

## Whooping Crane Survey Results: Winter 2016–2017

431 Wild Whooping Cranes Estimated (95% CI = 371.1–492.7)

The U.S. Fish and Wildlife Service estimated the abundance of whooping cranes in the Aransas-Wood Buffalo population for the winter of 2016–2017. Survey results indicated 431 whooping cranes (95% CI = 371.1–492.7; CV = 0.101) inhabited the primary survey area (Figure 1). This estimate included 50 juveniles (95% CI = 36.3–60.9; CV = 0.144) and 162 adult pairs (95% CI = 139.2–185.5; CV = 0.100). Recruitment of juveniles into the winter flock was 13.1 chicks (95% CI = 10.4–16.6; CV = 0.119) per 100 adults, which is comparable to long-term [average recruitment](#). The precision of this year’s estimate achieved the target set in the [whooping crane inventory and monitoring protocol](#) (i.e., CV < 0.10).

This season (winter 2016–2017) the U.S. Fish and Wildlife Service switched aircraft from a Cessna 206 to a Quest Kodiak. The Kodiak aircraft has better visibility, which improves survey data and results in a more accurate population estimate. Although the winter 2016–2017 estimate is 31% greater than the winter 2015–2016 estimate, this does not mean that the whooping crane population experienced above average growth (Table 1; Figure 2). Instead, the previous abundance estimates were biased low because of lower visibility in the Cessna 206. The U.S. Fish and Wildlife Service intends to continue using the Kodiak, or other aircraft with improved visibility, for future surveys.

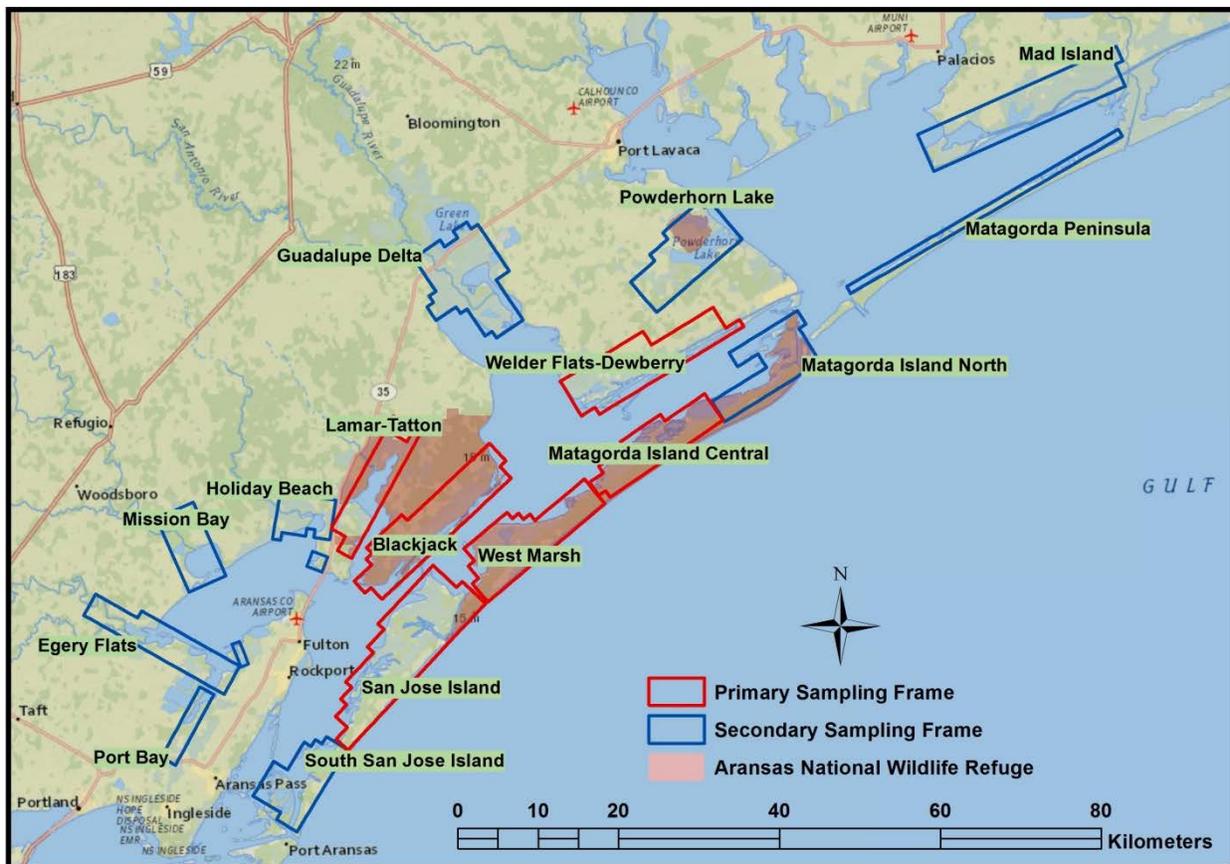


Figure 1. The sampling area used to monitor whooping crane abundance on their wintering grounds along the Texas coast of the Gulf of Mexico, USA.

**Table 1. Preliminary whooping crane abundance estimates for the Aransas-Wood Buffalo population on their wintering grounds, winter 2011–2012 through winter 2016–2017.**

Survey year <sup>a</sup>	Abundance <sup>b</sup>	CV	95% CI		No. assumed beyond primary survey area <sup>c</sup>
			LCL	UCL	
winter 2011–2012	254	0.126	198	324	13
winter 2012–2013	257	0.186	178	362	22
winter 2013–2014	304	0.078	260	354	6
winter 2014–2015	308	0.067	267	350	6
winter 2015–2016	329	0.073	293	371	9
winter 2016–2017	431	0.101	371	493	6

<sup>a</sup> All surveys were conducted with a Cessna aircraft except winter 2016–2017 when USFWS switched to a Kodiak.

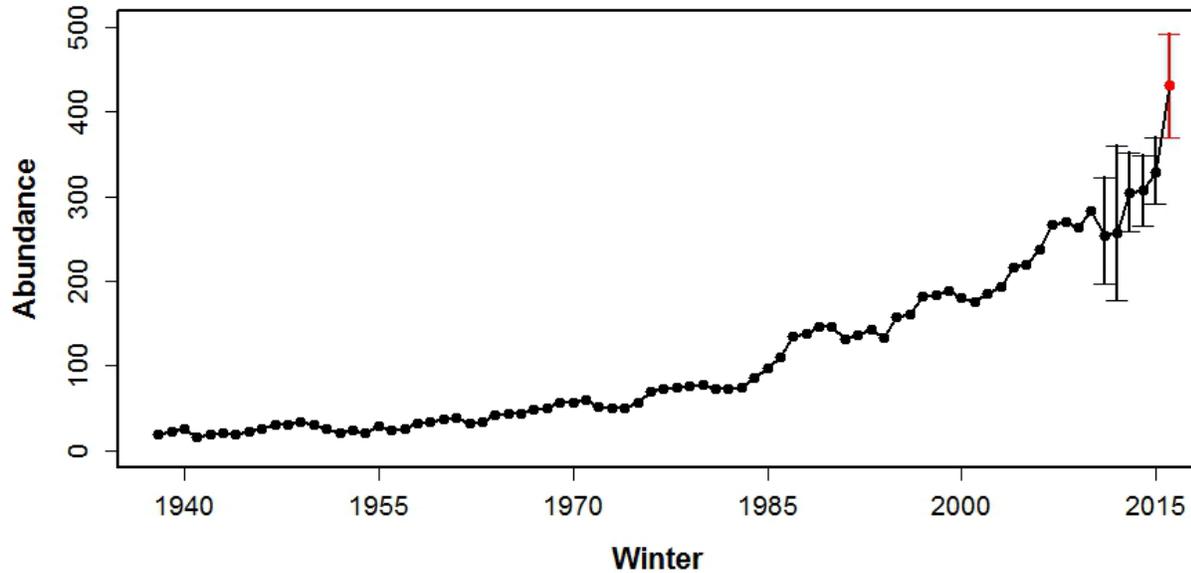
<sup>b</sup> Estimated whooping crane abundance in the primary sampling area using aerial surveys and hierarchical distance sampling. CV = coefficient of variation, CI = confidence interval, LCL = lower confidence limit, and UCL = upper confidence limit.

<sup>c</sup> Provides our best understanding of the number of whooping cranes, at the time of the aerial surveys, that were outside of the primary survey areas. This information was based on data from Texas Whooper Watch, Ebird reports, the whooping crane GPS tracking study, and aerial surveys conducted in the secondary survey areas.

During winter 2016–2017, the primary survey area (approximately 153,950 acres; Figure 1) was surveyed multiple times during December 9 through December 14, 2016. Blackjack Peninsula and West Marsh were surveyed four times and Matagorda Island Central, Lamar Peninsula-Tatton Unit, San Jose Island, and Welder Flats-Dewberry Island were surveyed three times. During the same period, the secondary survey area (approximately 169,300 acres; Figure 1) was surveyed to monitor ongoing expansion of the whooping crane’s occupied winter range. Due to poor weather conditions, only three of the secondary survey areas were surveyed. Matagorda Peninsula and Mad Island were surveyed on December 11, 2016 and South San Jose Island was surveyed on December 14, 2016.

During the survey period, some whooping cranes were observed outside of the primary survey area. These data were based on information from [Texas Whooper Watch](#), [Ebird](#) reports, the whooping crane GPS tracking study, and aerial surveys conducted in the secondary survey areas. Compared to winter 2011–2012 and winter 2012–2013, few whooping cranes were observed outside of the primary survey area (Table 1).

Table 2 provides our best understanding of whooping cranes outside the primary survey areas during the mid-December survey period. Some birds may have been missed. It is impossible to be certain that individuals did not move between these locations and to/from the primary survey area during the survey period.



**Figure 2.** Time-series of whooping crane abundance estimates for the Aransas-Wood Buffalo population beginning in winter 1938–1939. Starting in winter 2011–2012, the precision of abundance estimates were displayed as 95% confidence intervals. During years prior to winter 2011–2012, the precision of abundance estimates was unknown. In winter 2016–2017 (red), the USFWS began using a Quest Kodiak aircraft for the surveys which improved visibility, resulting in a more accurate estimate.

**Table 2. Whooping cranes documented outside of the primary survey area during December 9 through December 14, 2016.**

General area	Data source	Adults	Chicks	Total	Notes
Mad Island (secondary survey area)	Aerial survey	4	1	5	One pair with a chick and two individual adults detected once on December 11, 2017.
Western San Patricio and Nueces County (near Edroy and Driscoll, TX)	Ebird	1	0	1	Reported on December 3 <sup>rd</sup> , 6 <sup>th</sup> , and 18 <sup>th</sup> .

*The data and results presented in this report are preliminary and subject to revision. This information is distributed solely for the purpose of providing the most recent information from aerial surveys. This information does not represent and should not be construed to represent any U.S. Fish and Wildlife Service determination or policy.*

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