

JOB PROGRESS REPORT

State: California

Project Number: W-65-R-1

Subproject Title: Nongame Wildlife Investigations

Job Number: III-11

Job Title: Sandhill Crane Research and Management

Period Covered: July 1, 1984 - June 30, 1985

Job Type: Survey and Inventory

SUMMARY:

In previous years this job was reported as jobs titled Inland Nesting Water-bird Survey (Job number III-2) and Winter Sandhill Crane Inventory (Job number III-3). During 1985, a total of 100 breeding pairs of Greater Sandhill Cranes (Grus canadensis tabida) was located at 6 major nesting areas in Modoc and Lassen counties. An additional 18 pairs were found at 11 other sites in Lassen and Modoc counties. Fourteen sites were surveyed that produced no nesting cranes. Twenty-five young were observed at all sites checked. A combined age-ratio of 9.6% (25 young per 261 cranes, breeders + young) was obtained. Less than half this figure will survive to make the flight to wintering grounds. Non-breeders numbered at least 115 birds. As in 1984, efforts were made by staff at Modoc NWR to capture and color-mark a sample of Greater Sandhill Cranes.

Age-ratio data were obtained at Thornton and Butte Sink wintering areas. The 5.1% at Thornton and 3.4% at Butte Sink values are below what is needed to maintain a stable population. Thirty-one color-marked Greater Sandhill Cranes were observed at the Thornton and Butte Sink Areas. Aerial and ground surveys were conducted at roosts in the Central Valley.

BACKGROUND:

In 1978, an interagency task force lead by the U.S. Fish and Wildlife Service, developed management plans for populations of Sandhill Cranes breeding and wintering in the Pacific Coastal region of the United States and Canada.

Based on recommendations contained in the Pacific Flyway Management Plan and the fact that a study of cranes breeding in California was conducted in 1971, surveys were conducted during spring, 1981 to determine the number of nesting pairs and ascertain if any changes had occurred at selected nesting areas since 1971 (Littlefield 1982). A total of 191 pairs was located. Modoc County contained 110 nesting pairs, more than any other county. The largest single concentration of nesting birds occurred in Surprise Valley, Modoc County, where 44 pairs were counted. Nesting pairs also were found in Lassen, Siskiyou, Shasta, and Plumas counties.

During 1982, a total of 83 pairs of nesting Sandhill Cranes was located at five key breeding areas in northeastern California. The five areas were among 11 considered important to the breeding population in California and had been surveyed during 1971 and 1981. Since 79 percent of the nesting pairs were on

private land in 1981, there is a continuing threat of habitat loss through land conversions. Littlefield (1982) recommended that Greater Sandhill Cranes be placed on the California Department of Fish and Game's Endangered Species List if habitat loss causes population decline. It was also recommended that monitoring continue in order to determine population trends. Listing of the Greater Sandhill Crane as a State Threatened bird took place in early 1983 and a monitoring program is being implemented.

In summer, monitoring has occurred at six key breeding areas in northeastern California. These are: In Modoc County - Surprise Valley, Modoc National Wildlife Refuge, Goose Lake, Jess Valley, Ash Valley, and part of the Big Valley; in Lassen County - Big Valley (part). The six areas are deemed vital to the breeding population in California and have been surveyed previously during 1971 and 1981-84. In 1984, a total of 202 adults (101 pair) apparently made up the breeding population in the areas surveyed. The remaining 69 birds either had not attempted breeding or attempted and failed. Of the 25 chicks located, 12 were found in the Surprise Valley, Modoc County.

During the past decade, the Department has made counts of Greater Sandhill Cranes on breeding grounds during waterfowl census. Total counts in breeding and wintering grounds can provide a means to determine population trends. No special effort had been made by the Department to conduct age-ratio counts (a measure of recruitment rate of young into adult population) of Sandhill Cranes in California until December 1979. However, there has been considerable work conducted at Malheur NWR by C. D. Littlefield, U.S. Fish and Wildlife Service crane biologist, during the past decade.

During 1979, an age-ratio of 6.6% immatures was obtained from a total sample of 1,784 cranes in the Thornton Area, and 7.8% (N=663) was obtained for the Gray Lodge Area. The same areas were surveyed in the winter of 1980, with the results being 6.1% (N=1,904) for the Thornton Area and 3.0% (N=450) for the Gray Lodge Area. During 1981, the age-ratio for Greater Sandhill Cranes was 4.6% (N=2,509) at the Thornton Area while no counts were made at Gray Lodge Area. During the period from 23 December 1982 to 4 January 1983, a sample of Lesser and Greater Sandhill Cranes were aged. The age-ratio for Lesser Sandhill Cranes was 3.8% (170 young cranes per 4,447 total cranes aged). Greater Sandhill Cranes had an age-ratio of 4.6% (43 young per 936 total aged). The 1982-83 aging information was collected by University of Alaska, Fairbanks, graduate student Tom Pogson, while Nongame Program personnel were involved in attempts to capture, band and color-mark cranes.

During November, 1982 to mid-March, 1983, five Lesser Sandhill Cranes were trapped, color-banded, collared and released at Merced National Wildlife Refuge (NWR), Merced County. Two of three attempts to capture cranes were unsuccessful. Only 5 of 30 birds trapped were retained; the rest escaped capture. Banding and color-marking studies are identified as priority research objectives in Pacific Flyway Technical Committee Management plan for Greater Sandhill Cranes (Schlorff, et al. 1983). These studies are deemed necessary to determine location of breeding and wintering grounds, migration routes, and

important stopover and staging areas for Sandhill Cranes throughout the Pacific Flyway.

During winter of 1983-84, age-ratio counts were made of wintering Greater Sandhill Cranes and Lesser Sandhill Cranes (G. c. canadensis) in the Central Valley of California. Counts indicated 7.6% and 6.2% immature Greater Sandhill Cranes at Sacramento Delta and Butte Sink areas respectively. Aerial and ground surveys were conducted by Department staff and graduate student Tom Pogson and his assistant Susan Lindstedt. Counts were made at roosting areas in the Delta and the Butte Sink. Also, an unsuccessful attempt was made to capture, band and color-mark a sample of Sandhill Cranes in order to gain information on migratory habits and seasonal habitat use.

OBJECTIVES:

The objectives are to conduct research and develop management plans to ensure the survival of Sandhill Crane breeding and wintering populations in California.

PROCEDURES:

Surveys of breeding populations were conducted by visiting native meadow and wetland habitats in northeastern California known to support breeding Greater Sandhill Cranes. Information was gathered on nesting pairs present, habitat association, land ownership, and impacts that may be detrimental to nesting cranes and their habitat. Data on the use of the areas surveyed by non-breeding, sub-adult cranes were also gathered. In addition, several smaller known breeding areas and some potential breeding areas were surveyed from the air during the 1985 N.E. California waterfowl breeding count.

Survey personnel included student assistant J. Estep, wildlife biologist B. Deuel, and Department pilot K. McBride.

During winter, known concentration areas of Sandhill Cranes were chosen to make age-ratio counts in 1979, and the same areas have been visited during subsequent survey periods. Large flocks of birds are located and numbers of adult and juvenile Greater Sandhill Cranes and Lesser Sandhill Cranes are tabulated. Wintering surveys also include roost counts in which cranes are counted as they leave or return to winter roost sites. Winter surveys may include aerial reconnaissance to locate roosts and count cranes and to locate radio-marked birds. The location, behavior and habitat association of color-marked cranes are recorded during winter surveys.

FINDINGS:

The results of 1985 Greater Sandhill Crane breeding ground surveys are listed according to the areas surveyed within the breeding range in California (Figure 1).

Surprise Valley

The Surprise Valley, east of the Warner Mountains in northeastern Modoc County, remains as the densest concentration of breeding Greater Sandhill Cranes in the State. The native meadow habitats are found in the area bounded on the west by State Highway 81 and on the east by the shorelines of Lower Lake, Middle Alkali Lake and Upper Lake. Several creeks drain the east slope of Warner Mountains and flow into the Alkali lakes. In addition, there are flowing wells close to the lake shores. This moisture regime provides ideal growth of meadow grass, sedges, and rushes that are suitable for nesting Sandhill Cranes. During July, 1985, a total of 39 breeding pairs of cranes was located. Ten pairs had one chick each. The age-ratio for the area was 11.4% (10 young per 88 total cranes, young plus breeders). A number of non-breeders or adults that failed in their nesting attempts were found. These cranes were in flocks ranging from 1 to 40 birds with a total of 69 birds.

Evidence of land conversion in the area continues. Sites where breeding cranes were recorded in previous years are now irrigated fields of alfalfa. Native grasses as well as alfalfa is mowed in the valley throughout most of the spring and summer resulting in the destruction of many nests. On two separate occasions during the survey, mower operators discussed their own experiences of mowing nests and destroying eggs.

Modoc National Wildlife Refuge

Preliminary findings indicate that 30 territories were active at one time during the breeding season. Many of these pairs nested producing at least 12 young. Refuge staff are attempting to color-mark adult and juvenile cranes. Thus far, 22 birds have been captured, marked, and released unharmed. Further results from the refuge staff biologist will be reported in next year's report.

Likely Area

The Likely Area breeding ground consists of a series of meadows west of irrigation channels that run north and south along highway 395 from an area south of Modoc NWR south to the town of Likely, Modoc County. This area has supported as many as 14 breeding territories in 1981 (Figure 1). During 1984 no survey was made, but a private landowner reported seeing 2 pairs, each with a single young bird. This year only 2 pairs were again found in the entire area. Neither pair had young.

Jess Valley

Jess Valley is an isolated valley consisting of a single land holding on the west slope of the south Warner Mountains about 15 miles east of Likely. The area's meadows normally support about five to seven breeding pairs of cranes (Figure 1). Seven pairs of adults were found in the area. No young were observed.

Goose Lake Area

The south shore of Goose Lake, in the area west of Highway 395 and east of the bridge across Goose Lake from the southwestern shore to McGinty point, supports habitat suitable for nesting Sandhill Cranes. The area supported seven pairs in recent years (Figure 1). During 1985, five pairs were located. Much of the area appeared to be heavily grazed by cattle. One young crane was observed. Since last year, the area between the low and high water marks has been leased resulting in increased cattle grazing, particularly within sensitive crane habitat.

Big Valley Area

The Big Valley Area consists of a tract of wetland (Big Swamp) and upland habitats between the towns of Adin on the east and Bieber on the west near the Modoc/Lassen county line. Ash Creek and the Pit River provide the water source for the wetland and moist meadow habitats. Although there is evidence of yearly degradation through land conversion and heavy cattle grazing of this area, some suitable crane breeding habitat still remains, especially at the west end of the Big Swamp area on the east and west side of the county road between Bieber and Lookout. Landownership changed during 1983 and access has been restricted to the area since that time. This resulted in only an incomplete survey for 1984. This year, because of inaccessibility on the ground, aerial data are being used. A total of 13 pair, 3 individuals and 1 young was found. Most of these were in or near the Big Swamp area.

There were plans to severely alter the condition of the Big Swamp by digging a series of drainage ditches to drain a major portion of the area where Greater Sandhill Cranes have nested previously. Some of this has begun: Much of the area adjacent to Big Swamp, particularly on the south side, has been graded, and as of July 1985 was totally denuded of vegetation. This is apparently in preparation for alfalfa farming. Also, during the aerial survey, several drainage ditches were observed cutting through the swamp area. This would reduce the amount of breeding habitat for cranes in this area.

Ash Valley

Ash Valley is located midway between Adin and Madeline on Lassen County route 527. The valley consists of meadows and wetlands on a few large cattle ranches. Most vegetation is still in a natural state and very little land conversion has taken place. The main detriment to cranes is heavy cattle grazing of native meadow habitat. Six pairs of cranes were found. These birds were on more defined territories, unlike last year, where 13 pairs were found. Most congregated on one large tract of cattail (*Typha* sp.) marsh, apparently feeding. A group of 6 non-breeding cranes was also observed.

Two sites where cranes had bred in previous years but where none were found in 1984 included the Canby and Madeline areas in Modoc and Lassen county respectively (Figure 1). This year each had 1 pair.

Twenty-two other sites were surveyed from the air. Egg Lake had 4 pairs and 1 young, Honey Lake had 2 pairs, and Spaulding Reservoir, Mtn. Meadows, and Lake Almanor each had 1 pair. Wild Horse Reservoir had 1 pair and 1 non-breeder, Butte Valley had 1 pair and 7 non-breeders, while Telephone Flat, Miller Lake, and Bones Meadow each had 1 non-breeder. Mountain Meadows also had a group of 33 non-breeders. Those areas surveyed with no cranes observed include Crowder Mnt. Reservoir, Everly Lake, Baseball Reservoir, Weed Valley, Steele Swamp, Clear Lake, Indian Tom Reservoir, Beeler Reservoir, Fairchild Swamp, Antelope Plains, Lower Roberts Reservoir, and White Horse Flat. Most of these areas were much drier than normal for this time of year.

Age-ratio counts of Greater Sandhill Cranes were made at several locales in the Thornton and Butte Sink areas of the wintering ground (Table 1). Aerial surveys were conducted to locate radio-tagged cranes from the Malheur National Wildlife Refuge. Of the 20 young cranes radio-tagged at Malheur NWR, only one survived to winter in the Central Valley of California.

Department personnel located 31 color-marked birds and made visual recordings of 2 radio-tagged birds. Sightings were made at locales in the Thornton and Butte Sink areas (Table 2).

Winter roost counts were made on 4 occasions to determine level of use of certain important sites by Sandhill Cranes (Lesser and Greater) (Table 3).

ANALYSIS:

Although there continues to be a small and apparently stable breeding population of Greater Sandhill Cranes existing in portions of northeastern California, it is increasingly evident that agricultural trends of the area are dramatically affecting nesting birds on private lands. In 1981, it was discovered that at least 79% of nesting took place on private lands (Littlefield 1982). This figure has not changed appreciably in the past three years. Of the 6 major areas surveyed in 1985 for breeding cranes, 5 are found on private lands. These lands are threatened with conversion from native meadow to intensive agriculture. This has been the pattern since the 1971 survey and has been especially evident since the 1981 survey. The changed land ownership in Big Valley and current land conversion activities makes uncertain the consequences for cranes nesting there in the future.

Some habitat must be acquired to prevent the total loss of the breeding population on private lands. The birds now nesting on public lands may represent the core of what will be the remaining Sandhill Crane population in the next decade. Improved management on public land might offset some of the loss on private lands. However, there is evidence this won't occur on those public lands that are heavily grazed.

In some instances, habitat conditions may be improved on both public and private lands simply by restricting grazing by livestock. Cranes avoid using pastures or meadows that are heavily grazed by cattle. In some instances, cranes may have already established a breeding territory in a meadow prior to cattle grazing, and, as has been observed, nest failures may result when cattle are turned out in summer and disrupt crane breeding activities, trample nests and eggs, or reduce the protective cover of grasses by overgrazing.

A theoretical minimum of 12.0% (C. D. Littlefield, pers. comm.) recruitment (percent of young observed in the sample of adults and young) is required to maintain crane population stability. Over the past 14 years neither C. D. Littlefield (making pre-migration counts) nor Nongame staff have recorded a recruitment rate (age-ratio) of 12.0% or greater. In 1983-84 and 1984-85 results have been quite a bit lower than the required value. Littlefield has noted a small but steady decline in the number of birds nesting at Malheur NWR over this 14 year time period. We have noted loss of nesting habitat in Northeastern California in just the past 4 years. Clearly there are problems that depress recruitment rate and we have identified the major causes to be habitat destruction, disturbance during the nesting season, mower mortality, and predation. However, we seem powerless to significantly affect, let alone turn around the current land-use related trends in crane breeding areas.

This year we analyzed the 1983 and 1984 counts to determine confidence intervals of our estimates and tried to see if sample sizes were adequate (Table 1). Since our primary concern is to learn whether age-ratios fall below or exceed the 12% level both sampling and 95% confidence interval seem adequate. If specific actions are taken on the breeding ground we may want to intensify the sampling effort the following winter to determine if the effects of those actions can be measured.

LITERATURE CITED:

- Littlefield, C. D. 1982. The Status and Distribution of Greater Sandhill Cranes in California, 1981. State of California, Department of Fish and Game, Wildlife Management Branch, Admin. Rep. 82-1, 27 pp.
- Schlörff, R., G. Herron, G. Kaiser, C. Kebbe, G. Kramer, and C. D. Littlefield, 1983. Pacific Flyway Management Plan for the Central Valley Population of Greater Sandhill Cranes. 28 pp.

RECOMMENDATIONS:

1. Continue winter age-ratio counts of all populations of Sandhill Cranes wintering in California.
2. Continue roost counts on wintering ground.
3. Implement management programs designed to improve survivorship of young cranes on breeding grounds in California.

4. Implement management programs to protect habitat on breeding and wintering ground.
5. Coordinate efforts with other agencies to improve recruitment rates of all crane populations in Pacific Flyway.
6. Continue to enforce laws protecting cranes to reduce mortality on migration routes, wintering areas and breeding grounds.
7. Continue Sandhill Crane banding, color-marking and radio-tagging studies to mark a large sample of Greater Sandhill Cranes on breeding areas.
8. Coordinate efforts with other agencies and researchers to accumulate information on cranes marked on wintering or breeding areas in the Pacific Flyway.

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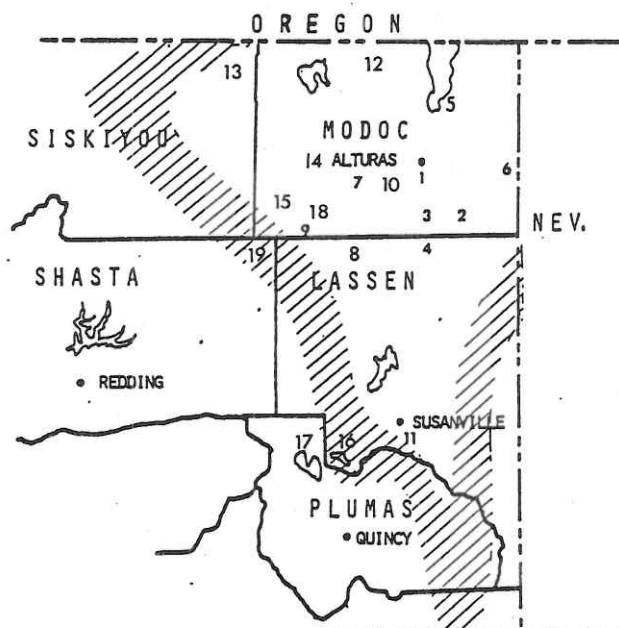
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Eldridge G. Hunt, Chief
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Date:

2-25-86

Figure 1. Comparison of Numbers of Greater Sandhill Crane Nesting Pairs, 1971, 1981-85



Numbers of Nesting Pairs

<u>Location</u>	<u>1971</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
1. Modoc NWR	16	21	19	26	15	3 ³
2. Jess Valley	7	7	5	0	6	7
3. Likely	14	9	NC ¹	4	NC	2
4. Madeline	1	1	NC	NC	0	1
5. Goose Lake	2	7	7	3	9	5
6. Suprise Valley	42	44	34	50	34	39
7. Canby	2	6	NC	NC	0	1
8. Ash Valley	NC	NC	NC	12	13	6
9. Big Valley	21	24	18	14	10 ²	13
10. Warm Springs Valley	NC	NC	NC	NC	NC	3
11. Honey Lake	3	6	NC	NC	NC	2
12. Wild Horse Res.	NC	NC	NC	NC	NC	1
13. Butte Valley	NC	NC	NC	NC	NC	1
14. Spaulding Res.	NC	NC	NC	NC	NC	1
15. Egg Lake	NC	2	NC	NC	1	4
16. Mnt. Meadows	NC	NC	NC	NC	NC	1
17. Lake Almanor	NC	1	NC	NC	NC	1
18. Round Valley	2	2	NC	NC	NC	NC
19. Fall River Valley	2	2	NC	NC	NC	NC
TOTALS	112	132	83	98	88	118

¹NC=Not checked

²Incomplete count due to restriction on access to private land.

³Figure may be high due to lack of information on actual nesting pairs.

Table 1. Summary of age-ratio count results for wintering Greater Sandhill Cranes during winters of 1983-84 and 1984-85

Sample Area	Year	n ¹	No. Juv.	No. of Juv. & Adults	Age Ratio	SE ²	95% C.I. ³
Thornton	83-84	125	137	1599	0.086	0.008	0.071-0.101
Butte Sink	83-84	35	66	829	0.080	0.011	0.058-0.101
Thornton	84-85	59	83	1645	0.051	0.007	0.037-0.064
Butte Sink	84-85	43	41	1205	0.034	0.005	0.025-0.043

¹Sample size; groups aged.

²Standard Error of the ratio.

³95% Confidence Interval.

Table 2. Greater Sandhill Crane Band Sightings 1984-85

Band No./Color	Sighting Location	Date	Remarks	Banding Location	Date	Observer
L R Tall W R Y	1/2 mi. W. of Cortopassi Grain storage area	11-27-84	In flock, ~ 51	Malheur NWR	1984	Schlorff Estep
L R Wor Y W O G	1/2 mi. W. of Cortopassi Grain storage area	11-27-84	Unk. which is tall band	Malheur NWR	1984(?)	Schlorff Estep
L R Tall W Y Y R	1/2 mi. W. of Cortopassi Grain storage area	11-27-84	Seen later @ N&W Butte Rd., Butte Sink on 12-7-84	Malheur NWR	1982	Schlorff Estep
L R Tall W Y Y O	1/2 mi. W. of Cortopassi Grain storage area	11-27-84	In flock ~ 51	Malheur NWR	1982	Schlorff Estep
L R Tall W G G	El Dorado Gun Club	11-27-84		Malheur NWR	1984	Schlorff Estep
L R Tall W W G	El Dorado Gun Club	11-27-84		Malheur NWR	1984	Schlorff Estep
L R Tall W G R	El Dorado Gun Club	11-27-84		Malheur NWR	1984	Schlorff Estep

Table 2. Greater Sandhill Crane Band Sightings 1984-85 (cont'd.)

Band No./Color	Sighting Location	Date	Remarks	Banding Location	Date	Observer
L Tall B R R W	Opposite Cortopassi Farms	12-5-84	Fed. 599-01453 Female of pair 235 Nests about 2 mi. WSW of HQ	Malheur NWR 21 mi. s. of HQ	9-25-81	Schlorff Estep
X54 L Tall W R Y Fed.	Opposite Cortopassi Farms	12-5-84	Fed. 599-01391 last seen 21 mi. S. HQ, 10-15-84	Malheur NWR 1.5 mi SW HQ	5-4-84	Schlorff Estep
L R A-01 R Tall W B	Opposite Cortopassi Farms	12-5-84	Fed. 599-01491 Male of pair 7 Nests in Dredger Pond ~ 35 mi. S. HQ	Malheur NWR 35 mi S. HQ	4-11-84	Schlorff Estep
L R Y Tall W O	Opposite Cortopassi Farms	12-5-84	Fed. 599-01491 Male Mate to A01	Malheur NWR 35 mi. S. HQ	4-11-84	Schlorff Estep
X88 L Tall W R G Fed./W	Opposite Cortopassi Farms	12-5-84	Fed. 599-01392 Caught with 5 others	Malheur NWR	5-4-84	Schlorff Estep

Table 2. Greater Sandhill Crane Band Sightings 1984-85 (cont'd.)

Band No./Color	Sighting Location	Date	Remarks	Banding Location	Date	Observer
L R Fed. Fed.	El Dorado Gun Club, Thornton Area	11-1-84	West end	Malheur NWR C.D. Littlefield	Ca. 1969	Schlорff Estep
L R A01 R Tall W B Fed. 599-01491	El Dorado Gun Club	11-1-84	West end	Malheur NWR 10 mi. NE French Glen	3-11-83	Schlорff Estep
X25 L R Tall W W 599- R G 01491 Fed. w/Blue streamer	El Dorado Gun Club	11-1-84	West end	Malheur NWR 1 mi. SW of HQ	5-5-84	Schlорff Estep
X39 L R Tall W G R G Fed. 599- 01393	El Dorado Gun Club	11-1-84	West end Mated w/X25	Malheur NWR 1 mi. SW of HQ	5-5-84	Schlорff Estep
X50 L R Tall W B R B Fed. 599- 36606	El Dorado Gun Club	11-1-84	West end	Malheur NWR 1 mi. So. of HQ	7-23-84	Schlорff Estep

Table 2. Greater Sandhill Crane Band Sightings 1984-85 (cont'd.)

Band No./Color	Sighting Location	Date	Remarks	Banding Location	Date	Observer
L R X59 R Tall W Fed. R 599- 36607	El Dorado Gun Club	11-1-84	West end Mated w/X50	Malheur NWR 22 mi. So. of HQ	7-23-84	Schlörff Estep
L R Fed. W Fed. 599- 36504 Y Tall R P024	Staten Is.	11-14-84	Also seen by S. Lindstedt on or about 11-19-84	Modoc NWR	8-6-84	Schlörff
X35 L R Tall W B R R Fed.	Cortopassi Farms Grain storage	11-20-84				Schlörff Estep
L R Tall W G R G Fed.	Cortopassi Farms Grain storage	11-20-84				Schlörff Estep
L R Tall W W R G Fed. Stream	Cortopassi Farms Grain storage	11-20-84				Schlörff Estep

Table 2. Greater Sandhill Crane Band Sightings 1984-85 (cont'd.)

Band No./Color	Sighting Location	Date	Remarks	Banding Location	Date	Observer
L R B R B Tall W	1/2 mi. W of Cortopassi Grain storage	11-27-84	In group about 51	Malheur NWR	Ca. 1981	Schlorff
L R Tall W R R O	1/2 mi. W of Cortopassi Grain storage	11-27-84	In group about 51	Malheur NWR	Ca. 1982	Schlorff Estep
L R Tall W B B (Taped) B	N&W Butte Rds. Butte Sink	12-7-84	Fed. 599-01306 Rice Stubble	Sycan Marsh Juv. when wintered in	7-23-83	Schlorff Estep
A95 L R Tall W W R Fed. 599-01342	N&W Butte Rds.	12-7-84	Seen on 11/27 in Thornton Area	1.5 mi SW of	3-25-84	Schlorff Estep
L R AO1 R Tall W B Fed.(?) Fed. 599-01491	El Dorado Duck Club	12-12-84	West side Pasture Pair 7 Male	Malheur NWR	4-11-83	Schlorff Estep
L R A-28 Y Tall W O Fed. 599-01492	El Dorado Duck Club	12-12-84	Pair 7 Male	Malheur NWR	4-11-83	Schlorff Estep

Table 2. Greater Sandhill Crane Band Sightings 1984-85 (cont'd.)

Band No./Color	Sighting Location	Date	Remarks	Banding Location	Date	Observer
L R Fed.	El Dorado Duck Club	12-12-84	West side Pasture	Malheur NWR	Pre-1969	Schlörff Estep
L R A-14 Y Tall W G 599-01467 Fed.	El Dorado Duck Club	12-12-84	West side Pasture	35 mi. S. HQ one of pair 15	3-15-82	Schlörff Estep
L R Tall W X-35 R R Fed. 599- 01371	El Dorado Duck Club	12-12-84	Capture w/8 others C.D. believes this is male	Malheur NWR	4-23-84	

Table 3. Winter Roost Counts, 1984-85

<u>Roost</u>	<u>Date</u>	<u>Times</u>	<u>Arriving</u>	<u>Leaving</u>	<u>No. Cranes</u>
Merlo Duck Club	12-18-84	0707-0750		X	2063
Canal Ranch	1-31-85	1705-1803	X		4259
Canal Ranch	2-7-85	1711-1754	X		3840
Canal Ranch	2-13-85	1723-1813	X		972