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Remote Tracking of Aransas-Wood Buffalo Whooping Cranes
2012 Breeding Season and Fall Migration Update

**********NOTICE**********
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Abstract: The Whooping Crane Tracking Partnership gathered location data for 36 whooping cranes during the 2012 breeding season. We confirmed mortalities of two juveniles and two subadults on the breeding grounds. Three marked cranes spent the summer months in south-central Saskatchewan. Twenty-nine marked cranes completed fall migration. Marked cranes initiated fall migration on 7 September, and all birds arrived at the Texas coast by 27 November. Future trapping efforts are planned for winter 2013–2014 at Aransas National Wildlife Refuge.

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, and 11 adult cranes during late November and early December 2011 along the Gulf Coast of Texas. Capture teams also marked nine juvenile cranes during August 2010, 12 juvenile cranes during August 2011 and ten juvenile cranes during August 2012 at Wood Buffalo National Park in Canada. During the 2012 breeding season 36 transmitters provided data and 30 provided location data during fall migration (Table 1).

Breeding Season Summary

GPS-marked cranes provided >30,000 locations during summer 2012. Three radiomarked subadults spent the summer months in central and southern Saskatchewan. Two of these birds, which were marked in August 2011, migrated to Wood Buffalo National Park presumably accompanied by their parents and then relocated to Saskatchewan. Six radiomarked cranes were confirmed near nests during the nesting survey conducted in late May at Wood Buffalo National Park. Three marked birds were sighted in Saskatchewan accompanied by juveniles during fall migration. We confirmed mortalities of two juveniles and two subadults within the boundaries of Wood Buffalo National Park prior to the onset of migration.

Migration Summary

Prior to migration, six transmitters stopped providing data (four mortalities, two transmitters with confirmed antenna breakage; Table 1). One transmitter stopped providing data during migration (partial migration, unknown fate; Table 1). Cranes departed Wood Buffalo National Park between 7 September and 26 October with an average departure date of 27 September. Twenty-four percent of birds departed by 15 September and 64% departed by 1 October. The first marked birds arrived at winter use sites on 19 October and the last marked crane arrived on 27 November. The average arrival date was 9 November. Total time spent migrating between summering and wintering areas during 2012 ranged from 21 to 67 days and averaged 46 days.

We documented whooping cranes using 261 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 and the Dakotas. The general migration corridor used by whooping cranes during fall 2012 was similar to past migrations and other published reports (Fig. 1). We observed three stopover sites along the Lexington-Chapman reach of the Platte River, one east of Lexington, one east of Kearney, and one east of Wood River, Nebraska. Five birds stopped at or near Quivira National Wildlife Refuge in Kansas, and seven birds stopped at Salt Plains National Wildlife Refuge in Oklahoma. We did not detect any mortalities during migration.

Recent and Future Activities

We captured 11 adult and one juvenile crane at Aransas NWR during winter 2012–2013 and plan to capture ten adult cranes at Aransas NWR during winter 2013–2014.

Table 1. Status of whooping cranes with active transmitters during breeding and fall migration, May 2012–November 2012.

Bird ID	Mark Date/Location	Markings[a] Left Leg	Markings[a] Right Leg	Status
2009-01	Aransas NWR	R/A/Y	GPS(BK)	Completed migration
2009-02	Aransas NWR	Y/A/Y	GPS(BK)	Completed migration
2010-03	Wood Buffalo NP	GPS(BK)	Y/Y/A	Completed migration
2010-04	Wood Buffalo NP	GPS(BK)	A/B/Y	Completed migration
2010-05	Wood Buffalo NP	GPS(BK)	A/G/Y	Completed migration
2010-06	Wood Buffalo NP	GPS(BK)	A/W/Y	Completed migration
2010-07	Wood Buffalo NP	GPS(BK)	G/Y/A	Completed migration
2010-08	Wood Buffalo NP	GPS(BK)	A/Y/Y	Completed migration
2011-11	Wood Buffalo NP	GPS(W/B-11)	BK/B	Completed migration
2011-12	Wood Buffalo NP	GPS(W/B-12)	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
2011-16	Wood Buffalo NP	GPS(W/B-16)	W/G	Died at Wood Buffalo NP
2011-17	Wood Buffalo NP	GPS(W/B-17)	Y/B	Died at Wood Buffalo NP
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
2011-03	Aransas NWR	W/BK	GPS(B/W-03)	PTT malfunction
2011-04	Aransas NWR	R/W	GPS(B/W-04)	Completed migration
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
2011-08	Aransas NWR	B/Y	GPS(B/W-08)	Unknown fate, ant. broken
2011-09	Aransas NWR	B/R	GPS(B/W-09)	Completed migration
2011-10	Aransas NWR	R/BK	GPS(B/W-10)	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
2012-22	Wood Buffalo NP	GPS(W/G-22)	W/R	Died at Wood Buffalo NP
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
2012-27	Wood Buffalo NP	GPS(W/G-27)	GRY/Y	Died at Wood Buffalo NP
2012-28	Wood Buffalo NP	GPS(W/G-28)	GRY/W	Completed migration
2012-29	Wood Buffalo NP	GPS(W/G-29)	GRY/R	Partial migration; Unknown fate
2012-30	Wood Buffalo NP	GPS(W/G-30)	GRY/G	Completed migration

[a] A = BBL aluminum band, B = blue, BK = black, G = green, R = red, W = white, Y = yellow.

[b] 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 2012 fall migration.

State/province	% sites	% days
Alberta	7	2
Saskatchewan	29	66
North Dakota	10	10
South Dakota	8	8
Nebraska	10	5
Kansas	12	4
Missouri	<1	<1
Oklahoma	10	3
Texas	15	3

Figure 1. Generalized migration corridor (shaded gray) and stopover sites (white circles) of 30 whooping cranes during fall migration, September–November 2012.