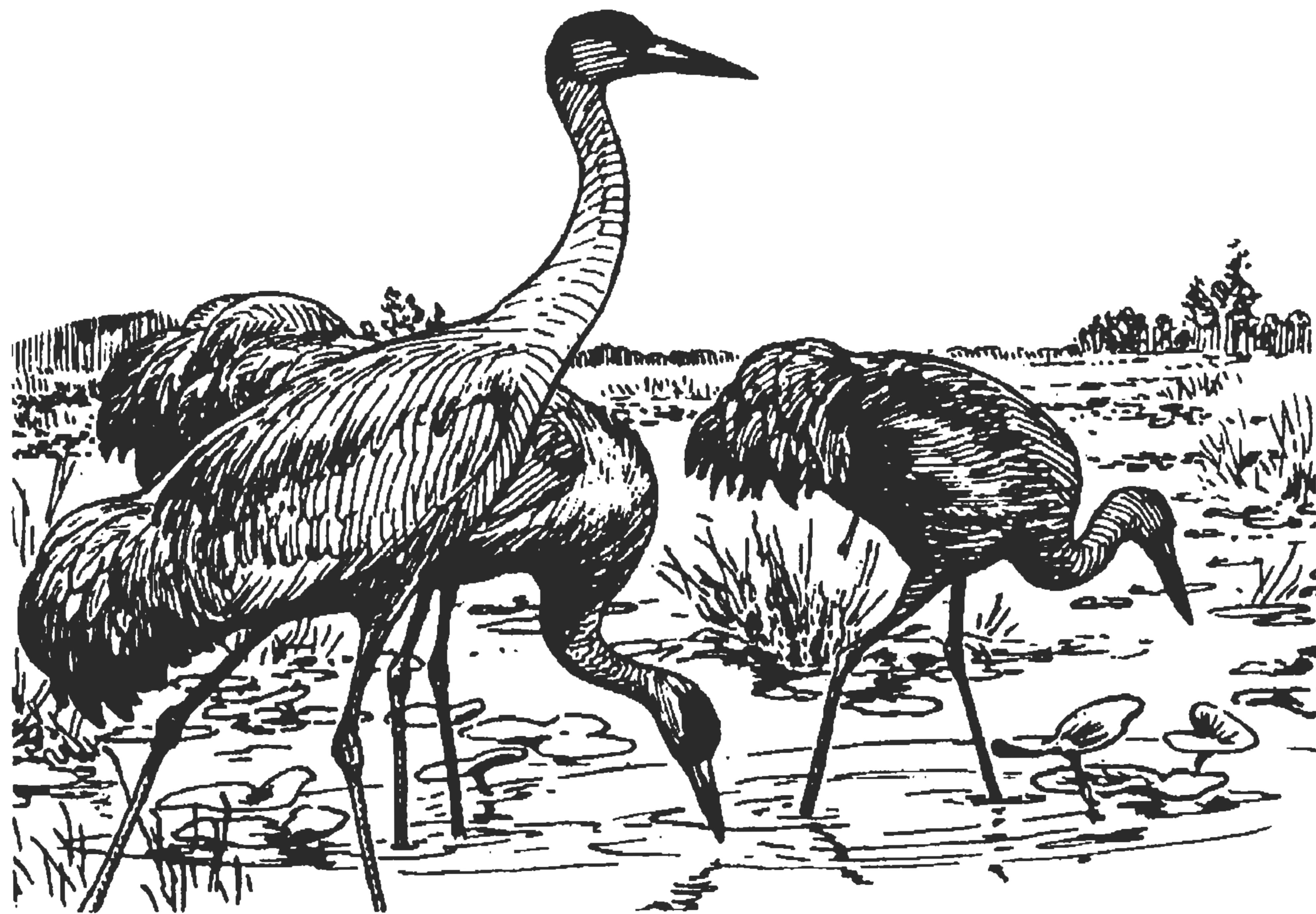


United States Fish and Wildlife Service  
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Administrative Report -- August 2004

## **SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN THE CENTRAL FLYWAY DURING THE 2003-2004 HUNTING SEASON\***

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**ABSTRACT:** A mail questionnaire survey was conducted in nine Central Flyway States to monitor the harvest of Sandhill Cranes (*Grus canadensis*) during the 2003-2004 hunting season. Permits were issued to 58,646 hunters and an estimated 8,315 individuals actively hunted Sandhill Cranes. Fifty-six percent of these active hunters were successful in bagging one or more cranes. They harvested an estimated 18,335 cranes with an additional 1,628 birds reported as downed but lost for a total kill estimate of 19,963, up 22% from that of the previous season.

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\*The primary purpose of this report is to facilitate the prompt distribution of timely information. It is intended for administrative use only and is not for publication without permission of the Director, United States Fish and Wildlife Service.



## INTRODUCTION

The 2003-04 hunting season was the 29th for which a Federal permit or similar registration has been required for hunting cranes during the regular Sandhill Crane season in the Central Flyway. After the season, almost 22% of the permit holders were contacted by questionnaire and asked to report their hunting activity and success. A follow-up questionnaire was mailed to nonrespondents. This report gives results of this questionnaire survey and summarizes long-term trends for selected estimates. Details of data collection and analysis procedures are given in Division of Migratory Bird Management Administrative Report "Sandhill Crane Harvest and Hunter Activity in the Central Flyway during the 1975-76 Hunting Season" (9 July 1976). Again this year in three states we also used a letter-type questionnaire more like that used in our Harvest Information Program surveys to compare with results of our regular card form as we work to get more uniformity among our surveys and prepare to change entirely to letter forms next season. These data have been incorporated into this report.

Several years ago first Texas and then Colorado changed their permit issuing systems. Many hunters in both states who never hunt cranes unknowingly became classed as crane hunters, a result of the way these systems were designed and used. Questionnaire response rates from such hunters have been found to be below those of hunters who plan to hunt cranes. Adjustment factors based on these differences have been calculated each year for each state and applied at the state level to the estimates for these states.

## RESULTS

A total of 58,646 "permits" was issued (6% more than in 2002), and about 14% of those obtaining permits hunted cranes (1% less than the previous year; Table 1). Crane hunting activity (days hunted) decreased 11% from 2002 levels while total success (cranes bagged) increased 22%. Overall, those permittees hunting one or more days (active hunters) averaged 2.99 days afield with an average seasonal bag of 2.21 cranes. Fifty-six percent of

about 8,315 active Sandhill Crane hunters were successful in bagging one or more cranes. The total estimated retrieved kill of Sandhill Cranes was 18,335 while unretrieved kill was 1,628 for a total of 19,963 birds killed, 22% more than last year. Additional comparisons with last year appear in Table 1. Tables 2A through 2I list the 2003-04 estimates for each county hunted as reported by respondents together with state totals. Generally, if a respondent hunted in more than one county, the hunting activity and harvest were assigned to the county with the most harvest or, if the harvest was equal, to the county in which the most hunting-days occurred. Note that most states show some out-of-state activity and harvest, figures duplicated in estimates for those other states. Table 3 compares data from the two questionnaires tested with the letter form appearing to produce somewhat higher estimates of activity and success. Selected figures are summarized by season since 1975 in Table 4.

## ACKNOWLEDGEMENTS

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Table 1. NUMBERS OF SANDHILL CRANE PERMITS ISSUED, ACTIVE AND SUCCESSFUL HUNTERS, AND CRANES BAGGED AND LOST DURING THE 2002-03 AND 2003-04 SEASONS.

		COLORADO		MONTANA		NORTH DAKOTA		SOUTH DAKOTA		WYOMING	
		KANSAS	NEW MEXICO	OKLAHOMA	TEXAS	COMBINED					
PERMITS ISSUED	2002-03	5,644 *	1,279	303	496	8,245	1,186	619	37,558 *	54	55,384
	2003-04	5,854 *	1,206	273	471	6,030	1,000	563	43,199 *	50	58,646
	% ch.	4%	-6%	-10%	-5%	-27%	-16%	-9%	15%	-7%	6%
ACTIVE HUNTERS	2002-03	208	517	85	166	2,764	237	144	4,222	15	8,358
	2003-04	236	495	60	244	2,271	64	114	4,821	10	8,315
	% ch.	13%	-4%	-29%	47%	-18%	-73%	-21%	14%	-33%	-1%
SUCCESSFUL HUNTERS	2002-03	71	339	11	104	938	129	63	2,278	10	3,943
	2003-04	79	304	21	158	1,218	39	59	2,783	4	4,665
	% ch.	11%	-10%	85%	52%	30%	-70%	-6%	22%	-60%	18%
DAYS HUNTED	2002-03	602	1,562	214	561	10,071	511	343	14,029	38	27,931
	2003-04	602	1,328	134	611	7,050	170	246	14,668	38	24,847
	% ch.	0%	-15%	-37%	9%	-30%	-67%	-28%	5%	0%	-11%
CRANES BAGGED	2002-03	275	1,067	23	342	2,975	490	160	9,654	22	15,008
	2003-04	230	942	49	617	4,564	200	166	11,560	7	18,335
	% ch.	-16%	-12%	113%	80%	53%	-59%	4%	20%	-68%	22%
CRANES LOST	2002-03	37	61	3	97	296	38	15	804	0	1,351
	2003-04	11	91	0	132	377	6	22	988	1	1,628
	% ch.	-70%	49%	-100%	36%	27%	-84%	47%	23%	++	21%

\* Colorado and Texas modified their permit issuing systems for identifying crane hunters these seasons, which greatly increased the numbers of hunters eligible to hunt cranes there. See discussion in text.

TABLE 2A. SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN COLORADO DURING THE 2003-04 HUNTING SEASON (combined survey results).

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS			EXPANDED ESTIMATES			ACTIVE HUNTER DISTRIBUTION				
		RESPOND -ING	EXPAND -ED	DAYS	CRANE BAG	CRANE LOSS	HUNTER -DAYS	BAG	LOSS	KILL	0	1-3	4-9	10+
# OF PERMITS	5,854	11	69	2.455	0.182	0.000	170	13	13	13	90.9	9.1	0.0	0.0
# CONTACTED	1,388	3	19	2.000	0.667	0.333	38	13	6	19	66.7	33.3	0.0	0.0
# RESPONDING	929	1	6	3.000	0.000	0.000	19	0	0	0	100.0	0.0	0.0	0.0
% RESPONDING	66.9	2	13	3.000	2.500	0.500	38	32	6	38	50.0	0.0	50.0	0.0
% ACTIVE	4.52	1	6	1.000	0.000	0.000	6	0	0	0	100.0	0.0	0.0	0.0
ADJ. % ACTIVE	4.03	2	13	3.500	1.000	0.000	44	13	13	13	50.0	50.0	0.0	0.0
	LINCOLN	1	6	3.000	0.000	0.000	19	0	0	0	100.0	0.0	0.0	0.0
	LOGAN	4	25	4.500	1.750	0.000	113	44	44	44	50.0	25.0	25.0	0.0
	MORGAN	4	25	2.000	1.500	0.000	50	38	38	38	50.0	25.0	25.0	0.0
	OTERO	2	13	1.000	1.000	0.000	13	13	13	13	50.0	50.0	0.0	0.0
	PHILLIPS	1	6	1.000	0.000	0.000	6	0	0	0	100.0	0.0	0.0	0.0
	PROWERS	3	19	1.333	1.333	0.000	25	25	25	25	66.7	33.3	0.0	0.0
	WELD	3	19	3.000	0.667	0.000	57	13	13	13	33.3	66.7	0.0	0.0
	YUMA	1	6	2.000	0.000	0.000	13	0	0	0	100.0	0.0	0.0	0.0
	OUT OF STATE	3	19	3.333	3.000	0.000	63	57	57	57	33.3	33.3	33.3	0.0
	UNADJUSTED STATE TOTALS	42	265	2.548	0.976	0.048	674	258	13	271	66.7	21.4	11.9	0.0
	ADJUSTED STATE TOTALS	42	236	2.548	0.976	0.048	602	230	11	241	66.7	21.4	11.9	0.0

TABLE 2B. SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN KANSAS DURING THE 2003-04 HUNTING SEASON.

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS			EXPANDED ESTIMATES			ACTIVE HUNTER DISTRIBUTION				
		RESPOND -ING	EXPAND -ED	DAYS	CRANE BAG	CRANE LOSS	HUNTER -DAYS	BAG	LOSS	KILL	0	1-3	4-9	10+
# OF PERMITS	1,206	8	24	3.500	0.875	0.375	84	21	9	30	50.0	50.0	0.0	0.0
# CONTACTED	583	5	15	3.000	2.400	0.800	45	36	12	48	40.0	40.0	20.0	0.0
# RESPONDING	397	58	176	2.431	1.241	0.052	428	219	9	228	46.6	51.7	1.7	0.0
% RESPONDING	68.1	1	3	1.000	1.000	0.000	3	3	3	3	0.0	100.0	0.0	0.0
% ACTIVE	41.1	1	3	3.000	0.000	0.000	9	0	0	0	100.0	0.0	0.0	0.0
	ELLSWORTH	1	3	3.000	0.000	0.000	9	0	0	0	100.0	0.0	0.0	0.0
	FORD	1	3	2.000	3.000	0.000	6	9	9	9	0.0	100.0	0.0	0.0
	HARPER	1	3	1.000	1.000	0.000	3	3	3	3	0.0	100.0	0.0	0.0
	KEARNY	1	3	1.000	1.000	0.000	3	3	3	3	0.0	100.0	0.0	0.0
	KIOWA	1	3	2.000	1.000	1.000	6	3	3	6	0.0	100.0	0.0	0.0
	MEADE	4	12	2.000	0.750	0.000	24	9	9	9	25.0	75.0	0.0	0.0
	MORTON	1	3	2.000	0.000	0.000	6	0	0	0	100.0	0.0	0.0	0.0
	OSBORNE	1	3	4.000	0.000	0.000	12	12	12	12	100.0	0.0	0.0	0.0
	PAWNEE	2	6	2.000	0.000	0.000	12	12	12	12	100.0	0.0	0.0	0.0
	PHILLIPS	2	6	2.000	1.000	0.500	12	6	3	9	0.0	100.0	0.0	0.0
	PRATT	1	3	1.000	2.000	0.000	3	6	6	6	0.0	100.0	0.0	0.0
	RENO	2	6	3.000	3.500	1.000	18	21	6	27	50.0	0.0	50.0	0.0
	RICE	3	9	1.000	0.667	0.000	9	6	6	6	66.7	33.3	0.0	0.0
	RUSSELL	1	3	2.000	0.000	0.000	6	0	0	0	100.0	0.0	0.0	0.0
	SEWARD	1	3	2.000	2.000	0.000	6	6	6	6	0.0	100.0	0.0	0.0
	STAFFORD	61	185	3.016	3.016	0.262	558	558	49	607	27.9	60.7	3.3	8.2
	OUT OF STATE	6	18	3.667	1.833	0.000	66	33	33	33	33.3	33.3	33.3	0.0
	STATE TOTALS	163	495	2.694	1.911	0.185	1,328	942	91	1,033	38.7	54.0	4.3	3.1



TABLE 2C. SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN MONTANA DURING THE 2003-04 HUNTING SEASON.

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS			EXPANDED ESTIMATES			ACTIVE HUNTER DISTRIBUTION				
		RESPOND -ING	EXPAND -ED	DAYS AFIELD	CRANE BAG	CRANE LOSS	HUNTER -DAYS	BAG	CRANE LOSS	0	1-3	4-9	10+	
# OF PERMITS	273	3	4	2.000	0.667	0.000	8	3	3	66.7	33.3	0.0	0.0	
# CONTACTED	253	1	1	4.000	0.000	0.000	5			100.0	0.0	0.0	0.0	
# RESPONDING	218	1	1	3.000	0.000	0.000	4			100.0	0.0	0.0	0.0	
% RESPONDING	86.2	1	1	3.000	0.000	0.000	4			100.0	0.0	0.0	0.0	
% ACTIVE	22.0	1	1	3.000	3.000	0.000	4	4	4	0.0	100.0	0.0	0.0	
		1	1	1.000	1.000	0.000	1	1	1	0.0	100.0	0.0	0.0	
		2	3	5.500	0.000	0.000	14			100.0	0.0	0.0	0.0	
		1	1	4.000	6.000	0.000	5	8	8	0.0	0.0	100.0	0.0	
		13	16	2.154	0.692	0.000	35	11	11	53.8	46.2	0.0	0.0	
		2	3	2.000	0.000	0.000	5			100.0	0.0	0.0	0.0	
		3	4	1.333	0.000	0.000	5			100.0	0.0	0.0	0.0	
		1	1	1.000	0.000	0.000	1			100.0	0.0	0.0	0.0	
		1	1	1.000	1.000	0.000	1	1	1	0.0	100.0	0.0	0.0	
		8	10	2.750	1.625	0.000	28	16	16	62.5	12.5	25.0	0.0	
		1	1	1.000	0.000	0.000	1			100.0	0.0	0.0	0.0	
		2	3	2.500	0.000	0.000	6			100.0	0.0	0.0	0.0	
		5	6	1.000	0.400	0.000	6	3	3	60.0	40.0	0.0	0.0	
		1	1	1.000	2.000	0.000	1	3	3	0.0	100.0	0.0	0.0	
		0	0	0.000	0.000	0.000				0.0	0.0	0.0	0.0	
STATE TOTALS		48	60	2.229	0.813	0.000	134	49	0	64.6	29.2	6.2	0.0	

TABLE 2D. SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN NEW MEXICO DURING THE 2003-04 HUNTING SEASON.

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS			EXPANDED ESTIMATES			ACTIVE HUNTER DISTRIBUTION				
		RESPOND -ING	EXPAND -ED	DAYS AFIELD	CRANE BAG	CRANE LOSS	HUNTER -DAYS	BAG	CRANE LOSS	0	1-3	4-9	10+	
# OF PERMITS	471	43	178	2.878	2.698	0.674	512	480	120	600	27.9	46.5	20.9	4.7
# CONTACTED	224	1	4	1.000	2.000	0.000	4	8		8	0.0	100.0	0.0	0.0
# RESPONDING	131	1	4	1.000	2.000	0.000	4	8		8	0.0	100.0	0.0	0.0
% RESPONDING	58.5	5	21	1.800	3.200	0.200	37	66	4	70	0.0	80.0	0.0	20.0
% ACTIVE	45.0	1	4	1.000	0.000	0.000	4			100.0	0.0	0.0	0.0	
		1	4	1.000	0.000	0.000	4			100.0	0.0	0.0	0.0	
		1	4	1.000	3.000	0.000	4	12		12	0.0	100.0	0.0	0.0
		1	4	2.000	0.000	0.000	8			100.0	0.0	0.0	0.0	
		1	4	2.000	2.000	0.000	8	8	8	0.0	100.0	0.0	0.0	
		1	4	2.000	1.000	2.000	8	4	8	0.0	100.0	0.0	0.0	
		3	12	1.333	2.333	0.000	17	29		29	0.0	100.0	0.0	
STATE TOTALS		59	244	2.504	2.525	0.542	611	617	132	749	25.4	54.2	15.3	5.1



TABLE 2E. SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN NORTH DAKOTA DURING THE 2003-04 HUNTING SEASON (combined survey results).

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS			EXPANDED ESTIMATES			ACTIVE HUNTER DISTRIBUTION				
		RESPOND -ING	EXPAND -ED	DAYS AFIELD	CRANE BAG	CRANE LOSS	HUNTER -DAYS	BAG	LOSS KILL	0	1-3	4-9	10+	
# OF PERMITS	6,030	95	524	4.137	1.789	0.242	2,166	937	127	1,064	62.1	29.5	2.1	6.3
# CONTACTED	1,499	1	6	2.000	0.000	0.000	11				100.0	0.0	0.0	0.0
# RESPONDING	1,094	15	83	2.200	2.133	0.067	182	176	6	182	33.3	60.0	0.0	6.7
% RESPONDING	73.0	11	61	3.000	4.364	0.374	182	265	23	287	27.3	63.6	0.0	9.1
% ACTIVE	37.7	1	6	1.000	0.000	0.000	6				100.0	0.0	0.0	0.0
		7	39	2.857	2.143	0.000	110	83		83	42.9	42.9	14.3	0.0
		15	83	2.667	2.733	0.000	220	226		226	26.7	60.0	6.7	6.7
		4	22	3.000	0.750	0.250	66	17	6	22	50.0	50.0	0.0	0.0
		4	22	3.000	2.250	0.000	66	50		50	50.0	25.0	25.0	0.0
		5	28	3.600	0.600	0.000	99	17		17	40.0	60.0	0.0	0.0
		3	17	1.000	0.000	0.000	17			100.0	0.0	0.0	0.0	0.0
		47	259	2.660	1.830	0.156	689	474	40	514	42.6	53.2	4.3	0.0
		6	33	2.833	0.667	0.000	94	22		22	83.3	16.7	0.0	0.0
		10	55	2.500	1.600	0.200	138	88	11	99	30.0	70.0	0.0	0.0
		4	22	4.000	0.000	0.000	88			100.0	0.0	0.0	0.0	0.0
		20	110	2.950	2.500	0.050	325	276	6	281	35.0	60.0	0.0	5.0
		1	6	1.000	1.000	0.000	6	6		6	0.0	100.0	0.0	0.0
		1	6	1.000	0.000	0.000	6			100.0	0.0	0.0	0.0	0.0
		19	105	2.316	2.684	0.158	243	281	17	298	21.1	68.4	5.3	5.3
		2	11	4.000	0.000	0.000	44			100.0	0.0	0.0	0.0	0.0
		16	88	2.625	2.313	0.125	231	204	11	215	50.0	31.3	18.8	0.0
		15	83	2.867	1.400	0.200	237	116	17	132	40.0	60.0	0.0	0.0
		1	6	4.000	10.000	1.000	22	55	6	61	0.0	0.0	0.0	100.0
		5	28	2.200	1.000	0.000	61	28		28	40.0	60.0	0.0	0.0
		33	182	3.121	3.121	0.303	568	568	55	623	42.4	48.5	0.0	9.1
		5	28	2.200	1.400	0.200	61	39	6	44	60.0	40.0	0.0	0.0
		19	105	3.000	1.368	0.000	314	143		143	57.9	36.8	5.3	0.0
		9	50	2.222	2.333	0.222	110	116	11	127	44.4	44.4	11.1	0.0
		15	83	3.600	1.333	0.067	299	110	6	116	53.3	40.0	6.7	0.0
		22	121	3.091	2.227	0.273	375	270	33	303	27.3	68.2	4.5	0.0
		1	6	3.000	0.000	0.000	17			100.0	0.0	0.0	0.0	0.0
		0	0	0.000	0.000	0.000	0			0.0	0.0	0.0	0.0	0.0
STATE TOTALS		412	2,271	3.104	2.419	0.339	7,050	4,564	377	4,941	47.1	45.6	3.6	3.6

TABLE 2F SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN WYOMING DURING THE 2003-04 HUNTING SEASON.

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS			EXPANDED ESTIMATES			ACTIVE HUNTER DISTRIBUTION				
		RESPOND -ING	EXPAND -ED	DAYS AFIELD	CRANE BAG	CRANE LOSS	HUNTER -DAYS	BAG	LOSS KILL	0	1-3	4-9	10+	
TOTAL PERMITS	50	1	1	3.000	0.000	0.000	3				100.0	0.0	0.0	0.0
# CONTACTED	48	4	5	4.500	1.000	0.250	23	5	1	6	50.0	50.0	0.0	0.0
# RESPONDING	40	1	1	3.000	0.000	0.000	3				100.0	0.0	0.0	0.0
% RESPONDING	83.3	2	3	3.000	0.500	0.000	9	2		2	50.0	50.0	0.0	0.0
% ACTIVE	20.0	0	0	0.000	0.000	0.000	38	7	1	8	0.0	0.0	0.0	0.0
STATE TOTALS		8	10	3.800	0.700	0.100	38	7	1	8	62.5	37.5	0.0	0.0

TABLE 2G. SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN OKLAHOMA DURING THE 2003-04 HUNTING SEASON.

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS		EXPANDED ESTIMATES		ACTIVE HUNTER DISTRIBUTION						
		RESPOND -ING	EXPAND -ED	DAYS AFIELD	CRANE BAG	CRANE LOSS	HUNTER -DAYS	BAG	LOSS	KILL	0	1-3	4-9	10+
# OF PERMITS	1,000	ALFALFA	2	6	1,500	1,500	0.000	9	9	9	0.0	100.0	0.0	0.0
# CONTACTED	628	COTTON	1	3	1,000	1,000	0.000	3	3	3	0.0	100.0	0.0	0.0
# RESPONDING	360	CUSTER	1	3	1,000	0.000	0.000	3	3	3	100.0	0.0	0.0	0.0
% RESPONDING	57.3	JACKSON	2	6	3,000	3,500	0.500	18	21	3	50.0	0.0	50.0	0.0
% ACTIVE	6.39	JEFFERSON	1	3	1,000	0.000	0.000	3	3	3	100.0	0.0	0.0	0.0
		KIOWA	2	6	3,500	10,500	0.000	21	63	63	0.0	50.0	0.0	50.0
		MAJOR	1	3	10,000	9,000	0.000	30	27	27	0.0	0.0	100.0	0.0
		ROGER MILLS	1	3	2,000	0.000	0.000	6	6	6	100.0	0.0	0.0	0.0
		TEXAS	1	3	2,000	0.000	0.000	6	6	6	100.0	0.0	0.0	0.0
		TILLMAN	2	6	2,000	1,500	0.000	12	9	9	50.0	50.0	0.0	0.0
		WASHITA	1	3	2,000	0.000	0.000	6	6	6	100.0	0.0	0.0	0.0
		WOODS	1	3	5,000	0.000	0.000	15	15	15	100.0	0.0	0.0	0.0
		OUT OF STATE	7	19	2,000	3,571	0.143	38	68	3	14.3	14.3	71.4	0.0
		STATE TOTALS	23	64	2,537	2,985	0.090	170	200	6	39.1	26.1	30.4	4.3

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TABLE 2H. SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN SOUTH DAKOTA DURING THE 2003-04 HUNTING SEASON.

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS		EXPANDED ESTIMATES		ACTIVE HUNTER DISTRIBUTION						
		RESPOND -ING	EXPAND -ED	DAYS AFIELD	CRANE BAG	CRANE LOSS	HUNTER -DAYS	BAG	LOSS	KILL	0	1-3	4-9	10+
# OF PERMITS	563	UNKNOWN	1	3	1,000	0.000	0.000	3	3	3	100.0	0.0	0.0	0.0
# CONTACTED	268	BENNETT	2	5	4,000	0.500	0.500	20	3	6	50.0	50.0	0.0	0.0
# RESPONDING	221	BUTTE	2	5	3,500	0.500	0.000	18	3	3	50.0	50.0	0.0	0.0
% RESPONDING	82.5	CAMPBELL	3	8	2,667	0.000	0.000	21	5	8	100.0	0.0	0.0	0.0
% ACTIVE	19.9	CHARLES MIX	3	8	3,333	0.667	0.333	27	5	3	66.7	33.3	0.0	0.0
		EDMUNDS	3	8	2,000	3,667	0.000	16	29	29	0.0	66.7	33.3	0.0
		FAULK	3	8	1,000	1,000	0.000	8	8	8	66.7	33.3	0.0	0.0
		HAND	2	5	2,000	1,000	0.000	10	5	5	50.0	50.0	0.0	0.0
		HUGHES	1	3	2,000	0.000	0.000	6	6	6	100.0	0.0	0.0	0.0
		MC PHERSON	6	15	3,000	3,167	0.167	45	48	3	66.7	0.0	16.7	16.7
		PENNINGTON	1	3	1,000	0.000	0.000	3	3	3	100.0	0.0	0.0	0.0
		POTTER	4	10	1,750	1,250	1.250	18	13	13	0.0	100.0	0.0	0.0
		SPINK	1	3	1,000	2,000	0.000	3	6	6	0.0	100.0	0.0	0.0
		SULLY	10	25	1,700	1,700	0.000	43	43	43	30.0	70.0	0.0	0.0
		WALWORTH	2	5	1,000	0.500	0.000	5	3	3	50.0	50.0	0.0	0.0
		OUT OF STATE	0	0	0.000	0.000	0.000	0	0	0	0.0	0.0	0.0	0.0
		STATE TOTALS	44	114	2,158	1,456	0.193	246	166	22	47.7	45.5	4.5	2.3



TABLE 21 SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN TEXAS THE 2003-04 HUNTING SEASON (COMBINED SURVEY RESULTS).

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS			EXPANDED ESTIMATES			ACTIVE HUNTER DISTRIBUTION				
		RESPOND -ING	EXPAND -ED	DAYS AFIELD	CRANE BAG	CRANE LOSS	HUNTER -DAYS	CRANE BAG	CRANE LOSS KILL	0	1-3	4-9	10+	
TOTAL PERMITS	43,199	125	1,286	3,640	1,864	0.191	4,682	2,398	247	2,645	50.4	43.2	1.6	4.8
# CONTACTED	7,815	6	62	2,667	1,833	0.333	165	114	21	135	16.7	83.3	0.0	0.0
# RESPONDING	4,200	3	31	1,000	0.000	0.000	31				100.0	0.0	0.0	0.0
% RESPONDING	53.7	5	51	1,800	2.400	0.250	92	122	13	135	0.0	100.0	0.0	0.0
% ACTIVE	11.9	2	21	2,500	0.000	0.000	53				100.0	0.0	0.0	0.0
ADJ. % ACTIVE	11.2	13	134	2,000	0.923	0.083	268	124	11	135	53.8	46.2	0.0	0.0
		2	21	2,500	1.000	0.000	53	21		21	50.0	50.0	0.0	0.0
		3	31	4,333	4.667	0.333	134	145	10	155	33.3	33.3	0.0	33.3
		4	41	4,250	4.000	2.250	174	164	92	256	25.0	50.0	25.0	0.0
		8	82	1,875	3.250	0.143	154	267	12	279	12.5	87.5	0.0	0.0
		2	21	2,000	0.000	0.000	42				100.0	0.0	0.0	0.0
		1	10	2,000	0.000	0.000	20				100.0	0.0	0.0	0.0
		1	10	2,000	3.000	0.000	20	30		30	0.0	100.0	0.0	0.0
		1	10	1,000	0.000	0.000	10				100.0	0.0	0.0	0.0
		23	237	2,435	0.739	0.045	577	175	11	186	56.5	43.5	0.0	0.0
		2	21	3,000	4.500	0.000	63	95		95	50.0	0.0	50.0	0.0
		2	21	2,000	0.500	0.000	42	11		11	50.0	50.0	0.0	0.0
		1	10	5,000	1.000	0.000	50	10		10	0.0	100.0	0.0	0.0
		1	10	2,000	0.000	0.000	20				100.0	0.0	0.0	0.0
		1	10	1,000	0.000	0.000	10				100.0	0.0	0.0	0.0
		3	31	2,333	4.667	0.000	72	145		145	0.0	66.7	33.3	0.0
		6	62	2,167	4.667	0.333	134	289	21	310	16.7	83.3	0.0	0.0
		3	31	2,000	2.000	0.000	62	62		62	33.3	66.7	0.0	0.0
		5	51	2,600	4.400	0.000	133	224		224	20.0	60.0	20.0	0.0
		1	10	2,000	0.000	0.000	20				100.0	0.0	0.0	0.0
		1	10	1,000	3.000	0.000	10	30		30	0.0	100.0	0.0	0.0
		1	10	1,000	1.000	0.000	10	10		10	0.0	100.0	0.0	0.0
		18	185	3,389	6.444	0.706	627	1,192	131	1,323	22.2	50.0	11.1	16.7
		8	82	1,875	0.750	0.000	154	62		62	50.0	50.0	0.0	0.0
		1	10	1,000	1.000	0.000	10	10		10	0.0	100.0	0.0	0.0
		2	21	2,000	1.500	1.000	42	32	21	53	0.0	100.0	0.0	0.0
		5	51	1,000	0.400	0.200	51	20	10	30	60.0	40.0	0.0	0.0
		1	10	2,000	3.000	0.000	20	30		30	0.0	100.0	0.0	0.0
		1	10	1,000	2.000	0.000	10	20		20	0.0	100.0	0.0	0.0
		2	21	1,500	2.500	0.000	32	53		53	50.0	50.0	0.0	0.0
		6	62	4,333	3.500	0.000	269	217		217	33.3	50.0	0.0	16.7
		5	51	1,800	0.400	0.000	92	20		20	60.0	40.0	0.0	0.0
		12	123	2,167	0.667	0.000	267	82		82	75.0	25.0	0.0	0.0
		1	10	2,000	0.000	0.000	20				100.0	0.0	0.0	0.0
		1	10	1,000	0.000	0.000	10				100.0	0.0	0.0	0.0
		1	10	1,000	1.000	0.000	10	10		10	0.0	100.0	0.0	0.0
		1	10	1,000	1.000	0.000	10	10		10	0.0	100.0	0.0	0.0
		6	62	3,333	7.167	0.333	207	444	21	465	0.0	50.0	16.7	33.3
		2	21	3,500	3.500	0.500	74	74	11	85	0.0	100.0	0.0	0.0
		2	21	2,000	0.500	0.000	42	11		11	50.0	50.0	0.0	0.0
		1	10	1,000	0.000	0.000	10				100.0	0.0	0.0	0.0
		2	21	3,500	4.000	0.000	74	84		84	50.0	0.0	50.0	0.0
		1	10	6,000	15.000	0.000	60	150		150	0.0	0.0	0.0	100.0
		1	10	10,000	23.000	0.000	100	230		230	0.0	0.0	0.0	100.0
		2	21	2,000	1.500	0.000	42	32		32	50.0	50.0	0.0	0.0
		2	21	1,000	0.000	0.000	21				100.0	0.0	0.0	0.0
		2	21	2,000	5.000	1.000	42	105	21	126	0.0	50.0	50.0	0.0
		1	10	10,000	0.000	0.000	100				100.0	0.0	0.0	0.0



TABLE 2I SANDHILL CRANE HARVEST AND HUNTER ACTIVITY IN TEXAS THE 2003-04 HUNTING SEASON (COMBINED SURVEY RESULTS).

GENERAL INFORMATION	COUNTY OF HARVEST	ACTIVE HUNTERS		ACTIVE HUNTER MEANS		EXPANDED ESTIMATES		ACTIVE HUNTER DISTRIBUTION					
		RESPOND -ING	EXPAND -ED	DAYS AFIELD	CRANE BAG	CRANE LOSS	HUNTER -DAYS	BAG	LOSS KILL	0	1-3	4-9	10+
LAVACA		1	10	2.000	2.000	0.000	20	20	20	0.0	100.0	0.0	0.0
LIVE OAK		1	10	2.000	3.000	0.000	20	30	30	0.0	100.0	0.0	0.0
LUBBOCK		21	216	2.048	2.905	0.105	442	628	23	47.6	42.9	0.0	9.5
LYNN		7	72	4.714	5.286	0.143	339	381	10	28.6	28.6	14.3	28.6
MC CULLOCH		1	10	3.000	4.000	0.000	30	40	40	0.0	100.0	0.0	0.0
MC MULLEN		1	10	2.000	0.000	0.000	20	20	189	100.0	0.0	0.0	0.0
MARTIN		7	72	2.286	2.286	0.333	165	165	24	28.6	71.4	0.0	0.0
MATAGORDA		34	350	3.235	1.794	0.212	1,132	628	74	38.2	58.8	0.0	2.9
MEDINA		1	10	3.000	1.000	0.000	30	10	10	0.0	100.0	0.0	0.0
MIDLAND		2	21	3.500	4.500	0.000	74	95	95	0.0	100.0	0.0	0.0
MOORE		2	21	1.500	1.500	0.000	32	32	32	50.0	50.0	0.0	0.0
MOTLEY		1	10	9.000	16.000	0.000	90	160	160	0.0	0.0	0.0	100.0
OCHILTREE		3	31	3.667	3.000	0.000	114	93	93	33.3	66.7	0.0	0.0
OLDHAM		1	10	9.000	24.000	5.000	90	240	50	0.0	0.0	0.0	100.0
PECOS		2	21	8.000	0.500	0.000	168	11	11	50.0	50.0	0.0	0.0
POTTER		4	41	4.750	9.000	1.250	195	369	51	0.0	50.0	0.0	50.0
RANDALL		1	10	1.000	3.000	2.000	10	30	20	0.0	100.0	0.0	0.0
REFUGIO		2	21	2.000	0.500	0.000	42	11	11	50.0	50.0	0.0	0.0
RUNNELS		2	21	5.000	3.500	0.500	105	74	11	0.0	100.0	0.0	0.0
SCURRY		1	10	1.000	0.000	0.000	10	10	85	100.0	0.0	0.0	0.0
SHACKELFORD		1	10	2.000	0.000	0.000	20	20	100.0	0.0	0.0	0.0	0.0
SWISHER		9	93	1.889	3.889	0.111	176	362	10	22.2	66.7	0.0	11.1
TARRANT		1	10	4.000	0.000	0.000	40	40	40	0.0	100.0	0.0	0.0
TAYLOR		1	10	2.000	4.000	0.000	20	20	40	0.0	100.0	0.0	0.0
TERRY		9	93	3.667	5.889	0.444	341	548	41	11.1	66.7	0.0	22.2
THROCKMORTON		3	31	1.333	2.000	0.000	41	62	62	33.3	66.7	0.0	0.0
VICTORIA		3	31	1.000	0.667	0.000	31	21	21	33.3	66.7	0.0	0.0
WALLER		4	41	3.000	1.500	0.000	123	62	62	50.0	50.0	0.0	0.0
WHARTON		52	535	3.750	1.327	0.118	2,007	710	63	44.2	53.8	0.0	1.9
WICHITA		1	10	1.000	0.000	0.000	10	10	100.0	0.0	0.0	0.0	0.0
WILBARGER		2	21	1.500	1.500	0.000	32	32	32	50.0	50.0	0.0	0.0
YOUNG		1	10	2.000	0.000	0.000	20	20	100.0	0.0	0.0	0.0	0.0
ZAVALA		1	10	3.000	0.000	0.000	30	30	100.0	0.0	0.0	0.0	0.0
OUT OF STATE		3	31	2.667	0.333	0.667	83	10	21	66.7	33.3	0.0	0.0
UNADJUSTED STATE TOTALS		498	5,122	3.042	2.398	0.205	15,582	12,281	1,049	42.4	49.6	2.4	5.6
ADJUSTED STATE TOTALS		498	4,821	3.042	2.398	0.205	14,668	11,560	988	42.4	49.6	2.4	5.6

COMBINED TOTALS (unadjusted) 1,297 8,645 2.988 2.208 0.196 25,833 19,084 1,691 20,775 43.9 47.7 3.7 4.7  
 (adjusted) 1,297 8,315 2.988 2.205 0.196 24,847 18,335 1,628 19,963 43.9 47.7 3.8 4.6

TOTAL PERMITS ISSUED = 58,646 NUMBER CONTACTED = 12,704 NUMBER RESPONDING = 7,593 (59.7%)



TABLE 3. COMPARISON OF POSTCARD (TYPE 1) AND LETTER (TYPE 2) CRANE HUNTER SURVEY QUESTIONNAIRE RESULTS IN THREE STATES.

STATE & SURVEY TYPE	PERMIT HOLDERS CONTACTED	QUEST. RESP. %	ACTIVE HUNTERS		SUCCESSFUL HUNTERS		ACTIVE HUNTER MEANS			EXPANDED ESTIMATES			ACTIVE HUNTER DISTRIBUTION BY SEASONAL BAG SIZE			
			%	Total	%	#	AFIELD	CRANE BAG	CRANE LOSS	HUNTER -DAYS	<- CRANE-> BAG	LOSS	0	1-3	4-9	10+
<u>2002-03</u>																
COLORADO* (5,644 permits issued)																
TYPE 1	690	65.2	3.56	175	1.16	65	2.688	1.688	0.312	469	294	55	62.5	25.0	6.3	6.3
TYPE 2	683	72.5	4.44	242	1.37	77	3.091	0.955	0.046	749	231	11	68.2	27.3	4.5	0.0
% CHANGE	-1.0	11.2	24.7	38.3	18.1	18.5	15.0	-43.4	-85.3	59.7	-21.4	-80.0	9.1	9.2	-28.6	-100.0
NORTH DAKOTA (8,245 permits issued)																
TYPE 1	822	74.8	29.3	2,413	10.2	845	3.439	1.183	0.067	8,299	2,856	161	65.0	30.6	2.8	1.7
TYPE 2	820	82.3	37.5	3,090	12.4	1,026	3.790	1.000	0.136	11,714	3,090	419	66.8	30.4	2.4	0.4
% CHANGE	-0.02	10.0	28.0	28.1	21.6	21.4	10.2	-15.5	103.0	41.1	8.2	160.2	2.3	-0.7	-14.3	-76.5
TEXAS (37,558 permits issued)																
TYPE 1	3,052	48.4	10.7	4,037	5.98	2,245	2.465	1.941	0.187	9,953	7,837	756	44.1	47.1	4.3	4.3
TYPE 2	3,244	54.8	11.7	4,408	6.17	2,316	4.180	2.631	0.194	18,423	11,598	853	47.5	41.4	3.7	7.4
% CHANGE	6.3	13.2	9.3	9.2	3.2	3.2	69.6	35.5	3.7	85.1	48.0	12.8	7.7	-12.1	-14.0	72.1
THREE STATES COMBINED* (51,447 permits issued)																
TYPE 1	4,564	55.7	12.9	6,625	6.06	3,155	2.826	1.659	0.147	18,721	10,988	971	52.3	40.5	3.8	3.4
TYPE 2	4,747	62.1	15.0	7,740	6.64	3,419	3.990	1.928	0.166	30,886	14,919	1,283	55.8	36.6	3.2	4.4
% CHANGE	4.0	11.5	16.3	16.8	9.6	8.4	41.2	16.2	12.9	65.0	35.8	32.1	6.7	-9.6	-15.8	29.4
-----																
<u>2003-04</u>																
COLORADO* (5,854 permits issued)																
TYPE 1	693	59.7	3.08	180	1.35	79	2.000	1.250	0.000	360	225	0	56.2	43.8	0.0	0.0
TYPE 2	695	74.1	4.99	292	1.34	79	2.887	0.808	0.077	842	236	22	73.1	15.4	11.5	0.0
% CHANGE	0.3	24.1	62.0	62.2	-0.7	0.0	44.4	-35.4	++	133.9	4.9	++	30.1	-64.8	++	0.0
NORTH DAKOTA (6,030 permits issued)																
TYPE 1	751	69.8	33.2	2,002	18.1	1,093	2.931	2.100	0.158	5,870	4,204	317	47.1	44.8	4.0	4.0
TYPE 2	748	76.2	41.8	2,518	22.1	1,333	3.227	1.941	0.197	8,125	4,888	496	47.1	46.2	3.4	3.4
% CHANGE	-0.4	9.2	25.9	25.8	22.1	22.0	10.1	-7.6	24.7	38.4	16.3	56.5	0.0	3.1	-15.0	-15.0
TEXAS* (43,199 permits issued)																
TYPE 1	3,949	50.4	9.2	3,896	6.13	2,650	2.670	2.759	0.212	10,402	10,747	825	39.9	50.2	3.4	6.4
TYPE 2	3,866	57.2	13.3	5,764	7.46	3,224	3.298	2.151	0.201	19,011	12,398	1,159	44.1	49.2	1.7	5.1
% CHANGE	-2.1	13.5	44.6	47.9	21.9	21.7	23.5	-22.0	-5.2	82.8	15.4	40.5	10.5	-2.0	-50.0	-20.3
THREE STATES COMBINED* (50,411 permits issued)																
TYPE 1	5,393	54.3	13.4	6,078	7.58	3,822	2.736	2.497	0.188	16,632	15,176	1,142	42.8	48.3	3.5	5.4
TYPE 2	5,309	62.1	17.0	8,574	9.20	4,636	3.263	2.044	0.196	27,978	17,522	1,677	45.9	47.1	2.5	4.4
% CHANGE	-1.6	14.4	26.9	41.1	21.4	21.3	19.3	-18.1	4.36	68.2	15.5	46.8	7.2	-2.5	-28.6	-18.5
=====																
<u>YEARS AND STATES COMBINED TO COMPARE QUESTIONNAIRE TYPES (101,858 permits issued)</u>																
TYPE 1	9,957	54.9	16.0	12,703	6.55	6,668	2.783	2.060	0.166	35,353	26,164	2,113	47.8	44.2	3.7	4.4
TYPE 2	10,056	62.1	12.5	16,314	7.91	8,055	3.608	1.989	0.181	58,864	32,451	2,960	50.6	42.1	2.9	4.4
% CHANGE	9.9	13.1	-21.2	28.4	20.8	20.8	29.6	-3.4	9.0	66.5	24.0	40.1	5.9	-4.8	-21.6	0.0
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\* Colorado and Texas estimates adjusted for response-nonresponse bias -- see text.



TABLE 4. SUMMARY OF SELECTED SANDHILL CRANE HUNTING ACTIVITY AND HARVEST DATA FOR THE CENTRAL FLYWAY BY SEASON SINCE 1975.

Season	TOTAL PERMITS ISSUED	PERCENT HUNTING CRANES	NUMBER HUNTING CRANES	NUMBER OF DAYS HUNTED	NO. OF CRANES BAGGED*	BAG PER ACTIVE HUNTER	NO. OF CRANES LOST*
1975-76	11,863	58.6	6,949	23,646	9,497	1.37	1,885
1976-77	11,352	44.9	5,092	18,780	7,393	1.45	1,384
1977-78	13,800	58.3	8,048	25,412	12,151	1.51	2,013
1978-79	13,659	56.2	7,683	22,992	10,146	1.32	1,860
1979-80	12,598	55.7	7,011	21,351	10,379	1.48	1,650
1980-81	13,413	53.4	7,164	21,951	10,152	1.42	1,737
1981-82	13,258	53.4	7,077	21,888	10,134	1.43	1,777
1982-83	12,370	41.8	5,172	14,559	7,916	1.53	1,397
1983-84	18,306	39.0	7,143	21,874	12,959	1.81	2,224
1984-85	17,420	39.2	6,821	20,281	11,271	1.65	1,889
1985-86	17,444	34.3	5,988	17,855	12,776	2.13	1,864
1986-87	19,298	30.3	5,840	15,959	12,487	2.14	1,867
1987-88	18,067	28.9	5,229	14,453	12,770	2.44	1,714
1988-89	16,368	32.0	5,232	14,169	12,772	2.44	1,628
1989-90	17,496	32.9	5,752	15,126	13,639	2.37	2,081
1990-91	22,720	33.6	7,631	20,423	18,041	2.36	2,519
1991-92	18,147	32.3	5,859	15,147	13,079	2.23	1,768
1992-93	17,127	30.9	5,284	14,833	12,433	2.35	1,459
1993-94	18,864 **	37.2	7,023	20,049	18,005	2.56	2,251
1994-95	19,412	36.8	7,141	20,392	16,201	2.27	1,676
1995-96	20,209	36.9	7,455	23,266	20,616	2.77	2,236
1996-97	21,330	34.5	7,354	22,291	17,111	2.33	2,011
1997-98	46,843 **	17.2	8,064	21,877	19,766	2.45	2,279
1998-99	47,734	17.1	8,173	24,242	19,831	2.43	2,143
1999-00	48,607	13.6	6,629	19,593	17,149	2.59	1,717
2000-01	61,311	11.3	6,950	19,112	15,504	2.23	1,430
2001-02	67,560	11.9	8,039	22,428	15,000	1.87	1,516
2002-03	55,384	15.1	8,358	27,931	15,008	1.80	1,351
2003-04	58,646	14.2	8,315	24,847	18,335	2.21	1,628
Change@	6.5% ***	-4.5% ***	0.7% *	0.3%	2.5% ***	1.8% ***	-0.05%

\* "Bagged" and "lost" refer to retrieved and unretrieved kill respectively.

\*\* Kansas began hunting cranes in 1993; see text for explanation of increases since 1996.

@ Average annual change, in percent, as indicated by linear regression; \* indicates a change significantly different from zero at the 95% confidence level while \*\*\* indicate a change significantly different from zero at the 99.9% confidence level.