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Fall Trumpeter Swan Survey  
of the  
High Plains Flock

**Fall 2012**



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## Introduction

The annual fall trumpeter swan survey is conducted to determine production and distribution for a portion of the Interior Population of trumpeter swans called the High Plains Flock, in accordance with the Interior Population and High Plains Flock trumpeter swan management plans (1997 and 2011, respectively). Each plan outlines population objectives (VI-2 and A-1) and management strategies for monitoring population status, which includes aerial surveys in South Dakota and Nebraska. These surveys are part of a trumpeter swan monitoring program that spans over two decades to track abundance trends in the flock and condition of the wetlands swans inhabit.

## Methods

The survey was conducted from September 4<sup>th</sup> to September 6<sup>th</sup>, 2012. We assumed that movement of swans was limited within this time frame; thus, double counting of swans was deemed minimal or non-existent. An aerial cruise survey was completed using a Cessna 182 airplane, flying at elevations of 600 to 1000 ft AGL and at speeds of 120 knots. The weather conditions were favorable with clear skies, winds of 15 to 20 mph on the ground, and temperatures 70 to 98° F.

When a potential swan was sighted, the survey biologists verified the species (ensuring it was not an American white pelican) and classified its age and social status. Swans were categorized as (1) pairs with or without broods, (2) singles with or without broods, (3) cygnets, or (4) groups. Adult and subadult birds were recorded as white birds, and gray birds were classified as cygnets. The survey biologist also evaluated habitat conditions (i.e., availability of food resources and water) from the air.

The traditional survey route included much of northwest Nebraska, southwest South Dakota, and Wyoming (Fig. 1), but Wyoming is not surveyed every year. The Wyoming route (Colony site) will be conducted every five years in conjunction with the total North American trumpeter swan survey which is scheduled for 2015.

## Results

During the 2012 survey, biologists counted a record-high 664 swans in the High Plains Flock (HPF) an increase of 91 birds since 2011. The large increase in swans was due to a surge in the number of birds in groups. The number of breeding pairs and broods decreased as well as the average brood size (Table 1). The 2012 results are above the 24-year average for total birds ( $334 \pm 27$ ), white birds ( $240 \pm 22$ ), and cygnets ( $94 \pm 7$ ). The Flock continues to experience a positive growth rate of 5.3% annually from 1990 to 2012 (Fig. 3). The overall production of cygnets and the index of production (i.e., cygnets/white birds) decreased to 0.22 compared to the long-term average (0.43). The specific results for each category are listed in Table 1 and Figure 2.

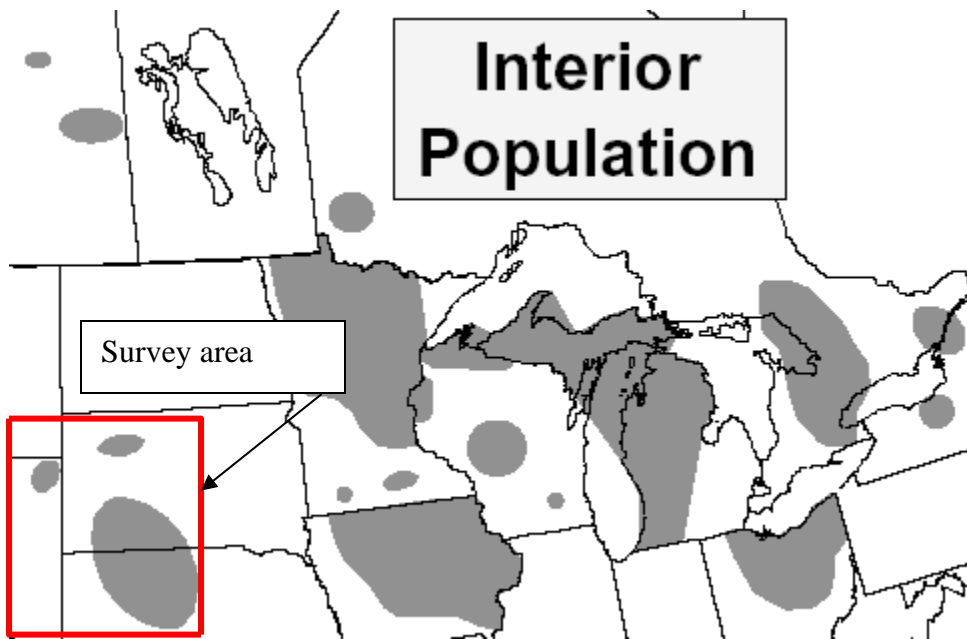


Figure 1. Survey area for High Plains Flock trumpeter swans located in southwest South Dakota and northwest Nebraska.

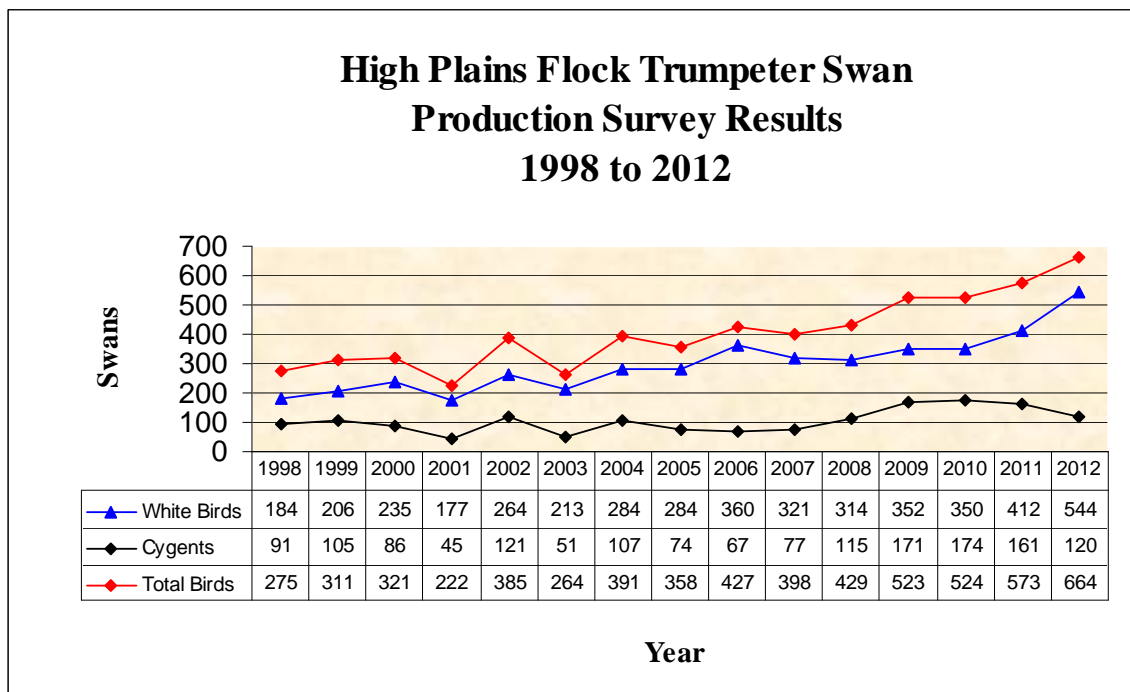


Figure 2. High Plains Flock Trumpeter Swan Production Survey Results 1998-2012.

Table 1. Results of the 2011 and 2012 fall production survey of High Plains Flock trumpeter swans.

Population parameter	2011	2012
Adults and subadults	412	544
Cygnets	161	120
Total swans	573	664
Adults and subadults in groups	101	246
Total flocks	17	34
Pairs with cygnets	54	47
Pairs without cygnets	90	88
Singles with cygnets	1	1
Singles without cygnets	23	28
Total broods	55	48
Mean brood size	2.93	2.58

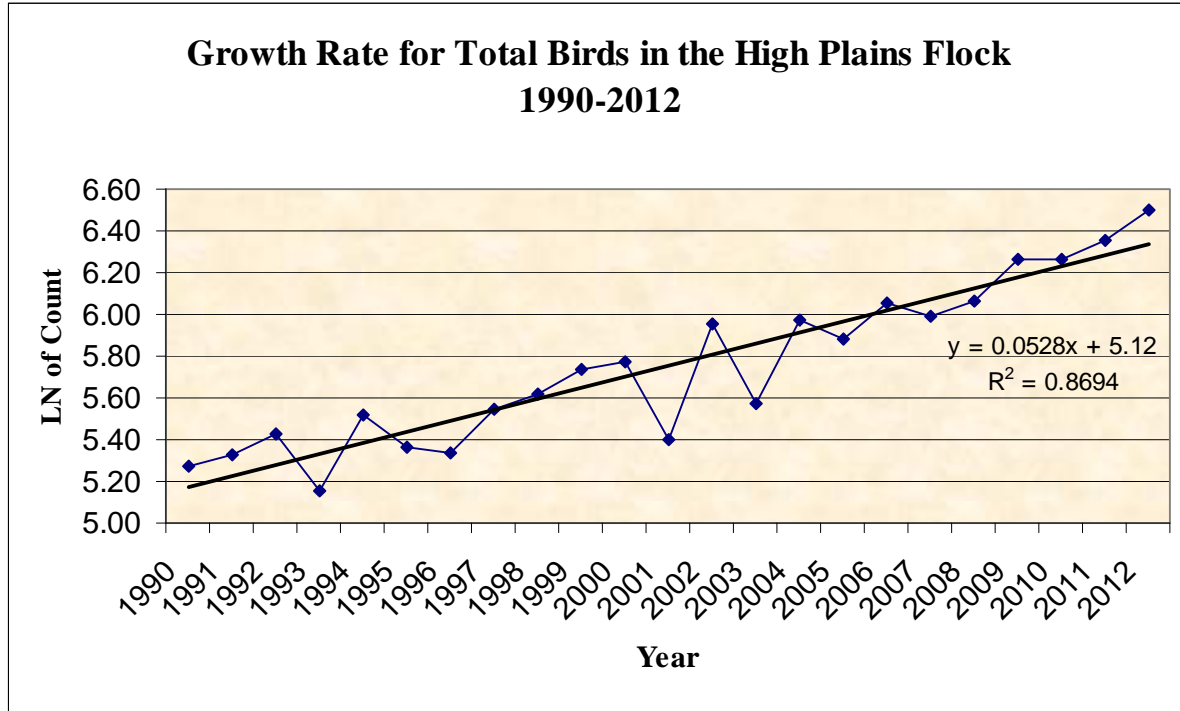


Figure 3. Growth rate of the HPF derived from the natural log of swans counted during fall production surveys from 1990 to 2012. The growth rate = 5.3% per year ( $R^2 = 0.87$ ,  $P = 0.00$ ).

## Discussion

### Habitat Conditions

Most of the breeding pairs were located on high quality wetlands (i.e., marshes with good water quality and food resources) within 75 miles of Lacreek National Wildlife Refuge in

the Sandhills area. Although the water source for many of these wetlands is subsurface, prolonged dry periods can affect the amount of water and food resources during the breeding season. This year the majority of wetlands in the survey area appeared to contain less water and subaquatic food resources than the previous four years. Precipitation amounts in the survey area were below normal according to NOAA and were categorized in the mid-range to extreme drought conditions from March to September (Fig. 5). This was an abrupt change from the previous year when precipitation conditions were above normal (Picture 1).



Picture 1. Wetland in the sandhills of Nebraska. Picture taken from the airplane during the 2011 survey, note four swans.

#### Flock Status

The number of swans counted this year is the highest on record for the HPF and this was attributed to an increase in the number of white birds in groups. The increase in white birds could be credited to a relatively high number of cygnets produced in 2009 and 2010, which are not reproductively active. A swan may take up to four years to reproduce, and many of the cygnets produced in these years are likely not yet reproductively active and therefore remain in groups. Although this was a banner year for this Flock, production declined. All the production parameters decreased which could be a result of the changes in habitat conditions and availability. During drought conditions, there is potentially less wetland habitat available for breeding because a

wetland may become dry or only provide marginal habitat. A drop in productivity similar to the one experienced this year also occurred during the previous drought period (2004-2007), but the Flock increased to pre-decline levels with in one to two years of improved precipitation conditions.

The population objective for this Flock is to maintain a dispersed population consisting of at least 500 total birds counted during the production survey and 50 successful breeding pairs (Comeau 2011). the number of successful breeding pairs declined to 48. If drought conditions continue, the number of breeding pairs may continue to fall below the management objective and reflect habitat conditions and availability. Furthermore, it is likely that this population will fluctuate between 400 and 600 total birds based on Flock trend data and variable environmental conditions.

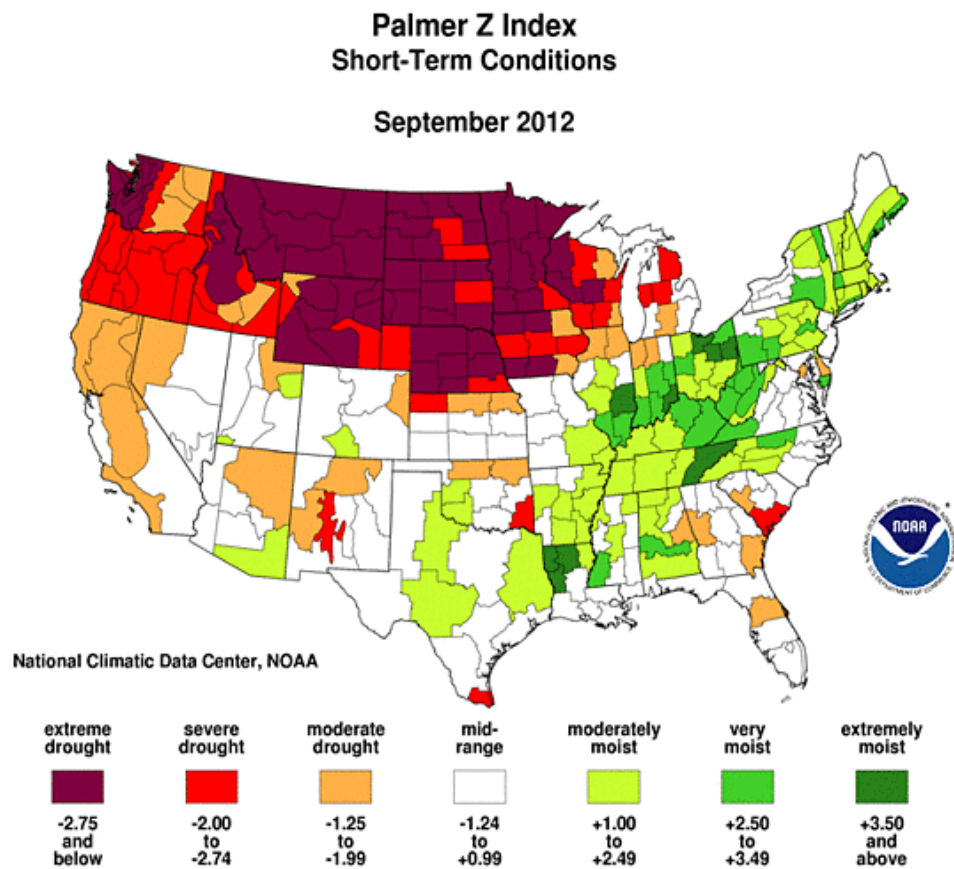


Figure 5. NOAA map of drought conditions the week of the survey.

## Literature Cited

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Appendix A. Survey results by location for the High Plains Flock, 2012 per day. W.B. = White bird (adult/subadult), N.B.P.= non-breeding pair, and B.P. = breeding pair.

	<b>Swans</b>				
<b>W.B. Single</b>	<b>B.P.</b>	<b>Cyg.</b>	<b>N.B.P</b>	<b>Group</b>	<b>Comments</b>
8	16	33	25	76	Subtotal for 9/4/2012
20	30	86	55	160	Subtotal for 9/5/2012
0	1	1	8	10	Subtotal for 9/6/2012
<b>28</b>	<b>47</b>	<b>120</b>	<b>88</b>	<b>246</b>	<b>Survey Total</b>