

August 20, 2004

Clayton Derby
West EcoSystems Technologys, Inc
2003 Central Avenue
Cheyenne, Wyoming 82001

RE: TRANSMITTAL OF SPRING 2004 WHOOPING CRANE REPORT

Dear Clayton,

Enclosed are two copies of the final whooping crane spring 2004 survey report. I also included a CD, which has the report as an Adobe file. The CD also has the text as a Word File and includes an Excel file with profile data for the single whooping crane sighting.

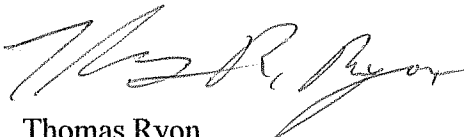
The final report includes edits resulting from comments from Wally Jobman, USFWS, and Mark Czaplewski, CPNRD. I made text edits accordingly. I also included a scanned version of Mr. Jobman's Migration Report as Appendix C and included a graph of the river profiles of the Whooping Crane Location near the Minden Bridge as Appendix E. Calculated bank-to-bank and obstruction-to-obstruction distances along the river transect were also included.

I will be providing a copy of the final database files in a few days.

Please let me know when you receive this packet and call me with any questions you may have concerning the report.

I have enjoyed working on this project with you and I look forward to proposing on the fall surveys.

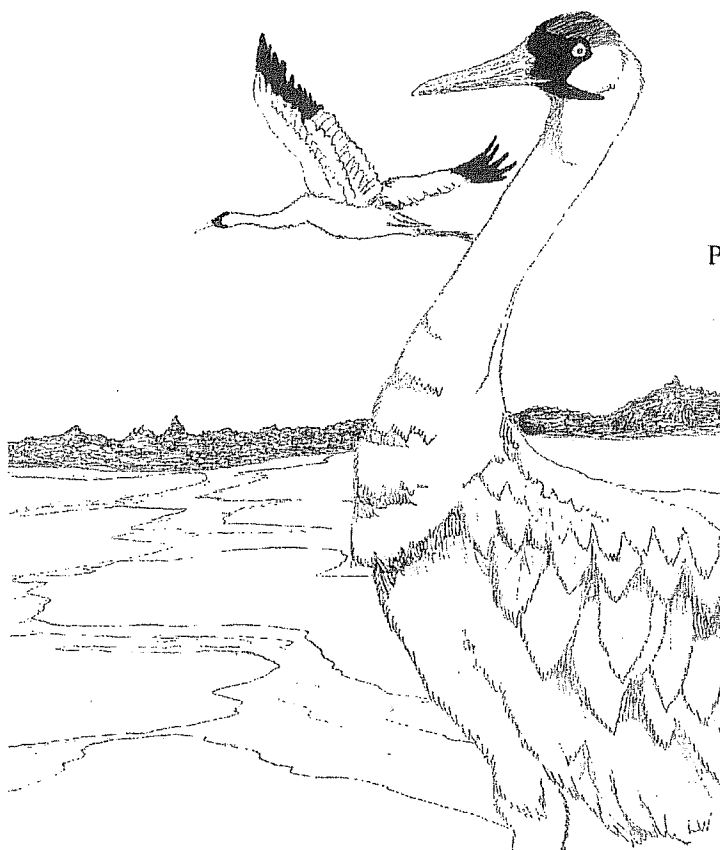
Sincerely,



Thomas Ryon
Wildlife Biologist

FINAL REPORT

SPRING 2004 WHOOPING CRANE MIGRATIONAL SURVEY PROTOCOL IMPLEMENTATION REPORT



Prepared for:

Platte River Cooperative Agreement
Platte River Endangered Species Partnership
Executive Director's Office
2003 Central Avenue
Cheyenne, Wyoming 82001

Prepared by:

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August 2004

OtterTail
Environmental INC.

Final Report

**Spring 2004 Whooping Crane
Migrational Survey
Protocol Implementation Report**

Submitted to:

Platte River Cooperative Agreement
Platte River Endangered Species Partnership
Executive Director's Office
2003 Central Avenue
Cheyenne, Wyoming 82001

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August 2004

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1.0 INTRODUCTION

The Platte River Endangered Species Partnership (PRES P) is an organization created from a cooperative agreement between the states of Colorado, Nebraska, and Wyoming. The tri-state partnership has two main objectives. The first objective is to develop and implement a program to improve and conserve habitat for four endangered species that utilize the central Platte River. The four species are the whooping crane, piping plover, interior least tern, and pallid sturgeon. The second objective is to develop programs that allow for continued and new water uses from the central Platte River, while also providing for the needs of the four endangered species.

To accomplish these objectives, PRES P has established a number of project milestones. One of the initial project milestones was to develop a protocol for monitoring whooping crane (*Grus americana*) use of the central Platte River. The first version of this protocol was developed for the spring 2001 monitoring period. The protocol has since been revised several times based on the results of field surveys. The most recent version of the protocol was last updated on January 14, 2004 (PRES P 2004a). This version of the protocol was used to implement the spring 2004 survey.

The protocol describes procedures for conducting aerial and ground surveys to document whooping crane use of the central Platte River. The primary objectives of the surveys include the following:

- Detect whooping crane stopovers in the study area;
- Identify the locations of use and crane group movements in the study area;
- Document crane group activities at use-sites;
- Document the physical and biological characteristics of use-sites; and
- Collect landscape-level data for whooping crane use-sites.

In addition to the morning surveys required under the monitoring protocol, the spring 2004 survey effort included a separate research study to compare detection rates of late-day (afternoon and evening) flights versus morning flights. A separate research protocol developed specifically for this late-day study was followed (PRES P 2004b). Results from this research study are included in this report.

OtterTail Environmental, Inc. (OtterTail) was contracted by PRES P to implement the protocol and conduct whooping crane surveys along the Platte River of Central Nebraska in the spring 2004. This

report summarizes the results of the spring 2004 whooping crane survey followed by a discussion of those results and survey methods. Information presented in this report includes the following:

Section 2.0 Methods - this section includes a description of field methods.

Section 3.0 Results - this section includes a summary of results, including documentation of habitat use and a calculation of the annual index of crane use.

Section 4.0 Results of Research Study – this section provides the results from the late-day aerial surveys conducted out of the Grand Island Airport.

Section 5.0 Recommendations for Future Protocol Implementation - this section includes recommendations for modifying the current protocol to facilitate the implementation of future whooping crane surveys.

2.0 METHODS

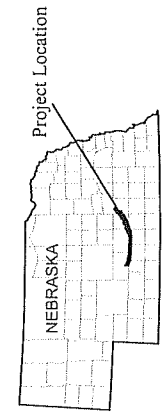
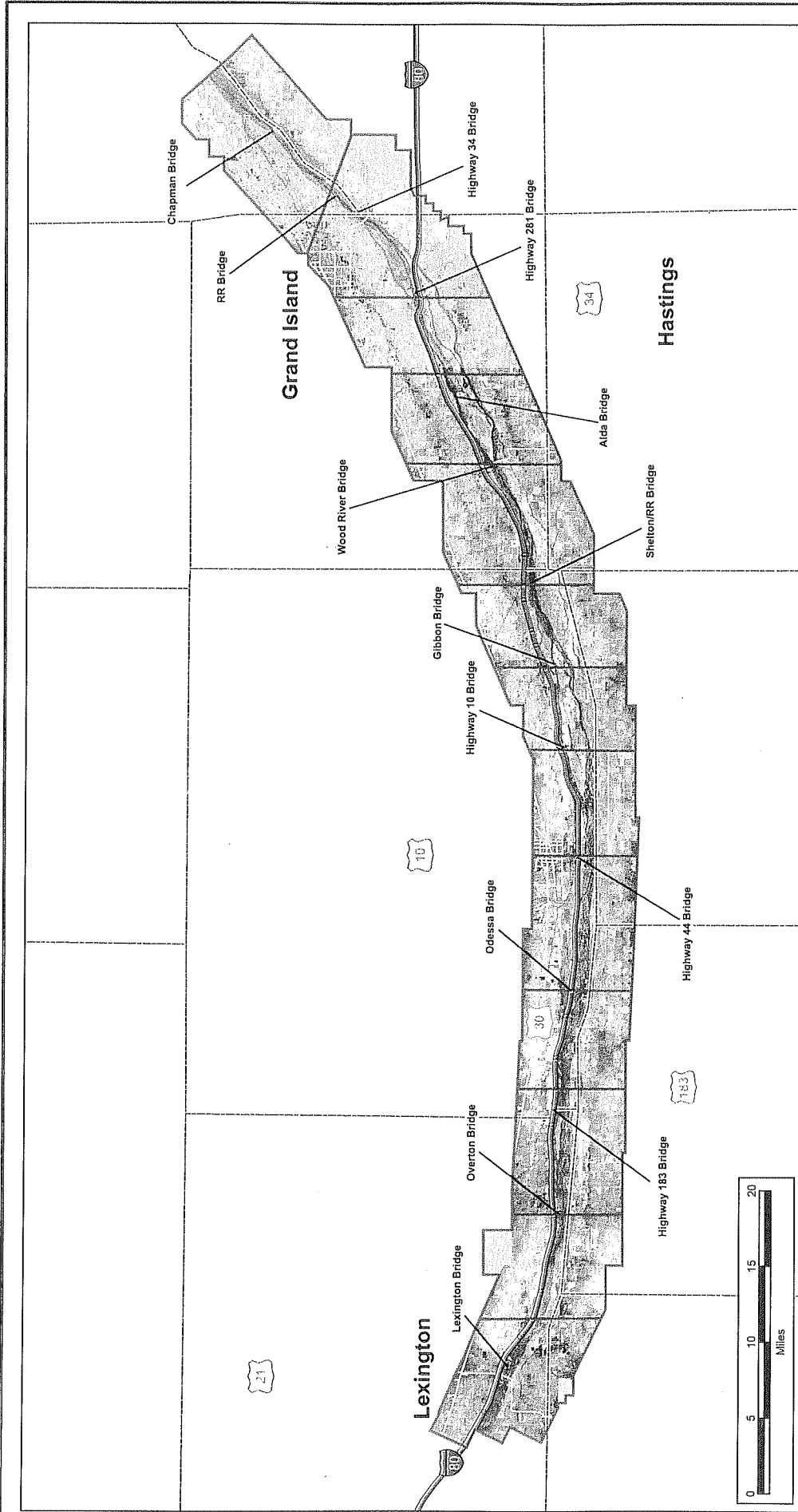
The “Draft Whooping Crane Migrational Habitat Use in the Central Platte River Valley - Whooping Crane Monitoring Protocol” (PRESP 2004a) was followed for the spring 2004 survey. The protocol includes methodologies for aerial surveys, ground surveys, ground monitoring, collecting physical and biological data for whooping crane use sites, and quality assurance/quality control. Both systematic and opportunistic sightings are documented under the protocol. A sighting was systematic when the whooping crane group was observed during the aerial survey. Systematic sightings also include any sightings by ground crews who are monitoring whooping cranes that were observed during the aerial survey. Opportunistic sightings include cases where crane groups were located by means other than the systematic aerial survey effort (reports from the public or “accidental” locates by the field crew).

The monitoring protocol establishes the study area and survey period for both the spring and fall surveys. The study area covers a 94.5-mile (river miles) section of the central Platte River between Lexington and Chapman, Nebraska (Figure 1). The survey period for the spring 2004 effort started on March 21 and ended on April 29, 2004 (PRESP 2004a).

Methods for a research study were also provided by PRESP entitled “Comparison of the Relative Value of Afternoon Flights versus Morning Flights for Detecting Whooping Crane Stopovers along the Central Platte River, Nebraska” (PRESP 2004b). As the title indicates, this document provides methods for conducting late-day (afternoon and into evening) surveys and comparing them to morning surveys in order to investigate if mornings are optimal survey times for whooping crane aerial surveys or if late-day surveys may be more effective.

2.1 AERIAL SURVEYS

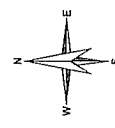
Daily aerial surveys were completed concurrently during the morning for two sections of the central Platte River between March 21 and April 29, 2004. The eastern, or Grand Island, section of the study area is located between Minden Bridge and Chapman Bridge. The western, or Kearney, section of the study area is located between the Lexington Bridge and Minden Bridge (Figure 1). Air Midway was contracted to fly the Kearney section, and Trego Dugan Aviation of Grand Island was contracted to fly the Grand Island section of the study area.



- Legend**
- Project Boundary
 - County Boundary
 - Interstate Highway
 - Major Road

OtterTail
Environmental

Scale: 1:400,000
UTM, NAD 1983, Zone 14N



SPRING - 2004	
WHOOPIING CRANE SURVEYS	
FIGURE 1	
CENTRAL PLATTE RIVER STUDY AREA	
ANALYSIS AREA: PLATTE RIVER, NEBRASKA	
Date: June 2004	File: Plt1.mxd
Drawn by: DPH	

Aerial surveys were scheduled daily from the Kearney and Grand Island Airports and were conducted daily as weather allowed. Two aerial surveyors were assigned to each plane flying from each airport. Pilots flew transects at an altitude of 750 feet. Flight transects were flown such that the direction was away from the rising sun. Two start locations were designated for each section of the study area. For the eastern section of the study area, start locations included the Chapman Bridge and the Wood River Bridge. For the western section of the study area, start locations included the Minden Bridge and the Odessa Bridge. Using the eastern section as an example, on day one, the flight began at Chapman, the riverine transect (i.e., river transect) was then flown west to Minden, and a predetermined return (upland) transect was flown back to Chapman. On day two, the flight began at the Wood River Bridge, the river was then flown west to Minden, a predetermined return (upland) transect was flown back to Chapman, and the remaining section of the river between Chapman and Wood River was then flown to complete the aerial survey. The flight directions were fixed for each day so that both planes started the transects at either the eastern most or midway points and subsequently flew in the same direction. Return transects for both planes began at the westernmost point of its section of the study area. This pattern was designed to reduce the potential for the two planes to be in the same location at the same time. A set of seven return transects were fixed according to each flight day. In the event that a flight was cancelled, all scheduled return transects were postponed one day. The set of seven return transects are described briefly as follows:

- River Return Transect – flown down the middle of the river, not to be confused with the riverine transect that is flown along the south side of the river with observers on both sides of the plane. Symbolized as “0” transect;
- Upland transect one mile south of the river. Symbolized as “1S” transect;
- Upland transect one mile north of the river. Symbolized as “1N” transect;
- Upland transect two mile south of the river. Symbolized as “2S” transect;
- Upland transect two mile north of the river. Symbolized as “2N” transect;
- Upland transect three mile south of the river. Symbolized as “3S” transect;
- Upland transect three mile north of the river. Symbolized as “3N” transect;

These return transect symbols are used in tables appearing in Section 3.0 and 4.0.

2.2 GROUND SURVEYS AND MONITORING

Ground crews verified systematic and opportunistic sightings of whooping cranes. Two ground crew members were assigned to two different locations within each section of the study area during the aerial surveys. For the Kearney section, members of the ground crew were assigned to the Odessa and Overton Bridges. For the Grand Island section, members of the ground crew were assigned to the Shelton and Alda Bridges. Members of the ground crews were assigned based on their place of residence. Air crews maintained communication with ground crews using two-way, 5-watt handheld radios (Vertex Standard VX-800). The members of the aerial crew immediately contacted the ground crew when they believed that a whooping crane was observed. The nearest member of the ground crew would then go to the location to search for the whooping crane. In accordance with the protocol, the ground crew searched for the whooping crane for a minimum of 2 hours. The aerial survey crew also assisted the ground crew in locating cranes after both transects were completed. When the ground crew was able to locate and confirm a sighting, the crew photographed the crane and began the observation period. Ground crews continued to observe the crane until it left the area. Data collected during the observation included location of the crane, movements, behavior, and physical and biological characteristics of each use site. While they were collecting data during the ground observation, ground crews adhered to the USFWS avoidance guidelines to limit the potential for disturbance to the whooping crane.

Ground crews were also responsible for verifying opportunistic sightings of whooping cranes. A hotline number (1-877-208-8557) was established to report opportunistic sightings. Brochures with information on the hotline number, how to identify whooping cranes, and how to report sightings were distributed to local organizations and agencies. Calls received on the hotline number were forwarded to the Platte River Trust. After potential sightings had been screened, Platte River Trust contacted OtterTail biologists, who then went to the site to investigate these sightings.

2.3 DECOY LOCATIONS

The efficiency of the aerial surveys was evaluated by placing whooping crane decoys in the study area during the survey period. Fifteen pre-determined decoy locations were provided to OtterTail biologists before the survey began:

- Three wooded river within floodplain locations
- One shrubs inside floodplain location

- One barren beach/sandbar location
- Ten wetted channel locations

In some cases, the habitat type provided by PRESP did not match the habitat at the actual Universal Transverse Mercator (UTM) location. In these cases, OtterTail biologists moved the decoys so they were located in the correct habitat type and were as close as possible to the pre-assigned UTM location. Coordinates for the new decoy location were recorded.

Decoys were placed at the pre-determined locations throughout the survey period. Members of the field crew who were not involved with whooping crane monitoring that day were responsible for placing the decoys. The aerial survey crew did not know the schedule for placement or the locations of the decoys. Ground crews were, however, notified of the locations as the decoys were placed in the field. Ground crews verified decoy observations when they received a report of a potential whooping crane from the aerial survey crews. In the case that aerial crews did not spot a decoy, ground crews notified the aerial crews of the location. Aerial crews then circled back to locate the decoys before they returned to the airport.

2.4 COLLECTING PHYSICAL AND BIOLOGICAL DATA FOR USE SITES

Physical and biological data for use sites were recorded as soon as practical after the crane had left the area. Data on stream profile and use site were collected for the whooping crane use sites and decoy locations where water was present. Data that were collected include characteristics of the landscape (unobstructed view, distance to disturbances, and habitat type) and river (percent sediment types, flow, and channel profile data, including channel width and water depth).

2.5 RESEARCH STUDY METHODS

One plane with two observers was used for the afternoon research study. Flight altitude, orientation of the transect, and flight protocol were the same as for the morning surveys. Afternoon surveys were flown only out of Grand Island airport for the eastern portion of the study area, however. Unlike the morning survey, the upland transect was flown first, heading west. The origin of this transect alternated daily between the Chapman Bridge and the Wood River Bridge. The same set of seven return transects was

used as for the morning flights. The riverine transect was then flown headed east (away from the setting sun), with the airplane following the northern bank of the river channel and both observers looking south out of the right side of the airplane. A total of 14 flights were scheduled from April 4-17, 2004. Flights were to be completed by ½ hour past sundown under the research study protocol (PRESP 2004b).

Ten decoys were placed during the afternoon surveys. Separate, pre-determined decoy locations were provided by PRESP to OtterTail biologists before the survey. Decoys were placed after the morning survey and in most cases were retrieved when they were detected by the afternoon survey. The current research study protocol (PRESP 2004b) does not require ground crews. However, radio contact with a team member on the ground was maintained during each afternoon survey. This contact was with a team member who placed a decoy, OtterTail biologists who were not in the air, or both.

2.6 QUALITY ASSURANCE/QUALITY CONTROL

A key component of the spring whooping crane survey was the quality control/quality assurance (QA/QC) program. OtterTail developed a project-specific QA/QC program in accordance with the protocol. Each crew member was individually responsible for maintaining the highest level of QA/QC for all components of the project, including completing data forms, maintaining accuracy of the aerial and ground surveys, promoting consistency among reporting methods, and entering data into the Microsoft Access database. The OtterTail lead field biologist reviewed completed data forms daily. Any changes to the original data forms were documented and initialed by the person who made the change. Specific deviations from the established protocol were also documented on data forms. Furthermore, detailed explanations for these deviations were included as part of the documentation.

A QA/QC program was also implemented for database entry. In accordance with the established protocol, database files were compared with the raw data forms to identify any discrepancies. Any discrepancies identified were corrected and documented in the database or on the raw data forms, as required.

3.0 RESULTS

The following sections present the results of the spring 2004 monitoring surveys.

3.1 EXTENT OF RIVER

Based on U.S. Geological Survey gauging stations at Overton, Kearney and Grand Island, a wetted channel was found throughout the central Platte River study area during the spring survey period. Gage height and mean daily discharge for these stations can be found in Appendix A from March 15 through May 3, 2004. Daily discharge in cubic feet per second shown a declining trend during the survey period at all three stations, but surface water was always present. Observations from aerial surveys confirmed the presence of surface water throughout the study area.

3.2 FLIGHT LOGS AND CANCELLATIONS

Several flights originating from the Kearney and Grand Island airports were cancelled or discontinued. Most flights were canceled due to limited visibility including fog, snow or low cloud ceiling. However, on April 18, flights from both airports were canceled due to high winds.

Of the 40 possible flight days, 32 (80%) were flown from Kearney over the west section of the study area and 33 (82.5%) were flown from Grand Island over the east section of the study area (Table 3-1). Comparing starting points for riverine transects within each section of the study area, the Odessa Bridge (split transect) was flown more often (90% vs. 70%, Table 3-1) than the Minden Bridge riverine transect due to flight cancellations. Within the eastern section of the study area, the riverine transects starting at the Chapman Bridge were flown less than those starting at the Wood River Bridge (70% vs. 95%, Table 3-1). A summary of the number and distribution of return transects flown during the spring 2004 survey is provided in Table 3-2.

**TABLE 3-1
COMPARISON OF RIVERINE TRANSECTS FLOWN WITHIN EAST AND WEST
SECTIONS OF THE PLATTE RIVER STUDY AREA, SPRING 2004**

East Section		West Section	
Chapman Bridge	14	Minden Bridge	14
Wood River Bridge	19	Odessa Bridge	18
Grand Island Total	33	Kearney Total	32

**TABLE 3-2
DISTRIBUTION OF RETURN TRANSECTS FLOWN FOR THE SPRING 2004
SURVEY**

Number of Return Transects Flown		
Return Transect	Grand Island	Kearney
0 (River)	5	5
1S	5	5
1N	5	5
2S	5	5
2N	5	4
3S	4	4
3N	4	4
Total Flight Days	33	32

3.3 SEARCH EFFICIENCY

Whooping crane decoys were placed at pre-determined locations to evaluate the efficiency of the aerial searchers. Fifteen decoy locations were provided by PRESP to OtterTail for the spring 2004 survey. Actual locations for all decoys are shown in Figure 2. Searcher efficiency was calculated using the following equation:

$$\text{Number of decoys observed} / \text{Total decoys placed} * 100$$

Results for the efficiency of the searchers are provided in the program database and are summarized as follows. Of the 15 total decoys placed, twelve (80 percent) were detected during the aerial surveys. Of the wetted channel habitat types, 100 percent of the decoys were observed, whereas only 40 percent of the other habitat types having more overstory cover were observed during the aerial surveys. In addition, one upland decoy was placed while the ground was snow covered. The aerial survey crew did not observe this decoy.

3.4 SUMMARY OF WHOOPING CRANE SIGHTINGS

OtterTail biologists regularly contacted Wally Jobman of the U.S. Fish and Wildlife Service in Grand Island to get updates on the spring migration from Aransas, Texas to the central Platte River Valley. This aided in knowing when crane groups were observed in southern states or when cranes were observed north of the Platte River. Tom Stehn of the Aransas National Wildlife Refuge prepared weekly migration reports relaying the number of cranes beginning the spring migration. These reports are provided in Appendix B.

The U.S. Fish and Wildlife Service 2004 Spring Migration Report is provided in Appendix C. This report includes observations within the United States and Canada.

Whooping Crane Sightings in the Study Area - Whooping Crane sightings within the central Platte River Study Area during the implementation of the protocol (PRESP 2004a) were limited to one observation on April 4, 2004. The roost site was located approximately 1.5 miles west of the Minden Bridge (Figure 2). Qualified observers confirmed this sighting during the aerial survey. The whooping crane was with a group of 20+ sandhill cranes. Although ground crews were dispatched to the area to begin ground observations, the whooping crane was never observed on the ground. However, a group number was assigned to this crane in accordance with the protocol. A USFWS Crane Group identification number was independently assigned by the USFWS based on aerial photos of the whooping crane and testimony of the observers. A summary of probable and confirmed sightings during the spring 2004 survey period is provided in Appendix D.

Total Crane Use Days - Total crane use days for the spring 2004 survey period were calculated by multiplying the number of cranes in each group by the number of days they were present in the study area. The total crane use days for the spring 2004 survey period of confirmed sightings was 1 day. Prior to implementation of the protocol, a whooping crane sighting was confirmed on the Platte River between the South Locust Street Bridge and the Highway 281 Bridge. This sighting was not considered when calculating crane use days and no river measurements were taken at this location as the sighting occurred prior to implementing the protocol. More details of this sighting can be found in Appendix D.

Systematic and Opportunistic Sightings - One whooping crane was confirmed during systematic sightings during the spring 2004 survey period. No whooping cranes were confirmed from opportunistic sightings. Many calls were received through the toll-free phone number, but the majority of these calls turned out to be white pelicans, snow geese or great egrets. One opportunistic sighting east of Kearney and north of Interstate 80 appeared to be a whooping crane, but could not be confirmed despite efforts by the survey crew. See Appendix D for more details on this sighting.

3.5 CHARACTERISTICS OF USE SITES

Information collected at the whooping crane river use site employed protocol for Use Site Characteristics and Stream Profiles. Figure 2 illustrates the location of the whooping crane roost location and the river use site. This river location was given the Use Site Identification Number of 2004SP01A. The wetted

channel at the crane use site was fairly clear of obstructions with the nearest obstruction 80m away. The middle profile at this use site had a bank-to-bank distance of 140 meters (Appendix E). The obstruction-to-obstruction distance along the transect was also 140 meters. Substrate at the use site was composed of fine sands (80%) and small gravel (20%). No management practices such as sandbar clearing or tilling were noted in the general area.

3.6 SANDHILL CRANE OBSERVATIONS

The 2004 spring migration produced record numbers of sandhill cranes in the central Platte River Valley. Many local residents commented on the numbers of sandhills being more than previous years in recent memory. Numerous albino sandhill cranes were also observed. These individuals were typically observed within the eastern side of the study area, but occurred throughout the central Platte River Valley. When first observed from a distance, these individuals were often difficult to distinguish from potential whooping cranes. However, most of the albino sandhills observed were lesser sandhills (*Grus canadensis canadensis*) and once seen with other cranes, it became easy to see that they were smaller birds. Closer inspection revealed that these individuals were indeed albino sandhill cranes with characteristic sandhill markings. Often the head or wings provided telling signs of their race.

During systematic aerial surveys, OtterTail biologists were asked to note sandhill crane activities within the Cottonwood Ranch Wildlife Area. Although aerial crews were instructed to record sandhills within this property, no sandhill cranes were observed using the Cottonwood Ranch Property.

4.0 RESULTS OF RESEARCH STUDY

A total of 14 late-day aerial surveys were scheduled to be flown from the Grand Island Airport from April 4-17, 2004. PRESP committee members are considering whether late-day flights may provide better weather conditions for pilots and visibility for observers during the systematic aerial surveys.

4.1 FLIGHT LOGS AND CANCELLATIONS FOR LATE-DAY AERIAL SURVEYS

A total of 14 of the 14 (100%) scheduled late-day flights were flown from the Grand Island Airport. All the flights were initiated; however three flights had to be discontinued due to poor weather conditions. Only small portions (i.e., $\frac{1}{4}$ length or less of the riverine transect) were not completed on these three occasions. On April 7th, approaching storm clouds limited visibility and made for windy conditions. On April 9th, a low cloudbank moved into the study area reducing visibility. On April 17th, high winds made flying extremely turbulent. During all three discontinued flights, the riverine transects were completed and at least $\frac{3}{4}$ of the upland transects were completed before the surveys were aborted; therefore, these flights were considered complete.

Compared to morning flights from the Grand Island Airport, late day flights were completed more often (100%) than morning flights (82.5%) in spring 2004. Split transects were completed more often, on average, during late-day surveys than during the morning surveys (Table 4-1). The distribution of the upland transects flown during the late day surveys is provided in Table 4-2.

The fall 2003 survey period also conducted late-day flights. The results of the fall 2003 research reported higher percentages of flight cancellations in the mornings than in the late-day periods (Greystone 2003). Results of late-day surveys during the fall 2003 and spring 2004 indicate that on average, more flights are completed during late-day surveys compared to morning surveys.

**TABLE 4-1
COMPARISON OF TRANSECT STARTING POINTS FOR LATE DAY AND MORNING
SURVEYS FLOWN FROM THE GRAND ISLAND AIRPORT, SPRING 2004**

Late Day Surveys		Morning Surveys	
Chapman Bridge	7	Chapman Bridge	14
Wood River Bridge	7	Wood River Bridge	19
Grand Island Total	14	Grand Island Total	33

TABLE 4-2
DISTRIBUTION OF RETURN (RIVERINE) TRANSECTS FLOWN FOR THE SPRING
2004 SURVEY

Return Transect	Number of Return Transects Flown	
	Late-Day	Morning
0 (River)	2	5
1S	2	5
1N	2	5
2S	2	5
2N	2	5
3S	2	4
3N	2	4
Total Flight Days	14	33

4.2 SEARCH EFFICIENCY

Ten decoy locations were provided for the research study and all were placed in wetted channels (Figure 2). Eight of the 10 (80%) decoys were observed during the late-day surveys.

Compared to the morning surveys, an equivalent percentage of decoys were observed during both time periods. However, if only the wetted channel decoy locations are considered during the morning surveys, the morning observations were more efficient than late-day observations as 100% of the wetted channel decoys were observed during morning surveys.

During the fall 2003 surveys, 90% of the decoys were observed in wetted channels during late-day surveys. These results are slightly higher than in the spring 2004 survey period. Greystone biologists observed one additional decoy compared to Ottertail biologist during the late-day surveys.

4.3 SUMMARY OF WHOOPING CRANE SIGHTINGS DURING LATE-DAY FLIGHTS

No whooping cranes were observed during late-day flights in the spring 2004 survey period. The only white objects observed during the late-day flights were one albino sandhill crane on April 6 and one snow goose on April 14. The albino crane sighting on April 6th was confirmed by use of the Rowe Sanctuary Crane Cam. When the aerial survey crew observed the white bird near west of the Gibbon Bridge, they radioed ground support (Blake Hatfield). Mr. Hatfield called the Rowe Sanctuary. Officials at Rowe Sanctuary were able to turn the cam and identify the white bird as an albino sandhill crane. Mr. Hatfield was then able to radio the plane and relay the information while the survey was still in progress. This

example shows the versatility of using a camera with aerial surveys and good ground to air communication.

5.0 RECOMMENDATIONS

The following recommendations are developed out of the experience gained in implementing the spring 2004 monitoring and research protocol.

5.1 FIELD MONITORING PROTOCOL

- Consider giving the contractor the option of forgoing random river site profiles, with permission from the executive director, when multiple (more than 3) whooping crane groups are observed. Conversely, give the contractor the option of canceling aerial surveys, with permission from the executive director, when reports from Aransas Wildlife Refuge indicate all whooping cranes accounted for and no whooping cranes in migration.
- Consider addressing how the aerial survey should proceed when a white object is observed. The protocol should address if the aerial survey needs to continue, with the survey as the main objective, or discontinue the survey until the ground crew has observed the white object. More data on whooping crane river use could be gained if ground crews could locate whooping cranes with the continued aid of an airplane. This may be especially true during the spring migration when whooping crane stopovers are short due to the birds' instinctive drive to get to the breeding areas.
- Sandhill crane data collection should be included in the field monitoring protocol or a separate protocol should be written for sandhill crane observations. Specifically, observations made at Cottonwood Ranch Wildlife Area and perhaps other areas in the central Platte River Valley where crane use should be recorded should be provided in writing.
- The decoy location coordinates need to include datum and projection information as well as the UTM X and Y coordinates. This will greatly aid the field crew in properly locating the random points within the study area and avoid any confusion at the beginning of each season.
- Consider using video cams concurrently with aerial surveys. If 1 or 2 cams were installed in high use areas, whooping crane activities may be observed more often. Poor weather inhibits migrating cranes and airplane use. During these conditions, video cams may be useful in observing cranes in high use areas and/or hard to access river reaches.

5.2 RESEARCH STUDY PROTOCOL

- Spring 2004 research results indicate more favorable flying conditions in the afternoon or evening compared to conditions in the mornings. This was also the case in the fall 2003 research. Consider continuing this research to the fall survey period. The late-day surveys may be more critical in the spring because whooping cranes do not dally on their way to the nesting grounds and more aerial surveys may eventually reveal more individuals using the study area.
- Although late-day flights were completed more often than morning surveys, biologists did not see more whooping cranes. We still have no data to suggest that detection of whooping cranes is more likely during late-day surveys except for the fact that more surveys may be completed. We recommend continuing research into late-day aerial surveys but changing the protocol may be premature.
- Setting decoys simultaneously for the morning and late-day flights is a labor-intensive activity. Consider reducing the number of decoy locations during the period when morning and late-day flights are scheduled at the same time.

6.0 LITERATURE CITED

Greystone Environmental Consultants. 2003. Fall 2003 Whooping Crane Migrational Survey Protocol Implementation Report. Prepared for Platte River Endangered Species Partnership. December.

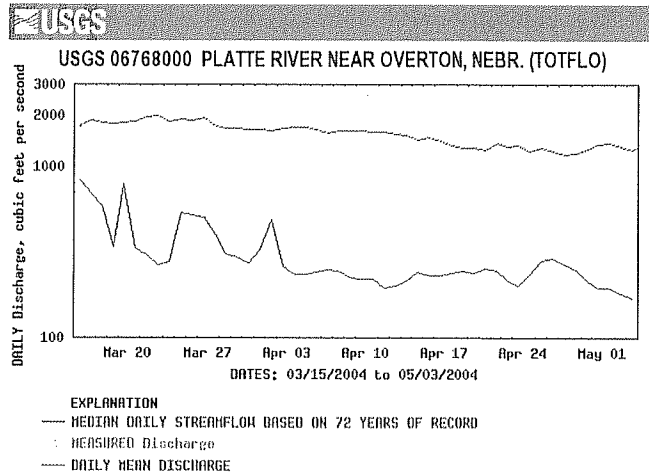
Platte River Endangered Species Partnership (PRES-P). 2004a. Draft Monitoring Whooping Crane Migrational Habitat Use in the Central Platte River Valley -- Whooping Crane Monitoring Protocol. January 14.

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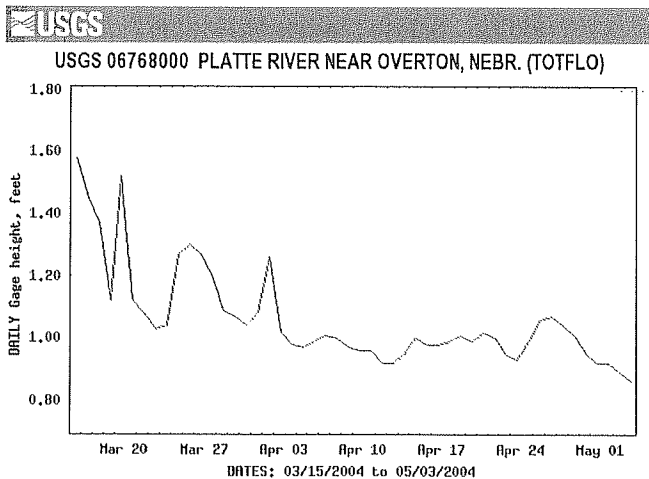
APPENDIX A—USGS GAGE STATION DATA MARCH 15 TO MAY 3, 2004

USGS Gage Station Data
March 15 to May 3, 2004

Overton, Nebraska Gage Station

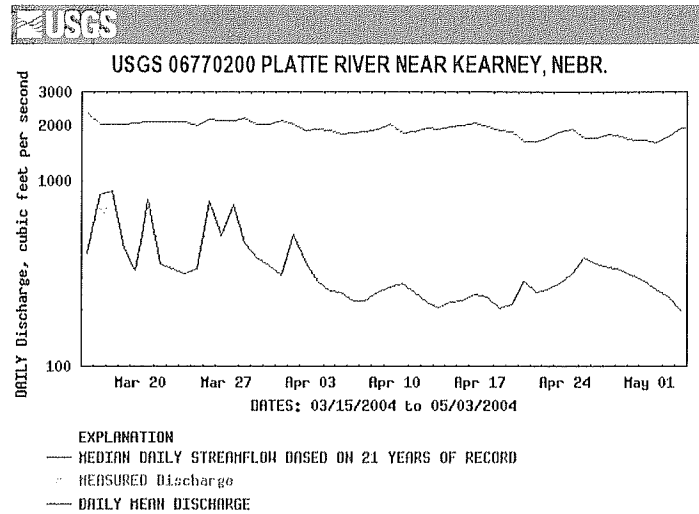


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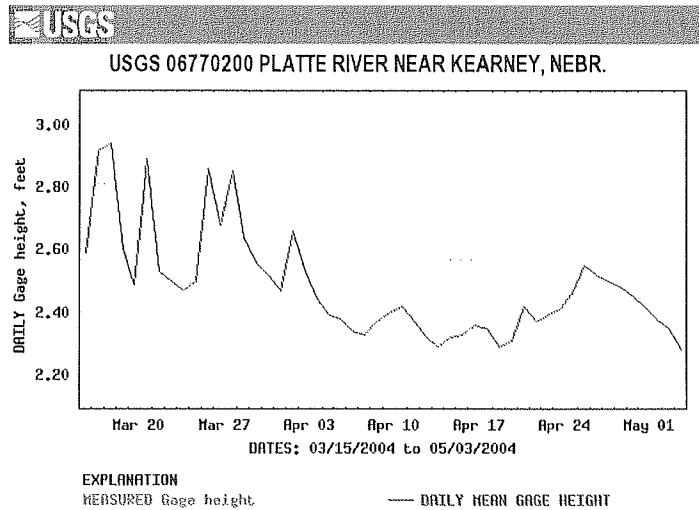


Provisional Data Subject to Revision

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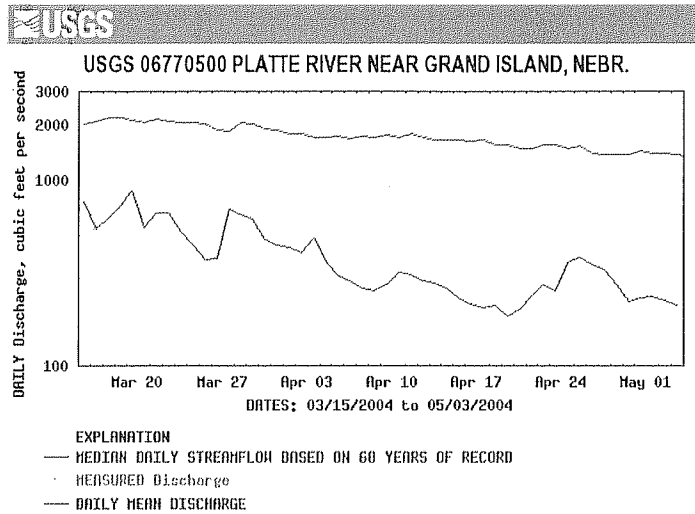


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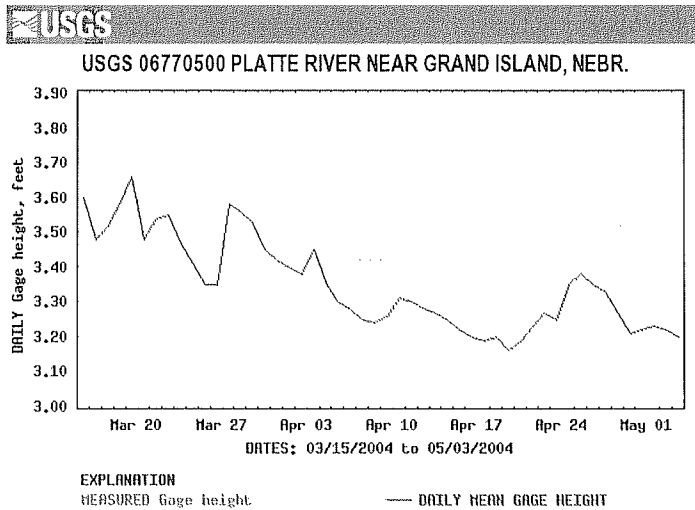


Provisional Data Subject to Revision

Grand Island, Nebraska Gage Station



Provisional Data Subject to Revision



Provisional Data Subject to Revision

APPENDIX B—ARANSAS NATIONAL WILDLIFE REFUGE WHOOPING CRANE SURVEY REPORTS

Aransas National Wildlife Refuge
Whooping Crane Reports

March 11, 2004

An aerial census on March 11, 2004 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes in the flock at 169 adults + 24 young = 193.

Recap of cranes observed: (189)

adults + young

Refuge 46 + 9

Lamar 4 + 1

San Jose 39 + 6

Matagorda 59 + 6

Welder Flats 17 + 2

Total 165 + 24 = 189*

* Cranes possibly overlooked were the Jay Bird Point pair on San Jose and 1 subadult.

Remarks: Flight conditions were good with bright overcast most of the day. It became darker for much of the census on San Jose before clearing during a final search on San Jose.

The number of cranes estimated present at Aransas is 192. From the peak winter population of 194, 1 juvenile is missing and presumed dead and 1 whooping crane is on the Platte River in Nebraska. Thus, an estimated 3 cranes were presumably overlooked, including the Jay Bird Point pair on San Jose and 1 subadult. This estimate would increase by 1 subadult if the crane on the Platte turns out to be a juvenile that may have wintered away from Aransas.

Thirty-two subadults were located on the flight, with 15 found on Matagorda. The N. Allyn's Bight family was not located for the sixth week in a row. The chick is listed as missing and presumed dead. The adults are presumably being seen on the census, but cannot be identified due to not having bands and are not on their territory.

Habitat: Six cranes were seen in uplands, including 3 first seen in flight over a burn green-up north of Power Lake. A new prescribed burn done March 10th near Contee Lake had small sections still burning. Eight cranes were observed in open bay habitat, all at Welder Flats. Three of these were the Dewberry family opposite Fulghums. Cranes were in a variety of habitats, with less evidence of foraging on crabs. Thirty-five cranes in large unvegetated flats or open bays were presumably foraging on clams or other invertebrates (6 on the refuge, 10 on Matagorda, 8 at Welder Flats, and possibly 11 on San Jose). One crane was observed pecking at a mid-size fish. Tides were measured at 2.3 mlt on March 8, and still low enough to have some oyster reefs exposed in the bays. About 60 % of the flats on San Jose were dry. Cedar Bayou remains open to the Gulf.

Locations of abandoned crab pots were marked on maps during the census. Totals included 6 pots at Welder Flats, 16 crab traps on San Jose, and 61 on Matagorda Island for a total of 83. The number used to be in the hundreds before cleanup was worked on the last 3 years. The area looks so much better.

Notes: A metal band was seen on the right foot of the N. Dunham Point male, WbW-low silver, the first time the metal band was seen this winter.

The census on San Jose added uncertainty to estimated totals. Cloudy skies made viewing conditions less than ideal while over San Jose. Observer fatigue was also a factor since San Jose was flown at the end of the day (flight hours 7 and 8). Transects were flown across the island due to the sun angle. The Jay Bird Point pair may have been overlooked. The E. Spalding Lake family group was overlooked initially, but found later at the end of the time over San Jose. One adult of the Long Reef pair was seen chasing a pair believed to be "Fenceline". On the initial coverage, no pairs were present on the "H" or "W" territories. However, 2 pairs were found west of those two territories. A limited search at the end of the coverage found pairs both at "W" and "H", but none to the west.

The North Lamar pair was overlooked when checked at 1 PM, but found on their territory at 4:30 PM. Where had they been earlier? The Big Tree family was on their usual spot at the "brackish" pond next to the uplands. Later, they were on a dirt road near a game feeding station.

March 23, 2004

An aerial census on March 23, 2004 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes at Aransas to be a minimum of 159 adults + 22 young = 181.

Recap of cranes observed: (181)

	adults + young
Refuge	41 + 7
Lamar	4 + 1
San Jose	39 + 6
Matagorda	60 + 6
Welder Flats	15 + 2
Total	159 + 22 = 181

Remarks: Flight conditions were fair with bright overcast mixed with sun throughout the day. Winds were strong, gusting up to 20 mph from the southeast. Haze limited visibility and kept accumulating on the windshield.

The number of cranes estimated present at Aransas is a minimum of 181. Approximately 6-10 cranes are believed to have started the migration, including the following territorial cranes; the Lobstick pair with their twin chicks, and the Grass Island pair from Welder Flats. All other pairs were present on their territories. It is probable that several subadults were overlooked on the flight.

There are at present no confirmed sightings in the Flyway. One whooping crane was reported earlier on the Platte River in Nebraska, but was only seen once. Two albino sandhills are currently being reported on the Platte where sandhill numbers are peaking. No sandhills were seen on today's flight at Aransas.

Habitat: Tides have risen substantially, measured at 2.7 mlt on March 22. The higher tides and warmer water temperatures have allowed blue crabs to move back into the marshes and are believed at present to be the predominate food of the cranes. Salinities are between 19-22 ppt. On today's flight, two cranes were seen at an apparent freshwater source. No cranes were on prescribed burns. Cranes were in a variety of habitats, but most were in open water or flooded vegetation. Some were standing alert on sandflats.

03-29-04 correction to 03-23-04 report:

I reported erroneously the Lobstick twin family as having started the migration. The family of 4 was seen back on their territory on March 26th. Thus, very few cranes had departed by my March 24th flight, with only 1 territorial pair unaccounted for that day.

Migration conditions were excellent on the Texas coast March 26-28. Two whooping cranes were confirmed at Salt Plains NWR in Oklahoma on March 28th.

It is still early. In a typical year, most adult pairs don't leave until the second week in April, give or take a few days. However, last spring, the migration was on the early side with nearly 1/3rd of the flock having left Aransas by April 2nd.

March 31, 2004

An aerial census on March 31, 2004 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes at Aransas to be a minimum of 145 adults + 22 young = 167.

Recap of cranes observed: (167)

	adults + young
Refuge	34 + 7
Lamar	4 + 1
San Jose	38 + 6
Matagorda	52 + 6
Welder Flats	17 + 2
Total	145 + 22 = 167

Remarks: Flight conditions were excellent with sunny skies and light winds.

The number of cranes estimated present at Aransas is a minimum of 167. A maximum of 26 cranes (13.5 % of the flock) are believed to have started the migration, including the following territorial cranes; Lobstick pair with their twin chicks, Mustang Slough, N. Sundown Bay, Middle Pond, North Dunham Point, Jay Bird Point, South Matagorda, Shell Reef Old, and South Cottonwood. In total, an estimated 9 out of the 69 wintering adult pairs (13%) have initiated the migration. The Lobstick family is the only family to have migrated. Although not located on last week's census flight, the Lobstick pair with their twins was reported back on their territory two days later on March 26th. The Grass Island pair, not found last week, was present this week and thus had also been erroneously reported as having migrated. Since a few cranes are generally overlooked on any given census flight, it is likely that about 20 cranes (10% of the flock) have started the migration. Most of the 20 plus cranes are believed to have departed March 26-28 when strong southeast winds blasted across the Texas coast. Recently, there has been only one confirmed sighting of one pair of whooping cranes at Salt Plains NWR in northern Oklahoma on March 28th.

A pair on the refuge's Mustang Slough was seen in spiral flight at 10:30 AM. The cranes got as high as 700 feet but did not seem to be making any progress to the north, so we broke off following them and resumed the census. An hour later, we observed the St. Charles Bay family group take flight from the mouth of Copano Creek and spiral up to 1,500 feet after which we lost sight of them and quickly decided to resume the census. Again, they did not seem to be making much progress to the north. In both cases, winds were west northwest (between 290 and 310 degrees) and unfavorable for migration. With the cranes needing to migrate at a heading of approximately 330 degrees, the light winds of less than 10 mph were a head wind. In the afternoon, the winds switched from the south at 10 mph. Had the cranes somehow sensed the wind shift and started migration, or were they simply restless and doing some pre-migration soaring? I believe the latter is more likely.

Habitat: A cold front that brought northeast winds March 29-30 to the coast lowered tides by 0.6 feet, measured at 2.3 mlt on March 30th. On today's flight, 12 cranes were seen at freshwater, a result of seeking out drinking water with the marsh salinities measured yesterday at 22-24 ppt. Two cranes were on a prescribed burn on San Jose. Three cranes were standing on an upland shell road. Two cranes were in open bay habitat.

April 7, 2004

An aerial census on April 7, 2004 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes at Aransas to be a minimum of 93 adults + 16 young = 109.

Recap of cranes observed: (109)

	adults + young
Refuge	29 + 5
Lamar	2 + 0
San Jose	17 + 5
Matagorda	34 + 4
Welder Flats	11 + 2
Total	93 + 16 = 109

Remarks: Flight conditions were excellent with sunny skies and light winds during 5.7 hours of flight time. A small number of cranes may have been overlooked since transects were flown wider than usual and not all sections of marsh were covered as thoroughly. However, most of the cranes present were believed to have been located.

The number of whooping cranes at Aransas is a minimum of 109. An estimated 58 whooping cranes have started the migration since the last flight on March 31. One third of the family groups are in migration (8 out of 24). Thirty-three of the 69 wintering territorial adult pairs are in migration (48%). The 84 cranes total having started migration is 43.5% of the flock.

Territorial pairs still present that are being intensively studied by TAMU are the unbanded Pipeline family group, the N. Pump Canal pair, and possibly the Blackjack pair. The N. Pump Canal pair was originally sighted in the adjacent territory to the north, but then returned to their territory. The Blackjack pair was on Dunham Point, although this also could have been two subadults. The Boat Ramp pair has migrated.

I believe we are in the middle of a peak whooping crane departure period at Aransas. I expect a significant number of cranes to have departed prior to my next flight on April 14th. A group of 3 cranes was confirmed at Salt Plains NWR in Oklahoma on April 7, and an unconfirmed sighting of 2 cranes east of Blanco, Texas (approximately 50 miles north of San Antonio) on April 5. I have received reports that most of the migratory Florida whooping cranes have started the migration, with some having already returned to Necedah NWR in Wisconsin.

Habitat: The Aransas refuge recently received substantial rains, with much of the mudflats observed on today's flight covered with water. No cranes were observed at fresh water sources, uplands, burns, or in open bay habitat. The cranes are presumably feeding heavily on crabs prior to migrating. Crab counts completed on April 1 found high numbers of all size classes of blue crabs in the marshes.

April 14, 2004

An aerial census on April 14, 2004 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes at Aransas to be 11 adults + 3 young = 14.

Recap of cranes observed: (14)

adults + young

Refuge 7 + 2

Lamar -

San Jose 4 + 1

Matagorda -

Welder Flats -

Total 11 + 3 = 14

Remarks: Flight conditions were excellent with sunny skies and light winds during 5.9 hours of flight time.

The number of whooping cranes found totaled 14. This included 3 family groups and 6 subadults. One of the family groups was the "Behind Middle Pond" single adult family. It is noteworthy that after spending much of the winter with another adult crane, the family was back to being a one adult family. Thus, re-pairing of this adult whose identity is unknown in Canada had not occurred at Aransas during the winter.

An estimated 95 whooping cranes have started the migration since the last flight on April 7. Conditions for migration were suitable April 8-10 but unsuitable April 11-13 as a strong low pressure system with strong north winds crossed the coast. On today's flight, after seeing two subadults and the unbanded E. Spalding Lake family group at approximately 0830 AM, these 5 cranes were not sighted during re-checks at 1220 and 1500 hours and are believed to have started migration by late morning. Winds had switched to the southeast by noon at about 5 mph after being calm or from 320 degrees up to about 10 AM. Even with light southeast winds, the strong thermals would have provided suitable migration conditions.

The third territorial family group present was the Pipeline family. Two cranes together on Dunham Point were possibly subadults. The Mustang Lake pair seen from the refuge observation tower has migrated.

The migration leaving Aransas is just about over with an estimated 9 cranes still present at the end of the day. Thus, 95% of the population has started migration. Strong southeast winds are forecast for the next three days, so most of the cranes should be gone by next week. Whooping cranes have been reported recently all the way from Texas to North Dakota. All but possibly 1 of the eastern whooping cranes have started the migration, with many back in Wisconsin already.

Habitat: No cranes were observed at fresh water sources, uplands, burns, or in open bay habitat. Tides were notably low due to the strong low pressure system and north winds present April 11-13.

April 21, 2004

An aerial census on April 21, 2004 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes at Aransas to be 6 adults + 2 young = 8.

Recap of cranes observed: (8)

adults + young

Refuge 6 + 2

All other areas 0

Total 6 + 2 = 8*

* 3 adults and 2 juveniles started migration during the flight, leaving only 3 subadults at Aransas.

Remarks: Flight conditions were fair with mostly cloudy skies become partly sunny by noon. The number of whooping cranes found totaled 8. This included the Pipeline family group, the Behind Middle Pond single adult with chick, one subadult south of the Pipeline, and a subadult duo on Blackjack Point. The presence of the two family groups was unexpected since migration conditions had been excellent April 15-20 with sunny skies and very strong southeast winds.

April 21st is the latest I have ever observed adult whooping cranes still at Aransas. All eight cranes were found on today's flight before 9 AM. After flying over the rest of the crane range, the refuge was re-checked at noon and only 3 subadult cranes were found. The two family groups (5 cranes total) had started migration between 9 and 12 noon on April 21st.

The migration leaving Aransas is just about over with only 3 whooping cranes still present. Ninety-eight percent of the flock has departed. Whooping cranes have been reported recently all the way from Texas to North Dakota. All the eastern whooping cranes have started the migration, with many already back in Wisconsin.

Habitat: On today's flight, no cranes were observed at fresh water sources, uplands, burns, or in open bay habitat. Many mudflats were exposed on San Jose and Matagorda islands as moderately low tides combined with strong southeast winds blew the water over towards the west side of the bay.

April 28, 2004

An aerial census on April 28, 2004 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes at Aransas to be 2 adults + 1 young = 3.

Recap of cranes observed: (3)

adults + young

Refuge 2 + 1

Remarks: Flight conditions were good with bright overcast skies and light winds. Only the refuge was covered with 1.4 hours of flight time.

The number of whooping cranes found totaled 3. The juvenile was identified by light brown feathers seen on the head and a small patch of brown on the back. An estimated 190 whooping cranes (98% of the population) have started the migration, with reports starting to be received of whooping cranes in Saskatchewan. A few subadult cranes (and once a widowed adult) occasionally have stayed at Aransas into the first week in May before departing. Winds at Aransas were unfavorable for migration April 25-27 with a low pressure system bringing north winds.

The 3 cranes together in the Middle Sundown Bay territory I believe were the Behind Middle Pond one adult family joined by another white-plumaged crane. However, they could have also been two subadults and the chick from the Behind Middle Pond single adult family, or the Pipeline family group. However, the chick was at first seen separate from the 2 white-plumaged cranes, showing similar independence similar to that shown by the Behind Middle Pond chick all winter. Last week, the Pipeline family group was believed to have started the migration by noon. At noon that day, a single white-plumaged crane was seen close to where the three cranes were seen today. Perhaps this had been the widowed Behind Middle Pond adult and the chick had been overlooked. However, the single bird seen at noon last week had looked bedraggled with some gray markings on the feathers, whereas the two white-plumaged cranes seen today showed typical plumage.

Habitat: No cranes were observed at fresh water sources, uplands, burns, or in open bay habitat.

May 12, 2004

A final census flight made May 12, 2004 did not find any whooping cranes at Aransas. The last two cranes were last seen on the refuge late in the day on May 4th. Census flights in Canada's Wood Buffalo Park are scheduled to begin this week. Tides at Aransas were notably high, the highest seen since mid-October, 2003.

APPENDIX C—U.S. FISH AND WILDLIFE SERVICE SPRING 2004 WHOOPING CRANE MIGRATION REPORT

COOPERATIVE WHOOPING CRANE TRACKING PROJECT (March 2004 - May 2004)

Whooping crane spring and fall migrations are monitored each year. The spring 2004 migration marked the fifty-eighth migration monitored since the tracking project began in the fall of 1975. Sighting reports are forwarded to the Ecological Services Field Office of the U.S. Fish and Wildlife Service, Grand Island, Nebraska, by private individuals, the National Audubon Society, the Nebraska Wildlife Federation (i.e., volunteer whooping crane monitoring program), other private organizations, State and Federal conservation agencies, and the Canadian Wildlife Service. Cooperation throughout the whooping crane flyway continues to be excellent. Special thanks go out to each participant.

Between 1977 and 1988, 132 juvenile whooping cranes were color-marked on the breeding grounds; of these 26 were accounted for during the winter of 2003-04. Four color-marked cranes were observed during the spring migration. All sightings of color-marked whooping cranes during migration are maintained at the Grand Island office. **We cannot over-emphasize the importance of observers looking closely for the colored leg bands.**

Whooping crane departures from Aransas National Wildlife Refuge (Aransas) (Fig. 1), a sighting report summary (Table 1), and a map of degree-block sighting locations (Fig. 2) are included with this narrative summary. Repeat sightings of the same birds at the same location during a stopover period are not included when known to be repeats. Only sightings classified as confirmed, based on whooping crane recovery plan criteria, are shown in the report. Probable and unconfirmed sightings are not shown. All whooping crane reports received from the United States are on record in the Grand Island Ecological Services Field Office and are available upon request.

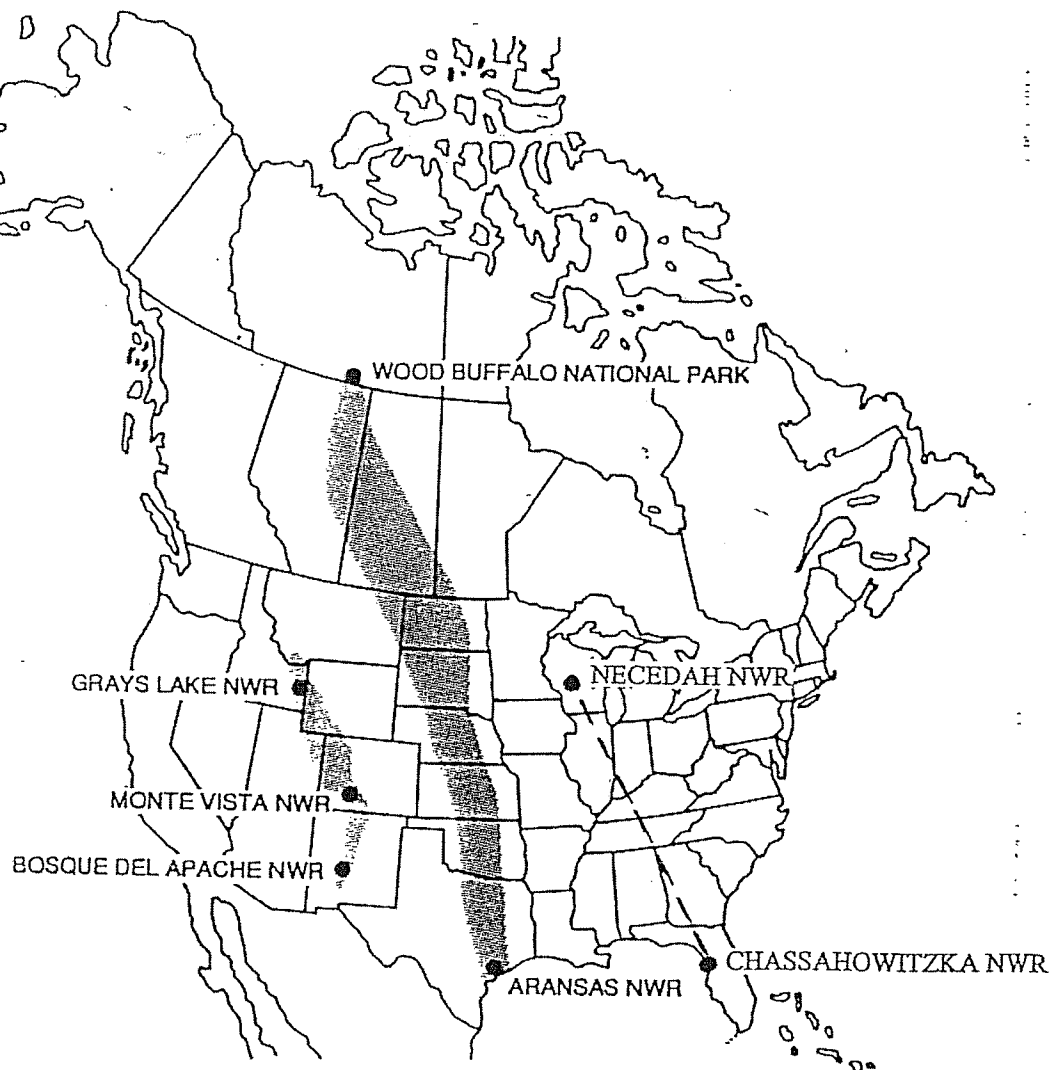
A peak population at Aransas of 194 (169 adult/subadult and 25 juvenile) whooping cranes was estimated for the winter of 2003-04. One juvenile crane is believed to have died at Aransas during the winter. Therefore, an estimated 193 (169 adult/subadult and 24 juvenile) whooping cranes were present during the spring of 2004. Departures from Aransas were about average (i.e., the majority of departures normally occur between April 4 and 12). An aerial census at Aransas on April 14 indicated that 153 whooping cranes had started migration since the flight on March 31. Approximately 89 percent (171) of the cranes departed Aransas between March 24 and April 14, and all cranes had migrated by May 12.

The first dates recorded for confirmed observations of migrating whooping cranes were March 8 in United States and April 16 in Canada (Table 1). The last sighting date was April 29 in the United States and May 30 in Canada. Sightings were reported from Texas (2); Oklahoma (3); Kansas (3); Nebraska (4); South Dakota (1); North Dakota (9); and Saskatchewan, Canada (18).

All but one (i.e., March 8) of the confirmed sightings in the United States were reported between March 27 and April 29. The weather during April was unseasonably warm and dry in the northern Great Plains, with numerous high temperatures in the 80s. A major sandhill crane, and probably whooping crane, migration occurred from April 3-5. The mild weather during April allowed the migration to progress quickly.

Thanks again to the many cooperators. Your continued assistance is essential to the tracking project. Please contact Mr. Wally Jobman, U.S. Fish and Wildlife Service, in Grand Island, Nebraska, if observation details are desired (203 West Second Street, Federal Building, Second Floor, Grand Island, Nebraska 68801; commercial telephone: (308)382-6468, ext. 16, FAX (308)384-8835, or email: wally_jobman@fws.gov).

(c)TracSp.04



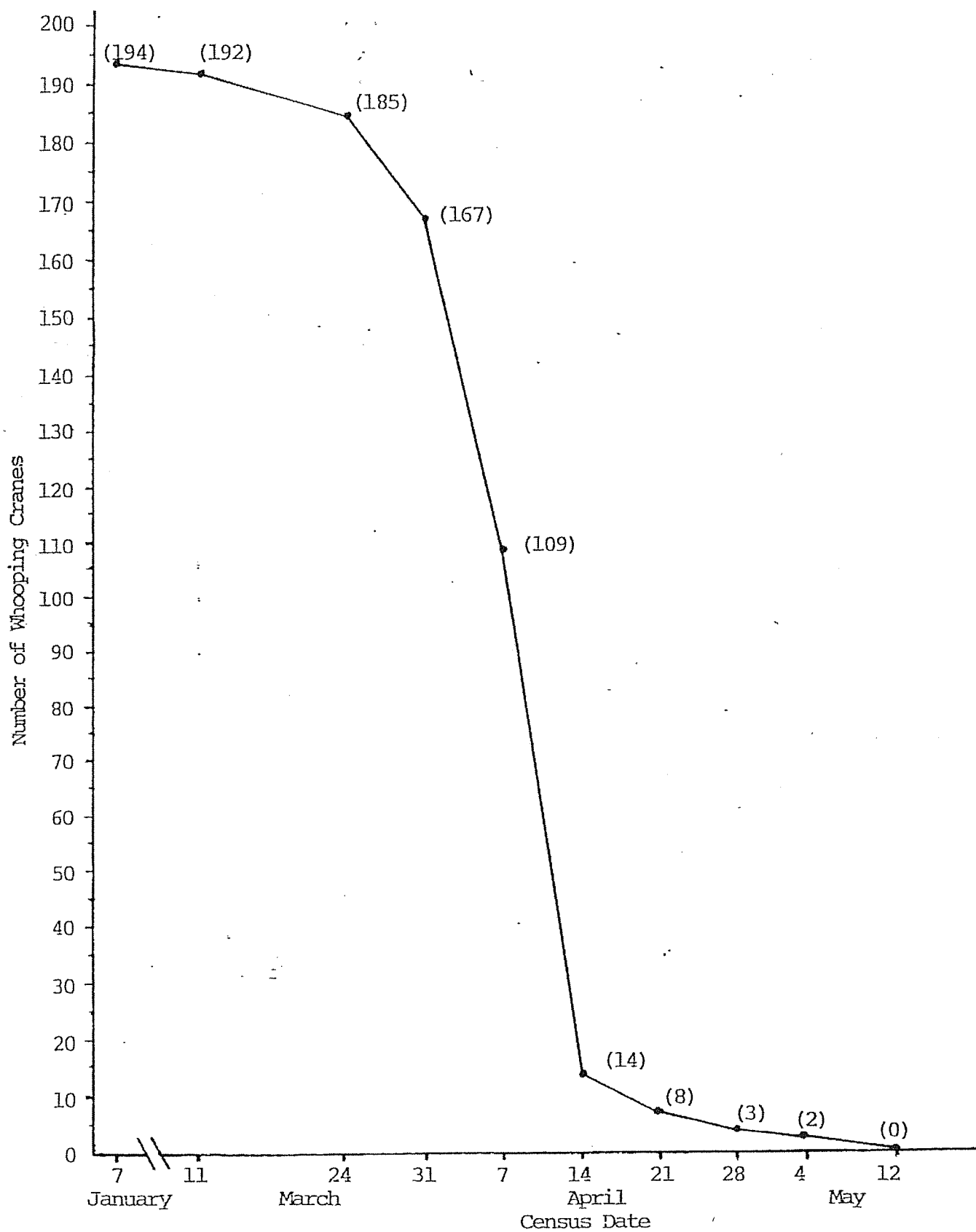


Fig. 1. Chronological departure of whooping cranes from Aransas NWR, Texas; Spring 2004.

Table 1. Date, State or Province of occurrence, and number of birds observed in confirmed whooping crane sightings reported during the Spring 2004 migration.¹

Date ²	TX	OK	KS	NE	SD	ND	Sask.
03/08				1-0			
03/27		2-0					
04/04				1-0			
04/05	4-0						
04/06					4-0		
04/07		3-0					
04/09						2-0;2-0	
04/10	6-0					4-0	
04/11			4-0				
04/12		6-2					
04/14			<u>4</u> -1				
04/15				4-0			
04/16			2-1	2-0			2-0
04/17						2-0	2-0;2-0
							1-0
04/20							2-0;2-0
04/21						<u>2</u> -1	2-0;4-0
04/22						1-0;2-0	2-0;4-0
04/24						2-1	3-0
04/26							2-0
04/27							3-0;2-0
04/28							1-0
04/29						4-1	
05/03							2-0
05/20							5-0
05/30							1-0
TOTAL REPORTED SIGHTINGS							
	2	3	3	4	1	9	18

¹Each report represented by number of whooping cranes reported; adult-young. Sightings in which color-banded birds were present are underlined.

²Month-day; first date of sighting used when bird(s) at location several days.

(c)tableS04

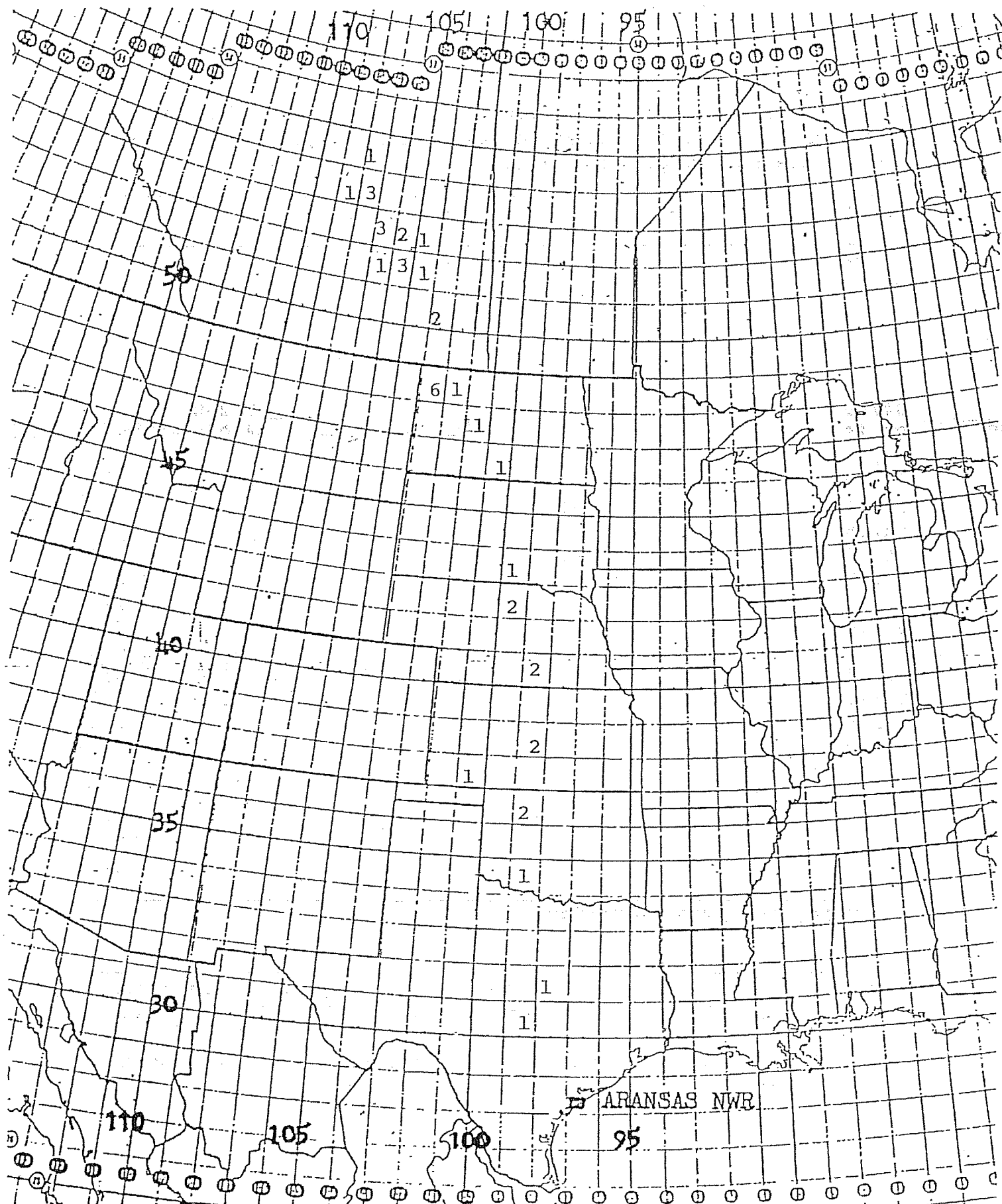


Fig. 2. Number of confirmed whooping crane sightings reported in each degree block during the spring 2004 migration.

CONFIRMED

Spring 2004 Whooping Crane Sightings in The U.S.A.

State/Obs.	Date	No.	Location
NE 04A-01	03/08/04	1	Hall Co., Platte River, 5 mi. south of Grand Island between South Locust St. and Hwy 281 bridges.
OK 04A-02	03/27-28/04	2	Alfalfa Co., Salt Plains NWR.
TX 04A-03	04/05/04	4	Blanco Co., 5 mi. east of Blanco. Flying.
SD 04A-04	04/06/04	4	Lyman Co., 4.5 mi. east and 2 south of Presho.
OK 04A-05	04/07/04	3	Alfalfa Co., Salt Plains NWR.
ND 04A-06	04/09/04	2	Divide Co., 4 mi. south of Fortuna. R-nil.
KS 04A-07	04/11/04	4	Meade Co., 5.5 mi. south and 3 east of Plains.
OK 04A-08	04/12/04	6+2	Tillman Co., 7 mi. south and 4 east of Frederick, Hackberry Flats WMA.
ND 04A-09	04/09/04	2	Williams Co., 1 mi. north-west or Zahl. T159N, R101W, S15, SE4.
KS 04A-10	04/14/04	4+1	Barton Co., Cheyenne Bottoms SWA, Pool 1A. Y-nil, Grey-nil.
KS 04A-11	04/16/04	2+1	Stafford Co., Quivira NWR.
ND 04A-12	04/10-12/04	4	McLean Co., 4 mi. west of Benedict. T150N, R82W, S3.
ND 04A-13	04/17/04	2	Divide Co., 2 mi. west and 2 south of Crosby.

NE 04A-14	04/15-17/04	4	Keya Paha/Rock Co. line, Niobrara River, 0.25 mi. downstream from Carns bridge. T32N,R18W,S19,NW4.
NE 04A-15	04/16/04	2	Keya Paha/Rock Co. line, Niobrara River, 1 mile upstream from Carns bridge. T32N,R19W,S23,SE4.
ND 04A-16	04/21/04	2+1	Mountrail Co., 3 mi. south and 3 west of Belden. T153N,R91W,S5,SW4. Y on one bird.
TX 04A-17	04/10/04	6	Parker Co., Brazos River, Horseshoe Bend, 10 mi. south of Weatherford, flying over Lake Granbury.
ND 04A-18	04/22/04	1	Divide Co., 4 mi. east and 8 north of Wildrose. T161N,R96W,S26,NW4.
ND 04A-19	04/22/04	2	Divide Co., 8 mi. south and 0.25 west of Ambrose. T162N,R99W,S23,SW4.
ND 04A-20	04/24/04	2+1	Williams Co., 4 mi. north and 2 west of Ray. T157N,R97W,S20.
ND 04A-21	04/29/04	4+1	Emmons Co., 1 mi. north and 1 west of Strasburg. T131N,R76W,S22.
NE 04A-22	04/04/04	1	Buffalo Co., Platte River, 1.5 mi. west of the Minden Bridge. T8N,R15W,S14.

APPENDIX D—SUMMARY OF PROBABLE AND CONFIRMED WHOOPING CRANE SIGHTINGS FOR THE CENTRAL PLATTE RIVER, SPRING 2004

Date: 8 March 2004

Location: Platte River between the South Locust Street and Highway 281 Bridges

Observation: The Whooping Crane Trust observed a single whooping crane with sandhill cranes during an aerial survey the morning of March 8, on the Platte River between the South Locust bridge and Hwy 281 bridge south of Grand Island.

Date: 3 April 2004

Location: Jeffery Island

Observation: Large white bird with Sandhill Cranes. Noted that bird had a long neck. Continued on survey and radioed to ground crew to search. After survey complete, returned to Jeffery Island area by plane to see a white bird flying, but did not see black wing tips. Could not observe if neck was extended or bent in flight. Returned to the point of the original observation, but no white bird was observed. Continued search with two ground crews for three hours, but nothing was found.

Resolution of observation: Unconfirmed Whooping Crane sighting per protocol

Date: 3 April 2004

Location: Platte River Trust Land – Uradell Property (west of Wood River Bridge)

Observation: White bird with black wing tips flew over the Uradell Property. Radioed to ground crew to begin searching in this area. After aerial survey was completed, crew returned by plane to the Uradell Property, but could not locate the bird. Ground crew searched for three hours but nothing was found.

Resolution of observation: Probable Whooping Crane sighting per protocol.

Date: 3 April 2004

Location: 1.0 mile north of the I-80 overpass of the Fort Kearney hike/bike trail on private land.

Observation: White bird with sandhill cranes in cropland observed in the morning by U.S. Fish and Wildlife Official, Bob Harms.

Resolution of observation: Probable Whooping Crane sighting.

Date: 4 April 2004

Location: 1.5 miles west of Minden Bridge – Platte River Trust Land

Observation: Large white bird seen by Eric Volden flying east leg of survey. Note that this is an area that the flight legs (Grand Island - east and Kearney - west) overlap. Therefore, both the Kearney flight and the Grand Island flight flew over this area on the riverine transect and both reported seeing two white birds and indicated one as an albino Sandhill Cranes. Eric confirmed the second white bird as a Whooping Crane given his experience in identifying cranes from aerial surveys and general ornithology skills.

Resolution of observation: Confirmed Whooping Crane sighting by aerial observation per protocol – see attached photos in 5 May 2004 email to Wally Jobman, USFWS. Recommend USFWS consider assigning Program Crane Group ID to this sighting.

Date: 9 April 2004

Location: 6-7 miles east of North Platte (outside of study area)

Observation: 4 Whooping Cranes seen in field along State Farm Road east of North Platte. Originated as a call to the 1-800 phone number on Sunday (two days later than observation).

Birds observed in cornfield near NPPD canal. Observer indicated that birds were not pelicans or snow geese when questioned, but not a biologist or bird expert.

Resolution of observation: Probable sighting outside of study area.

Date: 14 April 2004

Location: 3-4 miles east of Shelton Bridge, east of where the powerline crosses the Platte River.

Observation: Large white bird in with a group of Sandhill Cranes seen by aerial survey crew.

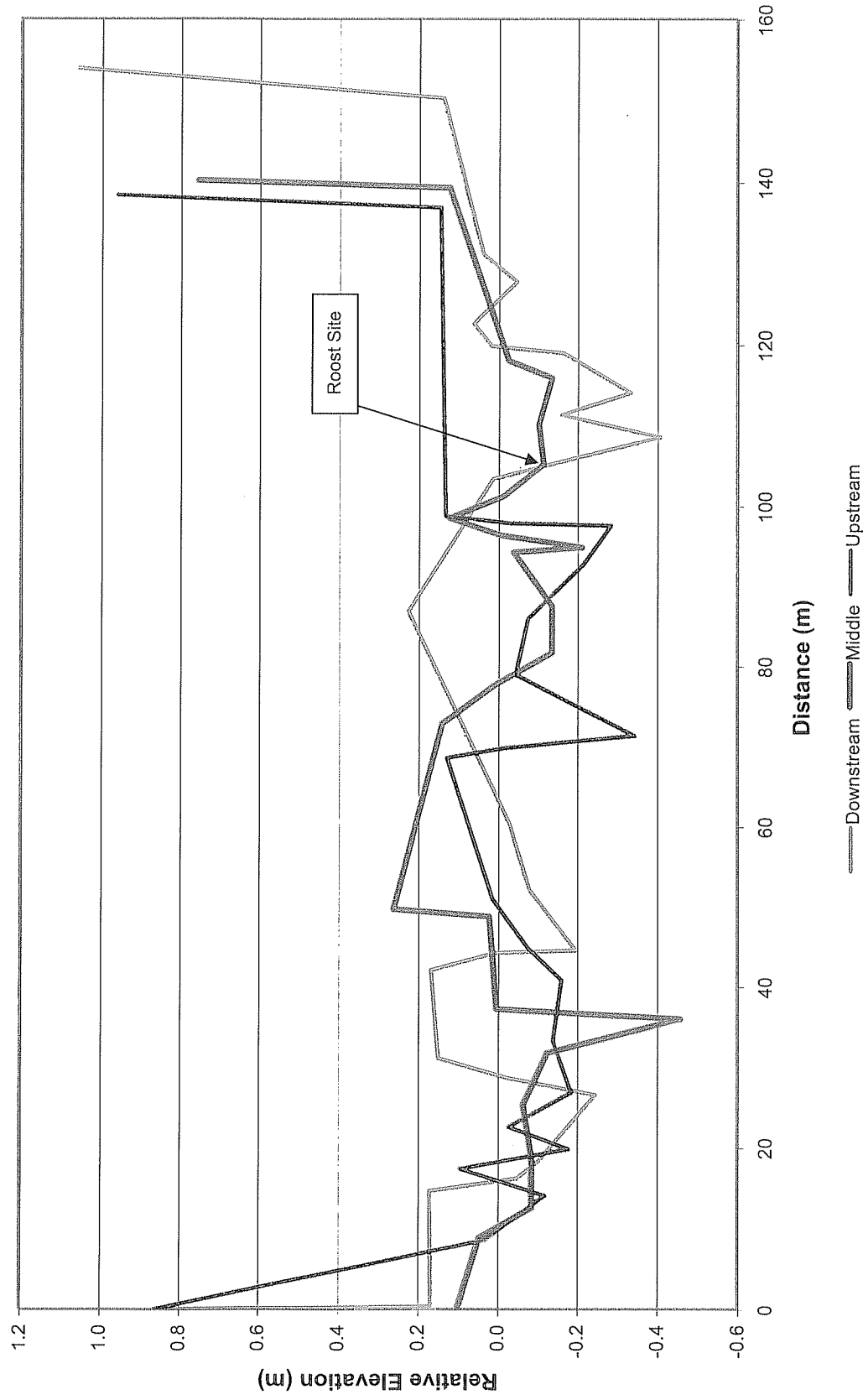
Ground crew searched by accessing river one mile downstream through PRT land. The cranes had left the river by then. Continued ground search found Sandhill Cranes on north side of river.

Ground crew saw a white bird in with the group of Sandhill Cranes on the ground, north of the river and east of Shelton, but they flew before a positive ID could be made. A white crane was subsequently seen by aerial survey crew the next 5 days and was always with Sandhill Cranes. Behavior leads one to believe this was an albino Sandhill Crane and no observations indicated Whooping Crane markings.

Resolution of observation: Unconfirmed Sighting - likely albino Sandhill Crane.

APPENDIX E— CHANNEL DEPTH PROFILES FOR STREAM TRANSECT 2004SP01A

Channel Depth Profiles for Stream Transect 2004SP01A



Transect Measures Collected May 6, 2004 3:00 p.m.