

**TRUMPETER SWAN SURVEY**  
**of the**  
**HIGH PLAINS FLOCK,**  
**INTERIOR POPULATION**

**Winter 2006**



Prepared by:

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U.S. Fish and Wildlife Service, Migratory Birds and State Programs

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## **Introduction**

Re-introduction of trumpeter swans at Lacreek National Wildlife Refuge (NWR) began in the early 1960s to restore extirpated populations that existed in this region prior to settlement. Cygnets from Red Rock Lakes NWR were translocated to Lacreek to establish the High Plains (formerly, Lacreek) flock of the Interior Population. Since then, the number of birds comprising the High Plains flock has increased steadily and their range has expanded. Swans are now commonly observed throughout most of the western and parts of the eastern Sandhills of Nebraska (Fig. 1).

Prior to the winter of 2005, aerial surveys were conducted by staff stationed at Lacreek NWR to quantify the number swans in the High Plains flock. Beginning in 2005, in coordination with the annual Mid-Winter Survey ([MWS], Blohm 1989), counts of trumpeter swans were obtained in accordance with management plans for these swans (Lacreek National Wildlife Refuge 1982, Subcommittee on the Interior Population of Trumpeter Swans 1997), and the special swan surveys conducted by Lacreek staff were discontinued. Each plan specifies population objectives and management strategies for monitoring population status. Surveys are conducted annually to assess wintering-ground abundance and distribution of swans.

## **Survey Area and Methods**

Rivers, creeks and other areas in western Nebraska and southwestern South Dakota were surveyed during 3-5 January 2007 by both air and ground to obtain counts of trumpeter swans. Two high-winged aircraft (a Cessna 172 and 182) were used on the majority of the survey and flew at approximately 30-90 meters above ground level at an airspeed of approximately 60 kph. One observer was used for portions of the Snake and Merritt Reservoirs, while two observers were used for the portions along the North Loup, Middle Loup and North Platte Rivers, and for Blue and Birdwood Creeks. Numbers of trumpeter swans and other waterfowl were estimated by ocular estimation. Swans were classified as cygnets if they contained gray plumage; adults and subadults were grouped as 'white birds'. Counts were not adjusted for birds present but not seen by aerial observers. Ground counts from vehicles or on foot also were conducted if not covered by the aerial portion. Where counts were made from both aerial and ground surveys, aerial counts were used as the official count, but were coordinated with and corroborated with ground counts when possible. Rivers were partitioned into identifiable segments (e.g., reaches

between bridges) to facilitate counting and recording of swans. The primary wintering areas were surveyed and conducted in a relatively short period of time to minimize biases in counts due to localized movements of birds.

### **Habitat Conditions Prior to Survey**

Temperatures were normal for most of October and above normal for early and mid-November. A major cold front occurred the week following Thanksgiving, and in early December extreme cold with some snow occurred, freezing most water areas. Areas of Nebraska received cold temperatures coupled with ice and snow in mid and late December. These ice and snow events probably concentrated birds. However, beginning in late December, temperature moderated and frozen water areas began to thaw, creating open water areas.

Precipitation was average or slightly below average for the fall and drought plagued most of Nebraska, although the drought conditions had moderated compared to previous years. Stream flows in creeks and rivers were slightly better than in 2003-2005. Water levels in the Sandhill lakes and other in reservoirs and lakes and watershed ponds increased slightly from previous years. Locally heavy rainfalls in some of these areas during summer greatly increased water levels.

The first swans began to arriving at Lacreek NWR in late September. The number of swans on the refuge increased through early December, when a record high of 364 trumpeter swans were counted on Pool 7 on the refuge on 10 December. This count exceeded previous numbers of trumpeter swans previously observed on the refuge at any one time. Nearly all of the swans were found on Pool 7, where a large amount of arrowhead (*Sagittaria* spp.) had grown during the summer. Water management in the developed wetland units will continue to emphasize arrowhead and other preferred submerged aquatic plant species preferred by waterfowl, and the units will be flooded to preferred foraging depths from October through March on approximately 25% of the units in during fall 2007.

### **Survey Conditions**

Survey conditions were considered good for the winter survey, with abundant open water areas in lakes and rivers. Swans were not as concentrated on remaining open water areas as in previous years. Mild temperatures and open water on Sandhill lakes probably dispersed swans

more and may have lead to a less accurate count. The primary wintering areas were surveyed and conducted in a relatively short period of time (3 days).

During the survey period, temperatures remained well above freezing. During the week of the survey, there was abundant open water at Lacreek NWR and most Sandhill lakes. Weather conditions during the survey included winds at 20-40 kph and daily high temperatures ranging from about 1 to 10 °C and daily lows of -11 to 1°C, with the colder temperatures occurring later in the week. Skies were mostly cloud-free with no precipitation.

## **Results**

We counted 538 trumpeter swans in the High Plains flock during the 2006 winter survey (Table 1) compared to 454 in 2005 (Table 4). In 2006, most of the swans were observed on the Snake and North Loup rivers and Birdwood Creek (Table 1). The Middle Loup River and Blue Creek also held significant numbers of swans during winter 2006 (Table 1), while a private lake south of Merriman held significant numbers of swans (Table 1). The 2006 winter count was a 19% increase in number from 2005 and represents the highest winter count recorded (Appendix A). There was about a 30% difference in the numbers of trumpeter swans counted between the fall 2006 and winter 2006 surveys (Appendix B; Comeau and Vrtiska 2006). In addition to High Plains trumpeter swans, 4 other swans were observed in 2006 during the MWS on the Loup River (Table 2). Given their more southeasterly occurrence, it is likely that these birds are from restoration efforts in other states (e.g., Iowa). However, their origin was not investigated or confirmed.

The number of white trumpeter swans observed during winter surveys continues to increase, similar to the trend for fall counts (Fig. 2). However, trends in cygnets counted in fall and winter surveys show little increase (Fig. 2). Nonetheless, counts of cygnets from both surveys appear to track each other closely, exhibiting similar peaks and valleys of abundance (Fig. 2). However, the ratio of cygnets to white birds in winter counts indicates a steady decline since 1976 (Fig. 3).

## **Discussion**

Although drought has occurred in most of the main U.S. nesting areas for trumpeter swans during the past several years, the High Plains trumpeter swan flock appears not to have been negatively impacted. Drought may not affect trumpeter swans nesting in the Sandhills to

Table 1. Areas surveyed and the number of trumpeter swans considered as part of the High Plains flock, observed during the 2006 winter trumpeter swan survey, Nebraska.

Area Surveyed	Number of Swans Observed		
	White birds	Cygnets	Total
North Loup River			
End of River to Purdum	76	11	87
Middle Loup River			
N. of Whitman to Mullen	2	1	3
Mullen to Seneca	14	2	16
Seneca to Halsey	6	0	6
Snake River	234	28	262
North Platte River			
Lake Ogallala – Keystone	7	4	11
Keystone – Paxton	2	1	3
Birdwood Creek	76	12	88
Blue Creek	17	2	19
Loup County	7	2	9
Cherry County – private lake	28	5	33
Lake Minatare	1	0	1
<b>Total</b>	<b>470</b>	<b>68</b>	<b>538</b>

Table 2. Location and numbers of other trumpeter swans observed during the 2006 Mid-Winter Survey that are not considered part of the High Plains flock.

Area Surveyed	Number of Swans Observed		
	White birds	Cygnets	Total
Loup River			
Monroe, NE to Columbus, NE	3	1	4
<b>Total</b>	<b>3</b>	<b>1</b>	<b>4</b>

the same degree as in other western areas of the U.S. (e.g., the tri-state area of Montana, Idaho, and Wyoming), because they inhabit large, more permanent lakes that are the last to dry up. Additionally, creeks and rivers that harbor most of the wintering High Plains flock are spring-fed and are less susceptible to drying up than river and creek systems dependent on runoff. Separate counts of adult swans and cygnets were not made in all areas during the 2006 winter survey, precluding direct comparison of the counts for each cohort from the survey this winter to those of last winter. However, it appears that counts of white birds in both fall and winter

surveys continue to increase, while the cygnet production rate (i.e., cygnets/white birds) appears to be steadily declining. The decline could be the result of the flock reaching the carrying capacity of the landscape, a reduction in the quality of habitats, an increased number of non-breeding pairs or subadults, or other factors. Continued monitoring of this flock and directed research is needed to better understand the ecology of these birds. Ensuring separate counts for adults and cygnets will assist in determining production in the future.

### **Acknowledgements**

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Appendix A. High Plains flock trumpeter swan Fall and Mid-Winter Survey results, 1960-2006.

Year <sup>a</sup>	Fall Survey			Winter Survey		
	White birds	Cygnets	Total	White birds	Cygnets	Total
1967/1968	30	21	51	b	b	57
1968/1969	b	b	76	b	b	57
1969/1970				b	b	85
1970/1971	c					
1971/1972						
1972/1973				b	b	112
1973/1974				102	36	138
1974/1975						
1975/1976				b	b	139
1976/1977				146	41	187
1977/1978				126	65	191
1978/1979				138	36	174
1979/1980				119	65	184
1980/1981	120	44	164	140	56	196
1981/1982	104	54	158	172	58	230
1982/1983				167	48	215
1983/1984				206	57	263
1984/1985	116	65	181	190	47	237
1985/1986	95	63	158	144	43	187
1986/1987	103	74	177	166	63	229
1987/1988	110	81	191	182	86	268
1988/1989				169	78	247
1989/1990	152	79	231	221	61	282
1990/1991	127	68	195	164	61	225
1991/1992	117	89	206	105	45	150
1992/1993	126	102	228	138	62	200
1993/1994	115	58	173	122	42	164
1994/1995	164	85	249	144	61	205
1995/1996	168	46	214	118	34	152
1996/1997	129	78	207	163	44	207
1997/1998	171	86	257	239	89	328
1998/1999	184	91	275	354	101	455
1999/2000	206	105	311	294	80	374
2000/2001	235	86	321	185	42	227
2001/2002	177	45	222	274	45	319
2002/2003	264	121	385	318	94	412
2003/2004	213	51	264	350	51	401
2004/2005	282	107	389	332	91	423
2005/2006	284	74	358	255 <sup>d</sup>	44 <sup>d</sup>	454
2006/2007	360	67	427	470	68	538

<sup>a</sup>Fall survey/Winter survey.

<sup>b</sup>Counts not divided into white birds and cygnets.

<sup>c</sup>Blanks denote survey was not conducted or counts were not available.

<sup>d</sup>Counts were not fully categorized as either adult or cygnets.

Appendix B. Differences in fall and winter counts of High Plains flock of trumpeter swans, 1980-2006.

Year <sup>a</sup>	Fall	Winter	Difference	
			<i>n</i>	%
1980	164	196	32	16
1981	158	230	72	31
1982	b	215		
1983		263		
1984	181	237	56	24
1985	158	187	29	16
1986	177	229	52	23
1987	191	268	77	29
1988		247		
1989	231	282	51	18
1990	195	225	30	13
1991	206	150	-56	37
1992	228	200	-28	14
1993	173	164	-9	5
1994	249	205	-44	21
1995	214	152	-62	41
1996	207	207	0	0
1997	257	328	71	22
1998	275	455	180	40
1999	311	374	63	17
2000	321	227	-94	41
2001	222	319	97	44
2002	385	412	27	7
2003	264	401	137	52
2004	389	423	34	9
2005	358	454	96	27
2006	427	538	111	21

<sup>a</sup>Winter counts were matched to nearest fall count (e.g., 2004 row is for the 2004 Fall Survey and the 2005 Mid-winter Survey).

<sup>b</sup>Blanks denote survey was not conducted or counts were not available.