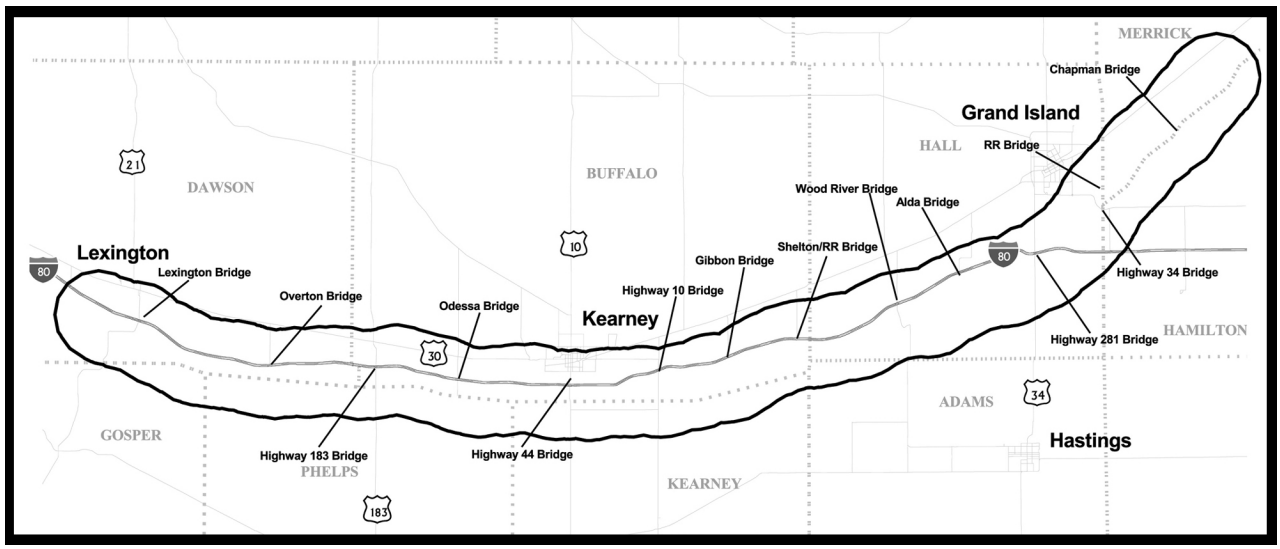
Final Report

Platte River Endangered Species Partnership

Platte River Endangered Species Partnership

Implementation of the Whooping Crane Migrational Survey Protocol Fall - 2003



February 2004

GREYSTONE®

FINAL REPORT

FALL 2003 WHOOPING CRANE MIGRATIONAL SURVEY PROTOCOL IMPLEMENTATION REPORT

Prepared for:

Platte River Cooperative Agreement
Platte River Endangered Species Partnership
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1.0 INTRODUCTION

Greystone Environmental Consultants, Inc. (Greystone), was contracted by the Platte River Endangered Species Partnership (PRESP) to monitor use of the central Platte River by whooping cranes during the fall 2003 migration period. PRESP is an organization created under a cooperative agreement among the States of Colorado, Nebraska, and Wyoming, and the U.S. Department of Interior (DOI).

PRESP has created a protocol for monitoring whooping crane use of the central Platte River during the spring and fall migrations. The PRESP Technical Committee developed the first version of the whooping crane monitoring protocol 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 issued on August 21, 2003 (PRESP 2003a). This version of the protocol was used to implement the fall 2003 survey.

The protocol includes procedures for conducting aerial and ground surveys to document use of the central Platte River by whooping cranes. The objectives of the surveys include:

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

PRESP's Whooping Crane Monitoring Protocol includes early morning flights as the systematic method for detecting whooping cranes. Early morning is also the period that has been historically used for past whooping crane surveys, sandhill crane surveys, and waterfowl surveys, conducted by other groups in the area. Members of the PRESP Technical Committee have raised several concerns regarding this systematic survey method (PRESP 2003b). These concerns include:

- Early morning flights may not be the most effective method due to weather and the frequency of canceled morning flights. It is possible that flying at another time of day will reduce the effect of these weather conditions and that surveys will be flown more regularly.
- Whooping cranes may be leaving the river earlier than originally thought and this results in the cranes departing the river before a morning survey flight arrives in their location.
- Early morning light may be causing observers to not see whooping cranes or whooping crane decoys.

In addition to the morning surveys required under the monitoring protocol, the fall 2003 survey effort included a separate research study during the late afternoon and early evening. A separate research protocol developed specifically for this study was followed (PRESP 2003b). Late-afternoon and early-evening flights were conducted to evaluate conditions at dusk compared with at dawn. The objective of this research is to determine if the detection of whooping cranes will be at least equal to or greater than with morning flights. Results from this research survey are included in this report.

This report summarizes the results of the fall 2003 whooping crane survey. Information presented in this report includes:

Section 2.0 Methods – this section describes field methods and explains quality assurance procedures used for the project.

Section 3.0 Results of Monitoring Protocol Implementation– this section includes a summary of results from implementing the fall 2003 monitoring protocol, including documentation of habitat use and a calculation of the annual index of crane use.

Section 4.0 Results of Research Protocol Implementation – this section describes the background, methods, and results of implementing the fall 2003 research protocol.

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

2.0 METHODS

Greystone followed the "Draft Monitoring Whooping Crane Migrational Habitat Use in the central Platte River Valley — Whooping Crane Monitoring Protocol" (PRESP 2003a) for the fall 2003 survey. The protocol includes methodologies for training, aerial surveys, ground surveys, ground monitoring, and collecting physical and biological data for whooping crane use sites. 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 continue to monitor 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 search 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 fall 2003 effort started on October 9 and ended on November 10, 2003, the 5th and 95th percentile of the dates for all recorded sightings of whooping crane groups in Nebraska from 1975 to 1999 (PRESP 2003a).

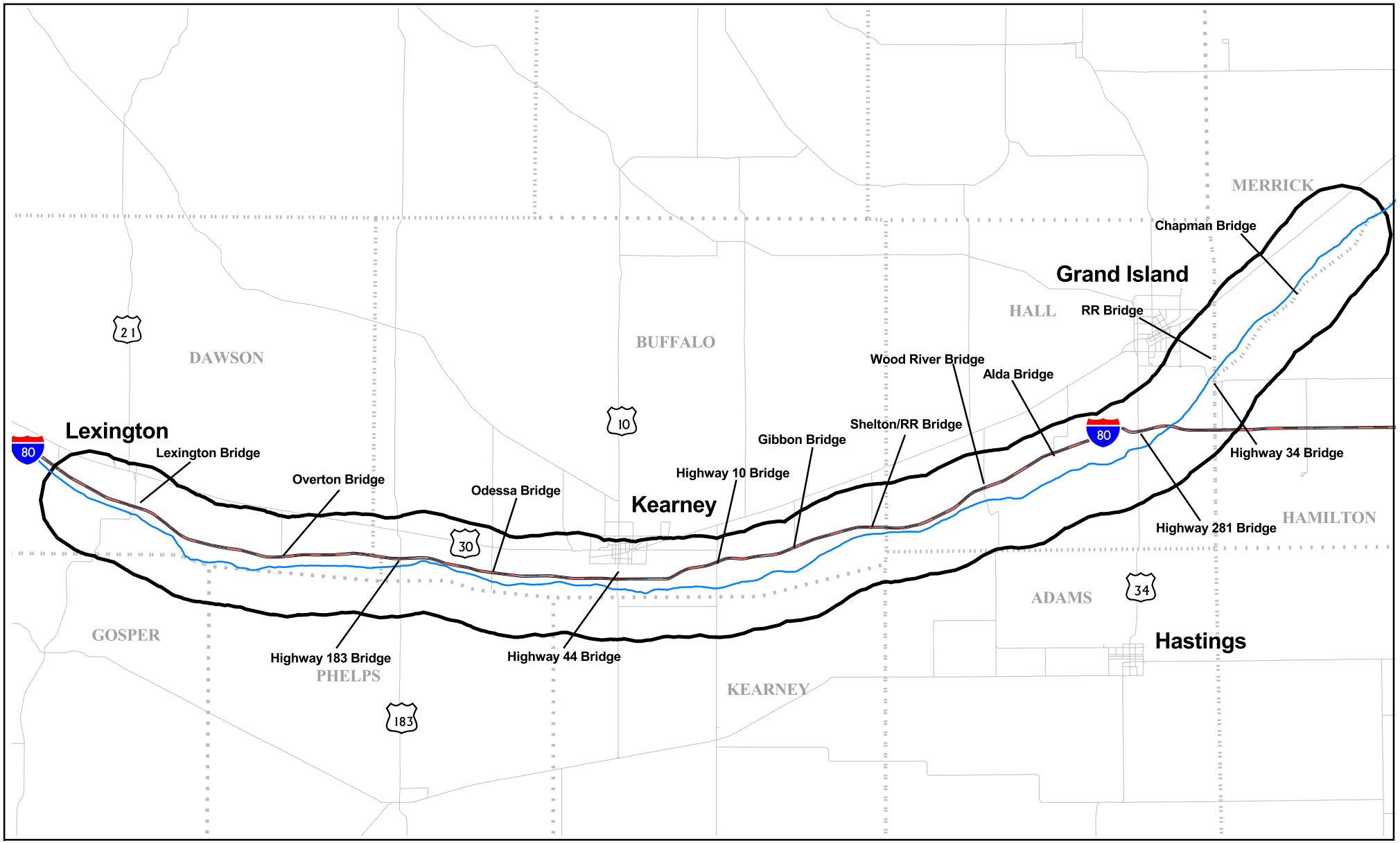
2.1 TRAINING

The monitoring protocol requires that all surveyors attend training on implementing the protocol. Greystone biologists were therefore required to attend a 2-day training session on October 7 and 8, 2003. In addition, Greystone hired a staff of 10 local Nebraskans to assist in implementing the protocol; these field technicians also attended the training session. Three of the six Greystone biologists and nine of the field technicians had participated in the previous year's whooping crane survey. The members of the fall 2003 survey team are listed in **Table 2-1**.

TABLE 2-1 MEMBERS OF THE FALL 2003 WHOOPING CRANE SURVEY TEAM

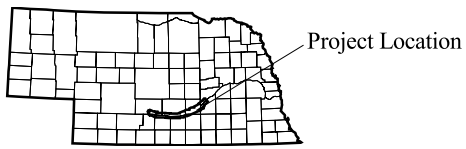
Greystone Biologists	
Chris Rutledge (Project Manager)	John MacDonald
Rebecca Dendinger	Steve Faulk
Pat Golden	Matt Kizlinski
Field Technicians	
Anne Cummings	Vickie Orr
Gene Groff	Jerry Pekas
Blake Hatfield	Barb Tebbel
Jerry Ingram	Ken Tweedy
Sharon Ingram	Eric Volden

The 2-day training session included both classroom and aerial survey training. The classroom training included a review of the survey protocol and instruction on use of survey equipment. The training also included a presentation by Wally Jobman, wildlife biologist for the U.S. Fish and Wildlife Service (USFWS), on avoiding disturbance to whooping cranes. Diane Beachly, coordinator for Whooper Watch, gave a presentation on whooping crane identification. Whooper Watch is a volunteer organization that assists in monitoring whooping cranes during the fall and spring migrations.



LEGEND

- Project Boundary
- Platte River



0 10 20 30 Miles

Scale: 1:600,000
Transverse Mercator Projection
1983 North American Datum
Zone 14

FALL - 2003
WHOOPING CRANE SURVEYS

FIGURE 1
PROJECT STUDY AREA

ANALYSIS AREA: PLATTE RIVER, NEBRASKA	
Date: 1/15/04	File: C:\PROJECTS\1421\DATA\FLIGHT_LINES.APR
Drawn By: MS	Layout: overall_proj_map

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Field technicians and Greystone biologists were also required to attend training on October 8, 2003, on aerial surveys. This training was designed to simulate an aerial survey. Because of poor weather, some staff with previous aerial survey experience were unable to complete this training. Technicians and biologists who were unable to complete training on October 8, 2003, were re-trained during their first flight of the fall 2003 season. However, all trainees without previous experience completed the training in aerial surveys. As part of the training, each trainee attempted to identify two whooping crane decoys on the river from the air. Total flight time for each training session was approximately 2 hours.

2.2 AERIAL SURVEYS

Daily aerial surveys were completed concurrently during the morning for two sections of the central Platte River between October 9 and November 10, 2003. The eastern, or Grand Island, section of the study area is located between Highway 10 Bridge (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 Grand Island Aviation was contracted to fly the Grand Island section of the study area. During the fall survey period, Trego Dugan purchased Grand Island Aviation and renamed the company Trego Dugan Aviation of Grand Island. This transfer of ownership had no effect on implementation of the survey protocol.

Aerial surveys were scheduled daily from the Kearney and Grand Island Airports and were conducted as weather allowed. Two aerial surveyors were assigned to each plane and section of the river. All transects were flown 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 river. 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 river 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 easternmost 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. Return transects were fixed according to each flight day. In the event that a flight was cancelled, all scheduled return transects were postponed 1 day.

In addition, one additional aerial survey that was not required under the current protocol was flown. A flight was added the afternoon of November 4, 2003, after both morning surveys had been cancelled. This flight was added because whooping cranes were reported north and south of the study area. For this survey, a riverine transect was flown from the Highway 281 Bridge west to the Lexington Bridge. A riverine transect was then flown from Lexington east to the Wood River Bridge, where the survey was ended because of the low light. These transects were chosen to maximize the area of river covered since no surveys were completed that morning. This additional afternoon survey was entered in the database as an opportunistic research survey.

2.3 PLACEMENT OF DECOYS AND VERIFICATION OF SIGHTINGS

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

- Two agriculture locations
- Two lowland grass locations
- One barren beach/sandbar location
- Ten wetted channel locations

Greystone biologists and field technicians used Garmin® hand held GPS units to place the decoys in the assigned locations. In some cases, the habitat type provided by PRESP did not match the habitat at the actual Universal Transverse Mercator (UTM) location. This discrepancy may be related to the recent drought and occurred because decoy locations were selected using aerial photographs from 1998. In these cases, Greystone 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. In some cases, the river was dry at decoy locations designated as "wetted channel." In these cases, the decoys were placed at the pre-determined UTM location even though the channel was dry. No data on stream profile were collected from decoys in dry channels. Decoy locations for the morning surveys were labeled using a "FAD" series.

One decoy, 2003FAD13, was not placed as a result of problems with access to land. This decoy was to be located in a wetted channel on land owned by the Nebraska Board of Education. However, a private company currently leases this property and is operating a gravel pit on the property. After consultation with PRESP, it was decided to omit this decoy from the survey.

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.

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.

The members of the aerial crew immediately contacted the ground crew when they believed that a whooping crane was observed. Air crews maintained communication with ground crews using two-way, 5-watt handheld radios (Vertex Standard VX-800). Locations of potential sightings of whooping cranes were relayed to the ground crew. 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 Whooper Watch. After potential sightings had been screened, Whooper Watch contacted Greystone biologists, who then went to the sites to confirm these sightings.

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 depths).

2.4 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 October 20 to November 2, 2003. Flights were to be completed by ½ hour past sundown under the research study protocol (PRESP 2003b). Decoy locations for the afternoon surveys were labeled using a "FAR" series.

Ten decoys were placed during the afternoon surveys. Separate, pre-determined decoy locations were provided by PRESP to Greystone before the survey. Decoys were placed after the morning survey and in most cases were retrieved when they were detected by the afternoon survey. One location for the research decoy was identical to a morning decoy location, and the decoy was left out for the following morning. Another research decoy was left out overnight because darkness prevented its retrieval. This decoy was detected by the aerial survey the following morning but was not included in the decoy results for that flight.

The current research study protocol (PRESP 2003b) 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, Greystone biologists who were not in the air, or both. Members of the fall 2003 survey team who conducted the research surveys are summarized in **Table 2-2.**

TABLE 2-2 MEMBERS OF FALL 2003 RESEARCH SURVEY TEAM

Greystone Biologists	Field Technicians
Steve Faulk	Gene Groff *
Pat Golden	Blake Hatfield
Matt Kizlinski	Jerry Pekas
John MacDonald	Ken Tweedy *
	Eric Volden

* Not an aerial observer, radio contact only

2.5 QUALITY ASSURANCE AND QUALITY CONTROL

A key component of the fall whooping crane survey was the quality control/quality assurance (QA/QC) program. Greystone 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 Greystone 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 OF MONITORING PROTOCOL IMPLEMENTATION

The results of the fall 2003 whooping crane survey are summarized in this section. This section is organized as follows:

Section 3.1 Extent of River
Section 3.2 Number and Distribution of Flights Flown
Section 3.3 Searcher Efficiency
Section 3.4 Summary of Whooping Crane Sightings
Section 3.5 Characteristics of Use Sites
Section 3.6 Sandhill Crane Observations

3.1 EXTENT OF RIVER

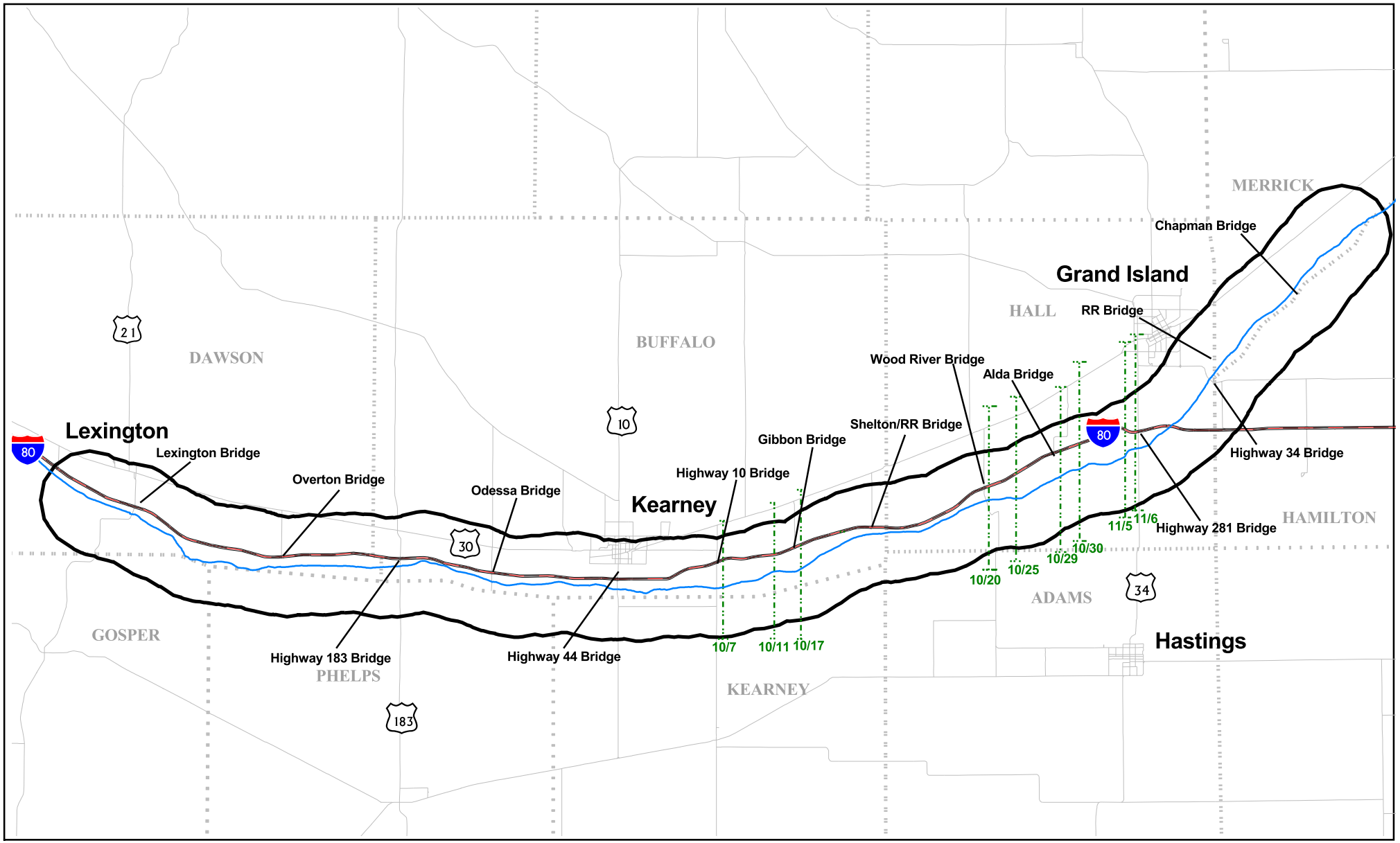
Low regional precipitation affected the water level in the central Platte River during the summer and fall of 2003. When the survey began on October 9, 2003, water was moving slowly downstream and had reached just east of the Minden Bridge. After it crossed the Gibbon Bridge on approximately October 17, the advancing edge of the river picked up pace, reaching a few miles east of the Wood River Bridge by October 25. Progress then slowed, and the river reached the Highway 281 Bridge by November 11. On the basis of observations during aerial surveys, the approximate location of the river's leading edge on several dates during the survey period is shown on **Figure 2**.

3.2 NUMBER AND DISTRIBUTION OF FLIGHTS FLOWN

Several flights were cancelled from both the Grand Island and Kearney airports as a result either of weather or of poor flight conditions. Some cancellations were related to large weather fronts that passed through the study area, which grounded flights. Most flight cancellations were because of poor visibility that resulted from low cloud cover and fog. One flight on the Kearney side (October 24, 2003) was cancelled halfway through because of increasing turbulence. The remaining cancellations occurred before takeoff. Of the 33 total possible flight days, 25 flights (76 percent) were flown out of the Kearney Airport and 28 flights (85 percent) were flown out of the Grand Island Airport. Several factors contributed to the smaller number of flights from the Kearney Airport, including differences in weather and elevation. A summary of the number and distribution of return transects flown during the fall 2003 survey is provided in **Table 3-1**.

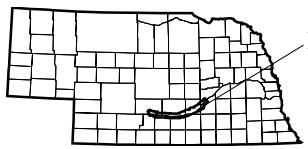
TABLE 3-1 DISTRIBUTION OF RETURN TRANSECTS FLOWN FOR THE FALL 2003 SURVEY

Return Transect	Number of Return Transects Flown	
	Kearney	Grand Island
0 (River)	4	4
1N	4	4
2N	4	4
3N	3	4
1S	3	4
2S	4	4
3S	3	4
Total Flight Days	25	28



LEGEND

- Project Boundary
- Eastern Extent Of Wetted Channel By Date
- Platte River



0 10 20 30 Miles

Scale: 1:600,000
Transverse Mercator Projection
1983 North American Datum
Zone 14

FALL - 2003
WHOOPING CRANE SURVEYS

FIGURE 2
EXTENT OF WETTED CHANNEL

ANALYSIS AREA: PLATTE RIVER, NEBRASKA	
Date: 2/09/04	File: C:\PROJECTS\1421\DATA\FLIGHT_LINES.APR
Drawn By: MS	Layout: water_location

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3.3 SEARCHER EFFICIENCY

Whooping crane decoys were placed at pre-determined locations during the fall survey to evaluate the efficiency of the aerial searchers. Fifteen decoy locations were provided by PRESP to Greystone for the fall 2003 survey. However, Greystone was not able to obtain permission to access the land for decoy location 2003FAD13. Actual locations for all decoys are shown in **Figure 3**. Searcher efficiency was calculated using the following equation:

Number of decoys observed/Total decoys placed * 100

Results for the efficiency of the searchers are summarized in **Table 3-2**. Of the 14 total decoys placed, seven (50 percent) were detected during the aerial surveys.

TABLE 3-2 FALL 2003 SEARCHER EFFICIENCY

Program Decoy ID	Section	Vegetation Description Provided	Actual Vegetation Present	Detected Yes/No
2003FAD01	Kearney	Barren beach/bar	Barren beach/bar	No
2003FAD02	Kearney	Lowland grasses	Lowland Grasses	No
2003FAD03	Grand Island	Lowland grasses	Mowed hayfield	Yes
2003FAD04	Kearney	Agriculture – other crops	Mowed hayfield	No
2003FAD05	Grand Island	Agriculture alfalfa	Dry channel	Yes
2003FAD06	Grand Island	Wetted channel	Dry channel	No
2003FAD07	Kearney	Wetted channel	Wetted channel	No
2003FAD08	Grand Island	Wetted channel	Dry channel	Yes
2003FAD09	Grand Island	Wetted channel	Dry channel	Yes
2003FAD10	Kearney	Wetted channel	Wetted channel	Yes
2003FAD11	Grand Island	Wetted channel	Dry channel	No
2003FAD12	Grand Island	Wetted channel	Wetted channel	No
2003FAD13	Kearney	Wetted channel	Gravel pit	*
2003FAD14	Grand Island	Wetted channel	Dry channel	Yes
2003FAD15	Grand Island	Wetted channel	Dry channel	Yes

* Not applicable; decoy was never placed due to problems with access to land

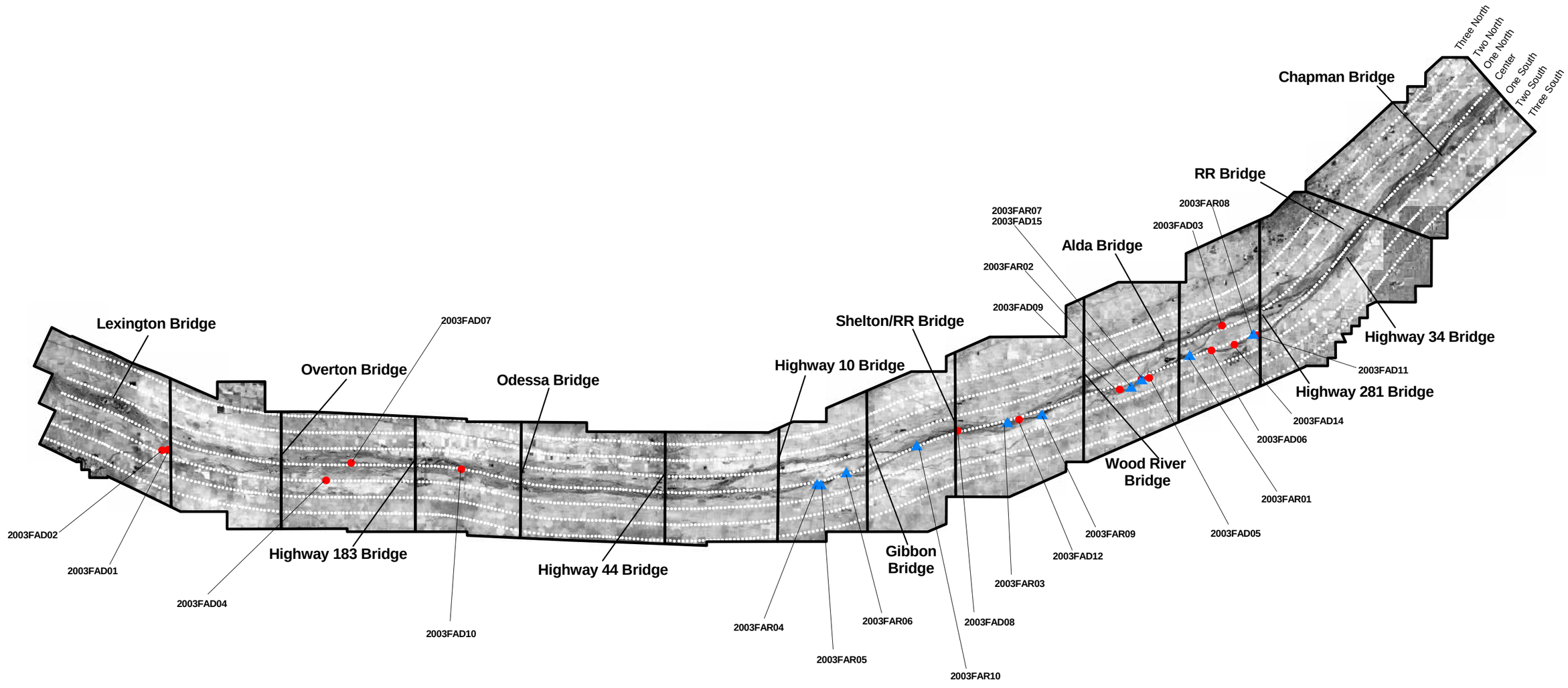
Six of the 10 decoys (60 percent) placed in the river channel were detected. One of the four decoys (25 percent) placed at off-channel (upland) locations were detected during the survey.

3.4 SUMMARY OF WHOOPING CRANE SIGHTINGS

The following sections include a summary of whooping crane sightings throughout the U.S. and within the project study area.

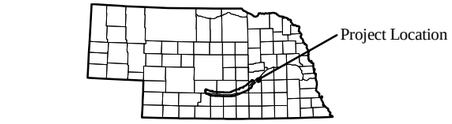
3.4.1. Whooping Crane Sightings in the U.S.

During the survey, Greystone contacted Mr. Jobman of USFWS on a regular basis to obtain reports on the status of the fall whooping crane migration. A summary of verbal reports received from Mr. Jobman is included in **Appendix A**. Reports on whooping crane migration prepared by Tom Stehn of Aransas National Wildlife Refuge in Texas are included in **Appendix B**. A report that summarized all confirmed whooping crane sightings was prepared by the USFWS at the end of the fall migration. This report is included in **Appendix C**.



LEGEND

- ● Morning Decoy Locations
- ▲ Afternoon Decoy Locations
- ○ ○ ○ ○ Flight Transects



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Scale: 1:400,000
Transverse Mercator Projection
1983 North American Datum
Zone 14

GREYSTONE

FALL - 2003
WHOOPING CRANE SURVEYS

FIGURE 3
WHOOPING CRANE DECOY LOCATIONS

ANALYSIS AREA: PLATTE RIVER, NEBRASKA	
Date: 12/08/03	File: C:\PROJECTS\1421\DATA\FLIGHT_LINES.APR
Drawn By: MS	Layout: decoys_key_a

3.4.2. Whooping Crane Sightings in the Study Area

One whooping crane was observed within the study area during the fall 2003 survey on October 15, 2003. This sighting was confirmed by USFWS. A group number was assigned to this crane in the field in accordance with the protocol. USFWS Crane Group identification numbers were independently assigned by the USFWS.

3.4.3. Total Crane Use Days

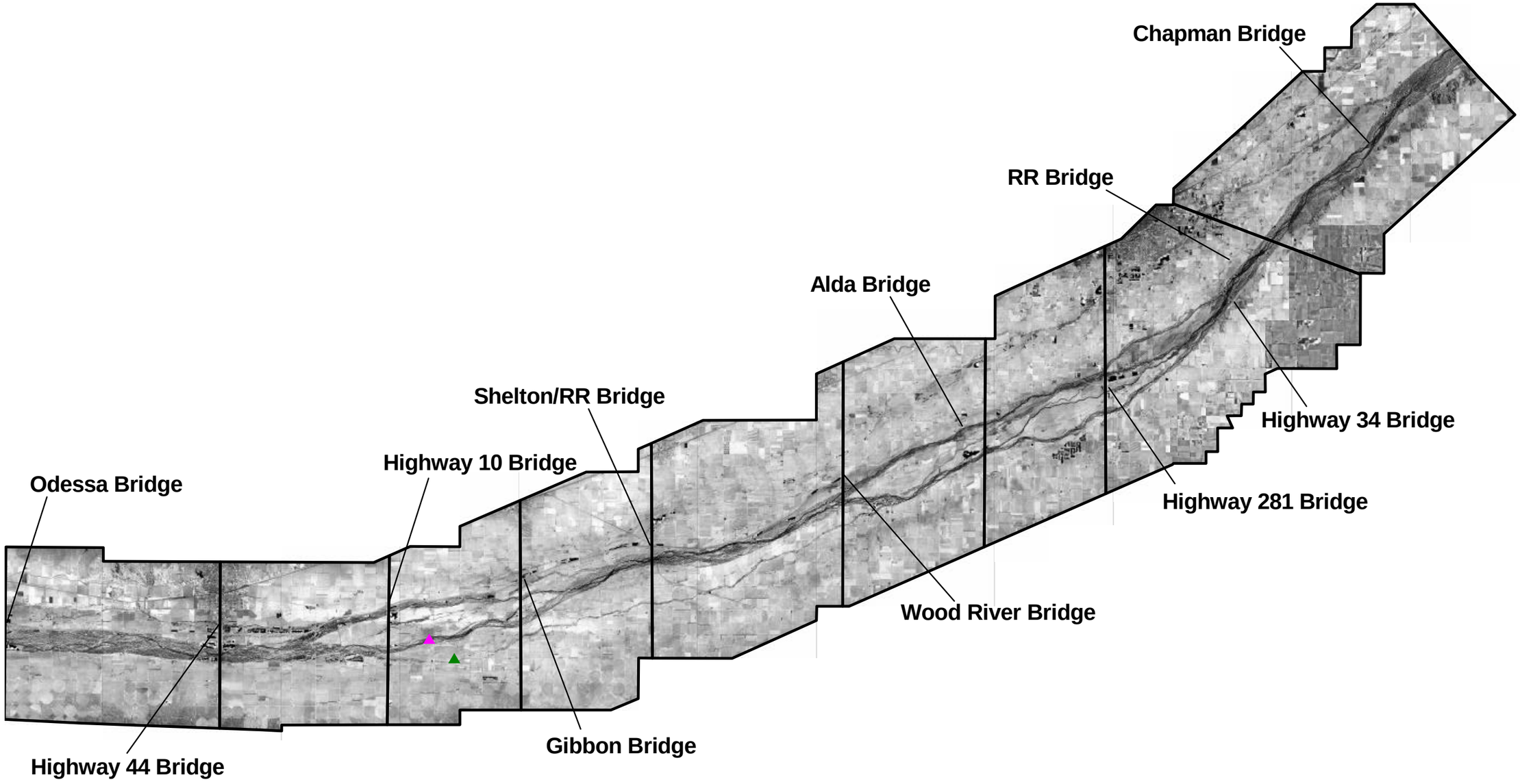
Total crane use days were calculated for the fall 2003 survey period. Crane use days were calculated by multiplying the number of cranes in each group by the number of days they were present in the study area. The total crane use days for the fall 2003 survey period for confirmed sightings was 1 day. However, this whooping crane may have also roosted on the central Platte River the previous evening. If the whooping crane roosted the previous evening on the central Platte River, total crane use days would be 2 days.

3.4.4. Summary of Systematic and Opportunistic Sightings

A single whooping crane was sighted during the systematic survey effort. Several reports were also received from opportunistic sources of whooping cranes in flight in the study area. However, the field crew confirmed none of these opportunistic sightings. **Figure 4** shows the locations of whooping crane use sites recorded during fall 2003 survey. A detailed view showing the locations of the whooping crane sightings is shown on **Figure 5**. The complete database for the fall 2003 survey is included in **Appendix D**. The following section provides a general summary of these data.

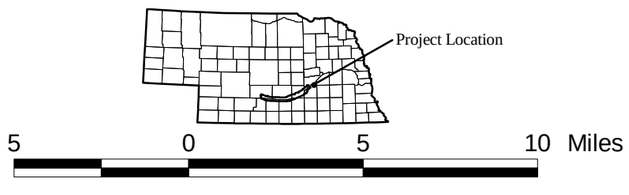
The single whooping crane observed during the fall 2003 survey was sighted during the systematic aerial survey of the Grand Island side of the study area. On October 15, 2003, at 7:55 a.m., the flight crew reported a white bird, believed to be a whooping crane, approximately ½ mile west of the Rowe Sanctuary. The white bird was seen in the wetted river channel with a group of 25 to 30 sandhill cranes. The member of the ground crew stationed at the Shelton Bridge was dispatched to attempt to locate and confirm the sighting. After the aerial survey transect had been completed, the flight crew returned to the sighting location to assist in locating the white bird, but was unable to re-locate it. They circled north and south of the river until 9:10 a.m. without success and then returned to the airport.

The ground crew later located and confirmed a single whooping crane approximately ½ mile south of where it was observed by the aerial crew. The single whooping crane was again observed with a group of 25 to 30 sandhill cranes. At 9:30 a.m., monitoring observations were begun for the whooping crane's continuous use site. The crane was feeding along with the sandhill cranes in a fenced grassland. Sandhill cranes began leaving the site in groups of three to five around 10:00 a.m. Observations were recorded every 15 minutes until 10:35 a.m., when the whooping crane took flight with the last two sandhill cranes and headed south. Field crews continued to monitor the flight of the single crane for approximately 10 minutes. During this time, the whooping crane climbed in altitude and continued south until it was no longer visible. Other groups of sandhill cranes were observed leaving the study area and flying south over the next 2 hours. This whooping crane was assigned program identification number 2003FA01 and USFWS identification number 03B-7.



LEGEND

- Crane Sighting Systematic (2003 FA01)
- Crane Sighting Systematic (2003 FA02)



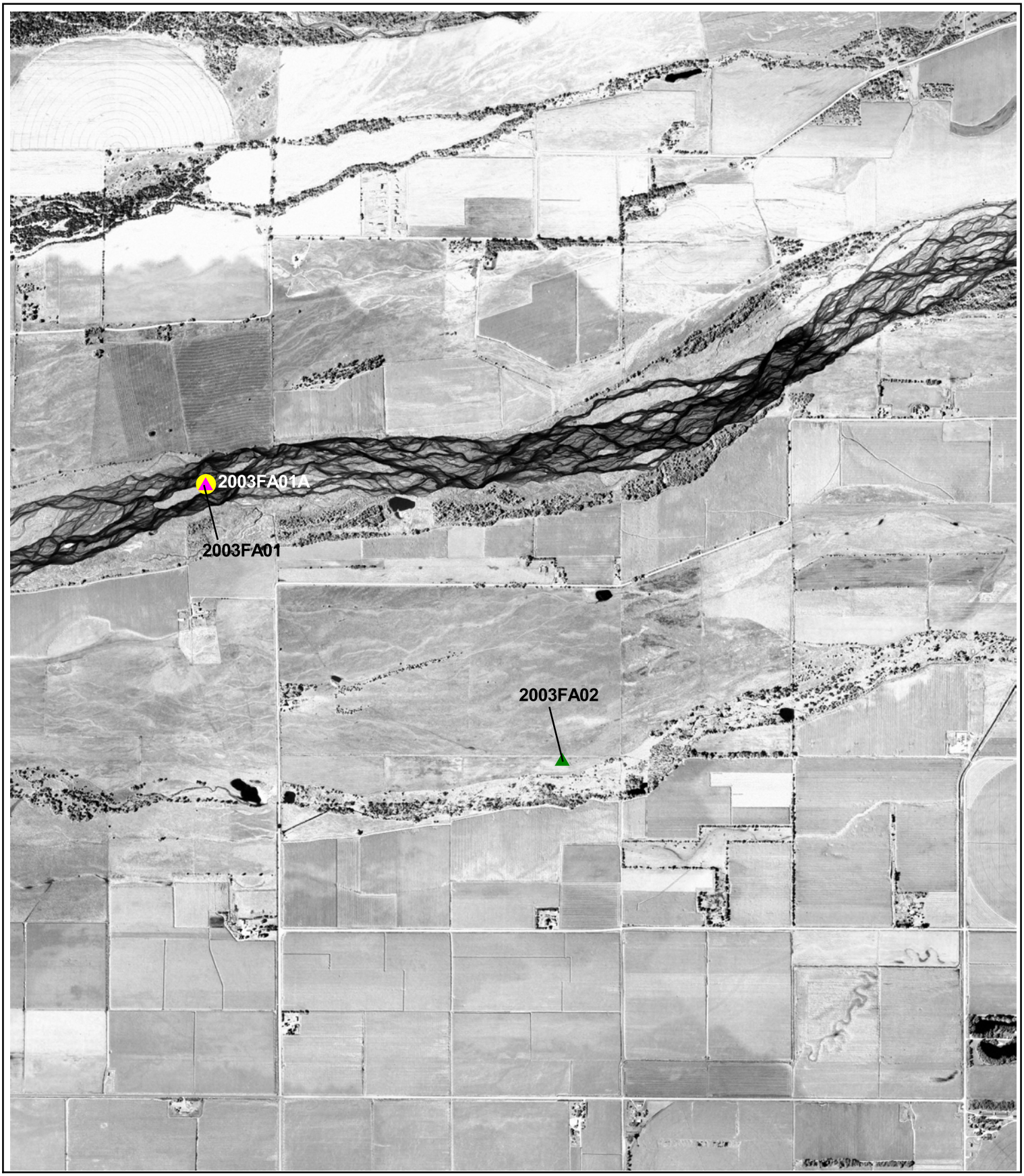
Scale: 1:275,000
Transverse Mercator Projection
1983 North American Datum
Zone 14

FALL - 2003
WHOOPING CRANE SURVEYS

FIGURE 4
WHOOPING CRANE SIGHTING LOCATIONS

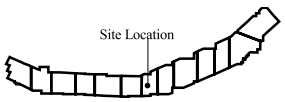
ANALYSIS AREA: PLATTE RIVER, NEBRASKA	
Date: 12/08/03	File: C:\PROJECTS\1421\DATA\FLIGHT_LINES.APR
Drawn By: MS	Layout: crane_pts_key_a

GREYSTONE



LEGEND

- Crane Sighting Systematic (2003 FA01)
- Crane Sighting Systematic (2003 FA02)
- Stream Transect (2003 FA01A)



1000 0 1000 2000 Feet

Scale: 1:24,000
Transverse Mercator Projection
1983 North American Datum
Zone 14

GREYSTONE®

FALL - 2003
WHOOPING CRANE SURVEYS

FIGURE 5
WHOOPING CRANE SIGHTINGS AND
STREAM TRANSECT LOCATION FOR FA01

ANALYSIS AREA: PLATTE RIVER, NEBRASKA	
Date: 12/10/03	File: C:\PROJECTS\1421\DATA\FLIGHT_LINES.APR
Drawn By: MS	Layout: crane_transect_pts_A2

3.5 CHARACTERISTICS OF USE SITES

This section summarizes the characteristics of river and non-river use sites.

3.5.1. River Use Site

Data on use site were obtained by collecting information on the channel profile at the documented river use site. The channel transect was located as close to the original crane use site as possible, and is shown in **Figure 5**. This river location was assigned use site identification number 2003FA01A. This wetted channel was generally open; the nearest obstruction was vegetation 2 meters tall located 15 meters west of the use site. Obstructions north, south, and east ranged from 2.5- to 3-meter tall vegetation located 80 to 440 meters from the use site. The substrate was mostly coarse sand and small gravel. No recent management practices such as disking or burning were observed. Graphs that depict the channel depth profiles of the river transects are included in **Appendix E**. Photographs of this river use site are included in **Appendix F** as **Photos 1** and **2**.

3.5.2. Off Channel Use Site

The off-channel site used by crane 2003FA01 was an open pasture. Use site identification number 2003FA02A was assigned to this site. Vegetation was heavily grazed upland grass with evidence of well-established patches of Canada thistle (*Cirsium arvense*). Photos of this location are included in **Appendix F** as **Photos 3** through **6**. The nearest obstruction was a 3-meter tall cedar located approximately 140 meters south of the off-channel site. Cottonwood trees located ¼ to 1 mile away were the only other obstructions.

3.6 SANDHILL CRANE OBSERVATIONS

Throughout all aspects of the survey protocol (morning and afternoon aerial surveys, ground searches, and opportunistic sighting searches), the number and location of sandhill cranes in the study area were recorded. All sandhill crane sightings documented during the fall 2003 survey are summarized in **Table 3-3**. The number of individuals observed in each group was estimated, and the location reported is depicted as accurately as possible in **Figure 6**.

Sandhill cranes were not observed in the study area until October 15, but were observed regularly during the remainder of the survey period. The majority of sandhill cranes were observed roosting in the river channel between the Minden and Highway 281 Bridges during aerial surveys. Wide, open channels that were recently disked characterize this portion of the study area. Several large groups of cranes were also observed roosting in dry portions of the river channel during the evening surveys.

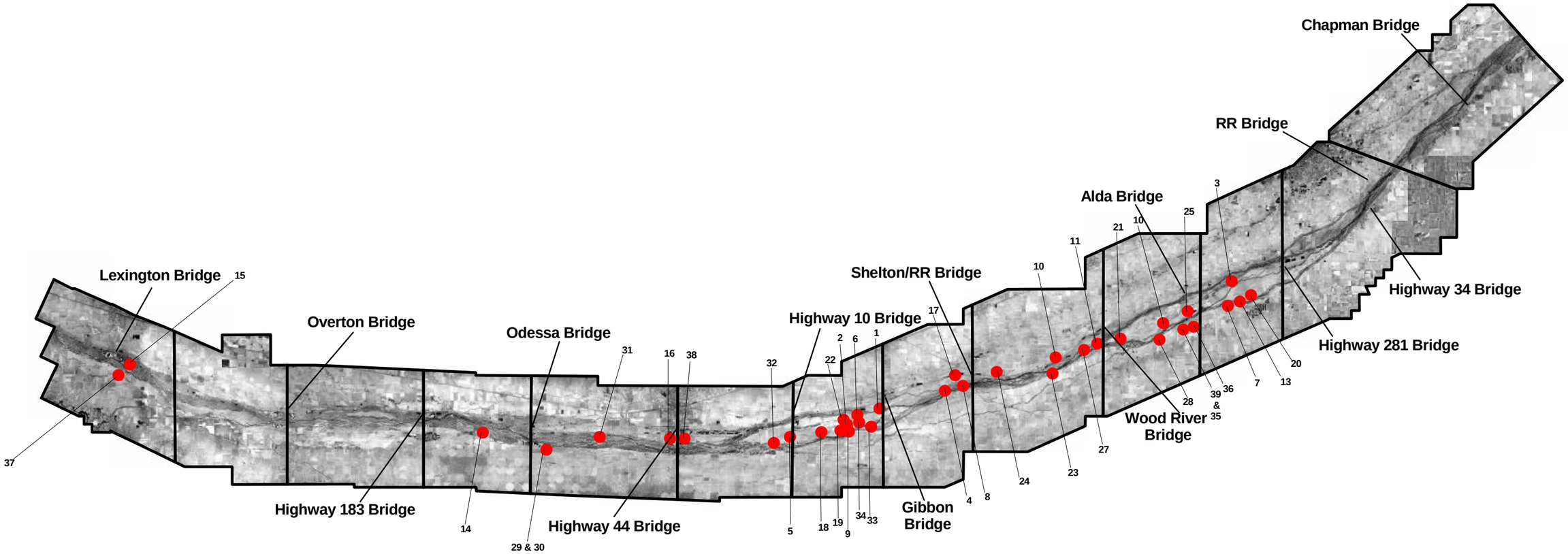
3.7 COST FOR FALL 2003 MONITORING

The cost of field implementation and report writing was $83,150.36.

TABLE 3-3 SANDHILL CRANE OBSERVATIONS DURING THE FALL 2003 SURVEY

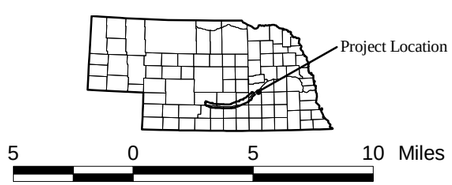
*Group Number**	*Date*	*Observation Time*	*Estimated Number*	*Description*
1	15-Oct	AM	25	In wetted river channel (UTMx 506915, UTMy 450558)
2	15-Oct	AM	100	Feeding in winter wheat field 1/2 mile south of Rowe Sanctuary
3	20-Oct	PM	35	In dry river channel
4	20-Oct	AM	50	In flight over river 2.5 miles west of Shelton Bridge
5	20-Oct	AM	200	In flight over Minden Bridge
6	20-Oct	AM	25	Roosting in channel 1 mile west of Gibbon Bridge
7	21-Oct	PM	265	In dry river channel (UTMx 54378, UTMy 451367)
8	21-Oct	AM	30	In river channel 1 mile west of Shelton Bridge
9	21-Oct	AM	350	Roosting in channel at Rowe Sanctuary
10	21-Oct	PM	4	Seen in river channel when retrieving decoy
11	22-Oct	AM	20	In channel 1 mile west of Wood River Bridge
12	22-Oct	AM	250	Roosting near Martin's Reach
13	22-Oct	AM	300	Roosting in river channel just east of Crane Trust buildings
14	22-Oct	AM	Flock[1]	On sandbar in south channel of river between Elm Creek and Odessa Bridges
15	22-Oct	AM	Flock[1]	In channel between Canaday steam plant and Lexington Bridge (UTMx 438253, UTMy 4509040)
16	22-Oct	AM	Flock[1]	In the south channel near the Kearney Bridge (UTMx 498812, UTMy 4007910)
17	23-Oct	AM	30	In channel 1/2 mile west of Shelton Bridge
18	23-Oct	AM	50	Roosting in channel between Rowe Sanctuary and Minden Bridge
19	24-Oct	AM	30	In river channel 1/2 mile west of Rowe Sanctuary
20	27-Oct	PM	200	Seen in flight over river (UTMx 557639, UTMy 456591)
21	27-Oct	PM	75	Roosted in river channel 3/4 mile east of Wood River Bridge (UTMx 538564, UTMy 4511054)
22	27-Oct	PM	55	Roosted in wetted channel (UTMx 508521, UTMy 4502152)
23	27-Oct	AM	50	In river channel east of Nature Conservancy property between Wood River and Shelton Bridges
24	28-Oct	AM	125	In river channel two miles east of Shelton Bridge
25	29-Oct	PM	550	In river channel 1 mile west of Alda Bridge
26	29-Oct	AM	100	Roosting near Martin's Reach
27	2-Nov	AM	12	Roosting just west of Wood River Bridge
28	3-Nov	AM	3	Spotted by ground crew in cut corn field south of Platte River Road, 1/4 mile east of 110th
29	3-Nov	PM	55	Spotted by ground crew in cut corn field north of intersection of 27 and V Road
30	4-Nov	AM	100	Spotted by ground crew in cut corn field north of intersection of 27 and V Road
31	4-Nov	PM	60	In flight above plane between Odessa and Kearney Bridges
32	4-Nov	PM	3	On river just west of Minden Bridge
33	5-Nov	AM	100	Roosting 1/2 mile east of Rowe Sanctuary
34	6-Nov	AM	50	Roosting in channel west of Rowe Sanctuary
35	8-Nov	AM	1000	Spotted by ground crew 1 mile south of river near 90th
36	8-Nov	AM	20	In channel 1 mile west of Alda Bridge
37	8-Nov	AM	5	In flight near the Lexington Bridge
38	8-Nov	AM	30	Roosting in river channel just east of Kearney Bridge
39	9-Nov	AM	1000	Spotted by ground crew 1 mile south of river near 90th

** Crane group numbers correspond to numbers on Figure 6*
1 Numbers of sandhill cranes were not estimated



LEGEND

● Sandhill Crane Location



Scale: 1:400,000
Transverse Mercator Projection
1983 North American Datum
Zone 14

FALL - 2003
WHOOPING CRANE SURVEYS

FIGURE 6
SANDHILL CRANE LOCATIONS

ANALYSIS AREA: PLATTE RIVER, NEBRASKA

Date: 12/08/03	File: C:\PROJECTS\1421\DATA\FLIGHT_LINES.APR
Drawn By: MS	Layout: sandhill_crane_locs

GREYSTONE

4.0 RESULTS OF RESEARCH PROTOCOL IMPLEMENTATION

Under the current monitoring protocol, systematic early-morning flights are used to detect the presence of whooping cranes on the central Platte River. However, members of the PRESP Technical Committee have expressed concern that early morning may not be the most effective time of day to conduct aerial surveys, for the following reasons:

- Poor weather conditions at dawn have forced cancellation of many flights
- Whooping cranes may be leaving the river channel before the riverine transect has been flown
- Early morning light may not be sufficient to detect decoys and whooping cranes

Therefore, afternoon surveys were conducted for a 2-week period during the fall 2003 survey to assess the value of conducting afternoon aerial surveys.

4.1 NUMBERS AND DISTRIBUTION OF FLIGHTS FLOWN FROM GRAND ISLAND AIRPORT

All 14 afternoon aerial surveys were successfully completed from October 20 to November 2, 2003. None of the flights was delayed or cancelled by poor weather. A summary of the number and distribution of return transects flown during the research survey is provided in **Table 4-1**. A goal of the research survey was to evaluate whether afternoon weather conditions are different from morning conditions. During the 14-day research survey period, one morning flight out of Grand Island (November 2) was cancelled. No afternoon surveys were cancelled.

TABLE 4-1 DISTRIBUTION OF RETURN TRANSECTS FLOWN FOR THE FALL 2003 RESEARCH SURVEY

Return Transect	Number of Return Transects Flown
0 (River)	2
1N	2
2N	2
3N	1
1S	2
2S	2
3S	3
Total Flight Days	14

4.2 ESTIMATE OF FLIGHT CANCELLATIONS AT KEARNEY AIRPORT

No research surveys were conducted out of the Kearney airport. Therefore, Mr. Jason Wieseler, a flight instructor with Air Midway, was consulted to evaluate afternoon weather conditions at the Kearney airport. Mr. Wieseler reviewed the automated weather station data for the survey period of October 9 through November 10, 2003. Wind speed and direction, visibility, and ceiling height conditions were

evaluated for the approximate takeoff times for morning and afternoon surveys. Mr. Wieseler evaluated this weather information to determine whether flights would have been flown or cancelled. Mr. Wiesler's report is included in **Appendix G,** and the results of his evaluation are summarized below.

The weather interpretation report identified seven mornings when flights would have been cancelled. This number was consistent with actual flight cancellations during this period (eight morning surveys from the Kearney airport were actually cancelled). All 7 days noted in his report were actually cancelled, indicating that his methods of evaluation weather conditions were accurate. The single day (October 24) that was cancelled but that was not identified in his report occurred when the flight was called off halfway through the survey because of increasing wind gusts and shear at the airport.

On the basis of this weather analysis, four afternoon flights would have been cancelled. Conditions worsened on only one day (November 1) so that an afternoon survey would have been cancelled when the morning flight was completed. Flight conditions improved enough to allow for afternoon surveys on five of the nine days when morning flights were cancelled.

4.3 SEARCHER EFFICIENCY AND DECOY VISIBILITY

Ten pre-determined decoy locations were provided for the research surveys. Nine decoys (90 percent) were detected during the afternoon flights. Although all decoys were to be located in wetted channels, the river had not advanced through the entire study area when some decoys were placed (**Figure 2**). As a result, five decoys were placed in dry channels. The single missed decoy was located in a dry channel and occurred when light conditions were low as the plane passed over. Observation of three groups of sandhill cranes and one additional decoy earlier in the flight delayed completion of the riverine transect. Results for the efficiency of the searchers are summarized in **Table 4-2**.

TABLE 4-2 FALL 2003 RESEARCH SURVEY SEARCHER EFFICIENCY

Program Decoy ID	Vegetation Description Provided	Actual Vegetation Present	Detected (Yes/No)
2003FAR01	Wetted channel	Dry channel	Yes
2003FAR02	Wetted channel	Dry channel	No
2003FAR03	Wetted channel	Dry channel	Yes
2003FAR04	Wetted channel	Wetted channel	Yes
2003FAR05	Wetted channel	Wetted channel	Yes
2003FAR06	Wetted channel	Wetted channel	Yes
2003FAR07	Wetted channel	Dry channel	Yes
2003FAR08	Wetted channel	Dry channel	Yes
2003FAR09	Wetted channel	Wetted channel	Yes
2003FAR10	Wetted channel	Wetted channel	Yes

Aerial survey crews reported good visibility along the river channel during the afternoon surveys, especially during the upland transects, when light was high. All decoys for the afternoon surveys were placed within the channel. Searcher efficiency for afternoon surveys was 90 percent. Searcher efficiency for decoys placed in the channel during morning surveys was 60 percent. Aerial survey crews also noted that decoys seemed easier to locate during the evening surveys because the water tended to be darker. White objects located on the river were highly visible as a result of this contrast.

Since the afternoon surveys are scheduled just before dusk, surveys must be completed while light conditions are optimal. The research study protocol called for the flight to be completed within 30 minutes after sunset. Observation of light conditions at sunset the evening before the first scheduled research survey indicated that the flight would have to be completed at least by, and preferably 15 to 20 minutes before, the published time of sunset. Considering the average duration of each survey, beginning the westbound upland transect 90 minutes before sunset would leave adequate time to complete the survey in good light conditions. Low clouds in the west should be noted, however, and an earlier takeoff should be scheduled as visibility will decline as the sun sets behind the clouds. On one day, the survey was delayed by the presence of several sandhill crane groups and a white object. Because of this delay, the survey was completed in less than optimal light conditions. Therefore, an earlier takeoff could be scheduled to accommodate delays. However, the flight should not be scheduled to start before the time whooping cranes would be reasonably expected to return to the river.

4.4 RESEARCH SURVEY RESULTS

There were no whooping crane sightings, either opportunistic or systematic, during the research survey. Since no actual whooping cranes were present, it is not possible to compare the quality of morning and afternoon observation conditions for detecting whooping cranes.

Although it was not scheduled, members of the ground crew were in radio contact with the aerial survey crew for each afternoon survey. On October 29, the aerial survey crew observed a white bird roosting in the river channel with a group of sandhill cranes approximately ½ mile east of the Minden Bridge. At 5:10 p.m., a Greystone biologist in radio contact from the Rowe Sanctuary attempted to locate the white bird on the ground. With the assistance of Paul Tebbel, Director of the Rowe Sanctuary, an observation blind near the group was accessed. The birds were roosting in a wetted channel along the southern bank, and the blind was approximately 100 meters away on the north bank. Tall vegetation on a sandbar between the blind and the birds made clear observation difficult. In addition, light levels were rapidly decreasing, and the white bird could not be located on the ground. The following morning, the aerial survey crew reported a snow goose with a group of sandhill cranes in the same area. This snow goose was likely the same white bird that was observed the previous evening.

Radio contact with a ground crew during the afternoon surveys was extremely helpful. At a minimum, the ground crew was able to confirm decoy locations. On several occasions, the ground crew relayed the location of sandhill cranes in flight that gave the aerial observers advance notice. On the one occasion where a ground crew was sent to search for a white bird, it was too late in the survey to confirm the sighting. However, this failure to confirm the sighting does not indicate that ground crews would not be useful for afternoon surveys. If a white object were sighted early enough in the survey, sufficient light would remain for a member of the ground crew to investigate. Should a whooping crane be identified in this manner, the evening would be available to identify the best viewing location for the crane and to secure permission from the landowner to access the site for the following day.

5.0 RECOMMENDATIONS FOR FUTURE IMPLEMENTATION OF PROTOCOL

The following recommendations are based on experience gained during implementation of the fall 2003 monitoring survey and research study. Recommended revisions to the field monitoring protocol, research study protocol, and database structure are provided below.

5.1 FIELD MONITORING PROTOCOL

- Since the river is constantly changing, use the most currently available aerial photographs and land ownership data to select decoy locations in the future.

- Develop specific guidelines for recording sandhill crane observations. These guidelines may include recording of date, time, UTM coordinates, and location of nearest water if found in dry channel.

- Conducting stream transects for a few decoy locations is useful for training. However, conducting stream transects for every decoy location is time and labor intensive. Consider collecting data on stream transect only for a few decoy locations (for training), rather than all decoy locations.

- The main channel may change course over time depending on the amount of water flowing through it. Consider delineating the main channel so that flight routes for riverine transects are repeatable. This may be useful during periods of low water flow, when side channels may contain the majority of water.

- Develop specific guidelines on the size of the area the aerial survey crews should search on return transects. For example, the guideline may state that "aerial survey crews should search an area approximately 1 mile north and 1 mile south of the flight transect."

- During this year's survey, the pre-determined UTM coordinates for decoys did not match the pre-determined habitat types. In these cases, allow the field crew to place a decoy in a similar habitat type that is close to the original UTM location.

5.2 RESEARCH STUDY PROTOCOL

- Consider using a field crew for all afternoon surveys to confirm decoy locations and investigate potential whooping crane sightings.

- Modify the start time for the afternoon and evening so the survey is completed at least 15 to 20 minutes before the published sunset time.

- If morning and afternoon surveys are conducted together in the future, limit the number of decoys placed for both surveys because decoy placement is a time- and labor-intensive activity. Decoys placed for evening surveys are also difficult to retrieve before aerial surveys begin the next morning.

6.0 LITERATURE CITED

Platte River Endangered Species Partnership. 2003a. Draft Monitoring Whooping Crane Migrational Habitat Use in the central Platte River Valley –- Whooping Crane Monitoring Protocol. August 21.

Platte River Endangered Species Partnership. 2003b. Comparison of the Relative Value of Late Afternoon and Early Evening Flights versus Morning Flights for Detecting Whooping Crane Stopovers along the central Platte River, Nebraska. August 22.

APPENDIX A
USFWS WHOOPING CRANE MIGRATION STATUS REPORT, FALL 2003

Appendix A
USFWS Whooping Crane Migration Status Report
Fall – 2003

Date Contacted	Contact	Notes
10/10/03	Wally Jobman	No reported sightings on Platte River. One more confirmed sighting in North Dakota.
10/14/03	Wally Jobman	One sighting in North Dakota on October 12, confirmed October 13. A single whooping crane in the northwestern part of Nebraska and a pair in central Nebraska near Long Lake.
10/15/03	Wally Jobman	Called Wally at 10:30 a.m. to report a single whooping crane near Rowe Sanctuary. Wally returned call at 1:30 p.m. and was told crane appeared to have left the area.
10/15/03	Wally Jobman	Received a report of a single whooping crane in central Montana. Numerous confirmed sightings of whooping cranes in North Dakota. Single likely sighting of a whooping crane in Dallas area. Aransas to start their weekly aerial surveys for whooping cranes next week.
10/17/03	Wally Jobman	No new confirmed sightings.
10/20/03	Wally Jobman	Left message with Wally to request an update on whooping crane migration. Later talked to John MacDonald who had already talked Wally.
10/20/03	Wally Jobman	Informed Wally of the two decoy locations for the evening aerial survey and the one location for the next morning (FAR06, FAR07, and FAD15). Wally had no new sighting reports of whooping cranes. Many are still in Canada and North Dakota.
10/21/03	Wally Jobman	Wally called and informed us of a confirmed sighting of five whooping cranes north of Bassett on the Niobara River approximately 90 miles north of the Platte River. They were sighted the morning of October 21. Wally was also informed of the two decoys (FAD02 and FAD12) that were placed by Greystone staff for the following morning.
10/21/03	Paul Tebbel	Informed Paul of the five whooping cranes that were confirmed north of Bassett on the Niobara River.
10/23/03	Paul Tebbel	Paul informed John MacDonald that there had been an unconfirmed whooping crane sighting yesterday (10/22) afternoon. A landowner phoned and told Paul that he saw two large white birds with a flock of sandhill cranes flying over his property at 3:00 p.m. Paul told John that the landowner lived

Date Contacted	Contact	Notes
		approximately two miles north of the Platte River near Gibbon. This sighting was not confirmed by any other ground sightings or by the evening survey on October 22.
10/24/03	Wally Jobman	Wally was contacted by John MacDonald for updated whooping crane sighting information. Wally had no new confirmed whooping crane sightings. He also reported that Aransas conducted its first aerial survey yesterday (10/23) and had located 5 whooping cranes.
10/27/03	Wally Jobman	Phoned Wally and left a message to request an update on confirmed whooping crane sightings in North America.
10/28/03	Wally Jobman	Wally informed John MacDonald that there had been no new confirmed whooping crane sightings in Nebraska. There have been some confirmed sightings in Oklahoma at a wildlife refuge (five birds on 10/24 and 2 birds on 10/27). Wally also mentioned that the twin juvenile whooping cranes had been spotted in Aransas. They made it from central Saskatchewan to Aransas in eight days.
10/29/03	Paul Tebbel	Paul informed John MacDonald that there were still many confirmed whooping crane sightings in North Dakota and Canada.
10/31/03	Wally Jobman	Wally Jobman stated there were no new sightings of whooping cranes in Nebraska. As of Wednesday (10/29), 49 whooping cranes were observed at Aransas. Several sightings have been reported from Nebraska to the southern Texas coast, including a family group observed in Cheyenne Bottoms, Kansas.
11/03/03	Wally Jobman	No new sightings.
11/04/03	Wally Jobman	Several new updates. Three whooping cranes were observed on the North Platte River, northwest of the town of North Platte, Nebraska. On October 31, a single crane was observed in Brown City, and ten cranes were observed on a stock pond in Furnas City south of Lexington (near the Kansas border). Whooping cranes were also observed three miles east of Ainsworth, Nebraska, north of Lexington.
11/04/03	Jim Jenegas	Phone Jim Jennigas of NPPD to gain permission to access NPPD parcel of land for placement of decoy FAD04. Permission granted.
11/05/03	Diane Beachly	An employee of the Platte River Trust reported

Date Contacted	Contact	Notes
		seeing a whooping crane on the wing flying southward near the intersection of Platte River Road and Alda Road.
11/07/03	Wally Jobman	No new updates.
11/10/03	Wally Jobman	No new updates.

APPENDIX B
MONITORING REPORTS FROM AERIAL SURVEYS AT ARANSAS NATIONAL WILDLIFE REFUGE, FALL 2003

Appendix B
Monitoring Reports from Aerial Surveys at Aransas National Wildlife Refuge
Fall – 2003

October 23, 2003

An aerial census on October 23, 2003 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at 5 adults + 0 young = 5 total.

Recap of cranes observed: (5)

adults + young
Refuge 3 + 0
Lamar -
San Jose -
Matagorda -
Welder Flats 2 + 0

Total 5 + 0

Remarks: Clear skies and light west winds made for ideal census conditions. All of the crane area was covered in 3.7 hours of flight time. Contract pilot Dr. Tom Taylor worked successfully to purchase a "new" re-built Cessna 172 airplane and get all required clearances after an accident damaged the former airplane at the end of August. The final inspection was completed this morning prior to today's first flight of the season. My thanks go to Dr. Taylor for all his efforts getting this done in a very
short time frame.

Five whooping cranes all believed to be subadults were present on the wintering grounds, distributed as two duos and a single. The first 2 whooping cranes arrived on October 18th with a weak cold front that brought clear skies and northeast winds. This was just 2 days after the average whooping crane first arrival date of October 16.

Status of migration: Most of the flock is still in migration, with sightings in the past week reported mostly in North Dakota and Saskatchewan. Sandhill crane numbers are reported building up at Salt Plains NWR in Oklahoma where 2 whooping cranes were reported present this morning.

Habitat: Tides have dropped 0.8 feet from very high levels (3.4 mlt) last week. Conditions appear to be excellent for the cranes. Abundant summer rains have benefited the blue crab population, and marsh ponds have much growth of algae and sea grass. Wolfberry flowers are everywhere and fruits are starting to form. Extreme high tides and heavy rains in September combined possibly with effects from an earlier hurricane re-opened Cedar Bayou, the natural pass between the bays in the whooping crane wintering area and the Gulf. This should benefit bay productivity until the pass silts back in.

Work on a seismic survey on the southern half of Matagorda Island that started in mid-July was completed a few days before the first whooping cranes arrived at Aransas. The exploration involved over 7,000 shot holes. The company worked hard to be finished by this work cut-off date on the island. About a month of work remains in the open waters of San Antonio Bay, but

methods have been modified so that no disturbance to the cranes will occur. The geophysical company worked hard to leave a minimal
footprint in crane habitat and did an excellent job.

Research: Field work has begun on the inflow / blue crab / whooping crane study. This multi-year study with approximately 5 graduate students and 3 professors is headed up by Dr. Doug Slack at Texas A & M University. Plant and water sampling stations are in place, blue crab census methods are being worked out, and observation blinds are nearly constructed to do intensive observations of crane feeding ecology and disturbance. The study has received clearance in an intra agency consultation under Section 7 of the Endangered Species Act.

- Tom Stehn

October 29, 2003

An aerial census on October 29, 2003 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at 45 adults + 4 young = 49 total.

Recap of cranes observed: (49)

adults + young
Refuge 22 + 3
Lamar -
San Jose 4 + 0
Matagorda 15 + 1
Welder Flats 4 + 0

Total 45 + 4 = 49

Remarks: Sunny skies and light south winds made for ideal census conditions. All of the crane area was covered in 6.4 hours of flight time.

The presence of 49 whooping cranes indicated that 44 cranes have arrived since the last flight on October 23rd. The arrival of most cranes was associated with a very strong low pressure system that swept across the Texas Coast on October 26th with north winds continuing through the following day.

The Lobstick adult pair was reported at Aransas on October 25th, just 8 days after leaving Saskatchewan. With strong south winds present October 25th at the refuge, it is possible the Lobstick pair actually arrived on October 24th. This pair has 2 chicks with them, the first set of "twins" to make it to Aransas since 1997. In the 7 years since the pickup of second eggs on the nesting grounds ceased, 2 pairs have now brought "twins" to Aransas.

The Mustang Lake pair that visitors can see at the refuge observation tower arrived the afternoon of October 28th. They first landed at Heron Flats Marsh and then are believed to have flown on to Mustang Lake.

Status of migration: An estimated 75% of the whooping flock is still in migration, with sightings in the past week distributed all the way from Saskatchewan, Canada, to Texas. Low pressure and snow in SK and the Dakotas October 29th should help whooping cranes continue the migration

and make rapid progress. Texas currently has high pressure and the warmest temperatures in the nation which is forecast to continue for at least the next 4 days.

Refuge Management: A refuge prescribed burn of Unit C-15 next to St. Charles Bay was conducted on October 29th. In the past, burns of this unit occasionally received use by whooping cranes. This area had been roller-chopped to convert lands with encroaching running live oak brush back into coastal oak savannah prairie habitat.

Resource Issues: During the crane census, I recorded 970 commercial crab traps in or near whooping crane areas. A breakdown of trap distribution found 240 traps in cuts leading into crane marshes, and 730 in open bays or open lakes close to crane areas. This very high number of traps is present presumably because of abundant blue crab populations. However, trend data shows that the average size of blue crabs is declining on the Texas coast, a sign of a resource under pressure. It is unknown what impact commercial crabbing may be having on whooping cranes.

The pickup of abandoned crab pots the past two winters organized by Texas Parks and Wildlife has greatly reduced the number of abandoned "ghost" traps that continue to catch crabs, fish, and diamondback terrapins. Thousands of abandoned traps have been removed from the bays and marshes. On Matagorda Island, I counted 43 abandoned pots in the crane area, and 20 more at Welder Flats. This is a vast improvement over surveys done several years ago with hundreds of abandoned pots present. Congratulations to TPWD for organizing and participating in this cleanup.

- Tom Stehn

November 5, 2003

An aerial census on November 5, 2003 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at 53 adults + 5 young = 58 total.

Recap of cranes observed: (58)

adults + young
Refuge 27 + 3
Lamar -
San Jose 2 + 0
Matagorda 18 + 1
Welder Flats 6 + 1
Total 53 + 5 = 58

Remarks: Partly cloudy skies and moderate southeast winds made for good census conditions. All of the crane area was covered in 6.1 hours of flight time.

The presence of 58 whooping cranes indicated that only 9 cranes have arrived since the last flight on October 29th. Two reports totaling 10 cranes came from north Texas on October 31. Four adults and 1 young were at Lake Arrowhead southeast of Wichita Falls, and 5 adults were at Lake Weatherford west of Ft. Worth. These cranes may have accounted for the increase in numbers at Aransas on today's flight.

The unbanded pair of cranes on Dewberry Island has arrived, bringing a chick to Aransas for the

first time. The identity of this pair in Canada is not known, but they have been occupying a winter territory since 1996-97 and may have been a subadult duo on Dewberry Island as early as fall,1994. Male crane r-r (1988) has arrived with its unbanded mate and was several territories north of their own marsh. This male has never brought a chick to Aransas and has only hatched a single chick in 7 nesting attempts. These cases demonstrate how long it takes some pairs to be productive. The Lobstick pair with 2 chicks was also north of their usual territory. The Airport family on Matagorda was across the island close to Ayres Bay. Cranes often wander this time of year when neighboring territories are vacant.

Status of migration:

No low-pressure system has reached the Texas coast since October 26th, with migration weather unfavorable across Texas. Saskatchewan had a strong cold front that brought snow on October 29th , with 2 sightings recorded that day in Canada. This storm presumably pushed most of the remaining cranes south into the U.S. The northern Great Plains experienced cold weather and snow in the Dakotas, with cranes presumably migrating across North and South Dakota, Nebraska, Kansas, and Oklahoma during the past week. Texas has had some of the warmest weather in the nation. A weak low pressure system has moved south from Oklahoma into central Texas and is forecast to reach the Texas coast on November 7th. I estimate that cranes are stacked up behind this front and expect numerous birds to complete the migration in the coming week. Five whooping cranes were reported in flight on November 5th near Amarillo, Texas.

Habitat: Tides are back at high levels, measured at 3.1 mlt on November 3rd . They have risen about 6 inches since the last flight.

- Tom Stehn

November 12, 2003

An aerial census on November 12, 2003 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at 93 adults + 11 young = 104 total.

Recap of cranes observed: (104)

adults + young Change from
11/05/03
Refuge 37 + 5 + 12
Lamar 0 0
San Jose 9 + 1 + 8
Matagorda 36 + 4 + 21
Welder Flats 11 + 1 + 5
Total 93 + 11 = 104 + 46

Remarks: Mostly clear skies and light southeast winds made for excellent census conditions. All of the crane area was covered in 6.7 hours of flight time.

The presence of 104 whooping cranes indicated that 46 cranes have arrived since the last flight on November 5th. Just over half of the whooping crane flock has completed the migration.

Newly arrived families included the following;

CNA NEST
Pipeline S-12 15/03
N. Cottonwood K-23 28/03
Power Lake S-15 18/03
Lakeside family on the refuge (unknown)
E. Spalding Cove New family (unknown on San Jose)
Vee Bayou family on Matagorda (unknown)

Pairs NOT expected to bring chicks that arrived this past week included;

G-YbY pair A-6 no nest in 2003
S. Matagorda S-13 37/03
Central Matagorda S-2 no nest in 2003
Middle Matagorda S-9 36/03

Pairs with chicks in August that have arrived without young include;

N. Pump Canal New NY-1 40/03
Shell Reef Old K-16 46/03
M. Sundown K-2 29/03 ? (question about identity of family in Canada)

Status of migration:

A low-pressure system that reached the Texas coast the evening of November 6th brought excellent migration conditions to Texas Nov. 7-9. A similar front favorable for migration reached Dallas the afternoon of Nov. 12 and the Texas coast the morning of Nov. 13, and is expected to bring more cranes with it.

On Nov. 5-6, several groups of whooping cranes were reported in Kansas. Several whooping crane sightings in Texas during the past week were investigated.

November 02 - a single juvenile was reported at Possum Kingdom Lake 70 miles WNW of Ft. Worth. This juvenile presumably separated from its parents, is with sandhills and is expected to winter away from Aransas.

November 07 - 8 whooping cranes 10 km northeast of Electra (NW of Ft. Worth)

November 08 - 1 subadult at Cape Vallero, just S of Rockport, close to Aransas.

November 10 - family present at quarry pond at Fort Hood (SW of Waco), departing at 8 AM.

Habitat: Tides remained at high levels, with the crane area on San Jose noted in particular with water everywhere and no exposed mudflats. Although bay salinities in Sundown Bay were generally between 15-19 ppt, 2 cranes at Welder Flats were observed flying to a Corps of Engineers disposal site to drink. Thirty working shrimp boats were counted in a small part of Aransas Bay off Allyn's Bight on San Jose.

- Tom Stehn

November 19, 2003

An aerial census on November 19, 2003 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at 152 adults + 20 young = 172 total.

Recap of cranes observed: (172)

Adults + young Change from Nov. 12
Refuge 53 + 8 + 19
Lamar 5 + 1 + 6
San Jose 33 + 5 + 28
Matagorda 47 + 5 + 12
Welder Flats 14 + 1 + 3

Total 152 + 20 = 172 + 68

Remarks: Mostly clear skies and light southeast winds provided excellent census conditions. All of the crane area was covered in 8.0 hours of flight time, with an extra search made of the Mission and Aransas River marshes.

One family group on Dewberry Island was believed overlooked, so the number of cranes estimated present at Aransas could be 154 + 21 = 175.

Newly arrived families included the following;
CNA NEST
Ayres Island K10 54/03 unbanded
N. Pipeline Flats S19 20/03 Bands read
S. Sundown Bay S08 13/03
This one is unexpected and doesn't fit Canadian data. Perhaps it?s an unknown family trespassing in SSB territory.
St Charles Bay K20? 47/03? Pair that brought twins in 1997.
Panther Point S21 12/03 Bands read
East Welder K8 52/03 unbanded
Pat?s Bay A09 02/03 Bands read
Spalding Lake K ? 58/03 Bands read
Behind Middle Pond unknown
(Could also be Middle Sundown Bay family (K2,29/03) or Pipeline family wandering from territory (S12, 15/03).
E Spalding Lake unknown
SE Spalding Lake unknown

Pairs not expected to bring chicks that arrived this past week included;

S Sundown Island SK7 61/03
N Dunham Point K17 42/03
N. Lamar SK6 13/03

Status of migration:

The presence of 172 whooping cranes indicated that 68 cranes have arrived since the last flight on

November 12th. Cold fronts that reached the Texas coast on 11/13 and 11/18 aided the crane migration. November 18th was especially notable with clear skies and NW winds averaging around 30 mph.

Recent crane sightings reported in the flyway include a pair seen in Kansas on 11/14, and a family in the southeast corner of Oklahoma on 11/18. One adult whooping crane was shot and killed by a hunter on 11/14 near Ennis, Texas south of Dallas. Some known territorial cranes have not yet arrived at Aransas, so additional cranes will definitely be arriving.

Habitat: Tides remained at high levels; with the crane area on San Jose noted particularly with water everywhere and no exposed mudflats. With bay and marsh salinities generally between 16-19 ppt, 7 cranes were sighted on today's flight at freshwater sources.

Wolfberry fruits are at their peak, with the cranes currently feeding heavily on wolfberry. A crab survey done on November 17th found 21 in 1 ½ hours of walking the marsh. This was the same as a count done in mid-October. High tides with crabs dispersing throughout the vegetated marsh are believed to have caused the crab population to be underrepresented on both surveys. Cedar Bayou remains open, with a little water also flowing from Cedar Bayou into Vinson Slough. Sandhills but no whoopers were seen on very small recent prescribed burn at Welder Flats.

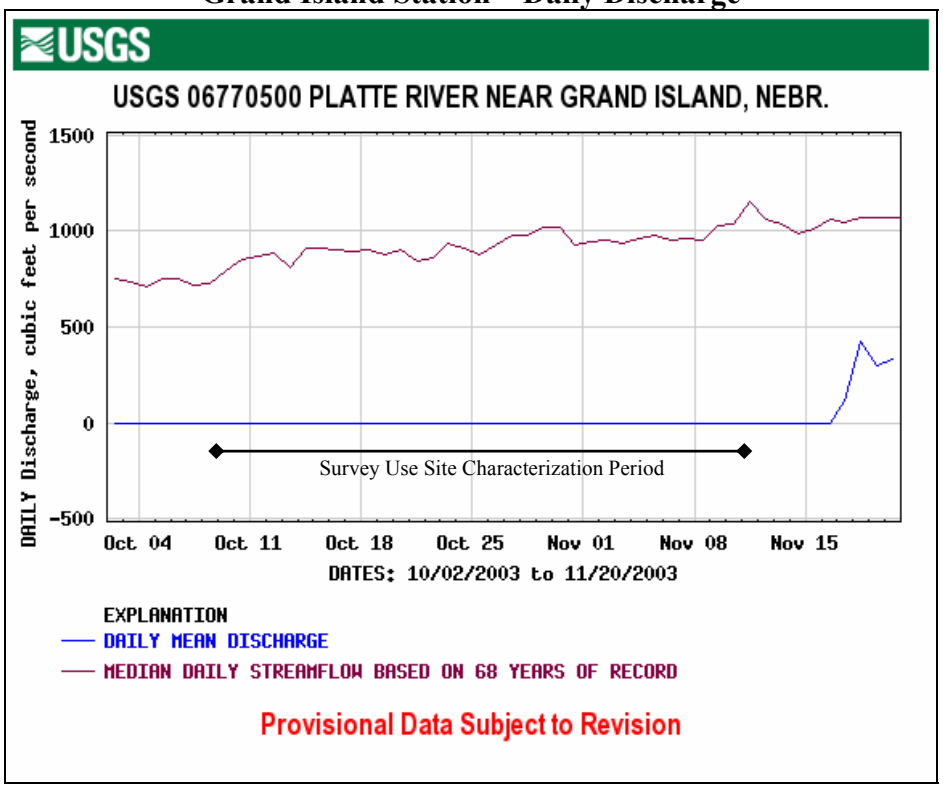
- Tom Stehn

APPENDIX C
COOPERATIVE WHOOPING CRANE TRACKING PROJECT REPORT (JULY 2003 — JANUARY 2004)

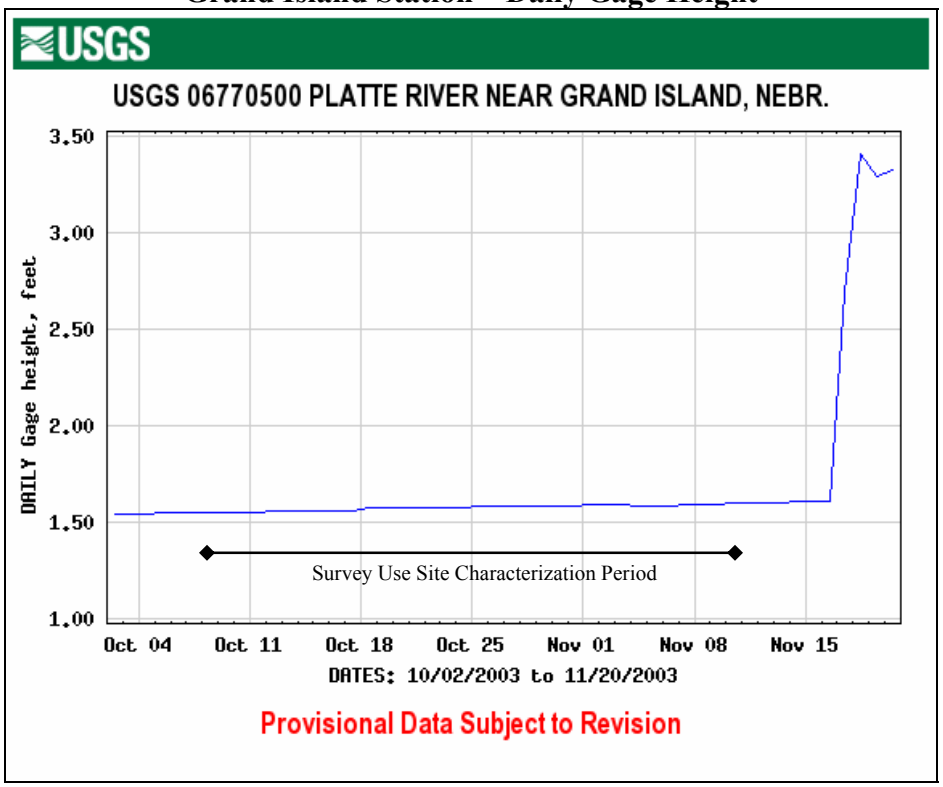
APPENDIX D
CD-ROM OF FALL 2003 PROJECT DIGITAL PHOTOS AND PROJECT DATABASE

APPENDIX E
STREAM CHANNEL PROFILES AND HYDROGRAPHS FOR FALL 2003

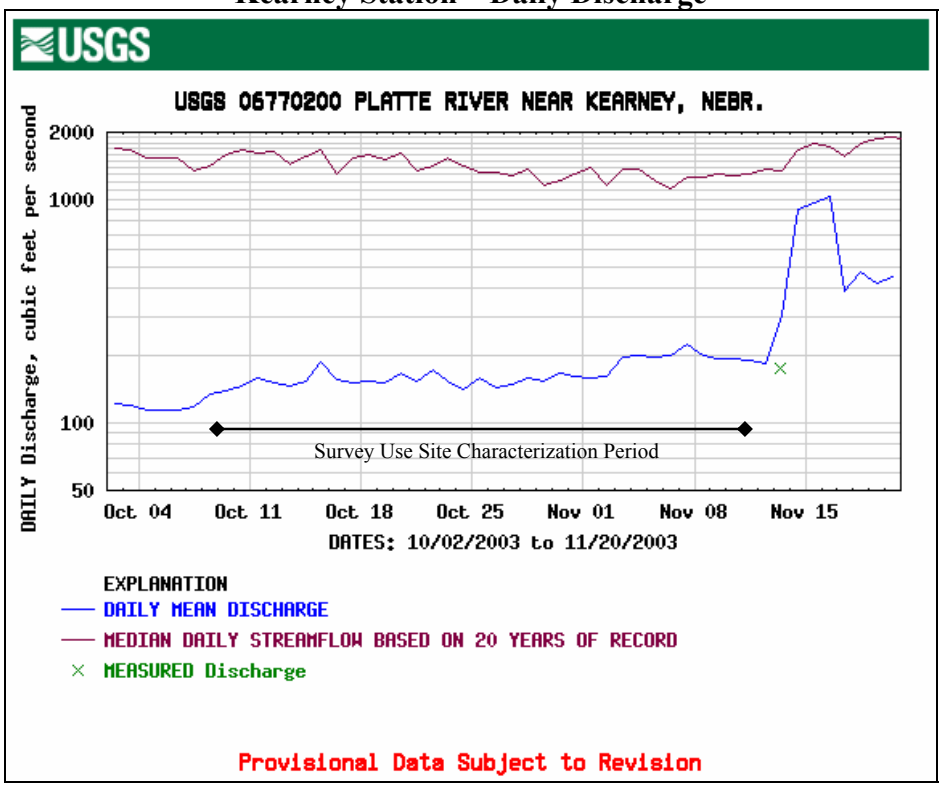
Grand Island Station – Daily Discharge



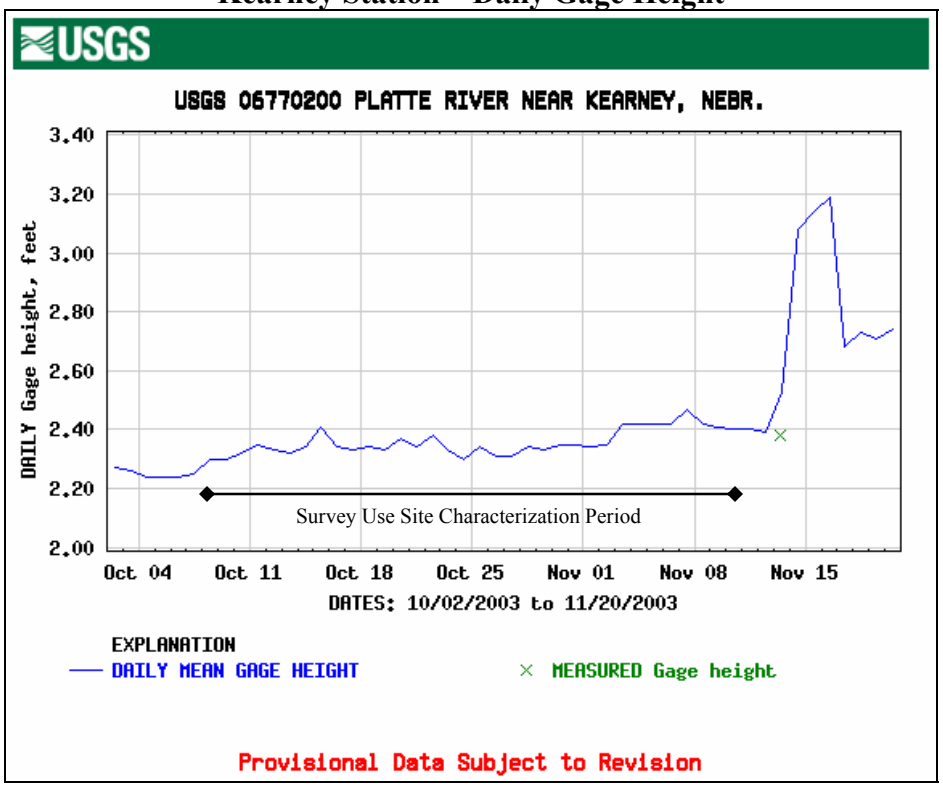
Grand Island Station – Daily Gage Height



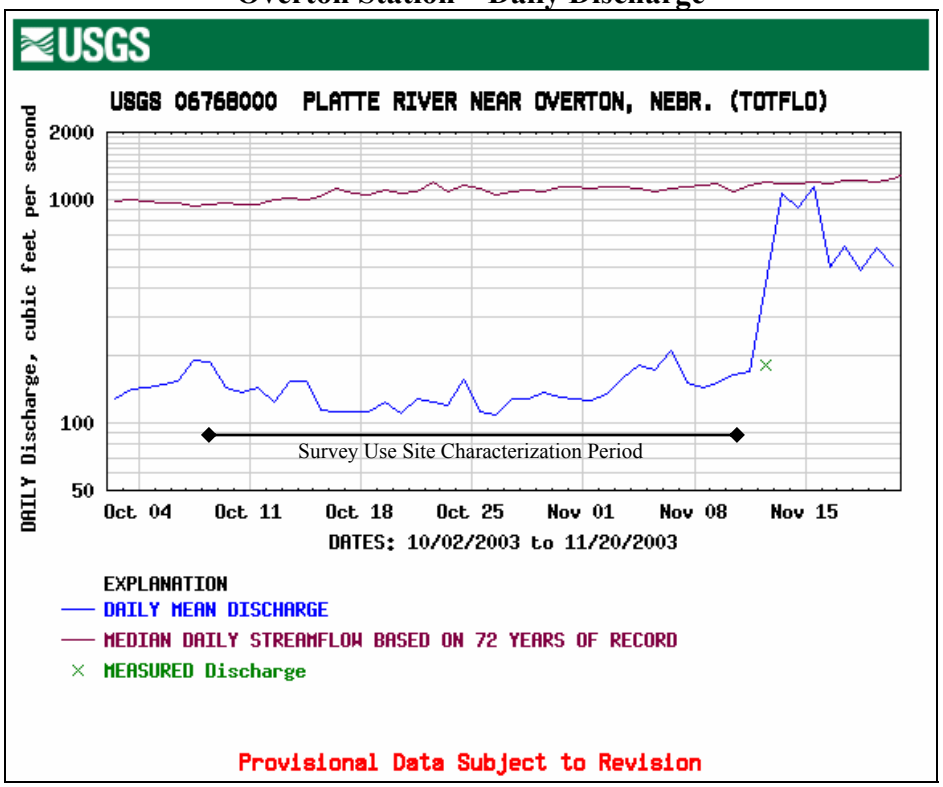
Kearney Station – Daily Discharge



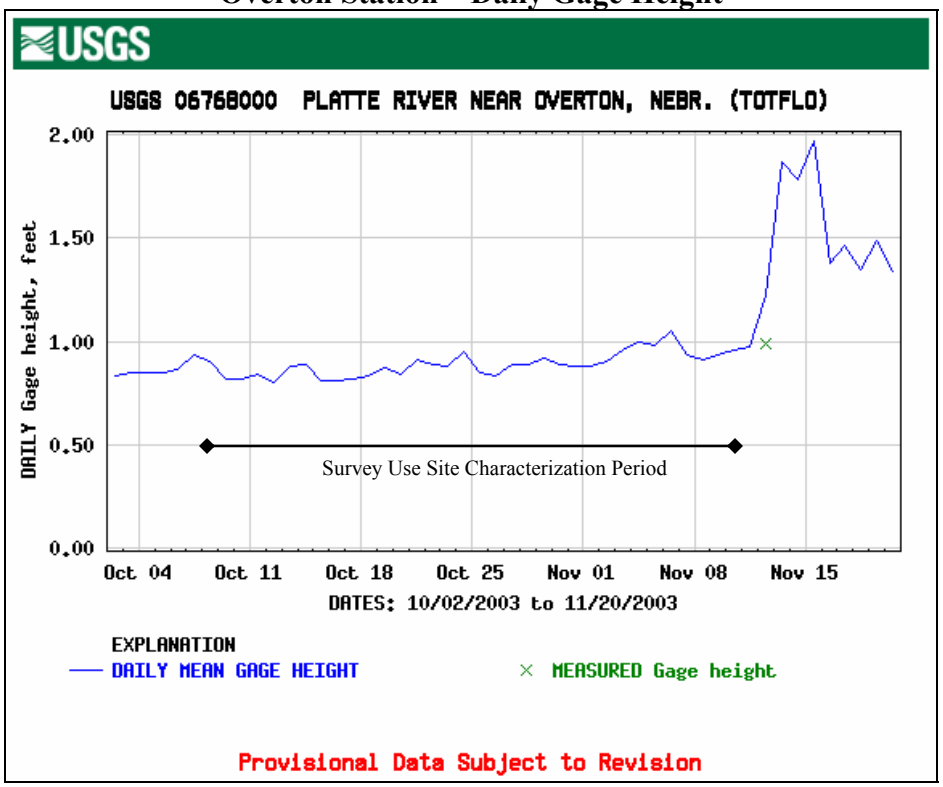
Kearney Station – Daily Gage Height

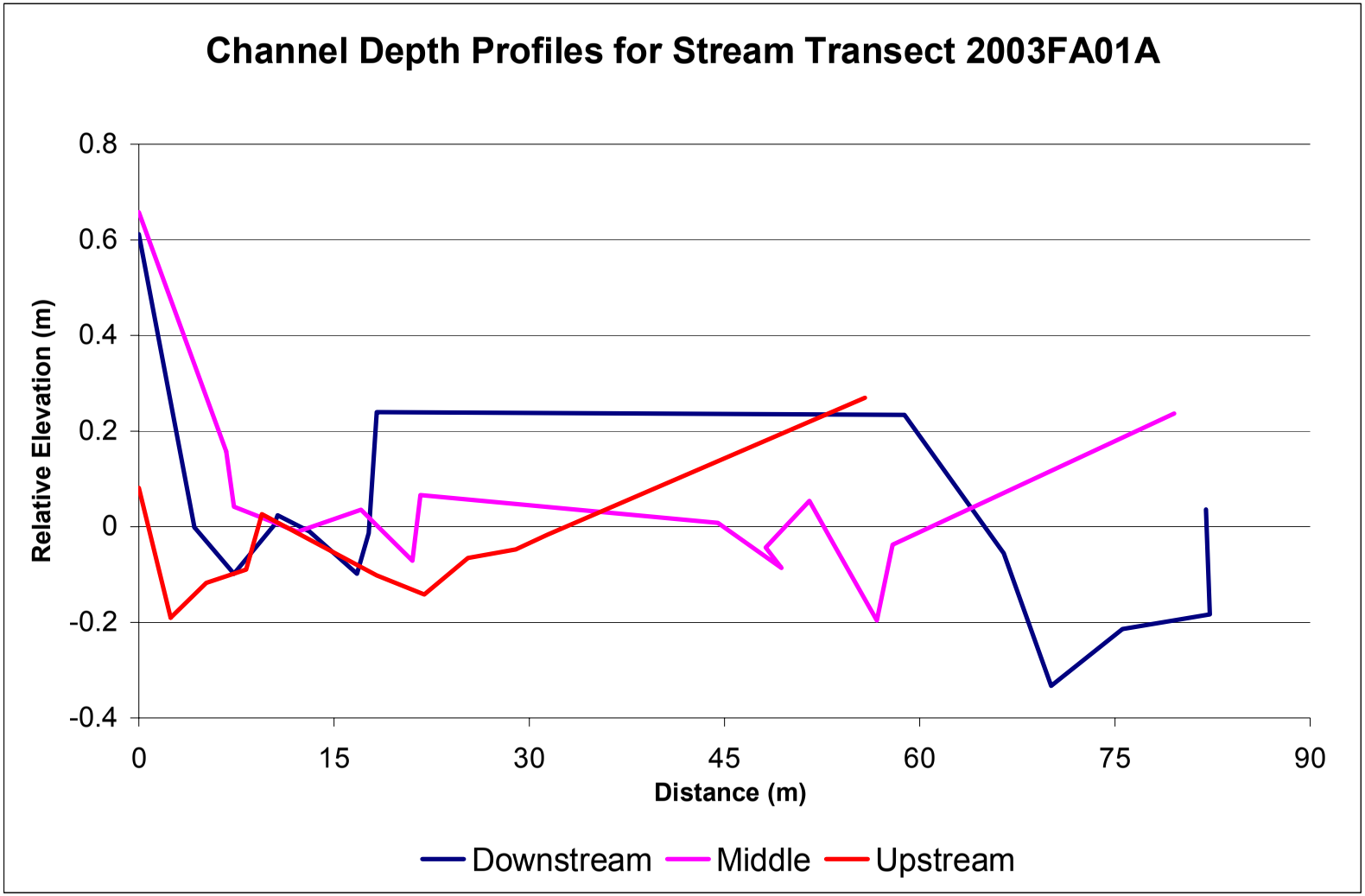


Overton Station – Daily Discharge



Overton Station – Daily Gage Height





Transect Data Collected October 17, 2002 4:00 p.m.

APPENDIX F
SELECT PROJECT PHOTOGRAPHS

Photo 1 Location of single whooping crane (2003FA01) sighted on October 15, 2003. This location was assigned use site identification number 2003FA01A. Photo was taken October 16, 2003 flying westbound along the south bank of the river.

Photo 2 South to north view of the same location as shown in Photo 1.

Photo 3

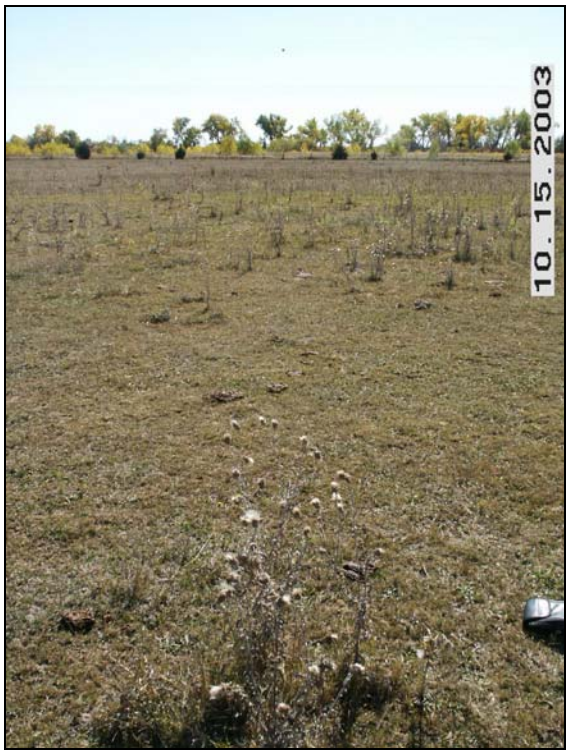


Photo 4

The off channel site used by whooping crane 2003FA01 on October 15, 2003. This site was assigned use site identification number 2003FA02. Photos were taken from the crane's location facing (clockwise from upper left) North, East, West, and South.

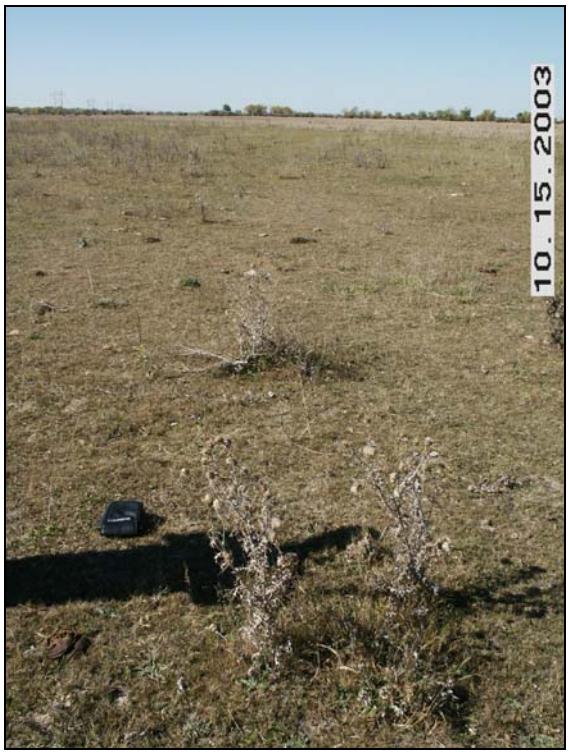


Photo 5

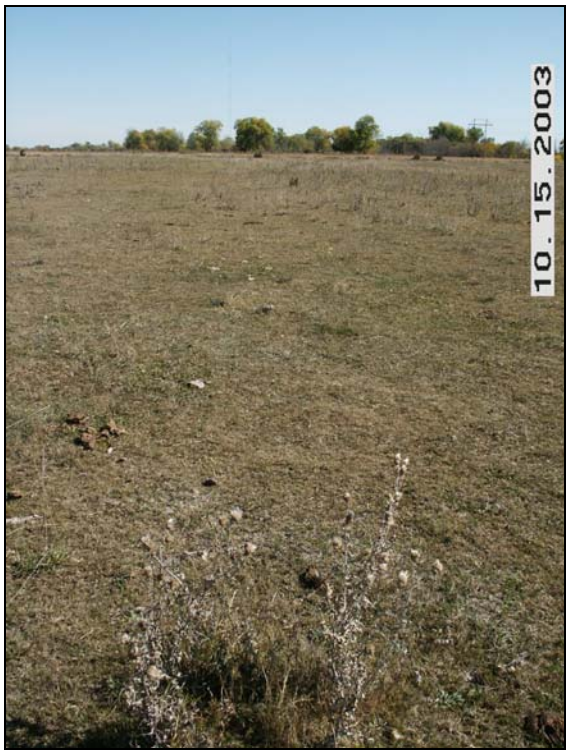


Photo 6

APPENDIX G
SUNRISE AND SUNSET WEATHER EVALUATION

Appendix G
Kearney Weather Report

Sunrise Sunset Weather Investigation — Compiled by Jason Wieseler 12-04-2003

Objective:
Crane Survey flights as defined and performed by contract are canceled when weather will not permit their successful completion. The most common factors affecting a cancellation decision are the wind speed, visibility, and ceiling. This investigation seeks to determine if there is a difference in the probable completion of Crane survey flights based on weather and time of day

Methodology:
Daily weather reports taken at the sunrise and the hypothetical sunset departure times for the duration of the Survey were reviewed to determine if changing the flight time from sunrise to sunset would result in an increase in the completion rate of the Survey Flights.

Resources:
All weather data was retrieved from the FAA Automated Weather Observation System (AWOS) at the Kearney Municipal Airport.
The retrieved data was complied and evaluated by Jason Wieseler, Air Midway Inc., Kearney, NE.
Greystone Environmental contact person Matt Kizlinski

Notes:
About the AWOS:
The FAA AWOS is a weather information gathering station located at the Kearney airport and provides primary information about current weather conditions for aviation purposes. It is capable of measuring several criteria including but not limited to: Time, Wind Direction and Speed, Visibility, Ceiling, Temperature/Dewpoint. The AWOS reports current conditions several times a minute and archives an hourly recording 24-hours a day. This results in "snapshots" of the weather conditions at Kearney over time.

Aviation Decision Making:
The decision to make a flight or to cancel it, know as the Go/No Go decision, is not an easy one. The aviation environment is a dynamic and fluid one. In this instance we will limit the discussion to the weather aspect of the Go/No Go decision. Pilots gather information about weather from a variety of sources to cover the entire route of their flight. It is not uncommon for weather to vary greatly across the course of a flight. For the purpose of this investigation only the information from the Kearney AWOS was available, however, due to the short range of the Crane Survey Flights this information is effective and representative.

Reading the Chart:
The attached chart is a translation of the AWOS information deemed relevant to this investigation. Two time periods or shown to illustrate the weather conditions at the actual departure times of the Crane Survey Flights and the hypothetical Sunset departure time. 1200 Zulu equates to 7:00am local daylight savings time and 6:00am local standard time. Likewise, 2300 Zulu equates to 6:00pm local daylight savings time and 5:00pm local standard time. Wind direction and speed are shown as the degrees of the compass and knots per hour. Visibility is show in statute miles or when unlimited as "+10". Cloud conditions are shown under the heading Ceiling. No reported clouds below 12,000 feet is read as Clear (CLR). Amount of sky covered by clouds is illustrated by Few, Scattered, Broken, and Overcast. Broken and Overcast are considered to be Ceilings by the FAA. Cloud height is above ground level and is abbreviated by using three digits and dropping the last two place values, i.e., 12,000 feet = 120; 1,400 feet = 014; 300 feet = 003. A Decision column gives the Go/No Go decision made by the pilots for each Sunrise flight and the decision made by Jason Wieseler for the hypothetical Sunset flight based on the AWOS report. The final column is uses an "X" to denote those times when the weather conditions resulted in a difference in the Sunrise Decision and the Sunset Decision. The following is provided as a key.

Table					Translation			
	1200 Zulu				7:00am Local			
Date	Wind	Vis	Ceiling	Decision	Wind	Visibility	Ceiling	Decision
Oct 9	190/6	+10	OVC 15	-	South/6 Knots	unlimited	Overcast at 1500 ft	No Go

Greystone Environmental Whooping Crane Survey Fall 2003 Sunrise Sunset Weather Investigation Compiled by Jason Wieseler 12-04-2003

	1200 Zulu				2300 Zulu				
Date	Wind	Vis	Ceiling	Decision	Wind	Vis	Ceiling	Decision	
Oct 9	190/6	+10	OVC 15	-	160/17G20	+10	CLR	+	X
Oct 10	160/11	+10	BKN 6 OVC 13	-	140/20G25	+10	FEW 19	-	
Oct 11	330/15G22	+10	OVC 9	+	310/15G19	+10	CLR	+	
Oct 12	200/6	+10	CLR	+	170/17G23	+10	CLR	+	
Oct 13	340/10	+10	CLR	+	020/10	+10	FEW 050	+	
Oct 14	280/9	+10	CLR	+	350/7	+10	FEW 085	+	
Oct 15	080/8	+10	CLR	+	020/12	+10	CLR	+	
Oct 16	060/4	+10	CLR	+	030/11	5	OVC 060	+	
Oct 17	210/8	+10	CLR	+	180/11	+10	CLR	+	
Oct 18	270/6	+10	CLR	+	060/5	+10	CLR	+	
Oct 19	230/3	+10	CLR	+	170/6	+10	CLR	+	
Oct 20	280/3	+10	CLR	+	340/6	+10	CLR	+	
Oct 21	220/6	+10	CLR	+	340/8	+10	CLR	+	
Oct 22	290/5	+10	CLR	+	320/4	+10	CLR	+	
Oct 23	040/3	+10	CLR	+	130/11	+10	CLR	+	
Oct 24	330/20G25	+10	CLR	+	350/15	+10	CLR	+	
Oct 25	280/7	+10	CLR	+	330/17G22	+10	CLR	+	
Oct 26	250/5	+10	CLR	+	320/15G23	+10	FEW 060	+	
Oct 27	000/0	+10	BKN 070	+	270/10	+10	FEW 120	+	
Oct 28	300/12G16	+10	CLR	+	330/8	+10	CLR	+	
Oct 29	120/11	+10	CLR	+	170/11	+10	CLR	+	
Oct 30	340/22G30	+10	CLR	-	340/17	+10	OVC 038	+	X
Oct 31	350/13	+10	OVC 016	+	010/13	+10	CLR	+	
Nov 1	100/14	+10	OVC 048	+	090/4	2.5	BKN 004 OVC 009	-	X
Nov 2	360/7	+10	SCT 004 OVC 025	-	060/10	+10	SCT 017 OVC 027	-	
Nov 3	050/9G14	3	OVC 004	-	020/10	2.5	OVC 002	-	
Nov 4	320/9	+10	OVC 009	-	350/12	+10	CLR	+	X
Nov 5	010/13G17	+10	OVC 011	+	060/6	+10	CLR	+	
Nov 6	000/0	+10	OVC 026	+	280/6	+10	CLR	+	
Nov 7	000/0	+10	CLR	+	110/6	+10	FEW 110	+	
Nov 8	090/9	+10	CLR	+	120/11	+10	CLR	+	
Nov 9	160/8	+10	OVC 040	+	150/16G21	+10	CLR	+	
Nov 10	180/12	4	OVC 004	-	240/6	+10	CLR	+	X