

Circulate
& file

COORDINATED SPRING SURVEY OF MID-CONTINENT SANDHILL CRANES

CW

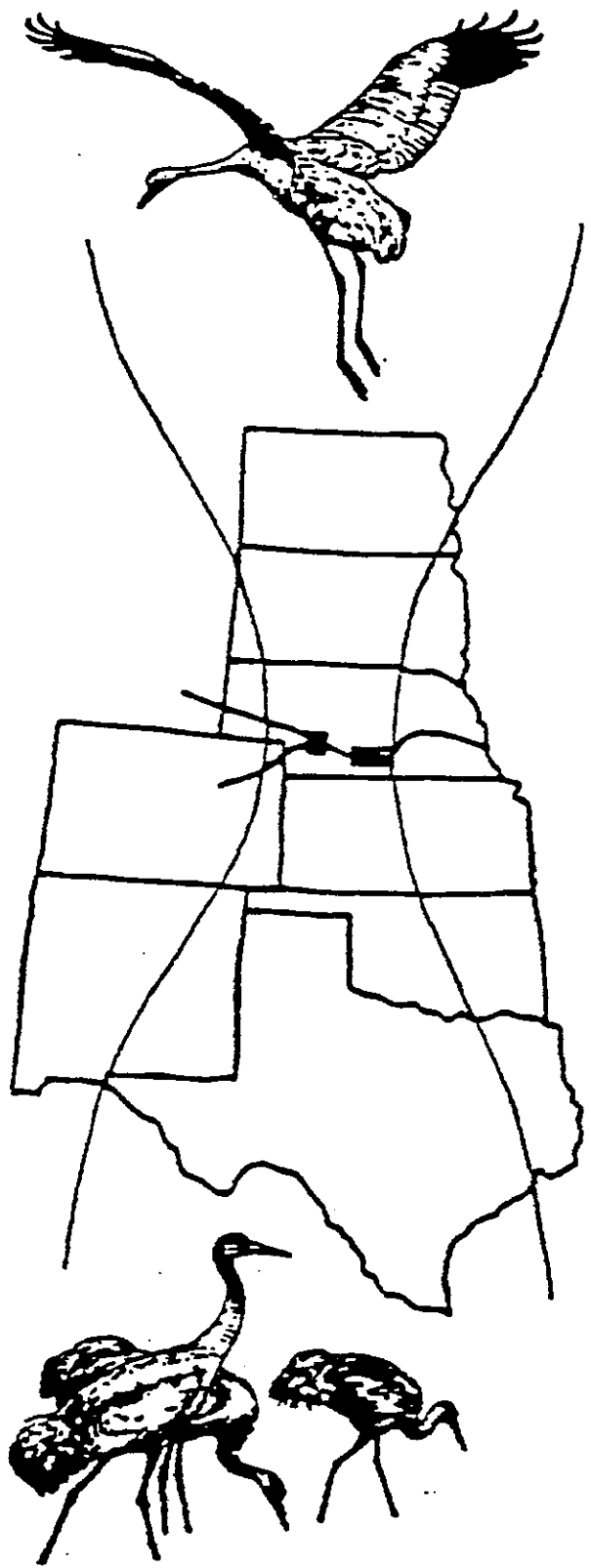
RSH

VP

HP

CD

1997



1997

COORDINATED SPRING MID-CONTINENT SANDHILL CRANE SURVEY

SURVEY DATES: 20 - 26 March 1997

SURVEY PERSONNEL:

Aerial Survey

Observer/pilot: John Solberg, USFWS, MBMO, Klamath Falls, OR
Observer: Michael Oliver, USFWS, R-3 Refuges & Wildlife,
Twin Cities, MN
Photographer: James Wortham, USFWS, MBMO, Laurel, MD

Ground Surveys

(Areas and Coordinators)

North Dakota: Stan Kohn (NDGFD) & John Cornely (USFWS)
South Dakota: Spencer Vaa (SDGFP) & John Cornely (USFWS)
Nebraska: Joe Gabig (NGPC) & John Cornely (USFWS)
Kansas: Marvin Kraft (KDWP) & John Cornely (USFWS)
Texas: Jay Roberson (TPWD) & Jeff Haskins (USFWS)

ABSTRACT: The aerial 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. Ground surveys were completed during the period of 20 - 26 March. The aerial portion of the survey provided an estimated 534,600 birds (photo corrected). Outside aerial coverage boundaries, ground observers in the Official Survey Area (OSA) of: Nebraska, Kansas, and Texas recorded an additional 16,300 cranes for a total index of 550,900 birds. The 1997 figure represents the highest index of record for all years and all survey methods. The current three-year average (1995 - 1997) of photo corrected aerial counts from Nebraska's Platte River Valley is 460,300.

METHODS: Methods used during the 1997 coordinated survey were similar to those used in 1996 and include coverage changes adopted by the Central Flyway-Central Management Unit (CMU) in 1985. Ground portions of the survey were conducted by various field personnel and coordinated by state and federal individuals (Table 5). Observations were forwarded to the Flyway Biologist (Klamath Falls, OR) for inclusion in the final report.

The aerial portion of the survey was completed by USFWS personnel who continued to utilize an ocular, line transect sampling scheme. Coverage is divided into ten strata sampled at a rate of approximately twenty-five percent. For the sixteenth consecutive year the survey employed sub-sampling of crane flocks using 35mm

oblique photography. The photos are used to quantify flock estimate errors and provide observer specific correction factors. Correction factors are applied to the aerial portion of the coordinated effort which has provided the major component (85-100%) of the mid-continent sandhill crane index in past years.

No procedural changes occurred in the survey since 1996. Following a 3 year hiatus, Solberg returned to participate for his seventh year of assistance with the survey. Although this was Mike Oliver's first year of participation in the mid-continent crane survey, he arrived highly experienced in aerial surveys of birds. Jim Wortham, a Flyway Biologist from Laurel, MD, acted as survey photographer for his second year. Flock estimation correction factors were calculated from 105 flocks (Solberg-53 & Oliver-52). The useable flock photos required the exposure and interpretation of 275 frames.

WEATHER AND HABITAT: Weather during the fall (September - November) of 1997 in Nebraska was generally cooler and wetter than normal. Areas in the Platte River Valley ended the period with 150% of normal precipitation. Precipitation in December and January was below normal with temperatures running normal to slightly below. February precipitation was near normal but temperatures were 1 to 3 degrees above normal. Conditions during the survey period in Nebraska were spring-like with clear to scattered skies. Temperatures reached the low sixties with winds from the north west at 15 to 20 mph. Water flows in the Platte (ice-free) were judged "normal" by most ground observers despite numerous comments on field forms suggesting a dry spring. The Rainwater Basins contained "reasonable" amounts of water, probably carried over from fall precipitation. The ground was void of snow and essentially no "green-up" had begun in pastures or wet meadow areas. Farming activities on the 25th were minimal and limited to discing and the application of anhydrous.

Weather conditions for ground observers in Texas were reported as improved since 1996. Scattered cloud cover was present with temperatures in the low 40's and winds from the north at 15 to 25 mph. Although the winter weather was reported as mild and the area received more precipitation than last year, wetland basins were only 50% full. Those basins containing water (estimated 40%) were ice free.

Kansas survey weather provided clear skies and temperatures in the fifties with north winds at 15 mph. No snow or ice cover was present and field reports indicated that one hundred percent of the wetland basins contained water.

Observers in South Dakota experienced "winter" conditions north of I-90 and more spring-like conditions south of the interstate. Under broken skies temperatures ranged in the 30's and 40's with northwesterly winds of 25 mph. Field observers reported excellent habitat conditions with 100% of basins and water courses containing water. Generally, water areas remained frozen north of I-90 and

"open" south of the road. Much of the state, particularly the northern half, was still blanketed by heavy snow. The prognosis for the spring melt is for excellent conditions with copious amounts of water. Extensive flooding is expected.

Weather in North Dakota was relatively mild at the time of survey. The southwest portion of the state was essentially snow free whereas the remainder of the state varied from 50% to complete snow cover. Water conditions were deemed excellent although little open water was present. Temperatures reached the 40's under variable skies with winds west to north at 10 to 25.

RESULTS: The 1997 estimate of mid-continent sandhill cranes is 550,900 (Table 1). Included are 534,600 (photo-corrected) birds from aerial counts and an additional 16,300 located outside the aerial coverage area. The 1997 index increased four percent compared to 1996 and is the highest of record. The current three-year average (1995-97) using the photo-corrected Nebraska aerial portion is 460,300. The three-year average approaches the upper limit of the management range (343,00 - 465,000) outlined in the Central Migratory Shore and Upland Game Bird Technical Committee's "Management Guidelines for Mid-Continent Sandhill Cranes", revised March 1993 (Table 4). Tables 2 and 3 present indices and standard errors for aerial counts in all years of ocular transect survey design. Table 2 reflects the initiation of photo correction in 1982.

DISCUSSION: The movement of sandhill cranes into Nebraska appeared to be near normal, beginning in mid-February. Field reports of significant crane arrival into the Platte River valley were common in early March, with sandhill crane populations continuing to build throughout the month. Pre-survey flights were conducted on 24 March from south of Kearney east to Grand Island. No cranes were observed in what could be considered migrational activity.

On the survey date, weather conditions were favorable in that they did little to promote migrational or soaring activities. Strong winds, generally from the north, blew throughout the survey area. Ambient temperatures in the aerial coverage unit peaked only in the low 60's and contributed little to thermal activity. Few soaring birds were noted from the aircraft and birds observed in flight seemed to be engaged in normal roost departures or heading to feed. Based on field observations south of Nebraska and statements of "no overflight," coupled with winter conditions to the north, we feel that the survey timing was good.

Although comfortable with the survey timing in 1997, anomalies somewhat similar to those experienced in 1996 occurred again this year. These anomalies might lead to a superficially high population index. Crane distributions were noticeably uneven. For example, crane observations from the aircraft fell 62% on the left side and only 38% on the right. Furthermore, some of the flock sizes were the largest I remember in my tenure. Typically, estimation errors increase with larger flocks. One flock in the

west (North Platte to Sutherland) was estimated by the left observer to be over 14,000 birds. On that particular transect, the left seat estimated over 15,000 birds while the right seat recorded less than 1,000. This is an extreme, but real example of differences in distribution and density.

Along with his statistical analysis, Dr. Johnson stated "This year's estimate is large both because of the high count of birds actually recorded by the pilot and the large visibility correction for the observer." It should be noted that along with the highest population index of record comes the highest standard error (Table 3). Survey conditions and estimate reliability can and does vary with any number of factors; hence, the use of the three-year average to moderate any aberrations which may occur. A historical summary of the logic behind using the three-year average in the management of this population is discussed in the 1995 report.

Of those areas outside the aerial survey unit but still within the OSA, 16,300 cranes were reported. The majority of these birds (15,480) were observed in the Lake Mc Conaughy - Lewellen, Nebraska area. Another 730 birds were reported in eastern areas, adjacent to the aerial unit. Kansas observers contributed only 87 birds to the index and it was their opinion that the crane migration was complete by 25 March. Texas reported no crane sightings on the survey date. The observations recorded outside the aerial coverage area represent three percent of the total index.

Survey effort in terms of field personnel increased forty-three percent from 1996 (1996-30; 1997-43). Miles covered by land vehicles also increased from about 1700 miles (18 vehicles) in 1996 to 1960+ miles (26 vehicles) in 1997 (Table 5).

ACKNOWLEDGMENTS: Appreciation is expressed to all coordinators, observers and other participants who assisted in the 1997 survey. Dr. Doug Johnson of Northern Prairie Wildlife Research Center continues to provide statistical analysis of survey results. Mr. John Steiner, a professional photographer from Jamestown, North Dakota, again provided his support in terms of aerial photograph interpretation. These two men may very well have the longest association with the survey of any past participants.

Submitted by: John W. Solberg
January 1998

Table 1. Distribution of sandhill cranes within the mid-continent region during the coordinated spring survey, 1974-87 (rounded to nearest 100).

DATE	MDS	SDs	NEBRASKA						KS	IX TOTAL (OSA)	OKs	NMA	GAs	TOTAL					
			Central Platte Valley			Ogallala								of all sources (excluding NO & SD)					
			Ocular sculua	Ocular females	Ocular imm. w/photos	Ocular females	Ocular imm. w/photos	Vertical photo females						Ocular sculua	Ocular females uncorrected	Ocular females corrected	Ocular females	Ocular females	Vertical photo females
3/24-3/74	0	0	182,800(82%) ¹	-	-	-	9,000	1,900	-	400	0	0	177,100	-	-	-	-	-	-
3/25-3/76	0	0	223,800(98%)	-	-	-	2,300	900	-	100	100	600	227,600	-	-	-	-	-	-
3/22-2/78	- ²	0	147,600(97%)	-	-	-	2,800	300	-	100	1,000	0	152,600	-	-	-	-	-	-
3/13-2/77	0	300	173,400(79%)	-	-	-	1,100	1,600	30,700	400	12,500	0	220,000	-	-	-	-	-	-
3/20-2/78	0	0	149,800(94%)	188,600(95%)	-	-	2,200	700	4,800	0	2,300	0	159,900	198,700	-	-	-	-	-
3/20-2/78	0	0	-	203,600(87%)	-	-	2,800	1,100	0	1,500	0	500	208,300	208,300	-	-	-	-	-
3/24-4/15/80	Tr ³	-	223,400(95%)	254,400(98%)	-	-	5,000	4,100	1,400	0	600	0	234,500	265,900	-	-	-	-	-
3/22-2/81	0	0	-	248,900(86%)	-	-	8,300	11,200	21,800	0	0	200	-	290,400	290,400	-	-	-	-
3/22-2/82	0	Tr	-	348,000(95%)	417,300(95%)	-	4,100	200	7,000	0	100	2,800	-	387,800	387,800	437,100	-	-	609,900
3/25-2/83	0	0	-	308,300(98%)	343,400(97%)	-	18,100	900	800	200	Tr	0	-	317,600	317,600	282,700	-	-	-
3/25-3/84	0	Tr	-	222,700(91%)	261,800(93%)	-	11,500	3,000	1,200	1,100	Tr	0	-	363,800	363,800	530,600	-	-	-
3/25-2/85	-	Tr	-	378,100(98%)	514,800(97%)	-	1,000	200	2,100	-	-	-	-	320,300	320,300	358,300	-	-	-
3/25-2/86	Tr	Tr	-	317,000(99%)	353,000(99%)	-	0	Tr	400	-	-	-	-	384,000	384,000	418,500	-	-	-
3/24-2/87	0	0	-	383,600(100%)	416,100(100%)	-	0	0	7,700	-	-	-	-	364,600	364,600	471,200	-	-	-
3/21-2/88	0	0	-	388,800(98%)	483,500(98%)	-	100	1,000	800	-	-	-	-	393,300	393,300	393,900	-	-	-
3/28-2/88	0	200	-	391,400(100%)	392,000(100%)	-	11,000	5,200	10,300	-	-	-	-	412,600	412,600	438,700	-	-	-
3/27-2/90	Tr	Tr	-	297,800(100%)	340,600(100%)	-	100	800	200	-	-	-	-	298,900	298,900	341,700	-	-	-
3/18-2/91	0	200	-	287,700(95%)	408,600(97%)	-	12,200	300	1,100	-	-	-	-	298,900	298,900	420,100	-	-	-
3/23-2/93	0	100	-	253,800(79%)	378,900(85%)	-	16,800	37,700	13,500	0	2,400	0	-	321,900	321,900	449,900	-	-	-
3/20-2/94	400	0	-	385,500(98%)	477,200(98%)	-	14,600	0	0	0	0	6,700	-	410,500	410,500	494,200	-	-	-
3/18-3/96	200	0	-	273,400(88%)	328,200(90%)	-	30,400	0	0	0	0	3,900	-	310,500	310,500	363,300	-	-	-
3/25-2/96	0	0	-	318,900(98%)	620,000(98%)	-	7,800	0	0	0	0	0	-	330,400	330,400	631,500	-	-	-
3/20-2/97	Tr	Tr	-	350,900(98%)	534,600(97%)	-	16,200	100	0	0	0	0	-	347,200	347,200	650,900	-	-	-

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

² No survey.

³ Less than 50.

⁴ Percent of total M-G population index.

⁵ Grass sightings for North and South Dakota (from 1985 and later are noted for overflight 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 CMAJ; crane sightings are noted for informational purposes only.

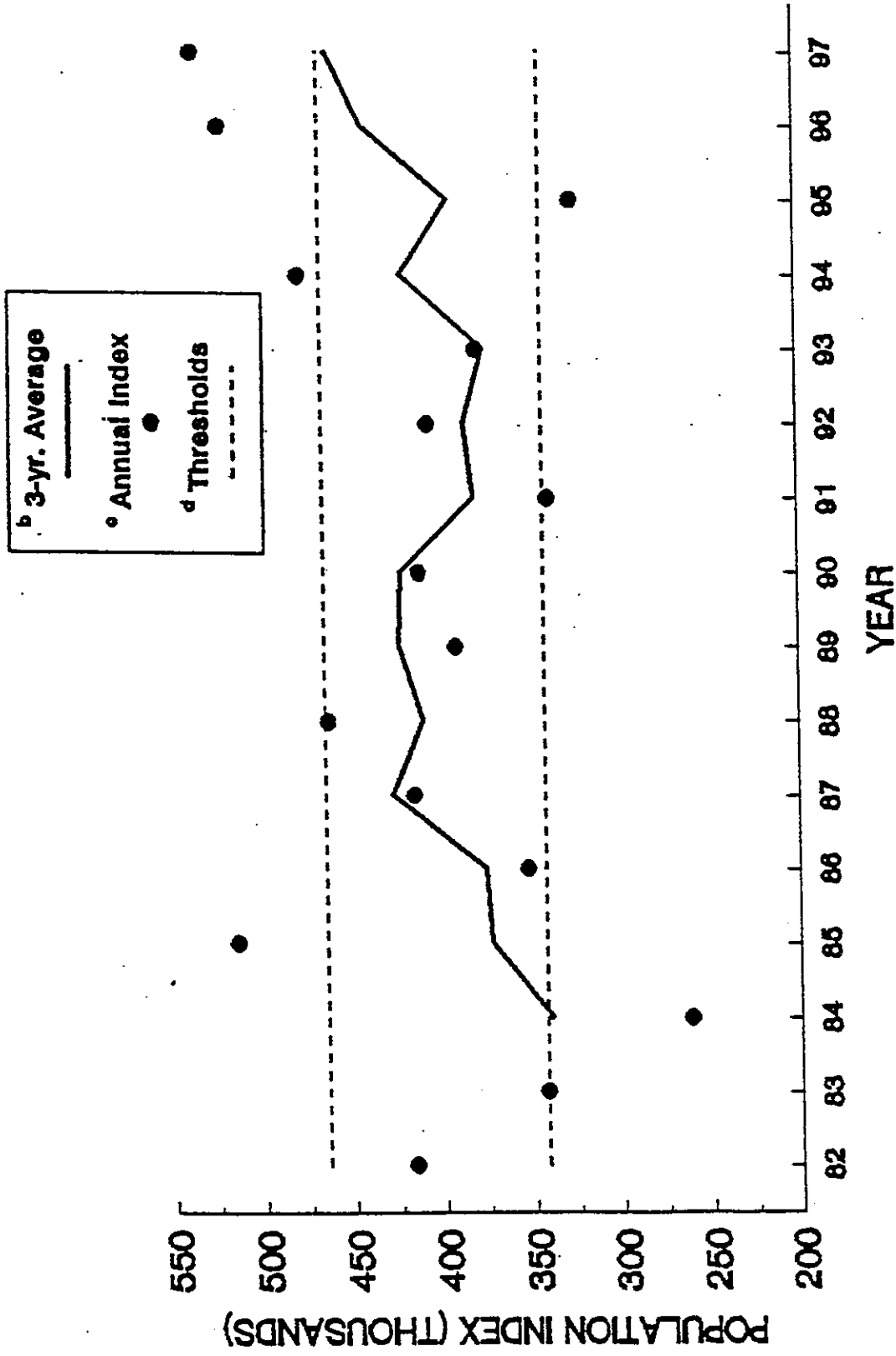
Table 2. Results of ocular transect survey for Mid-Continent Sandhill Cranes in the central Platte Valley of Nebraska during the coordinated spring surveys.

<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%)

Table 3. Results of ocular transect survey with photo correction 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>
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%)

Table 4. Photo-corrected spring indices of Mid-Continent Sandhill Cranes (Nebraska aerial portion only)^a.



^a From: "Management Guidelines for Mid-Continent Sandhill Cranes" revised March 1993.

^b Calculated using photo-corrected Nebraska aerial portion only.

^c Nebraska aerial portion only (photo corrected).

^d As defined in "Management Guidelines for Mid-Continent Sandhill Cranes" revised March 1993.

Table 5. Coordinated spring mid-continent sandhill crane survey participation by state - 1997.

Survey Dates	Aircraft	Ground Vehicles	Miles Covered		No. of observers		
			Air	Gnd.	Federal	State	Volunteer
ND*	20-26 March 1997	-	13	0/1120	10	7	1
SD*	25 March 1997	-	?	-/ ?	6	2	-
NE	24-26 March 1997	1	9	900/ 660	3	9	-
KS	25 March 1997	-	2	-/ 30	3	-	-
TX	25 March 1997	-	2	-/ 150	?	2	-
Total		1	26	900/1960	22	20	1

*Monitors for overflights on or prior to scheduled survey date.

Coordinated Spring Mid -Continent Sandhill Crane Survey

Distribution

Central Management Unit Technical Committee	10
Chief, Migratory Bird Management Office, Arlington, VA	1
Chief, Branch of Surveys and Assessment, MBMO, Arlington, VA	1
Central Flyway Representative, MBMO, Denver, CO	1
Chief, Section of Population and Habitat Assessment, MBMO, Laurel, MD	1
Chief, Waterfowl Harvest Surveys, MBMO, Laurel, MD	1
Chief, Waterfowl Population Surveys, MBMO, Portland, OR	1
Flyway Biologists, MBMO, Laurel, MD	5
Flyway Biologist, MBMO, Lafayette, LA	1
Flyway Biologists, MBMO, Denver, CO	2
Flyway Biologist, MBMO, Klamath Falls, OR	1
Project Leader, Waterfowl Investigations, USFWS, Juneau, AK	1
Region 6 - USFWS (Regional Director and Migratory Bird Coordinator)	2
Region 2 - USFWS (Regional Director and Migratory Bird Coordinator)	2
Region 7 - USFWS (Regional Director and Migratory Bird Coordinator)	2
Project Leader, Rainwater Basin WMD, Kearney, NE	1
Whooping Crane Coordinator, USFWS, Albuquerque, NM	1
Director, Northern Prairie Wildlife Research Center, Jamestown, ND	1
Doug Johnson, Northern Prairie Wildlife Research Center, Jamestown, ND	1
Gary Krapu, Northern Prairie Wildlife Research Center, Jamestown, ND	1
State Supervisor, FWE, USFWS, Grand Island, NE	1
Nick Lyman, Nebraska Game & Parks Commission, North Platte, NE	1
Director, Western and Northern Region, CWS, Edmonton, AB	1
Population Management Biologist, CWS, Saskatoon, SK	1
Jack Smith, CWS, Saskatoon, SK	1
Librarian, CWS, Saskatoon, SK	1
Provincial Waterfowl Biologist, Winnipeg, MB	1
Provincial Waterfowl Biologist, Saskatoon, SK	1
Provincial Waterfowl Biologist, Edmonton, AB	1
Gary Lingle, Platte River Trust, Grand Island, NE	1
Ken Strom, National Audubon Society, Gibbon, NE	1
John, Steiner, Jamestown, ND	1
Other State/Federal Representatives	4
Other State Personnel/Federal Refuges/Volunteer Observers	25