

2015 COORDINATED SPRING SURVEY OF MID-CONTINENT SANDHILL CRANES



Prepared by:
Terry Liddick, USFWS-BMBS
26 September 2015



2015

COORDINATED SPRING SURVEY OF MID-CONTINENT SANDHILL CRANES

2015 TOTAL: 452,645

2015 AERIAL TRANSECT: 386,500

THREE-YEAR AVERAGE (2013-15): 623,800

SURVEY DATES: 23 – 25 March 2015

SURVEY PERSONNEL:

Aerial Survey

Observer/pilot: Terry Liddick, USFWS, DMBM, Phoenix, AZ
Observer: Jeff Drahota, USFWS, RB WMD, Kearney, NE
Photographer: Dave Fronczak, USFWS, DMBM, Fort Snelling, MN

Ground Surveys

(State Coordinators)

Kansas: Richard Schultheis, KDWPT, Great Bend, KS
Nebraska: Mark Vrtiska, NGPC, Lincoln, NE
North Dakota: Mike Szymanski, NDGFD, Bismarck, ND
Oklahoma: Jeff Neal, OKDWC, Arcadia, OK
South Dakota: Rocco Murano, SDGFP, Brookings, SD
Texas: Shaun Oldenburger, TPWD, San Marcos, TX

ABSTRACT: The aerial transect portion of the coordinated spring survey of mid-continent sandhill cranes was conducted on 25 March in Nebraska's Platte and North Platte River valleys. The 2015 photo-corrected aerial estimate is 386,500 birds. Outside the traditional aerial transect portion, observers utilized ground coverage during the period 23 – 26 March. From these regions, observers in the Official Survey Area (OSA) of Nebraska, Kansas, and Texas reported an additional 66,145 cranes. The 2015 total estimate (452,600) decreased 31% from 2014. The current three-year average (2013 - 2015), based on photo corrected estimates from aerial transects is 623,800.

METHODS: The annual target date for the coordinated survey is the 4th Tuesday of March and in 2015, the survey was accomplished on Wednesday, March 25th. The "traditional" aerial portion of the survey utilizes an ocular transect design with a sampling rate of approximately

twenty-five percent. Sub-sampling crane flocks using digital photography, allows determination of observer-specific estimation correction factors which are applied to estimates from the 54 aerial transects. Once again, Jeff Drahota, a Wildlife Biologist from Kearney, NE, performed duties as the front right seat observer and Dave Fronczak, a Wildlife Biologist from Bloomington, MN, performed duties as rear seat photographer in the USFWS aerial crew in 2015. Data collection outside the region of the aerial transects was directed and summarized by state coordinators. Using ground coverage, the state efforts focus in areas of traditional crane use/occurrence. Observations recorded outside the aerial transect region were not photo corrected. Survey coverage in 2015 was similar to 2014 and included changes adopted by the Central Management Unit Technical Committee (CMU) in 1985. Specific details regarding coverage, personnel, photography, habitat, and weather conditions are on file in the Spearfish, SD office of Flyway Biologist Terry Liddick.

RESULTS: On or prior to the survey target date, North Dakota reported 324 cranes and South Dakota's count was 8,723, down slightly from the 11,973 reported in 2014. Neither state had any significant snow cover remaining and most wetlands were thawed. The flight from Bismarck, ND to Kearney, NE to begin the survey revealed no snow cover and 100% of the observed wetlands were thawed, at least around the margins. Some coulees and the lea side of some banks had some residual snow drifts in North Dakota but no snow was observed from the South Dakota border southward. Texas observers reported 37,121 cranes, up significantly from the 7,534 birds reported last year. Kansas reported 4,479 cranes, about 1,500 less than the 5,996 birds observed in 2014. Considering the geographic locations of reported birds from state coordinators and the disparate numbers of cranes reported in those locations from 2014, we feel that the 2014 survey was appropriately timed, however, the migration appeared quite protracted in 2015.

The winter of 2015 was slightly warmer and significantly dryer than average. There was no snow cover in North Dakota nor South Dakota as well as no snow cover in any of the states from Nebraska southward. The 2015 total estimate of mid-continent sandhill cranes is 452,600, which includes 386,500 birds (85% of the total) from the traditional aerial transect portion and 66,145 cranes from other regions in the OSA (Table 1). This indicates a 31% decrease from the 2014 survey. However, the apparent decrease may be somewhat explained by comparing the significant differences in the number of cranes encountered in the State surveys between Texas and North Dakota. Furthermore, conditions on the survey day were marginal in 2015. Low overcast, poor light and several rain showers could have reduced visibility and detectability.

Flock estimation correction factors, which are applied to aerial estimates, were calculated from photographs of 105 unique flocks (54 Liddick, 51 Drahota). Observer effort in 2015 is presented by state in Table 4. The current three-year average (2013 – 2015), based on the photo-corrected Nebraska aerial portion of the survey, is 623,800 (Fig. 1) and exceeds the management range (349,000 – 472,000) outlined in the Management Guidelines for the Mid-Continent Population of Sandhill Cranes (revised March 2006).

Appreciation is expressed to all coordinators, observers, and participants who assisted in the 2015 survey. Two long time contributors, Dr. Douglas Johnson (USGS) for his statistical analysis and Mr. John Steiner (Jamestown, ND) for his photo processing and interpretation, continued their able assistance, patience, and support.

Terry S. Liddick
July 2015

References:

Benning, D. S. and D. H. Johnson. 1987. Recent improvements to sandhill crane surveys in Nebraska's Central Platte Valley. pp 10 – 16 in J. C. Lewis (ed.), Proc. 1985 Crane Workshop, Platte River Whooping Crane Habitat Maint. Trust, Grand Island, NE.

Central Flyway Council, Pacific Flyway Council, and Mississippi Flyway Council. 2006. Management Guidelines for the Mid-continent Population of Sandhill Cranes. Special Report in files of the Central Flyway Representative, Denver, Colorado.

Table 1. Distribution of Sandhill Cranes within the Mid-Centinent region during the coordinated spring survey, 1974-2015 (rounded to nearest 100).

Survey Dates	Nebraska Central Platte Valley ¹						Other										TOTAL	
	Ocular Cruise	% ²	Ocular Transect	% ³	Ocular transect w/photo correction	% ³	Other NE	KS	TX	OK	NM	CO	ND ⁵	SD ⁵	Ocular Cruise	Includes Other Nebraska, Kansas and Texas ⁶		
																Ocular Transect Uncorrected	Transect Photo Corrected	
3/24-31/74	162,600	92%	-	-	-	-	9,000	1,900	3,200	400	0	0	0	0	177,100	-	-	
3/25-30/75	223,600	98%	-	-	-	-	2,300	900	Tr	100	100	500	0	0	227,500	-	-	
3/22-26/76	147,500	97%	-	-	-	-	2,800	300	800	100	1,000	0	-	0	152,500	-	-	
3/13-23/77	173,400	79%	-	-	-	-	1,100	1,600	30,700	400	12,500	0	0	300	220,000	-	-	
3/20-24/78	149,800	94%	188,600	96%	-	-	2,200	700	4,900	0	2,300	0	-	0	159,900	196,400	-	
3/20-29/79	-	-	203,600	98%	-	-	2,600	1,100	0	1,500	0	500	0	0	-	207,300	-	
3/24-4/15/80	223,400	95%	254,400	96%	-	-	5,000	4,100	1,400	100	500	0	Tr	-	234,500	264,900	-	
3/22-28/81	-	-	248,900	86%	-	-	8,300	11,200	21,800	0	0	200	0	0	-	290,200	-	
3/22-27/82 ⁴	-	-	348,000	95%	417,300	95%	7,100	2,000	7,800	0	100	2,800	0	Tr	-	364,900	437,100	
3/25-26/83	-	-	306,300	96%	343,400	97%	4,100	200	7,000	200	Tr	0	0	0	-	317,600	354,900	
3/25-30/84	-	-	222,700	92%	261,800	93%	18,100	900	800	1,100	Tr	0	0	Tr	-	242,500	282,700	
3/25-26/85	-	-	378,100	96%	514,800	97%	11,500	3,000	1,200	-	-	-	-	-	-	393,800	530,500	
3/25-26/86	-	-	317,000	99%	353,000	99%	1,000	200	2,100	-	-	-	Tr	Tr	-	320,300	356,300	
3/24-26/87	-	-	383,600	100%	416,100	100%	0	Tr	400	-	-	-	0	0	-	384,000	416,500	
3/21-25/88	-	-	386,900	98%	463,500	98%	0	0	7,700	-	-	-	0	0	-	394,600	471,200	
3/28-29/89	-	-	391,400	100%	392,000	100%	100	1,000	800	-	-	-	0	200	-	393,300	393,900	
3/27-28/90	-	-	386,000	94%	412,200	94%	11,000	5,200	10,300	-	-	-	Tr	Tr	-	412,500	438,700	
3/25-26/91	-	-	297,800	100%	340,600	100%	100	800	200	-	-	-	0	200	-	298,900	341,700	
3/19-25/92	-	-	257,700	95%	406,500	97%	12,200	300	1,100	-	-	-	200	Tr	-	271,300	420,100	
3/23-24/93	-	-	253,800	79%	378,900	85%	16,800	37,700	13,500	-	-	-	0	-	-	321,800	446,900	
3/20-22/94	-	-	395,500	96%	477,200	97%	14,600	0	0	-	-	2,400	400	0	-	410,100	491,800	
3/28-30/95	-	-	273,400	90%	326,200	91%	30,400	0	0	-	-	6,700	200	0	-	303,800	356,600	
3/25-26/96	-	-	318,900	98%	520,000	99%	7,600	0	0	-	-	3,900	0	0	-	326,500	527,600	
3/20-26/97	-	-	350,900	96%	534,600	97%	16,200	100	0	-	-	-	Tr	Tr	-	367,200	550,900	
3/24-26/98	-	-	337,200	96%	530,800	97%	13,600	100	0	-	-	-	0	Tr	-	350,900	544,500	
3/22-25/99	-	-	219,800	68%	284,900	73%	3,500	100,000	0	-	-	-	0	500	-	323,300	388,400	
3/10-29/00	-	-	484,600	92%	490,100	92%	16,900	26,100	500	-	-	-	100	800	-	528,100	533,600	
3/25-27/01	-	-	387,300	87%	413,500	88%	10,500	42,300	3,500	-	-	-	0	Tr	-	443,600	469,800	
3/25-27/02	-	-	309,000	90%	315,000	90%	17,100	15,100	1,200	5,800	-	-	Tr	0	-	342,400	348,400	
3/22-27/03	-	-	300,900	90%	348,000	91%	24,800	4,100	3,800	-	-	-	Tr	400	-	333,600	380,700	
3/22-25/04	-	-	365,400	95%	426,500	95%	17,700	1,200	2,200	100	-	-	50	600	-	386,500	447,600	
3/5 - 25/05	-	-	412,300	91%	491,900	93%	27,100	2,900	8,700	2,600	-	-	Tr	500	-	451,000	530,600	
3/15-29/06	-	-	178,600	70%	216,800	74%	70,000	2,100	5,500	-	-	-	Tr	Tr	-	256,200	294,400	
3/12-27/07	-	-	307,100	91%	384,100	93%	20,400	3,600	5,900	-	-	-	2,000	8,700	-	337,000	414,000	
3/24-26/08	-	-	474,100	95%	545,900	96%	24,500	1,100	0	-	-	-	0	1,600	-	499,700	571,500	
3/21-26/09	-	-	457,400	92%	565,300	93%	29,900	Tr	10,800	-	-	-	100	4,800	-	498,100	606,000	
3/23-26/10	-	-	455,100	91%	691,500	94%	17,600	1,300	28,000	-	-	-	0	2,100	-	502,000	738,400	
3/20-24/11	-	-	347,500	90%	482,800	93%	18,800	3,500	14,300	4,700	-	-	0	100	-	384,100	519,400	
3/27-30/12	-	-	253,800	94%	339,600	95%	12,900	Tr	4,200	-	-	-	970	14,600	-	270,900	356,700	
3/25-27/13	-	-	745,900	97%	867,100	97%	16,080	279	9,740	1,800	-	-	0	400	-	771,999	893,199	
3/24-26/14	-	-	402,200	91%	617,900	94%	24,390	5,996	7,534	239	-	-	0	11,973	-	440,120	655,820	
3/23-25/15	-	-	326,000	83%	386,500	85%	24,545	4,479	37,121	2,195	-	-	324	8,723	-	392,145	452,645	

¹ Utilizing various survey techniques within Nebraska's Central Platte Valley.

² Percent of total M-C population index.

³ % of cranes counted in aerial transect portion of survey

⁴ Vertical photo transect conducted in 1982. Within MCPV, index was 490,100 and including Other 509,900.

⁵ Crane sightings for North and South Dakota from 1985 and later are noted for over flight monitoring purposes and are not included in totals.

⁶ OK, NM, CO were eliminated from the Official Survey Area in 1985 by the Central Flyway CMU; crane sightings are noted for informational purposes only.

Tr <50 cranes

Table 2. Results of ocular transect survey for Mid-Continent Sandhill Cranes in the central Platte Valley of Nebraska during the coordinated spring surveys.

<u>YEAR</u>	<u>Population Index</u>	<u>Standard Error</u>	
1978	188,582	± 23,948	(± 12.7%)
1979	203,574	± 24,968	(± 12.1%)
1980	254,417	± 51,738	(± 20.3%)
1981	248,882	± 31,957	(± 12.8%)
1982	347,996	± 33,353	(± 9.6%)
1983	306,316	± 21,257	(± 6.9%)
1984	222,710	± 17,466	(± 7.8%)
1985	378,127	± 34,230	(± 9.1%)
1986	317,025	± 32,461	(± 10.2%)
1987	383,581	± 53,508	(± 13.9%)
1988	386,853	± 35,775	(± 9.2%)
1989	391,353	± 44,066	(± 11.2%)
1990	385,950	± 40,585	(± 10.5%)
1991	297,831	± 27,551	(± 9.2%)
1992	257,709	± 24,551	(± 9.5%)
1993	253,799	± 29,896	(± 11.2%)
1994	395,543	± 40,430	(± 10.2%)
1995	273,376	± 30,316	(± 11.1%)
1996	318,514	± 36,182	(± 11.3%)
1997	350,932	± 58,925	(± 16.7%)
1998	337,203	± 39,505	(± 11.7%)
1999	219,794	± 32,164	(± 14.6%)
2000	484,585	± 57,598	(± 11.9%)
2001	387,336	± 47,679	(± 12.3%)
2002	309,029	± 34,399	(± 11.1%)
2003	300,918	± 32,869	(± 10.9%)
2004	365,370	± 31,001	(± 8.5%)
2005	412,285	± 32,482	(± 7.8%)
2006	178,564	± 13,156	(± 7.4%)
2007	307,094	± 27,245	(± 8.9%)
2008	474,051	± 52,201	(± 11.0%)
2009	457,436	± 39,355	(± 8.6%)
2010	455,104	± 44,324	(± 9.7%)
2011	347,501	± 26,841	(± 7.7%)
2012	253,783	± 18,261	(± 7.2%)
2013	745,854	± 77,801	(± 10.4%)
2014	402,228	± 33,616	(± 8.4%)
2015	326,053	± 30,691	(± 8.5%)

Table 3. Results of ocular transect survey with photo correction fo for Mid-Continent Sandhill Cranes in the central Platte Valley of Nebraska during the coordinanted spring surveys.

<u>YEAR</u>	<u>Population Index</u>	<u>Standard Error</u>	
1982	417,263	± 42,331	(± 10.1%)
1983	343,378	± 31,674	(± 9.2%)
1984	261,802	± 24,198	(± 9.2%)
1985	514,763	± 49,650	(± 9.6%)
1986	353,040	± 37,340	(± 10.6%)
1987	416,058	± 65,588	(± 15.7%)
1988	463,457	± 53,213	(± 11.4%)
1989	391,995	± 51,349	(± 13.0%)
1990	412,154	± 50,496	(± 12.2%)
1991	340,645	± 33,897	(± 10.0%)
1992	406,457	± 50,644	(± 12.4%)
1993	378,883	± 50,454	(± 13.3%)
1994	477,215	± 50,910	(± 10.7%)
1995	326,181	± 35,256	(± 10.8%)
1996	519,984	± 62,582	(± 12.0%)
1997	534,630	± 86,889	(± 16.2%)
1998	530,848	± 79,164	(± 14.9%)
1999	284,858	± 35,599	(± 12.5%)
2000	490,118	± 71,754	(± 14.6%)
2001	413,498	± 64,221	(± 15.5%)
2002	315,044	± 42,218	(± 13.4%)
2003	348,023	± 41,263	(± 11.9%)
2004	426,534	± 43,337	(± 10.2%)
2005	491,915	± 47,392	(± 9.6%)
2006	216,810	± 18,054	(± 8.3%)
2007	384,118	± 39,637	(± 10.3%)
2008	545,884	± 76,107	(± 13.9%)
2009	565,257	± 50,923	(± 9.0%)
2010	691,534	± 85,236	(± 12.3%)
2011	482,797	± 44,851	(± 9.2%)
2012	339,642	± 31,609	(± 9.7%)
2013	867,061	± 126,196	(± 14.5%)
2014	617,903	± 60,551	(± 9.8%)
2015	386,471	± 49,504	(± 12.8%)

Table 4. Coordinated spring Mid-Continent Sandhill Crane survey effort by state - 2015.

<u>State</u>	<u>Date</u>	<u>Coverage Means</u>		<u>Effort</u> (Miles) Air/Gnd.	<u>Observer Affiliation</u>		
		Aircraft	Ground		Federal	State	Volunteer
ND*	22-29 March-15	-	13	0 /1119	11	3	1
SD*	18-24-March-15	-	2	- / ?	unk	unk	unk
NE	25-March-15	1	1	700/0	0	4	0
KS	24-March-15	-	13	0 / 450	3	9	1
TX	24-March-15	-	14	0 /968	1	8	5
OK	25-Mar-15	0	13	0/480	2	11	0
Total		1	56	700/2412	17	35	7

* Monitors for over flights on or prior to scheduled survey date.

Figure 1. Annual and three-year average photo-corrected ocular transect spring population indices and population objective thresholds for Mid-Continent sandhill cranes.

