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Remote Tracking of Aransas-Wood Buffalo Whooping Cranes 2015 – 2016 Project Update

*****NOTICE*****

This document includes summaries and a map that have been generated from a subset of preliminary data. In some instances, these data may include errors or other inconsistencies. Therefore, interpretations or conclusions drawn solely from information presented in this report would be premature and lack scientific rigor. This information is preliminary and is subject to revision. The assessment is provided on the condition that neither the U.S. Geological Survey nor the United States Government may be held liable for any damages resulting from the authorized or unauthorized use of the assessment. In reference to this project, please acknowledge the following partners: the Canadian Wildlife Service, Crane Trust, U.S. Fish and Wildlife Service, the Platte River Recovery Implementation Program, and U.S. Geological Survey, with support from the Gulf Coast Bird Observatory, International Crane Foundation, and Parks Canada.

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Abstract: The Whooping Crane Tracking Partnership gathered location data for whooping cranes during summer 2015. Fourteen cranes were tracked during fall migration and 13 were documented completing the trip. Marked cranes initiated fall migration on 2 September, and all arrived at the Texas coast by 13 December. Numerous stopovers were identified during fall migration and the average time spent in migration was 58 days. Eleven marked cranes departed the wintering grounds and completed the migration to traditional summer areas. Cranes initiated spring migration on 22 March and all birds arrived on summer grounds by 28 April. Average

time spent in migration was 23 days, with 109 stopovers were identified in all states and provinces within the migration corridor.

General Background and Methods

The Whooping Crane Tracking Partnership began in 2008 as a research project conceived by the Crane Trust with support from the U.S. Geological Survey to use Platform Transmitting Terminals with Global Positioning System capabilities (GPS-PTTs) as a means to identify migration pathways of Aransas-Wood Buffalo whooping cranes. The Whooping Crane Recovery Team provided necessary support for initiation of this study. The U.S. Fish and Wildlife Service and Canadian Wildlife Service authorized capture of whooping cranes at wintering areas on and surrounding Aransas National Wildlife Refuge and at breeding sites at Wood Buffalo National Park. They also made technical, in-kind, and financial contributions. The Platte River Recovery Implementation Program provided the Crane Trust funds to initiate this work.

During 2011, the Crane Trust, Canadian Wildlife Service, U.S. Fish and Wildlife Service, Platte River Recovery Implementation Program, and U.S. Geological Survey entered into a research partnership. Partner organizations have agreed to function as equal partners to administer this research project, as each has a substantial stake in the successful outcome of this endeavor. Other organizations that support this work include the Gulf Coast Bird Observatory, International Crane Foundation, and Parks Canada. The fundamental objectives of the research are to: 1) advance knowledge of whooping crane breeding, wintering, and migratory ecology, including threats to survival and population persistence; 2) disseminate research findings in reports, presentations, and peer-reviewed literature to provide reliable scientific knowledge for conservation, management, and recovery of whooping cranes; and 3) minimize negative effects of research activities to whooping cranes. Partners agree that this opportunity to mark wild whooping cranes with GPS technology represents the best prospect in the past 30 years to enhance understanding of whooping cranes and assess risks they face during their entire life cycle.

We captured cranes and attached GPS-PTTs at breeding sites at Wood Buffalo National Park and wintering sites along the Texas coast near and at Aransas National Wildlife Refuge. Over the lifespan of the project we captured 33 juvenile (hatch-year) birds and 35 adult (after-hatch-year) birds. Capture teams consisted of individuals with experience handling endangered cranes, including a licensed veterinarian. At capture, the veterinarian performed a health check on each crane, which included a general external examination, blood collection for pathogen, toxin, and genetic screening, and fecal collections for parasite evaluation. Captured birds were marked with a GPS-PTT attached with two-piece leg bands. The GPS-PTTs have solar panels integrated on all 3 exposed surfaces to maximize battery recharge, which will provide a potential lifespan of 3–5 years. The transmitter and leg band weigh approximately 72 g, which represent <1.5% of body weight of adult whooping cranes. Transmitters were programmed to record 4 GPS locations daily, which provide daytime and nighttime locations. This data collection schedule allows for detailed information on roosting sites, diurnal site use, and general flight paths. Transmitters upload new data approximately every 2.5 days, allowing for monitoring of survival.

Capture Summary

Capture and marking of wild whooping cranes concluded in February 2014. We captured one juvenile and one adult crane in 2009, one adult crane in January 2011, 11 adult cranes during late November and early December 2011, one juvenile and 11 adult cranes during late November 2012 through early January 2013, and 11 adult cranes during late January and early February 2014 along the Gulf Coast of Texas. Capture teams also marked 9 juvenile cranes during August 2010, 12 juvenile cranes during August 2011, and 10 juvenile cranes during July and August 2012 at Wood Buffalo National Park in Canada.

2015 Summer Season Summary

During summer 2015, 19 transmitters provided over 9,100 GPS locations on the breeding and summering grounds, which aided searches for whooping crane nests and fledged young. Nesting of banded birds (active and non-active transmitters) was observed directly in 11 cases and in five cases it was inferred from subsequent re-sighting of banded birds with offspring. In total, 16 banded cranes were suspected to be nesting. Of those 16 cranes, nine were re-sighted in summer or fall with juveniles, five were re-sighted without juveniles, and two cranes with inactive transmitters were not re-sighted. All birds with active transmitters spent the summer within the traditional breeding area. No mortalities were detected from the data prior to the onset of fall migration.

2015 Fall Migration Summary

Prior to migration, five transmitters stopped providing data leaving 14 GPS-marked cranes initiating migration. One transmitter ceased providing data during migration (Table 1). Cranes departed sites in Wood Buffalo National Park between 2 September and 27 October with an average departure date of 22 September. Fifty percent of the birds departed by 15 September and 79% departed by 15 October. Total time spent migrating between summering and wintering areas during 2015 ranged from 13 to 83 days and averaged 58 days. For comparison, we estimated average migration time during fall 2010 at 36 days (12–70 days; $n = 10$), fall 2011 at 36 days (9–63; $n = 19$), fall 2012 at 45 days (9–67 days, $n = 25$), fall 2013 at 35 days (9–78, $n = 25$), and fall 2014 at 42 days (14–86 days, $n = 24$).

During fall staging in Saskatchewan, observations of marked birds provided information on their status (i.e., with or without offspring or mate). From September–November, visual sightings of 24 banded birds were obtained by CWS biologists. Seven marked birds were accompanied by offspring. Of four banded birds that were detected with young on the breeding grounds, one was re-sighted during fall staging in Saskatchewan without offspring and one was not re-sighted.

We documented whooping cranes using 181 stopover locations (geographic areas where cranes remained ≥ 1 night), which occurred in every state and province in the Great Plains.

Saskatchewan contained the majority of sites used, and other states and provinces received relatively similar use (Table 2). Cranes spent the most time at staging sites in Saskatchewan, Nebraska, Kansas, North Dakota, and Alberta. The general migration corridor used by whooping cranes during fall 2015 was similar to past migrations and other published reports (Fig. 1). We observed one stopover site along the central Platte River system near Phillips, Nebraska. One bird stopped at Quivira National Wildlife Refuge in Kansas. Nine birds stopped

at Salt Plains National Wildlife Refuge in Oklahoma. We did not detect any mortalities during fall migration.

2015-16 Winter Season Summary

The first marked bird arrived at winter use sites on 27 October, and the last marked cranes arrived on 13 December. Average arrival date was 20 November. Thirteen GPS-marked cranes provided >6,300 locations during winter 2015-2016 of which over 5,000 were within the boundaries of Aransas NWR. Birds used a variety of ecologically distinct areas including coastal salt and brackish marsh communities, agricultural and ranching areas, and inland freshwater wetlands. Less than one percent of locations were outside of Aransas and Calhoun counties. The first bird departed the wintering grounds on 22 March 2016 and the last bird left 4 April 2016. One bird remained at Aransas NWR as of 1 June and is the same bird that did not initiate spring migration until 22 June in 2014.

2016 Spring Migration Summary

Prior to migration, two transmitters stopped providing data leaving 11 active transmitters. Cranes departed wintering sites in Texas between 22 March and 4 April with an average departure date of 30 March. Forty percent of the birds departed by 1 April and 100% departed by 15 April. The first birds arrived at summer use sites on 17 April, and the last marked crane arrived on 28 April. The average arrival date was 21 April. Total time spent migrating between wintering and summering areas during 2016 ranged from 18 to 31 days and averaged 23 days. For comparison, we estimated average migration time during spring 2011 at 30 days (21–38 days; $n = 11$), spring 2012 at 26 days (15-46; $n = 25$), spring 2013 at 37 days (16-69 days, $n = 32$), spring 2014 at 28 days (15-47, $n = 27$) and spring 2015 at 20 days (14-28 days, $n = 19$).

Ten actively transmitting birds provided complete migration information back to northern summer areas. We documented whooping cranes using 109 stopover locations (geographic areas where cranes remained ≥ 1 night), which occurred in every state and province in the Great Plains. Cranes spent the most time at staging sites in Saskatchewan followed by Kansas and South Dakota. Staging in the remaining states and provinces accounted for only 35% of overall stopover time (Table 3). The general migration corridor used by whooping cranes during spring 2016 was similar to past migrations and other published reports (Fig. 2). Three birds stopped at or near Quivira National Wildlife Refuge in Kansas, and one bird stopped along the central Platte River in Nebraska between Odessa and Elm Creek. All cranes with active transmitters terminated migration in the traditional summer use area in and around Wood Buffalo National Park. No mortalities were detected during spring migration.

Recent and Future Activities

The captures in 2014 attained study plan objectives and no new capture activities are currently planned.

Table 1. Status of whooping cranes with active transmitters during summer 2015 through spring migration 2016, June 2015–May 2016.

Bird ID	Capture Location	Markings ^a		Status
		Left Leg	Right Leg	
2011-12	Wood Buffalo NP	GPS(55-GLD)	GLD/R	Completed both migrations ^c
2011-80	Wood Buffalo NP	GPS(46-GLD)	G/GRY	Completed both migrations ^c
2012-21	Wood Buffalo NP	GPS(W/G-21)	Y/W	Initiated fall migration, fate unknown
2012-30	Wood Buffalo NP	GPS(W/G-30)	GRY/G	Completed both migrations
2012-31	Aransas NWR	R/G	GPS(B/B-31)	Completed both migrations
2012-32	Aransas NWR	GPS(G/W-32)	NONE	Completed both migrations ^b
2014-44	Aransas NWR	R/GLD	GPS(44-GLD)	Completed fall migration, at ARNWR
2014-47	Aransas NWR	GLD/G	GPS(47-GLD)	Completed both migrations
2014-48	Aransas NWR	GLD/BK	GPS-48-GLD	Completed both migrations
2014-49	Aransas NWR	GLD/W	GPS(49-GLD)	Completed both migrations
2014-51	Aransas NWR	G/GLD	GPS(51-GLD)	Completed both migrations
2014-52	Aransas NWR	GLD/B	GPS(52-GLD)	Completed both migrations
2014-53	Aransas NWR	GLD/Y	GPS(53-GLD)	Completed both migrations ^b
2014-56	Aransas NWR	Y/GLD	GPS(56-GLD)	Completed both migrations

^a A = BBL aluminum band, B = blue, BK = black, G = green, R = red, W = white, Y = yellow, GRY = gray GLD=gold. GPS bands pre-2011 were all black, 2011-2012 PTT bands are color coded with superimposed numbers on the band half without the transmitter. For example: GPS(B/W-01) = upper half is blue with number 0, and lower half is white with number 1. 2014 PTT bands are all Gold with Black numbers.

^b Transmitter giving intermittent data but enough to ascertain completion of migration.

^c Bird recaptured and transmitter replaced.

Table 2. Percentage of stopover sites used by whooping cranes and percentage of time spent by U.S. state and Canadian province during 2015 fall migration.

State/province	% sites	% days
Northwest Territories	<1	<1
Alberta	11	5
Saskatchewan	33	70
North Dakota	10	5
South Dakota	5	1
Nebraska	11	5
Kansas	5	5
Oklahoma	12	3
Texas	14	5

Table 3. Percentage of stopover sites used by whooping cranes and percentage of time spent by U.S. state and Canadian province during 2016 spring migration.

State/province	% sites	% days
Northwest Territories	1	<1
Alberta	12	6
Saskatchewan	38	35
North Dakota	8	10
South Dakota	10	15
Nebraska	6	12
Kansas	12	15
Oklahoma	5	2
Texas	8	4

Figure 1. Generalized migration corridor (shaded gray) and stopover sites (white circles) of 14 whooping cranes during fall migration, September–December 2015.



Figure 2. Generalized migration corridor (shaded gray) and stopover sites (white circles) of 10 whooping cranes during spring migration, March–April 2016.

