S. Geological Survey 3:655–695.
- MOORE, T.D., L.E. SPENCER, AND C.E. DUGNOLL. 1974. Identification of the dorsal guard hairs of some mammals of Wyoming. Wyoming Game and Fish Department, Cheyenne.
- OBERHOLSER, H.C., AND E.B. KINCAID, JR. 1974. The bird life of Texas. 2 volumes. University of Texas Press, Austin.
- ORTEGO, B. 2003. Project No. 10: Bald Eagle nest survey and management. Performance report, Federal Aid Grant No. W-125-R-14, Texas Parks and Wildlife Department.
- RETFALVI, L.I. 1970. Food of nesting Bald Eagles on San Juan Island, Washington. Condor 72:358–361.
- RICCA, M.A., R.G. ANTHONY, AND J.C. WILLIAMS. 2004. Bald Eagles consume Emperor Geese during late-winter in the Aleutian Archipelago. Journal of Raptor Research 38:81–85.
- SABINE, N., AND K. GARDNER. 1987. Agonistic encounters between Bald Eagles and other raptors wintering in west central Utah. Journal of Raptor Research 21:118–120.
- SEYFFERT, K.D. 2001. Birds of the Texas Panhandle. Texas A&M Press, College Station.
- STALMASTER, M.V. 1987. The Bald Eagle. Universe Books, New York.
- STOLEN, E.D. 1996. Black and Turkey Vulture interactions with Bald Eagles in Florida. Florida Field Naturalist 24:43–45.
- SWENSON, J.E., K.L. ALT, AND R.L. ENG. 1986. Ecology of Bald Eagles in the greater Yellowstone ecosystem. Wildlife Monographs 95:1–46.
- TATE, R.C. 1923. Some birds of the Oklahoma Panhandle. Oklahoma Academy of Science Proceedings 3:41–51.
- TODD, C.S., L.S. YOUNG, R.B. OWEN, AND F.J. GRAMLICH. 1982. Food habits of Bald Eagles in Maine. Journal of Wildlife Management 46:636–645.
- WATKINS, M.A., E. WILLIS, AND D.W. MULHERN. 1994. A history of successful Bald Eagle nesting in Kansas. Kansas Ornithological Society Bulletin 45:29–35.
- WHEELER, B.K. 2003. Raptors of western North America. Princeton University Press, Princeton, NJ.

Received 31 January 2005
Accepted 8 September 2005