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Whooping Crane Quarterly Report: July-September 2010

Avian Research Subsection
Wildlife Research Section
Fish and Wildlife Research Institute
Florida Fish and Wildlife Conservation Commission

Project: **9256 287 2153 - Whooping Crane Reintroduction in Florida**

Study Duration: Began in 1993; On-going

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Abstract: This quarter we documented the mortality of a 10-year-old male and 17-year-old female whooping crane (*Grus americana*). Results from necropsy suggest at least one, and maybe both, were victims of lightning strike. A 7-year-old female went missing. One of 4 chicks that hatched in the wild this spring survived to achieve flight on 6 July at 78 days of age. At quarter's end we monitored 22 birds (9 males, 12 females, 1 undetermined) including 8 pairs. Especially of interest are the pairings within this flock, because the research questions that still need to be addressed have to do with nesting. The transcribing of nesting behavioral data (collected from years 2000 to 2009) from video tape to computer is nearly complete. We will begin the analyses of these data. We also are analyzing data on the gender of individual birds that lead flocks. Males of this population are not surviving as well as females and we hypothesize that it is associated with the males leading the groups and therefore encountering the problems first (like power lines, predators, etc). To our knowledge this aspect of social behavior in cranes has not been described. We began preparations for another breeding season of nesting studies of whooping and sandhill cranes (*Grus canadensis pratensis*). This was prompted by last season's pilot study using artificial eggs to measure incubation temperature. A different tool will be employed at nests this year to document why whooping cranes sometime leave their nests unattended at night. Camera traps capable of capturing images at night via infrared flash will be deployed near nests to determine not only the reasons for the incubation absences, but also to determine how common it is for crane pairs to switch incubation duties at night. This basic biology has not yet been described for North American cranes (or for any other crane species that we are aware of). In addition, these cameras may assist in determination of cause of nest failure (e.g. predators approaching the nest, etc).

INTRODUCTION

The whooping crane was on the brink of extinction in 1941 when the only self-sustaining flock (Aransas/Wood Buffalo (AWB) flock) numbered only 15 individuals. Thanks to rigorous conservation and educational efforts there are now 263 whooping cranes in the AWB flock (Tom Stehn, U.S. Whooping Crane Coordinator, personal communication). Whooping cranes occur in Florida as a result of 2 reintroduction

projects-one of non-migratory birds and the other migratory. During this quarter we focused efforts on the non-migratory flock. The project has evolved, in recent years, from the establishment of a population via an aggressive release program, to that of a research emphasis to answer questions regarding the challenges in survival and reproduction. The benefits of such knowledge go beyond the value of explaining the problems with this flock and have implications for other introductions.

METHODS

We continued monitoring the health and survival of the non-migratory population of whooping cranes in Florida. We monitored each bird 2-3 times per week. We tracked dispersing and isolated birds (difficult to access from the ground) as needed from the air. Especially of interest are the pairings within this flock, because the research questions that still need to be addressed have to do with nesting. Also during the quarter we organized data and began preparing manuscripts.

RESULTS AND DISCUSSION

Population Status

We documented the mortality of 2 birds this quarter. Male 1024, 10 years of age, was recovered in Polk County 12 July. Female 369 (17 years of age) was recovered from Osceola County 14 July. Results from necropsy (by Dr. Marilyn Spalding) suggest 1024 was killed by lightning strike. Bird 369 may have been struck or injured by lightning, then killed or scavenged by a bobcat. As we learn more about the lesions involved with lightning strikes we suspect a number of birds in the past could have been victim of lightning but scavenging and decomposition masked the evidence. Additionally, they could die of lightning that wasn't a direct hit and these cases would be difficult to detect even if the remains were fresh, due to the subtlety of the lesions.

Bird 1348 went missing during this quarter. This 7 year old female, paired with male 1343, was last seen 8 July. On an over-flight 2 August, male 1343 was seen alone, limping, on Paynes Prairie (Alachua County). On 11 August 1343 was walking better but was still alone on the prairie. Neither of this pair had functioning radios.

The population also gained a bird this year. The single surviving chick of 4 that hatched this spring fledged at 78 days of age on 6 July 2010. When the weather cools off, the plan is to capture this chick (Lake County) for routine banding, health check, and gender determination (via blood sample). At quarter's end we monitored 22 birds (9 males, 12 females, 1 undetermined) including 8 pairs (Table 1). Of 11 total chicks fledged in the wild to date, 4 were accounted for at the end of this quarter.

Some of the most important knowledge to be gained from research on this flock has to do with their breeding, not only to facilitate a better understanding of this flock's shortcomings, but also to provide information of benefit to future introductions and even to provide basic life history information that has yet to be described for this rare bird. Therefore, as this population declines, it will be most "useful" as a research flock if as many birds as possible are paired. The outlook for the maximizing of pairs looks pretty good. Fortunately, as birds die off, they are skilled at finding new mates, even when they are scattered over 3 counties.

In Polk County, at the loss of male 1024, its mate, 1020, paired with male 1015. Male 1018 lost its mate this spring in Osceola County; it has since been with its female chick (Bird 1901) from last year. On 8 September the 2 showed up in Polk County near eligible female 1202. It is hoped 1018 will pair with 1202.

On Paynes Prairie (Alachua County), Male 1343 lost its mate (see above). Later, 1343 was observed with an eligible female (1644) from Lake County. The 2 were in Sumter County where 1343 had spent time in the past. At the end of the quarter they were at the Pruitt Ranch near Okahumpka.

At the loss of its mate 369 (see above), male 1336 now was in the same vicinity as female 477, near Lake Kissimmee. This 16-year-old female, which suffered an injury to her left wing many years ago (but is still flight-capable), has never paired. We will watch them to see what happens. Male 1336 may also pair with one of 2 females that are paired in the vicinity, 1441/397.

The female-female pair 1441/397, which spends part of the year near male 1336, and the other down at Lake Okeechobee, remained together this quarter. This pair of females appeared to nest last year. Since then, we conducted behavioral observations of the 2 females to look for evidence that 1441 was falsely identified as a female (from blood test). Based on preliminary observations it does not obviously act like a male. This is the

first female-female pair documented for whooping cranes, but not other avian species, and therefore should not be surprising as the population declines and females are left without males to pair with. Female-female pairings have been observed in gull and tern populations with a female-biased sex ratio (Nisbet and Hatch 1999), and have been reported in three procellariiformes (Lorentsen *et al*. 2000; Young *et al*. 2008; Bried *et al*. 2009). When a small (17-20 pairs) isolated population of common terns (*Sterna hirundo*) in Bermuda was struck by a category 3 hurricane, resulting in the loss of all the males, 14 females paired, nested, and laid infertile eggs the following breeding season (Nisbet et al. 2010). In subsequent years, when males appeared and paired with some females, some female-female pairs continued to nest (and lay infertile eggs).

For the reader unfamiliar with these individual birds, these descriptions of pairings and potential pairings may appear to be just a jumble of numbers. The take-home message is that it is important, for our nesting research next spring, that as many pairs as possible be available for nesting. If there becomes an opportunity for us to be proactively involved with pair formation, we intend to trans-locate some individuals to enhance pair formation. This has worked successfully in the past; the chances of success are enhanced by conducting the trans-locations as close the time of the breeding season as possible (Folk et al. 2008).

Data Analysis

The transcribing of nesting behavioral data (collected from years 2000 to 2009) from video tape to computer is nearly complete. We will begin the analyses of these data.

Male are not surviving as well as females in this flock; males generally do not live past 10 years of age (Spalding et al. in review). Males also are more prone to power line collisions (Miller et al. in review). We speculate that this is due to the males' propensity to lead the flocks (based on personal observations); males may be the first bird in a group to encounter the power line or predator. There have been detailed studies of crane behavior (Tacha 1988, Ellis 1998) but to our knowledge no one has looked at the gender of flock leaders. This is not surprising given the fact that male and female cranes generally are indistinguishable (except for size difference, more obvious in some pairs than others). Only a color-marked population would allow gender-specific determination of the bird that leads flock movements. From 25 February 2009 to 22 July 2010 we

identified the individuals leading flocks during flying and walking. This work was often conducted in association with trapping of birds; biologists collected behavioral observations as they watched birds approaching bait for capture attempts. This quarter we began organizing and analyzing these data.

We began to evaluate the blood values of older male whooping cranes compared to the general population to see if there might be a health-related reason for increased mortality of older males. We compared the frequency of 5 year old males above the population mean to the frequency below the same mean (Fig. 1). Thus, for those parameters that equal 1 there was no difference in age distribution above and below the mean. The greatest differences are seen in packed cell volume and white blood cell numbers, both of which generally increase with infectious disease. Additional sampling to increase the sample size may enhance understanding of what is preventing males from surviving for 10 or more years in Florida.

Kristi (Candelora) Nolte was a member of our team from 2003-2005, during which she conducted her master's research on infectious bursal disease. Her research has now been published in the Journal of Wildlife Diseases (Candelora et al. 2010). In addition, a paper describing the modeling of this whooping crane population has been accepted for publication in the Journal of Ornithology (Moore et al in press).

Research Planning and Preparation for Next Breeding Season

Plans were made to continue several research projects next spring during the breeding season. Like last season, we plan to deploy artificial eggs into whooping and sandhill crane (*Grus canadensis pratensis*) nests to collect data on incubation temperature. We will follow the protocols used last season (see Whooping Crane Quarterly Report: January-March 2010). Data from more nests, especially from those of sandhill cranes, will enhance the knowledge gained from this technique. Data from successful nests are also needed, in order to permit comparisons between successful and unsuccessful nests. Surveillance video cameras will also be deployed, as last year, to collect concurrent data on behaviors of the incubating birds.

Incubation temperature data from last spring revealed that there were lapses in incubation at night by whooping cranes that could not be detected with video surveillance (equipment recorded in daylight only). This spring, to identify why these absences occur, we will deploy camera traps near nests. These cameras, capable of

capturing images at night via infrared flash, will be deployed near nests to determine not only the reasons for the absences, but also to determine how common it is for crane pairs to switch incubation duties at night. This basic biology has not yet been described for North American cranes (or for any other cranes species that we are aware of). In addition, these cameras may assist in determination of cause of nest failure (e.g. predators approaching the nest, etc). This type of camera has been used at the nests of Mississippi sandhill cranes (*G. c. pulla*) (Butler 2009) and whooping and sandhill cranes (*G. c. tabida*) in Wisconsin (R. King, USFWS, personal communication). Based on bird response to cameras from those studies, we plan to install camera traps on steel posts 5-10m from nests. Efforts will be made to place the cameras near existing vegetation in order to avoid a change in the visual appearance of the horizon (and thereby minimize nest abandonment). Vegetation will be cleared between the camera and nest to avoid images triggered by vegetation movement.

University of Florida veterinarian Marilyn Spalding, project partner since project inception, retired on 30 June but remained actively involved with crane research as a volunteer this quarter. In January we plan to hire her as OPS (hourly staff) as we begin what we anticipate to be a busy field season of nesting research. An itemized whooping crane budget for calendar year 2011 will be submitted to the USFWS so that our grant can be adjusted to accommodate the change in routine next calendar year.

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Table 1. Breeding status and locations of whooping cranes in the Florida non-migratory flock September 2010.

Members of pairs are presented in adjacent rows.

Bird ID	Gender	Age (years)	Breeding history[1]	2010 breeding status	Location this quarter
1343	M	7	Paired	Hatched 2 chicks	Okahumpka area
1644	F	4	Never paired	Unpaired	Okahumpka area
1027	M	10	Nested	Hatched 1 chick	Lake Wales area
387	F	17	Nested	Hatched 1 chick	Lake Wales area
1019	M	10	Fledged 1	Paired	Okahumpka area
915	F	11	Fledged 1	Paired	Okahumpka area
920	M	11	Nested	Nested, failed	Okahumpka area
659	F	14	Nested	Nested, failed	Okahumpka area
1015	M	10	Nested	Observed nest-building, lost mate	Lake Wales area
1020	F	10	Nested	Paired	Lake Wales area
1291	M	8	Fledged 1	Fledged 1 chick, alive at qtr's end	Leesburg area
898	F	12	Fledged 4	Fledged 1 chick, alive at qtr's end	Leesburg area
926	M	11	Fledged 1	Nested, failed	Okahumpka area
646	F	14	Fledged 1	Nested, failed	Okahumpka area
1441	F?	6	Paired	Nested, failed	Lake Okeechobee/Kissimmee
397	F	17	Hatched	Nested, failed	Lake Okeechobee/Kissimmee
477	F	16	Never paired	Unpaired	Lake Kissimmee area
1018	M	10	Fledged 1	Nested, failed, lost mate	Lake Wales area w/ chick 1901
1202	F	8	Nested	Unpaired	Lake Wales area
1336	M	7	Paired	Nested, failed, lost mate	Lake Kissimmee area
1901	F	1	NA, 2009 hatch	NA, too young	Lake Wales area w/male parent 1018
Pending	?	0	NA, 2010 hatch	NA	Leesburg area with parents 1291/898

[1] Highest level of breeding status accomplished prior to this year

Bold: wild-fledged birds

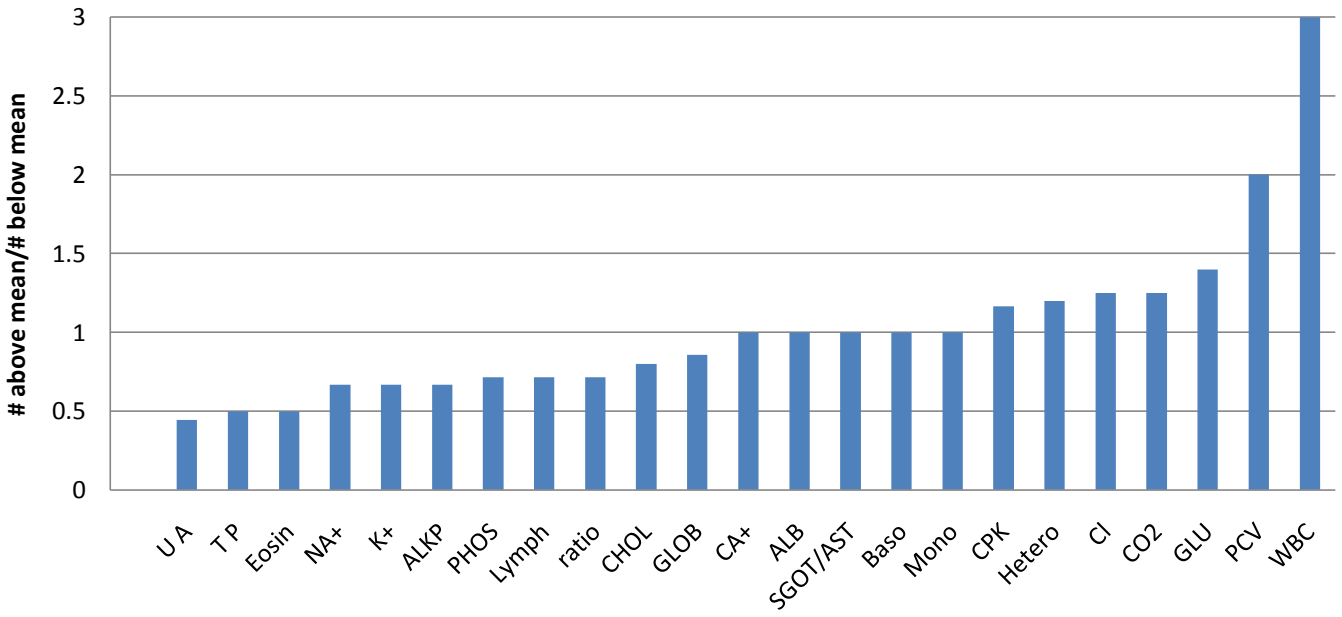

Figure 1. Relative frequency of blood values (# above mean/# below mean) of 5+ year old male whooping cranes compared to all others in the non-migratory flock in central Florida. Note the packed cell volume (PCV) and white blood cell count (WBC), suggestive of a disease issue.