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Fall Trumpeter Swan Survey
of the
High Plains Flock

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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 2005, 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 August 29th to September 1st, 2011. 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 800 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. This year Wyoming (Colony site) was included because a total North American count is conducted every five years, and this was the fifth year.

Results

During the 2011 survey, biologists counted a record-high 573 swans in the High Plains Flock (HPF) an increase of 49 birds since 2010. There was an increase in the number of non-breeding pairs, single, and birds in groups. The number of breeding pairs and broods decreased, and the average brood size remained slightly increased (Table 1). The 2011 results are above the 22-year average for total birds (320 ± 24), white birds (277 ± 19), and cygnets (93 ± 8). The Flock continues to experience a positive growth rate of 5.1% annually from 1990 to 2011 (Fig. 3). The overall production of cygnets and the index of production (i.e., cygnets/white birds) decreased to 0.38 compared to the long-term average (0.45). The specific results for each category are listed in Table 1.

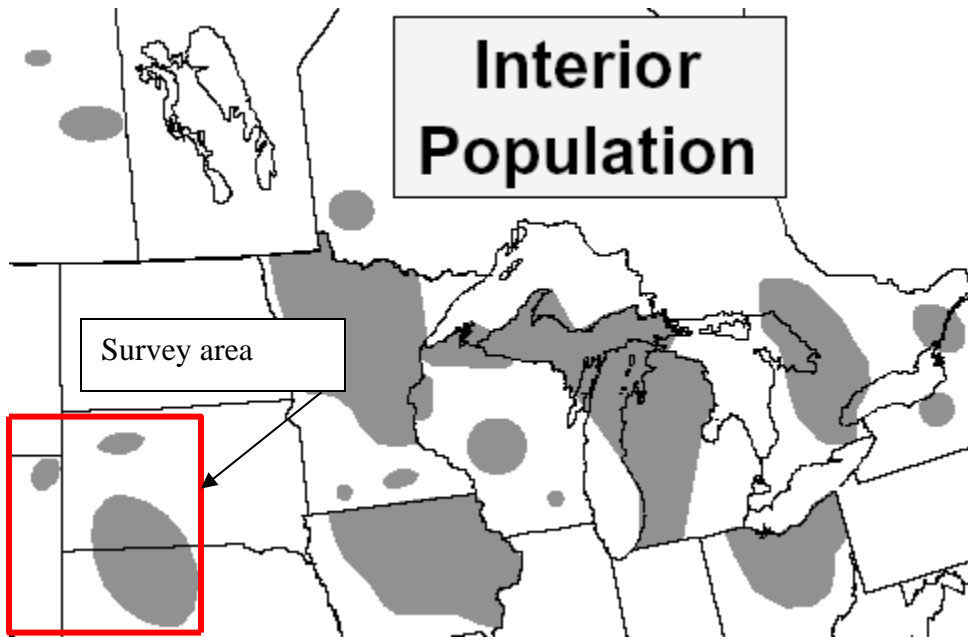


Figure 1. Survey area for High Plains Flock trumpeter swans located in southwest South Dakota and northwest Nebraska.

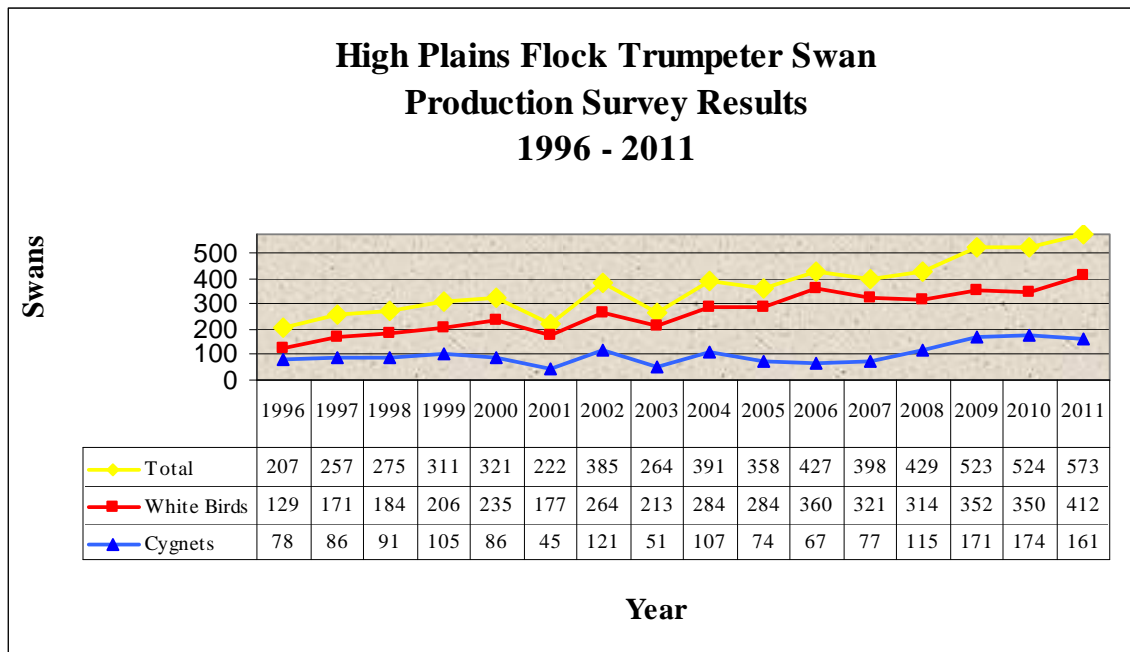


Figure 2. High Plains Flock Trumpeter Swan Production Survey Results 1996-2011.

Table 1. Results of the 2010 and 2011 fall production survey of High Plains Flock trumpeter swans.

Population parameter	2010	2011
Adults and subadults	350	412
Cygnets	174	161
Total swans	524	573
Adults and subadults in groups	91	101
Total flocks	21	17
Pairs with cygnets	65	54
Pairs without cygnets	56	90
Singles with cygnets	1	1
Singles without cygnets	16	23
Total broods	66	54
Mean brood size	2.68	2.93

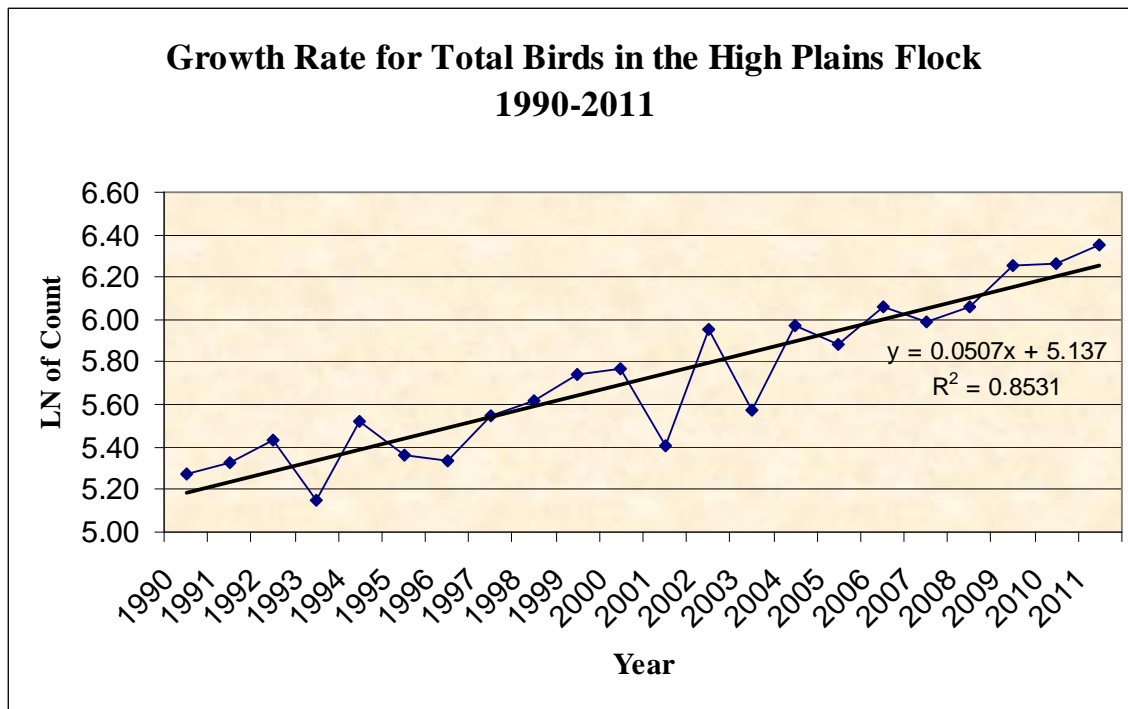


Figure 3. Growth rate of the HPF derived from the natural log of swans counted during fall production surveys from 1990 to 2011. The growth rate = 5.1% per year ($R^2 = 0.83$, $P = 0.00$).

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 100 miles of Lacreek National Wildlife Refuge in the Sandhills area. The water source for many of these wetlands is subsurface, thereby providing adequate water and food resources throughout the breeding season. This year

the majority of wetlands in the survey area contained some water, cover, and the subaquatic food resources appeared abundant (Fig 4). Precipitation in the survey area was normal to extremely moist from March to August, and continued to be moist at the time the survey was conducted (Fig. 5). This is the fourth year precipitation conditions have been at or above normal. Conditions continued to be favorable in the central and southeastern portions of the route, and swans have been expanding their range eastward according to Nebraska Game and Parks Commission personnel. Five years ago the route was extended farther east into the sandhills and biologists counted additional birds (53) in those areas this year.



Figure 4. Wetland in the sandhills of Nebraska. Picture taken from the airplane during the 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 non-breeding pairs, singles, and the number of swans in groups. Most of the production parameters for this flock decreased with the exception of the average brood size. The increase in non-breeding pairs and total birds could be credited to a relatively high number of cygnets (171) produced in 2009, but also wetland habitat quality. A swan may take up to four years to become reproductively active, and many of the cygnets produced in 2009 are likely paired but not yet reproductively active. The precipitation levels maintained habitat quality and provided many areas for breeding

that may have been limited during the drought conditions. During the dry period many of the highest quality wetlands were likely occupied by established pairs that nest at these locations year after year. Thus, wetlands that provided marginal breeding habitat for newly established pairs during the drought may now be adequate for production.

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). This goal of total birds and number of breeding pairs was achieved this year, and this is attributed breeding habitat and strong production for several years. As long as habitat conditions remain favorable and no major stochastic event occurs, it is likely these parameters will continue to be achieved. If these conditions are not met, the population may drop below management objectives and adjust accordingly. It is likely that this population will fluctuate between 350 and 500 total birds, based on trend data and the current growth rate.

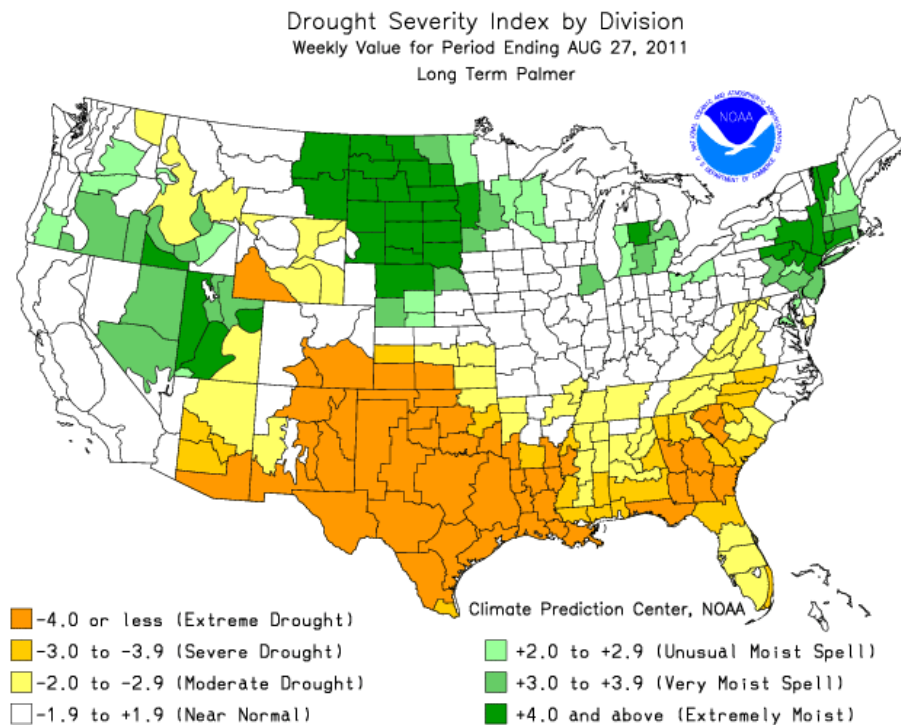


Figure 5. NOAA map of drought conditions the week of the survey.

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Appendix A. Survey results by location for the High Plains Flock, 2010 per day. W.B. = White bird (adult/subadult), N.B.P.= non-breeding pair, and B.P. = breeding pair.

	Swans				
W.B. Single	B.P.	Cyg.	N.B.P	Group	Comments
0	8	22	14	9	8/29/10 subtotal
12	28	89	48	37	8/30/10 subtotal
10	17	49	25	55	8/31/10 subtotal
1	1	1	3	0	9/1/10 subtotal
23	54	161	90	101	Survey Total