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Chelonian Species in the Diet of Reintroduced Whooping Cranes (*Grus americana*) in Louisiana

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ABSTRACT.—Migratory and non-migratory Whooping Cranes (*Grus americana*) historically inhabited southwestern Louisiana until they were extirpated in 1950. Little is known about the feeding habits or dietary items of these cranes except for anecdotal evidence from local residents provided to R. P. Allen for his influential 1952 work on Whooping Cranes. Other populations of Whooping Cranes have been characterized as opportunistic omnivores, consuming small vertebrates, invertebrates, and plant material. In 2009, southwestern Louisiana was selected as a reintroduction site for Whooping Cranes. We report on four observations of reintroduced Whooping Cranes depredating at least two different species of turtles (common snapping turtle and mud turtle), which have not been previously reported as a dietary item for this species. Received 26 September 2012. Accepted 13 January 2013.

Key words: diet, Louisiana, predation, reintroduction, turtle, Whooping Crane.

Historic resident and migrant Whooping Cranes (*Grus americana*) once inhabited the Chenier Plain marshes and the Cajun Prairie of southwestern Louisiana (Gomez 1992). Distinct populations utilized the landscape differently, with migrant cranes wintering primarily on the tall grass prairies and sea-rim/coastal brackish marshes, while resident cranes primarily used freshwater and intermediate marshes north of White and Grand Lakes (Allen 1952). However, by 1950 Whooping Cranes were extirpated from Louisiana because of shooting of cranes by farmers, collectors, or for food; major hurricane events; and altered wetland and prairie habitats (Allen 1952).

Other than anecdotal observations, little is known about the diet of either resident or migratory Whooping Cranes that previously utilized marshes and prairies in Louisiana. Prey species possibly included small American alligators (*Alligator mississippiensis*; as depicted by Audubon 1827–1838), small fish, crayfish (*Cambarus* sp.), blue crabs (*Callinectes sapidus*), aquatic insects, and vegetation, including Olneyi three-square grass (*Scirpus americanus*), smooth cordgrass (*Spartina alterniflora*), southern swamp lily (*Crinum americanum*), and prairie lily (*Nothoscordum bivalve*; Allen 1952). Interviews by Allen (1952) found that Louisiana Whooping Cranes were attracted to “swale marshes” that were grazed by cattle, as well as recently burned marshes. Contemporary studies of migratory Whooping Cranes in Texas have found that they are largely opportunistic omnivores that forage in shallow fresh and brackish waters, wetlands, grain fields, and uplands (Lewis 1995). Cranes probe, search, and glean for tubers, wolfberry, acorns, benthic invertebrates, insects, razor clams, snails, blue crabs, crawfish, amphibians, reptiles, mice, and voles (Allen 1952, Hunt and Slack 1989, Lewis 1995, Chavez-Ramirez 1996, Westwood and Chavez-Ramirez 2005). Cranes also feed on low vegetation for epiphytic invertebrates, seeds, and fruits (Lewis 1995).

In 2009, White Lake Wetlands Conservation Area (WLWCA; owned by Louisiana Department of Wildlife and Fisheries [LDWF]) was selected as a reintroduction site for an experimental and non-essential Whooping Crane population as part of a cooperative effort between LDWF and the U.S. Fish and Wildlife Service (USFWS). The cranes for the reintroduction are costume-reared from captive breeding facilities (Nagendran et al. 1996) and two juvenile cohorts of 10 and 16 cranes were released at WLWCA in 2011. Subsequently, these cranes dispersed on the southwestern Louisiana landscape and have utilized agricultural and wetland habitats that support many aquatic plant and animal resources,

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many of which may be new items to Whooping Cranes (TLP and S. King, unpubl. data). Herein, we report on four observations of reintroduced Whooping Cranes depredating turtles (Testudiniidae), a previously unrecorded prey item for the species.

OBSERVATIONS

Observation #1.—On 26 March 2011, while conducting Whooping Crane observations on WLWCA (Vermilion Parish), TLP observed a juvenile female crane (L1-10) locate a turtle while walking and foraging. L1-10 struck the carapace with her bill but was not able to pierce the shell. Next, she lifted the turtle out of the water by the neck, shook it vigorously, and dropped it after having shaken the turtle, which appeared lifeless after this point. The female then used her bill to penetrate and separate the neck of the turtle, which she was able to do after approximately 3 min. Thereafter, the female swallowed pieces of the neck once they were detached. At this time, two additional cranes came over to investigate the activities of the female. A struggle for the remains of the turtle occurred, but female L1-10 was able to fend off the other two cranes and continued eating the turtle. Once the neck was eaten, she then performed the same procedure with the tail until it too was consumed. The turtle (unknown species) was approximately 13 cm long with a smooth, dark carapace.

Observation #2.—On the morning of 9 May 2011, and while in the crane release pen at WLWCA, SEZ observed a juvenile female crane (L10-10) pick something from the mud, shake it, and manipulate it; cranes will shake and manipulate both potential prey items and non-food items (SEZ, pers. obs.). Initially, this item looked like a large clump of mud, but as the crane continued to shake it and repeatedly drop it, SEZ was able to determine the item to be a turtle. As L10-10 continued to shake and drop the turtle, several other cranes approached and also took turns picking up, shaking, and dropping the turtle for approximately 5 min before they ceased. At this point, SEZ (in crane costume) approached and picked up the turtle for identification. After a few minutes of the cranes showing no further interest, the turtle was collected to be photographed and examined in detail.

Upon further evaluation, the turtle was identified as a juvenile *Chelydra serpentina* (common snapping turtle; 5.3 cm maximum carapace length).

Three puncture wounds were evident and were likely lethal beak strikes from the Whooping Cranes. There were two punctures through the carapace (left and right of the midline) and one to the dorsum of the skull. The plastron was also torn away at the left and right bridge attachments, with most of the internal organs consumed and presumably picked away by the cranes.

Observation #3.—A third turtle predation event occurred on 6 July 2011 while TLP was conducting a behavior scan on a female (L5-10) foraging in a crawfish pond (Vermilion Parish). TLP observed the female crane chasing something under the water. The crane then proceeded to capture the turtle in the same manner as observation #1. Over the course of approximately 5 mins, the female was able to eat the head and tail of the turtle, similar to the feeding strategy employed by the crane in observation #1. TLP was not able to accurately identify the turtle to species, but it also appeared to be a small turtle (~7.6–12.7 cm carapace length) with a dark carapace.

Observation #4.—On 22 February 2012 in the release pen at WLWCA, SEZ observed a juvenile female crane (L9-11) capture a small turtle from the water. The turtle appeared to be dead upon removal from the water, but the crane shook it several times and dropped it back into the water. She repeated this activity a number of times, apparently trying to determine how to consume the turtle. As in observations 1 and 2, the female's activity attracted the attention of several other cranes, including an older male from the first release cohort (L4-10) and a younger male (L16-11). Thereafter, the two males attempted to take the turtle from L9-11, who then dropped the turtle in the water and moved away. Both males searched the area where the turtle had been dropped until L4-10 found it. He repeated the same activity as the female had shown, shaking the turtle and dropping it into the water, and eventually carried it farther away from the other birds. He continued shaking and dropping the turtle until he either lost the turtle or abandoned consuming it. The species of turtle was later confirmed as an adult mud turtle (*Kinosternon subrubrum*) from photographs taken during the observation (Fig. 1).

DISCUSSION

Allen (1952: 119) noted that reptiles are probably “chance prey, taken when an opportunity is offered and the crane is not occupied with other



FIG. 1. A reintroduced juvenile female Whooping Crane (L9-11) holding a mud turtle in her beak; see observation 4 Vermilion Parish, Louisiana). Photograph by SEZ.

matters.” Reptile prey species for Whooping Cranes include snakes (cottonmouth- *Agkistrodon piscivorus*, saltmarsh snake- *Nerodia clarkii*; Stevenson and Griffith 1946), lizards (Netting 1927), and likely alligators (Audubon 1827–1838). K. P. Schmidt (as cited by Allen 1952: 122) also reported on probable reptile prey items consumed by Whooping Cranes near the Platte River during migration, including some turtle species (common snapping turtle and painted turtle-*Chrysemys picta*) as “the hatchlings would be present in the spring. They should be freely taken by cranes.” However, this assumption was never confirmed until the observations reported herein from Louisiana.

Common snapping turtles are considered one of the most ubiquitous freshwater turtles throughout the eastern United States (Ernst and Lovich 2009), as well as within Louisiana (Dundee and Rossman 1989). Because of the many freshwater environments common snapping turtles may inhabit, there are a range of predators of hatchlings and juveniles. Many species of wading birds are known predators of common snapping turtles, including Great Blue Herons (*Ardea herodias*), Great Egrets (*Ardea alba*), and American Bitterns (*Botaurus lentiginosus*; Ernst and Lovich 2009). From our observation, the small size and flexible shell of the juvenile snapping turtle was inadequate to deter the piercing bill of the Whooping Crane; it is interesting that the only portion consumed was the entrails, while in observations #2 and #3, the head and tail were eaten. It is

unlikely that older and larger snapping turtles with hard shells would be potential prey for Whooping Cranes; larger snapping turtles and other large turtle species (i.e., softshell and slider turtles) may also defend themselves with their mouth in order to deter Whooping Cranes.

Positive turtle species identification was not possible in observations #1 and #3, but it is likely that these were of the Kinosternid Family (mud and musk turtles) and probably a mud turtle as in observation #4. Similar to common snapping turtles, mud turtles are a common, statewide inhabitant of Louisiana waters, including ponds, marshes, ditches, and soft-bottomed waterways. Dundee and Rossman (1989) noted that the species is “particularly abundant in the marsh” of southern Louisiana, with records occurring throughout the reintroduction area for Whooping Cranes in southwestern Louisiana. However, musk turtles (*Sternotherus odoratus*) are found primarily in permanent freshwater habitats (Dundee and Rossman 1989), which would exclude most ephemeral marsh habitats and rice/crawfish agricultural fields that reintroduced Whooping Cranes in Louisiana have utilized (TLP and S. King, unpubl. data). Similar to common snapping turtles, Kinosternid turtles are often depredated by large wading birds (Family Ardeidae; Ernst and Lovich 2009), with Louisiana Whooping Cranes inhabiting similar habitats to herons and egrets (TLP and S. King, unpubl. data).

In three of the four cases, the authors could not recover the remains of the depredated turtles, and therefore, it is difficult to ascertain how much of the turtles were consumed. In observations #1 and #3, we do not know if the cranes consumed only the head and tail or the alternative, most of the edible portions of the turtle (i.e., head, tail, limbs, entrails), as the former are the only access points to the latter because of the bony shell of adult turtles. At this point, it is unknown how much turtles contribute to the diet of Whooping Cranes, but small turtles could be considered an abundant and easily attainable food resource that reintroduced Whooping Cranes can opportunistically exploit in southwestern Louisiana.

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