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## Remote Tracking of Aransas-Wood Buffalo Whooping Cranes 2013 Breeding Season and Fall 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 33 whooping cranes during the 2013 breeding season. Five marked cranes spent summer months south of the traditional breeding areas. We tracked 30 cranes during fall migration. They initiated fall migration from summering areas on 3 October, and all marked cranes arrived at the Texas coast by 21 November. Average time spent in migration was 40 days. No mortalities were documented during summer and fall migration.

## **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 plan to capture cranes and attach 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 intend to capture approximately 30 juvenile (hatch-year) birds and 30 adult (after-hatch-year) birds. Capture teams consist of individuals with experience handling endangered cranes, including a licensed veterinarian. At capture, the veterinarian performs a health check on each crane, which includes a general external examination, blood collection for pathogen, toxin, and genetic screening, and fecal collections for parasite evaluation. Captured birds are 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 are programmed to record 4 GPS locations daily, which will provide daytime and nighttime locations. This data collection schedule will allow 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 encompasses 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,

and 11 adult cranes and one juvenile between late November 2012 and January 2013 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 breeding season 33 transmitters provided data and, during fall migration, 30 provided location data (Table 1).

### **Breeding Season Summary**

Thirty-three GPS-marked cranes provided >12,000 locations during summer 2013. Five marked subadults spent the entire summer in Saskatchewan and Alberta. One spent time in western Alberta near Grande Prairie, and another spent nearly two months in southeastern Alberta near Galahad and in southern Saskatchewan. The remaining three subadults used southern Saskatchewan exclusively. Two birds spent a brief time in North Dakota in early June. Canadian Wildlife Service personnel confirmed that seven marked cranes (one nonfunctioning and six active transmitters) successfully nested and were observed with young during August fledging surveys (n=6) or fall staging surveys (n=1). In addition, comparison of nest locations and GPS data indicate that six additional marked birds may have nested. Four marked cranes were sighted with young during fall migration in Saskatchewan. No mortalities were identified from the data prior to the onset of migration.

### **Migration Summary**

Prior to migration, three transmitters stopped uploading data, and four provided intermittent data during migration (Table 1). Cranes departed sites in Wood Buffalo National Park between 22 August and 31 October with an average departure date of 3 October. Thirty-five percent of the birds departed by 15 September and 60% departed by 15 October. The first bird arrived at winter use sites on 14 October, and the last marked cranes arrived on 21 November. The average arrival date was 9 November. Total time spent migrating between summering and wintering areas during 2013 ranged from 12 to 78 days and averaged 40 days.

We documented whooping cranes using approximately 260 stopover locations (geographic areas where cranes remained  $\geq 1$  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 3). Cranes spent the most time at staging sites in Saskatchewan and the Dakotas. The general migration corridor used by whooping cranes during fall 2013 was similar to past migrations and other published reports (Fig. 1). We observed three stopover sites along the Central Platte River system, six birds stopped at or near Quivira National Wildlife Refuge in Kansas, and three birds stopped at Salt Plains National Wildlife Refuge in Oklahoma. One marked subadult terminated its migration at Brazoria National Wildlife Refuge in Texas. We did not detect any mortalities during fall migration.

### **Recent and Future Activities**

We deployed 11 transmitters on unmarked adult cranes at Aransas NWR during winter 2013–2014. Additionally, we recaptured three cranes with inoperative transmitters and remarked two birds with functioning transmitters. The third recaptured crane was released with auxiliary color markers after removing the nonfunctioning transmitter. Capture and marking efforts this winter attained study plan objectives, thus no new capture activities are currently planned.

## Acknowledgements

This extensive research project has been made possible because of a partnership among multiple agencies and organizations including, the Canadian Wildlife Service, Crane Trust, U.S. Fish and Wildlife Service, Platte River Recovery Implementation Program, U.S. Geological Survey, Gulf Coast Bird Observatory, International Crane Foundation, and Parks Canada. We thank all for providing past and continued financial, technical, and in-kind contributions.

Table 1. Status of whooping cranes with active transmitters during summer and fall migration, May–November 2013.

Bird ID	Mark Date/Location	Markings <sup>a</sup>		Status
		Left Leg	Right Leg	
2009-02	Aransas NWR	Y/A/Y	GPS(BK)	Completed migration, broken ant. <sup>b</sup>
2010-03	Wood Buffalo NP	GPS(BK)	Y/Y/A	Completed migration, failed PTT <sup>b</sup>
2010-04	Wood Buffalo NP	GPS(BK)	A/B/Y	Completed migration
2010-05	Wood Buffalo NP	GPS(BK)	A/G/Y	Completed migration, broken ant.
2010-07	Wood Buffalo NP	GPS(BK)	G/Y/A	Unknown fate
2010-08	Wood Buffalo NP	GPS(BK)	A/Y/Y	Completed migration
2011-12	Wood Buffalo NP	GPS(W/B-12) <sup>c</sup>	G/B	Completed migration
2011-13	Wood Buffalo NP	GPS(W/B-13)	BK/R	Completed migration
2011-15	Wood Buffalo NP	GPS(W/B-15)	BK/Y	Completed migration
2011-80	Wood Buffalo NP	GPS(W/B-80)	BK/G	Completed migration
2011-90	Wood Buffalo NP	GPS(W/B-90)	G/G	Completed migration
2011-02	Aransas NWR	Y/BK	GPS(B/W-02)	Completed migration
2011-04	Aransas NWR	R/W	GPS(B/W-04)	Unknown fate
2011-05	Aransas NWR	A/B/W	GPS(B/W-05)	Completed migration
2011-06	Aransas NWR	B/G	GPS(B/W-06)	Completed migration
2011-07	Aransas NWR	GPS(B/W-07)	G/BK	Completed migration
2011-09	Aransas NWR	B/R	GPS(B/W-09)	Completed migration
2011-99	Aransas NWR	B/B	GPS(B/W-99)	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	Completed migration
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)	Completed migration, sporadic data
2012-37	Aransas NWR	W/GRY	GPS(G/W-37)	Completed migration
2012-41	Aransas NWR	BK/GRY	GPS(G/W-41)	Completed migration
2012-42	Aransas NWR	R/Y	GPS(G/W-42)	Unknown fate

<sup>a</sup> A = BBL aluminum band, B = blue, BK = black, G = green, R = red, W = white, Y = yellow.

<sup>b</sup> Transmitter failure. Migration was confirmed by sighting on wintering grounds.

<sup>c</sup> GPS bands pre-2011 were all black, post-2011 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.

Table 2. Percentage of stopover sites used by whooping cranes and percentage of time spent by U.S. state and Canadian province during 2013 fall migration.

State/province	% sites	% days
Northwest Territories	1	3
Alberta	9	2
Saskatchewan	28	64
Montana	<1	<1
North Dakota	7	4
Minnesota	<1	<1
South Dakota	11	11
Iowa	<1	<1
Nebraska	9	3
Kansas	14	4
Oklahoma	6	4
Texas	14	5

Figure 1. Generalized migration corridor (shaded gray) and stopover sites (white circles) of 27 whooping cranes during fall migration, August–November 2013.

