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Remote Tracking of Aransas-Wood Buffalo Whooping Cranes 2013 Winter Season and 2014 Spring Migration 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 40 whooping cranes during the 2013 winter season. Two adult birds marked in the last capture efforts died on the wintering grounds. Of the 32 cranes monitored during spring migration, the first crane initiated migration on 14 March, and all cranes that migrated arrived at summer use sites by 23 May. One crane stayed on the wintering grounds accompanied by an unmarked individual. One crane terminated spring migration in southern Alberta.

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, our goal was to capture approximately 30 juvenile (hatch-year) birds and 30 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 was expected to provide a 3–5-year lifespan. The transmitter and leg band weighed approximately 72 g, which represented <1.5% of body weight of adult whooping cranes. Transmitters were programmed to record 4–5 GPS locations daily, which provided 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 Update and Active Transmitters

Capture and marking of wild whooping cranes has encompassed the main fieldwork activities conducted for this project thus far. 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 13 (2 recaptures) 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. During the 2013 winter season, 40 transmitters provided location data (Table 1).

During this past winter, we captured two cranes and released them with color bands. One crane had a lesion on its tarsus and the other bird was paired with a marked individual. Finally, we assisted in capture of a bird with an amputated tarsus. This bird was captured on 17 December and taken to the San Antonio Zoo for rehabilitation.

Winter Season Summary

GPS-marked cranes provided >11,000 locations during winter 2013, of which over >6,000 were within the boundaries of Aransas National Wildlife Refuge. The first date a marked bird arrived on the Texas coast, or nearby wintering areas, was 14 October 2013, with the last to arrive on 21 November 2013. Birds used a variety of ecologically distinct areas including coastal salt and brackish marsh communities, agricultural and ranching areas, and inland freshwater wetlands. The majority of locations were in Aransas, Calhoun, Refugio, Williamson, Wharton, and Colorado counties. We confirmed two mortalities of marked birds on Aransas Wildlife Refuge. One marked bird remained on the Texas Gulf Coast into early summer (as of 20 June 2014) accompanied by an unmarked individual.

Migration Summary

Prior to migration, six transmitters stopped providing data (Table 1). Cranes departed wintering sites in Texas between 14 March and 3 May with an average departure date of 11 April. Thirty percent of the birds departed by 1 April and 52% departed by 10 April. Departure was approximately one week later than previous years. The first birds arrived at summer use sites on 24 April, and the last marked crane arrived on 23 May. Average arrival date was 8 May. Total time spent migrating between wintering and summering areas during spring 2014 ranged from 21 to 47 days and averaged 30 days. For comparison, we estimated average migration time during spring 2011 at 31 days (25–38 days; $n = 10$), spring 2012 at 27 days (15–46; $n = 25$) and spring 2013 at 36 days (16–69 days, $n = 32$).

We monitored 32 birds successfully migrating to summer areas. We documented whooping cranes using 315 stopover locations (geographic areas where cranes remained ≥ 1 night), which occurred in every state and province in the Great Plains. As in other years, Saskatchewan contained the majority of sites used, and other northern Great Plains states and provinces received relatively similar use (Table 2). Cranes spent the most time at staging sites in Saskatchewan followed by North Dakota, Nebraska and South Dakota. Staging in the remaining states and provinces accounted for 20% of migration stopover nights. The general migration

corridor used by whooping cranes during spring 2014 was similar to past migrations and other published reports (Fig. 1). Three birds stopped at Salt Plains National Wildlife Refuge in Oklahoma; we observed no stopovers at Quivira National Wildlife Refuge in Kansas. Four birds used stopover sites along the Central Platte River between Lexington and Chapman, Nebraska. One crane terminated migration near Rumsey, Alberta.

Recent and Future Activities

Recent captures have met study plan objectives and no new capture activities are currently planned.

Acknowledgements

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Table 1. Status of whooping cranes with active transmitters during winter and spring migration, November 2013–May 2014.

Bird ID	Capture Location	Markings ^a		Status
		Left Leg	Right Leg	
2009-02	Aransas NWR	Y/A/Y	GPS(BK)	Completed migration, broken ant. ^b
2010-04	Wood Buffalo NP	GPS(BK)	A/B/Y	Completed migration ^b
2010-05	Wood Buffalo NP	GPS(BK)	A/G/Y	Completed migration, broken ant. ^b
2010-08	Wood Buffalo NP	GPS(BK)	A/Y/Y	Completed migration ^b
2011-02	Aransas NWR	Y/BK	GPS(B/W-02) ^c	Completed migration ^b
2011-05	Aransas NWR	A/B/W	GPS(B/W-05)	Unknown fate
2011-06	Aransas NWR	B/G	GPS(B/W-06)	Completed migration
2011-07	Aransas NWR	GPS(B/W-07)	G/BK	Completed migration ^b
2011-09	Aransas NWR	B/R	GPS(B/W-09)	Unknown fate
2011-99	Aransas NWR	B/B	GPS(B/W-99)	Completed migration
2011-12	Wood Buffalo NP	GPS(55-GLD)	GLD/R	Completed migration. ^d
2011-13	Wood Buffalo NP	GPS(W/B-13)	BK/R	Unknown fate
2011-15	Wood Buffalo NP	GPS(W/B-15)	BK/Y	Completed migration
2011-80	Wood Buffalo NP	GPS(46-GLD)	G/GRY	Completed migration. ^d
2011-90	Wood Buffalo NP	GPS(W/B-90)	G/G	Completed migration
2012-21	Wood Buffalo NP	GPS(W/G-21)	Y/W	Completed migration
2012-23	Wood Buffalo NP	GPS(W/G-23)	G/R	Completed migration
2012-24	Wood Buffalo NP	GPS(W/G-24)	Y/G	Completed migration
2012-25	Wood Buffalo NP	GPS(W/G-25)	GRY/B	Completed migration
2012-26	Wood Buffalo NP	GPS(W/G-26)	GRY/BK	PTT removed
2012-28	Wood Buffalo NP	GPS(W/G-28)	GRY/W	Completed migration
2012-30	Wood Buffalo NP	GPS(W/G-30)	GRY/G	Completed migration
2012-31	Aransas NWR	R/G	GPS(B/B-31)	Completed migration
2012-32	Aransas NWR	GPS(G/W-32)	NONE	Completed migration
2012-33	Aransas NWR	G/Y	GPS(G/W-33)	Completed migration
2012-35	Aransas NWR	Y/GRY	GPS(G/W-35)	Completed migration
2012-36	Aransas NWR	Y/R	GPS(G/W-36)	Unknown fate
2012-37	Aransas NWR	W/GRY	GPS(G/W-37)	Completed migration
2012-41	Aransas NWR	BK/GRY	GPS(G/W-41)	Completed migration
2014-44	Aransas NWR	R/GLD	GPS(44-GLD)	Did not migrate
2014-45	Aransas NWR	GPS-45-GLD	NONE	Completed migration

2014-47	Aransas NWR	GLD/G	GPS(47-GLD)	Completed migration
2014-48	Aransas NWR	GLD/BK	GPS-48-GLD	Completed migration
2014-49	Aransas NWR	GLD/W	GPS(49-GLD)	Completed migration
2014-50	Aransas NWR	W/GLD	GPS(50-GLD)	Died during winter
2014-51	Aransas NWR	G/GLD	GPS(51-GLD)	Completed migration
2014-52	Aransas NWR	GLD/B	GPS(52-GLD)	Completed migration
2014-53	Aransas NWR	GLD/Y	GPS(53-GLD)	Completed migration
2014-54	Aransas NWR	BK/GLD	GPS(54-GLD)	Died during winter
2014-56	Aransas NWR	Y/GLD	GPS(56-GLD)	Completed migration

^a A = BBL aluminum band, B = blue, BK = black, G = green, R = red, W = white, Y = yellow, GRY = gray GLD=gold.

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

^c 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.

^d 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 2014 spring migration.

State/province	% sites	% days
Northwest Territories	<1	<1
Alberta	14	5
Saskatchewan	31	30
Montana	2	2
North Dakota	10	20
South Dakota	11	14
Nebraska	10	17
Kansas	4	4
Oklahoma	7	4
Texas	9	5

Figure 1. Generalized migration corridor (shaded gray) and stopover sites (white circles) of 32 whooping cranes during spring migration, March–May 2014. The migration corridor was developed based on an analyst-defined concave polygon of stopover sites during this migration season.

