OtterTail Environmental INC.

February 16, 2006

Clayton Derby
West EcoSystems Technologys, Inc.
4007 State St., Ste. 109
Bismarck, ND 58503

RE: TRANSMITTAL OF FALL 2005 WHOOPING CRANE FINAL REPORT

Dear Clayton,

Enclosed are a CD and a hardcopy of the Final Whooping Crane Migration Report for Fall 2005. All comments received by the deadline have been incorporated into this final version.

We delivered a final version of the Whooping Crane Fall 2005 database on December 15, 2005. In an earlier mailing (November 18th), we transferred all the original datasheets.

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

Thank you for the opportunity to work on this project.

Sincerely,

Thomas Ryon
Wildlife Biologist

Cc: Ed Fleming – OtterTail
file

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Final Report

Fall 2005 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

Submitted by:

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February 2006

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1.0 INTRODUCTION

The Platte River Endangered Species Partnership (PRESP) is an organization created from a cooperative agreement with the Department of Interior between the states of Colorado, Nebraska, and Wyoming. The tri-state/federal partnership has two main objectives. The first objective is to develop and implement a program to improve and conserve habitat for four target endangered and threatened species that utilize the central and lower 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 target species.

To accomplish these objectives, PRESP 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 fall 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 September 16, 2005 (PRESP 2005). This version of the protocol was used to implement the fall 2005 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.

OtterTail Environmental, Inc. (OtterTail) was contracted by PRESP to implement the protocol and conduct whooping crane surveys along the Platte River of Central Nebraska in the fall of 2005. This report summarizes the results of the fall 2005 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 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 "Monitoring Whooping Crane Migrational Habitat Use in the Central Platte River Valley" (i.e., Draft Whooping Crane Monitoring Protocol; PRESP 2005) was followed for the fall 2005 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 fall 2005 effort started on October 9 and ended on November 10, 2005 (PRESP 2005).

2.1 AERIAL SURVEYS

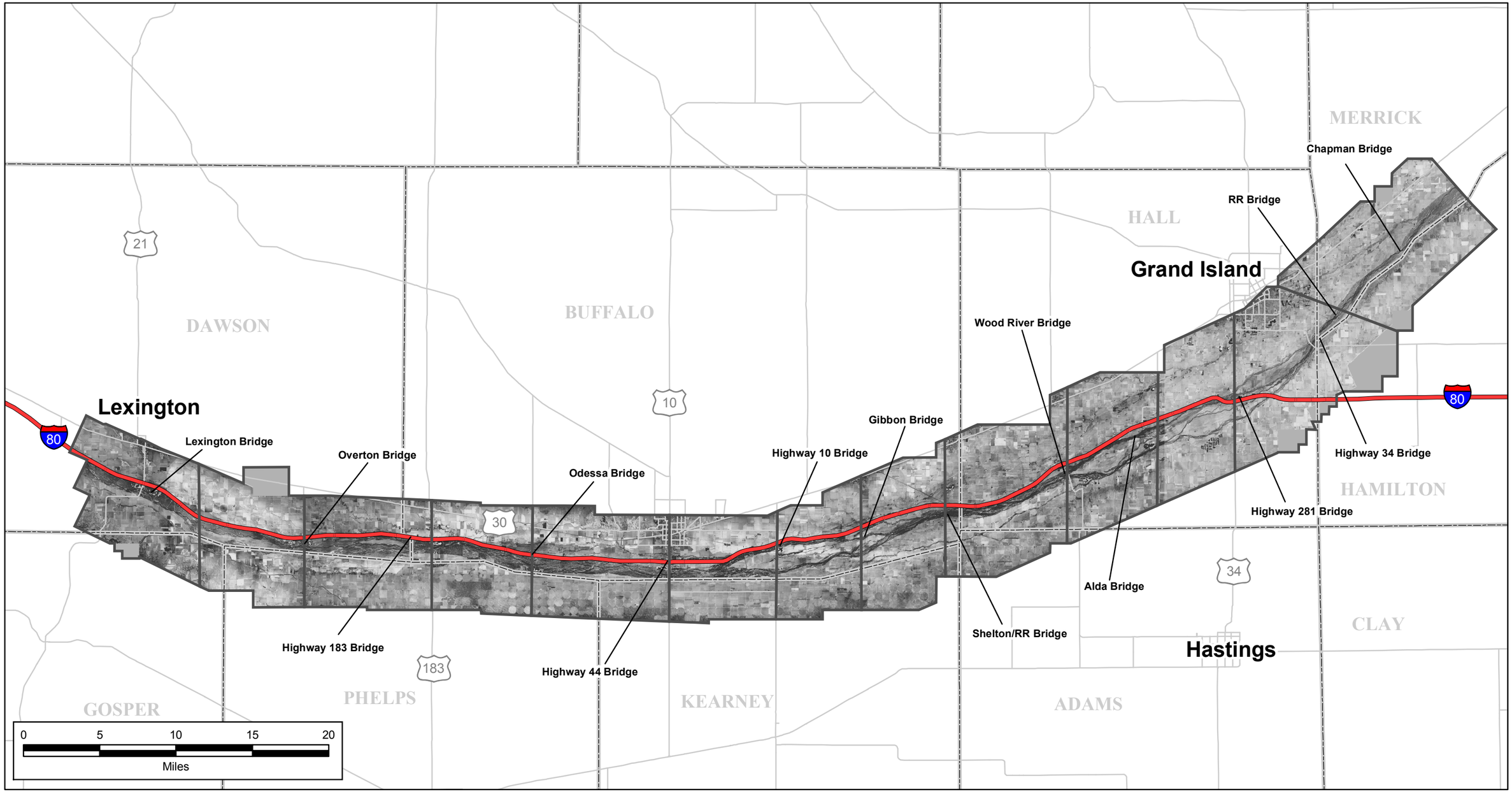
Daily aerial surveys were completed concurrently during morning hours for two sections of the central Platte River between October 9 and November 10, 2005. The eastern, or Grand Island, section of the study area is located between Minden Bridge and Chapman Bridge. The western, or Kearney, section of the study area is located between the Lexington Bridge and Minden Bridge (Figure 1). Air Midway was contracted to fly the Kearney section, and Abbott Aviation of Hastings was contracted to fly the Grand Island section of the study area.

Aerial surveys were scheduled from the Kearney and Grand Island Airports and were conducted daily as weather allowed. Two surveyors were assigned to each plane flying from each airport. Pilots flew transects at an altitude of 750 feet. 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 riverine transects at either the eastern most or midway points and subsequently flew in the same direction away from the rising sun. 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:

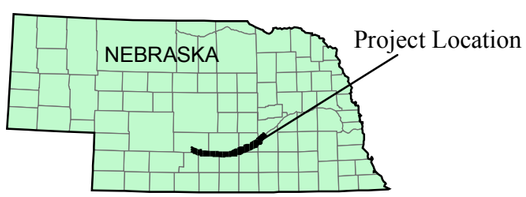
- River Return Transect – flown down the middle of the river, not to be confused with the riverine transect that is flown along the south side of the river with observers on both sides of the plane. Symbolized as "0" transect;
- Upland transect one mile south of the river. Symbolized as "1S" transect;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



Legend

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



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OtterTail Environmental INC.

FALL - 2005
WHOOPING CRANE SURVEYS

FIGURE 1
CENTRAL PLATTE RIVER STUDY AREA

ANALYSIS AREA: PLATTE RIVER, NEBRASKA	
Date: November 2005	File: Fig1.mxd
Drawn By: DRH	

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 U.S. Fish and Wildlife Service (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 (1-888-399-2824) was established to report opportunistic sightings. Calls received on the hotline number were forwarded to the Platte River Trust. Potential sightings were screened by Platte River Trust personnel who had previously been instructed to contact OtterTail biologists.

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:

- One wooded river within floodplain locations
- One shrub inside floodplain location

- One lowland grass location
- One agricultural corn field location
- Eleven 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 QUALITY ASSURANCE/QUALITY CONTROL

A key component of the fall whooping crane survey was the quality assurance/quality control (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 fall 2005 monitoring surveys.

3.1 EXTENT OF RIVER

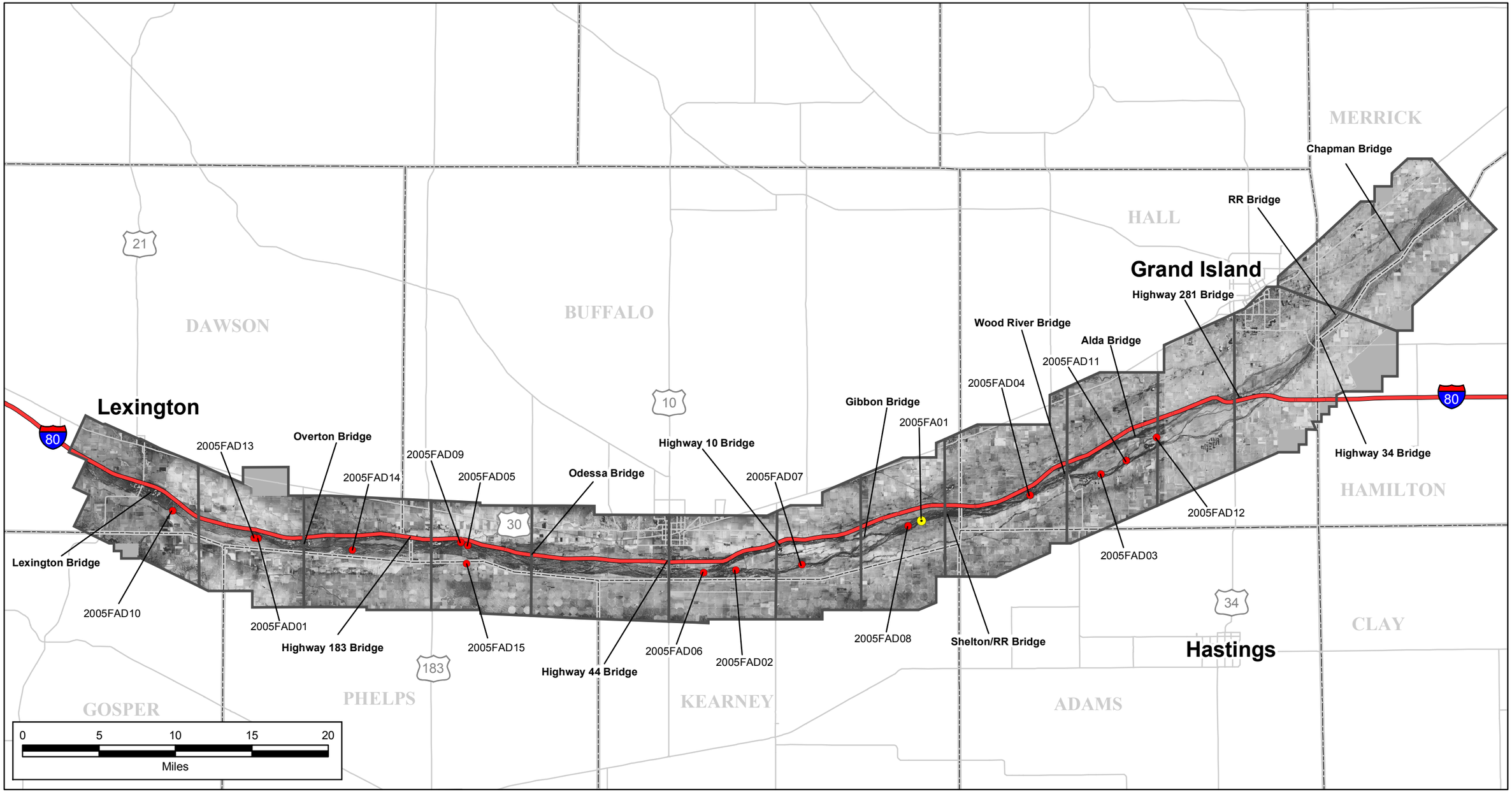
Based on U.S. Geological Survey gauging stations near Overton, Elm Creek, Kearney and Grand Island (Appendix A), a wetted channel was found throughout the central Platte River study area during the fall survey period. Observations from aerial surveys confirmed the presence of surface water throughout the study area. Not reflected in these data is the observation from aerial surveys that the middle channel from approximately the Minden Bridge to the Gibbon Bridge was dry the first 10 days of the survey period in an area (Rowe Santuary) where crane use can be high when water is present. During this time, the north channel was flowing continuously along this stretch of the Platte River. The exact reasons why the middle channel was not flowing is not entirely clear, but it appeared that water was being diverted, through natural events or human activities.

Reviewing daily discharge from October 8 through November 18 2005 shown great variability at the three upstream stations (Overton, Elm Creek, and Kearney) with daily discharge often being well below the median historic stream flow for each site. The exception to this phenomenon was the Elm Creek station which showed most flows above median historic stream flow. At the Grand Island station, an increasing trend was observed during the first two-thirds of the survey period and a decreasing trend during the last third and flows were always well below the median historic stream flow for this site (Appendix A).

3.2 FLIGHT LOGS AND CANCELLATIONS

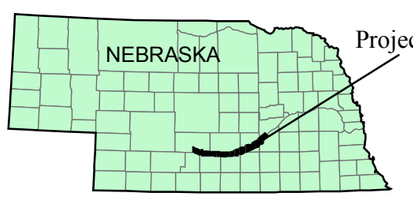
Few flights were cancelled or discontinued. When flights were canceled, the groundings were due to limited visibility including fog, rain or low cloud ceiling.

Of the 33 possible flight days, 32 (97%) were flown from Kearney over the west section of the study area and 31 (94%) 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 Minden Bridge was flown slightly more often (100% vs. 94%, Table 3-1) than the Odessa Bridge (split transect) riverine transect due to a flight cancellation. Within the eastern section of the study area, the riverine transects



Legend

- Project Boundary
- County Boundary
- Interstate Highway
- Major Road
- Decoy Location
- Whooping Crane Sighting



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OtterTail Environmental INC.

FALL - 2005
WHOOPING CRANE SURVEYS

FIGURE 2
DECOY LOCATIONS AND
WHOOPING CRANE SIGHTING

ANALYSIS AREA: PLATTE RIVER, NEBRASKA	
Date: November 2005	File: Fig2.mxd
Drawn By: DRH	

starting at the Chapman Bridge were flown more than those starting at the Wood River Bridge (100% vs. 93%, Table 3-1). A summary of the number and distribution of return transects flown during the fall 2005 survey is provided in Table 3-2.

Compared to previous fall surveys, the 2005 effort had fewer cancellations and milder weather conditions than fall surveys in 2004 (AIM 2005) and 2002 (Greystone 2003).

TABLE 3-1
COMPARISON OF RIVERINE TRANSECTS FLOWN WITHIN EAST AND WEST SECTIONS OF THE PLATTE RIVER STUDY AREA, FALL 2005

East Section		West Section	
Chapman Bridge	17	Minden Bridge	17
Wood River Bridge	14	Odessa Bridge	15
Grand Island Total	31	Kearney Total	32

TABLE 3-2
DISTRIBUTION OF RETURN TRANSECTS FLOWN FOR THE FALL 2005 SURVEY

Number of Return Transects Flown		
Return Transect	**Grand Island**	**Kearney**
0 (River)	5	5
1S	5	5
1N	5	5
2S	4	5
2N	4	4
3S	4	4
3N	4	4
Total Flight Days	31	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 fall 2005 survey. Actual locations for all decoys are shown in Figure 2. Searcher efficiency was calculated using the following equation:

Number of decoys observed/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, 13 (87 percent) were detected during the aerial surveys. Results by strata reveal that 100 percent of the decoys in the river flights (0 strata) were observed, whereas only 60 percent of the return flights (0-3.5 strata) were observed during the aerial surveys.

3.4 SUMMARY OF WHOOPING CRANE SIGHTINGS

OtterTail biologists regularly contacted Martha Tacha of the U.S. Fish and Wildlife Service in Grand Island to get updates on the fall migration from Wood Buffalo, Canada to the central Platte River Valley and on to Aransas, Texas. This aided in knowing when crane groups were observed in northern states or when cranes were observed south of the Platte River. Ms. Tacha provided weekly updates from northern states and Canada. Tom Stehn of the Aransas National Wildlife Refuge prepared weekly migration reports relaying the number of cranes arriving at wintering grounds. These reports are provided in Appendix B.

A provisional U.S. Fish and Wildlife Service 2005 Fall 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 of whooping cranes on November 3, 2005. The roost site was located approximately 1.5 miles west of the Shelton Bridge (Figure 2). Qualified observers confirmed this sighting during the aerial survey during a split riverine transect of 2 adult whooping cranes. Although ground crews were dispatched to the area to begin ground observations, whooping cranes were never observed on the ground as access to private land was not granted. However, the birds were observed from the ground as they flew from the river. This gave a second qualified observer the opportunity to identify the birds as whooping cranes before they kettled (i.e., rose using thermal updrafts) and presumably migrated from the study area. A group number was assigned to these cranes in accordance with the protocol. A USFWS Crane Group identification number (05B-26) 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 fall 2005 survey period is provided in Appendix D.

Total Crane Use Days - Total crane use days for the fall 2005 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 fall 2005 survey period of confirmed sightings was 2 days. More details of this sighting can be found in Appendix D. After the survey period was completed, it is possible that more crane used the river after November 10th as more than 100 whooping cranes were still absent at Aransas and numerous sightings were still being made in northern states.

Systematic and Opportunistic Sightings - Two whooping cranes were confirmed during systematic sightings during the fall 2005 survey period. No whooping cranes were confirmed from opportunistic sightings. No calls were received through the toll-free phone number, but apparently information on the toll-free number was not readily available to the public as information was not widely distributed. One opportunistic sighting on October 15 near the Alda Bridge and called in to the U.S. Fish and Wildlife Service was confirmed as a project decoy.

3.5 CHARACTERISTICS OF USE SITES

Information collected at the whooping crane river use site employed the 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 2005FA01A. River channel profiles were not measured at the use site due to resistance by landowners to grant access. Because of this issue only ½ of the use site could be accessed. Instead, the field crew used a laser rangefinder to measure distances, however the transet and stadia rod were not used. The wetted channel at the crane use site was fairly clear of obstructions with the nearest obstruction 76m away. This section of the Platte River had a river width (i.e., sum of wetted channels and sandbars) of 136 meters (Appendix D). The obstruction-to-obstruction distance along this section was greater than the river width at 176 meters. Substrate at the use site was composed of coarse sands (70%), small gravel (10%), and fine sand (10%). The streamflow when Whooping Cranes were observed on the river as measured at the Grand Island station was 525 cfs. Recent land clearing north of the river was a management action observed near the use site. The U.S. Fish and Wildlife service is in the process of reclaiming a former river slough. Actual river clearing was not apparent at the use site.

3.6 SANDHILL CRANE OBSERVATIONS

The 2005 fall migration produced few numbers of sandhill cranes in the central Platte River Valley. Only on two occasions were sandhill cranes observed during the fall survey period (week of October 17th and November 3-4. These dates corresponded to weather fronts that spurred waterfowl and crane migration.

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 Wildlife Area.

4.0 RECOMMENDATIONS

The following recommendations are developed out of the experience gained in implementing the fall 2005 monitoring protocol.

4.1 FIELD MONITORING PROTOCOL

- Consider reviewing the survey periods. These dates are based on the 95 percentile of historic sightings. However, a review that incorporates more recent observations may shift the dates within the 95 percentile of observations in the central Platte River Valley. It may be prudent to extend the fall survey period a week or two even if percentiles remain unchanged after review. Weather patterns often dictate the migration to weeks outside of the survey period. This certainly happened during the 2005 fall season and end dates where also pressed in 2002 fall season (Greystone 2003).

- The decoy location coordinates need to include datum and projection information should be provided with 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. Vegetation type associated with the random selection should also be provided to insure that the decoy is placed in the correct vegetation type.

- 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.

4.2 DATABASE

- A preliminary screen could be developed to lead a data entry person to the correct form.
- Further information on Use Sites may be needed especially with sightings that are observed from the air but not by the ground crew.

5.0 LITERATURE CITED

AIM Environmental Consulting. 2005. Implementation of the Whooping Crane Monitoring Protocol; Fall 2005. Prepared for the Committee's of the Platte River Cooperative Agreement. February.

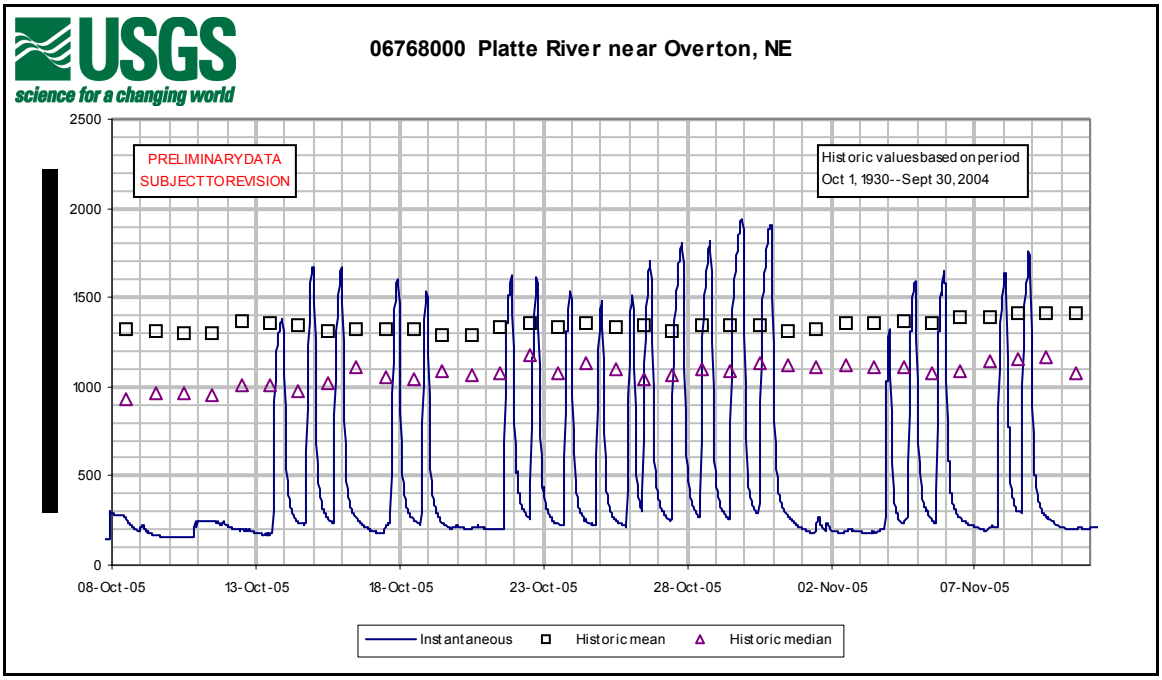
Greystone Environmental Consultants. 2003. Fall 2002 Whooping Crane Migrational Survey Protocol Implementation Report. Prepared for Platte River Endangered Species Partnership. December.

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

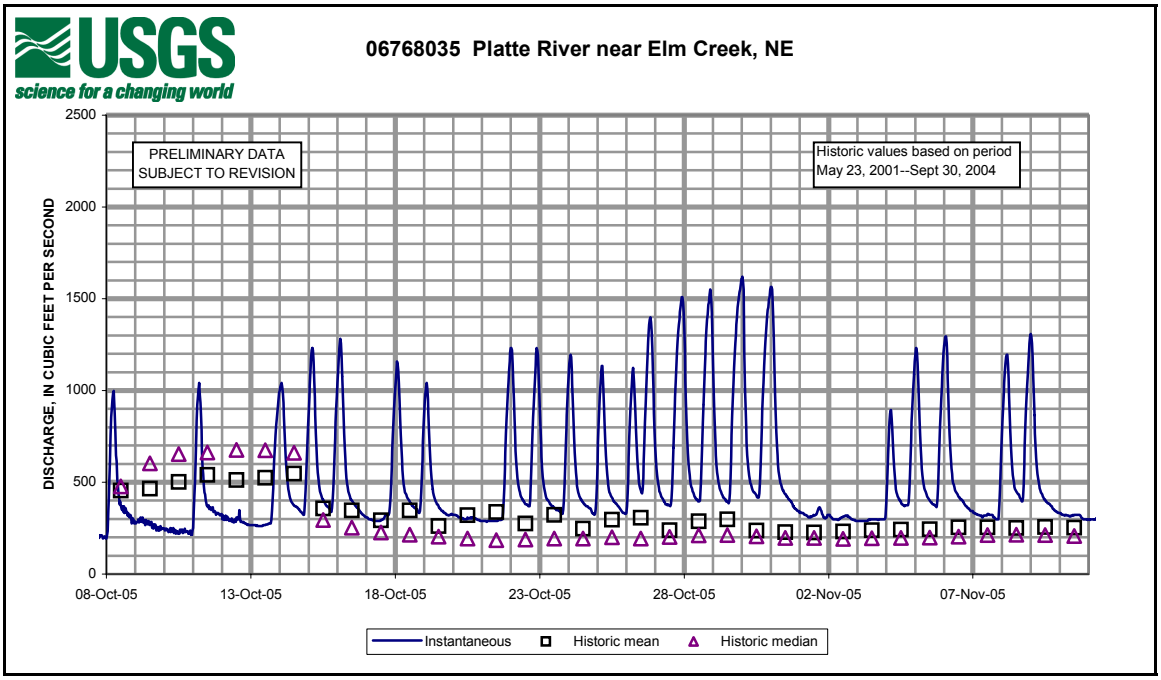
Platte River Endangered Species Partnership (PRESP). 2005. Draft Monitoring Whooping Crane Migrational Habitat Use in the Central Platte River Valley –- Whooping Crane Monitoring Protocol. September 16.

APPENDIX A—USGS GAGE STATION DATA
OCTOBER 8 TO NOVEMBER 10, 2005

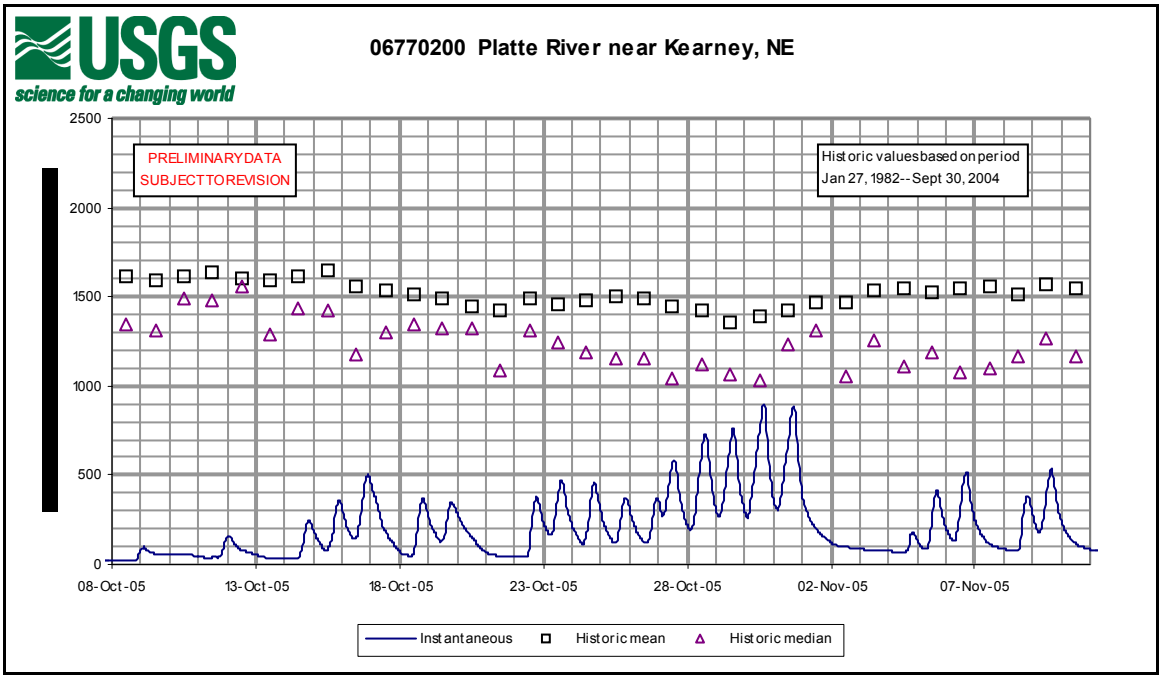
Overton, Nebraska Gage Station



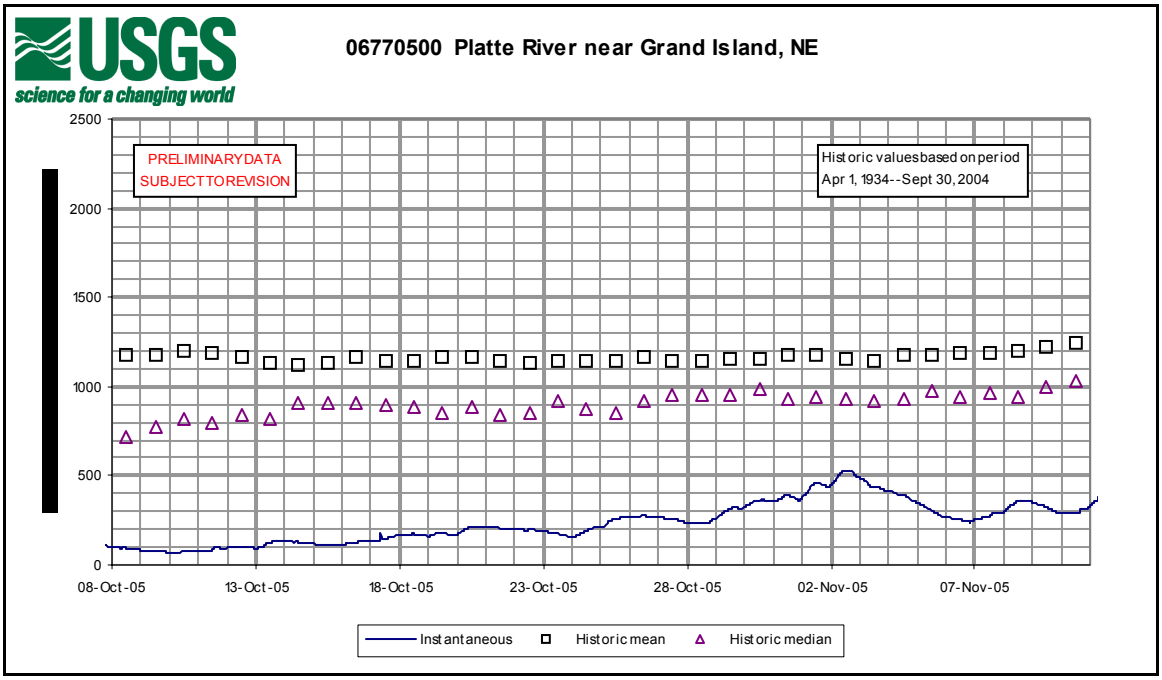
Elm Creek, Nebraska Gage Station



Kearney, Nebraska Gage Station



Grand Island, Nebraska Gage Station



APPENDIX B—ARANSAS NATIONAL WILDLIFE REFUGE WHOOPING CRANE SURVEY REPORTS

Aransas National Wildlife Refuge
Whooping Crane Reports

October 19, 2005

A whooping crane census conducted October 19, 2005 of the wintering grounds located a total of 3 whooping cranes. Two migrant cranes were together on San Jose Island, and the whooping crane injured last spring that over summered at Aransas was present near the refuge's Sundown Bay and continued to look fine. The two cranes on San Jose were the first migrant whooping cranes to arrive and could have arrived shortly after a cold front crossed the Texas coast on October 8. This has been the only low pressure system to reach Aransas this fall. The average date for the first whooping cranes to arrive at Aransas in the fall is October 16.

Recent reports from the flyway indicated many of the whooping cranes are in Saskatchewan, with only 3 reports in the U.S. (2 from North Dakota and 1 from Montana). Canadian Whooping Crane Coordinator Brian Johns on October 18 observed a group of 19 at Muskiki Lake, SK. That day, he picked up the remains of a whooping crane banded Green-Red as a juvenile in 1977, the oldest banded bird in the flock. This 28-year-old female was with her mate and juvenile, but was not staying close together as a typical family group when observed by Brian on October 3, indicating a possible health problem for the female. On October 8, Brian received a report of only one adult with a juvenile present, and later was able to get to the site and recover the carcass. The cause of death is not known.

Red tide, a microscopic algae that can cause large fish kills, has been present in the Corpus Christi, Texas and surrounding areas since mid-October. None has been reported further north in the whooping crane area. Cedar Bayou, a natural pass between the Gulf of Mexico and Mesquite Bay within whooping crane critical habitat has remained open throughout 2005. This pass, important for many organisms including blue crabs that reproduce in the Gulf to complete their life cycle, has a history of silting closed.

October 26, 2005

An aerial census on 26 October, 2005 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at Aransas at 91 adults + 10 young = 101 total. Approximately 235 whooping cranes are expected to arrive at Aransas this winter. Thus, an estimated 43% of the flock has completed the migration.

Recap of cranes observed on the flight: (101)

	adults + young
Refuge	32 + 3
Lamar	2 + 0
San Jose	20 + 1
Matagorda	30 + 4
Welder Flats	7 + 2
Total	91 + 10 = 101

Remarks: Excellent viewing conditions and moderate winds were present throughout the day. Nearly all of the crane winter area was flown in a 6.5-hour census.

An estimated 98 whooping cranes (88 adults and 10 young) have arrived from migration since the previous flight on October 19. A weak front crossed Texas on October 21 and helped steer Hurricane Wilma away from the Texas coast. A strong cold front with winds gusting up to 40 mph crossed the Texas coast on the evening of October 23. This front provided excellent migration conditions across Texas on October 23-25. Most of the whooping cranes present on today's flight presumably completed migration in association with these two fronts, pushing the migration slightly ahead of average.

Multiple reports of whooping cranes were reported during the past week throughout the U.S. whooping crane migration corridor. The first confirmed sighting in Texas was 6 birds flying south over Weatherford, Texas (just east of Fort Worth) on October 25. Eight cranes were sighted at Magic Ridge near Indianola, Texas about 10 miles north of the wintering area on the morning of October 26. These cranes took flight by 11 AM, but it is not yet known if they completed their migration and were seen during the census flight.

The crane pair known as Lobstick has arrived with a juvenile and should provide excellent viewing for the tour boats this winter. No cranes so far are visible from the refuge observation tower. A one-adult family group is believed to have arrived based on the presence of a group of 3+1 seen on Matagorda Island in the known territory of a banded 28-year-old female crane that had died in Saskatchewan approximately October 8.

A blue crab count done at Aransas on October 25th indicated the refrigerator is fully stocked for the whooping cranes this fall. Crabs were abundant and wolfberry flowers were everywhere, with a few plants already bearing fruits that are readily consumed by cranes.

November 02, 2005

An aerial census on 02 November, 2005 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at Aransas as 113 adults + 14 young = 127 total. Approximately 235 whooping cranes are expected to arrive at Aransas this winter. Thus, an estimated 54% of the flock has completed the migration.

Recap of cranes observed on the flight: (127)

	adults + young
Refuge	41 + 5
Lamar	4 + 0
San Jose	27 + 2
Matagorda	32 + 4
Welder Flats	9 + 3
Total	113 + 14 = 127

Remarks: Excellent viewing conditions and light northeast and east winds were present throughout the day. Nearly all of the crane winter area was flown in a 6.3-hour census with contract pilot Dr. Tom Taylor of Rockport, Texas.

An estimated 26 whooping cranes (22 adults and 4 young) have arrived from migration since the previous flight on October 26. The four newly arrived families are from nests 19, 26, 37 and one unknown. The chick arriving from nest 26 that winters at the refuge boat ramp was a pleasant surprise, having apparently not been encountered on the August surveys in Wood Buffalo. Three more banded cranes were identified on today's flight, including one from nest 04 that was expected to bring a chick but did not.

Most of the whooping cranes presumably arrived at Aransas on November 1. More sandhill cranes were also observed compared to last week's flight. A strong Pacific cold front crossed Texas on the evening of October 31. The leading edge of the front brought severe thunderstorms to the Texas coast just as trick or treaters were out and about. This front provided excellent migration conditions throughout much of the flyway October 31 and November 1.

Reports of whooping cranes scattered throughout the migration corridor are still coming in. Most of the birds had departed from Canada by October 22 when temperatures got well below freezing. Another report in Texas was confirmed of 3 birds on October 24 flying over Lake Kickapoo south of Wichita Falls.

Interesting crane locations on today's flight included 3 cranes at Pringle Lake on Matagorda Island, 1 crane on Dewberry Island at Welder Flats, and 2 cranes south of Holiday Beach on Lamar. The male in a one-adult family group seen last week in a group of 3 adults with 1 chick has apparently re-paired, with typical family group spacing with 2 adults and the chick observed on today's flight. The banded 28-year-old female crane had died in Saskatchewan approximately October 8. No cranes so far are visible from the refuge observation tower.

All cranes were found in salt marsh habitat. No cranes were seen on prescribed burns or at sources of fresh water.

November 09, 2005

An aerial census on 09 November, 2005 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at Aransas as 115 adults + 14 young = 129 total. Approximately 235 whooping cranes are expected to arrive at Aransas this winter. Thus, an estimated 55% of the flock has completed the migration.

Recap of cranes observed on the flight: (126)*

	adults + young
Refuge	38 + 5
Lamar	2 + 0
San Jose	30 + 2
Matagorda	36 + 4
Welder Flats	7 + 2 *
Total	113 + 13 = 126

* One family group was overlooked. Thus, an estimated 129 cranes are at Aransas (115+14).

Remarks: Excellent viewing conditions and light south/southeast winds were present throughout the day. Nearly all of the crane winter area was flown in a 7.5-hour census. The flight when combined with data from the past 2 weeks provides excellent data on what territorial pairs are present at Aransas and which pairs are still in migration.

An estimated 2 whooping cranes have arrived from migration since the previous flight on November 2nd. In the past week, there has been no weather favorable for whooping cranes to complete their migration to the Texas coast. A Pacific front pushing across the Flyway States north of Texas has allowed the whoopers to make some progress.

Reports of whooping cranes scattered throughout the migration corridor are still coming in, including a family group still in Saskatchewan on November 5, two birds on the Platte River in Nebraska November 3, and most likely 3 at Salt Plains NWR, Oklahoma on November 4. At the other end of the flyway, a single whooping crane was confirmed within the city limits of Corpus Christi, Texas November 4-6 about 3 miles south of the University. The bird was with sandhill cranes, utilized fields and pasture including a location where the landowner puts out feed for cranes, and presumably roosted in nearby Oso Bay. This single crane overshot the wintering grounds by about 30 miles and presumably will make a course correction. However, it also could be the 2004 juvenile that wintered with sandhill cranes near Bay City, Texas who has never been to Aransas.

Interesting crane locations on today's flight included 2 cranes that continued to use salt marsh south of Holiday Beach on Lamar. On Matagorda Island, the male in a one-adult family group seen 2 weeks ago in a group of 3 adults with 1 chick has apparently re-paired, with typical family group spacing with 2 adults and the chick observed on the past 2 flights. No cranes so far are visible from the refuge observation tower or refuge boat ramp.

Most cranes were found in salt marsh habitat. Six cranes were seen at sources of fresh water as marsh and bay salinities are high and approaching the level where cranes are forced to seek out freshwater to drink. Some cranes were in dry, high marsh habitat feeding on wolfberries.

…Agent Mason had been working the opening day of waterfowl season. Six airboats used for access to the interior portions of San Jose Island for waterfowl hunting were observed on today's flight. The growing use of coastal marshes for hunting, fishing and birding is increasing my concerns about whooping crane disturbance.

November 17, 2005

An aerial census on 17 November, 2005 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at Aransas as 167 adults + 27 young = 194 total. Approximately 235 whooping cranes are expected to arrive at Aransas this winter. Thus, an estimated 83% of the flock has completed the migration. Last year at this same time, 86% of the cranes had completed the migration, so this year's migration is similar.

Recap of cranes observed on the flight: (194)

	adults + young
Refuge	51 + 8
Lamar	2 + 0
San Jose	41 + 5
Matagorda	59 + 9
Welder Flats	14 + 5
Total	167 + 27 = 194

Remarks: Excellent viewing conditions and moderate northeast winds were present throughout the day. All of the crane winter area was flown in an 8.0-hour census. The flight when combined with data from the past three weeks provides excellent data on what territorial pairs are present at Aransas and which pairs are still in migration. Approximately 16 adult pairs may still be in migration, including one pair with twin chicks.

An estimated 52 + 13 = 65 whooping cranes have arrived from migration since the previous flight on November 9th. Although light northeast winds were favorable for cranes to arrive at Aransas on November 10th, most of the cranes are thought to have arrived with a very strong Pacific front that reached the refuge just before sunset on November 15. On November 16, north winds up to 30 mph were

present all day at Aransas. This very strong cold front brought snow to Minnesota, tornados to Kentucky and Tennessee, but really aided the whooping crane migration.

The first pair of twin chicks to arrive at Aransas was first observed by USFWS Pilot Jim Bredy doing a waterfowl census at Aransas on November 16. The pair with twins was identified on today's flight as nesting pair 08-05 containing the banded female G-YbY (1987). Their winter territory is located on the refuge's Sundown Bay across from Roddy Island south of the Pump Canal and north of the Pipeline and Wynne's Cut. The total of 27 chicks that have successfully completed the migration is very encouraging since 31 chicks were estimated to have fledged in August on the nesting grounds. Survival appears to be high. Several more chicks are expected to complete the migration, including a second pair of twins confirmed in Saskatchewan on November 10th.

Interesting crane locations on today's flight included 9 cranes on the refuge's Bludworth Island, and 6 subadults scattered south of the refuge's Mustang Slough. No cranes so far are visible from the refuge observation tower. The refuge's Boat Ramp pair has arrived with a juvenile, as has the Dewberry island pair with a juvenile closest to Port O'Connor. No cranes were found on the extreme north end of Matagorda Island although one crane had been confirmed present in that area on November 12.

Most cranes were found in salt marsh habitat. Twenty-three cranes in 8 groups were seen at or near sources of fresh water, including two subadult groups of 4 cranes each. Marsh and bay salinities were measured at 21 and 22 parts per thousand on 11-16-05, approaching the level when cranes are forced to seek out freshwater to drink. Some cranes were in dry, high marsh habitat feeding on wolfberries, with many others believed foraging on blue crabs.

Cedar Bayou, the natural pass between the Gulf of Mexico and Mesquite Bay located between San Jose and Matagorda islands remains open, but the connection from Cedar Bayou into Vinson Slough on San Jose remains plugged. A recent engineering study recommends that both of these connections should be open to increase the length of time Cedar Bayou remains flowing before it next silts shut. Cedar Bayou is an important passageway for many marine species to complete their life cycle, including the blue crab.

November 23, 2005

An aerial census on 23 November, 2005 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at Aransas as 181 adults + 29 young = 210 total. Numbers counted are approaching last winter's record peak population of 217. One additional whooping crane is in extreme south Texas in Hidalgo County near Hargill. This is believed to be the 2004 juvenile that had separated from its parents last fall and had spent the 2004-05 winter with sandhills near Bay City, Texas north of Aransas. It has never been to Aransas but may be brought to Aransas when it is older and gets a mate.

Approximately 235 whooping cranes are hoped to arrive at Aransas this winter. Thus, an estimated 90% of the flock has completed the migration.
Last year at this same time, 98% of the cranes had completed the migration, so this year's migration is not quite as advanced. It is hoped that about
2 dozen more whooping cranes are still in migration, although there have been no recent migration reports.

Recap of cranes observed on the flight: (210)

	adults + young
Refuge	57 + 8
Lamar	2 + 0

San Jose	41 + 5
Matagorda	65 + 11
Welder Flats	16 + 5
Total	181 + 29 = 210

Remarks: Excellent viewing conditions and moderate southwest winds were present throughout the day. All of the crane winter area was flown in an 8.0-hour census.

An estimated 14 + 2 = 16 whooping cranes have arrived from migration since the previous flight on November 17th. Moderate winds and clear skies provided excellent migration conditions daily during the past week. On today's flight, color bands were read on several adult pairs and one family that had arrived in the last week.

The total of 29 chicks that have successfully completed the migration is very encouraging since 31 chicks were estimated to have fledged in August on the nesting grounds. Survival of juveniles appears to be high.
However, it was disappointing on today's flight not to encounter a second set of twins that had been anticipated.

Whooping cranes on today's flight were located in salt marsh habitat (182), open bays (15), on a shell road (2), and at sources of fresh water or ponds thought to be somewhat fresher than nearby salt marsh (11). No whooping cranes were found on recent prescribed burns done on the refuge and at Welder Flats. Tides levels had dropped 0.8 feet since last week's flight due to the north winds, leaving bay and lake edges as exposed mud and oyster reefs exposed in the bays. Tidal flats on San Jose were dry over about 50% of the island.

Interesting crane locations on today's flight included 8 cranes on the refuge's Bludworth Island. The largest subadult flock observed was 5 birds together on the refuge. A pair of cranes was visible from the refuge observation tower that had been first sighted on November 20th. One newly arrived family located on Panther Point consisted of 3 adults and 1 juvenile. I do not know where they may try to establish a territory or how to explain the unusual grouping of 3+1. No cranes were found on the extreme north end of Matagorda Island, although one crane had been confirmed present in that area on November 12. A farm field with over 1,000 sandhill cranes located northwest of the refuge's Burgentine Lake was checked, but no whooping cranes were present. Five airboats were sighted on San Jose Island and 1 airboat was traveling through the refuge on the GIWW thought to be transporting duck hunters.

November 30, 2005

An aerial census on 30 November, 2005 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at Aransas as 185 adults + 29 young = 214 total. Numbers counted are approaching last winter's record peak population of 217. One additional whooping crane is in extreme South Texas in Hidalgo County near Hargill. This is believed to be the 2004 juvenile that had separated from its parents last fall and had spent the 2004-05 winter with sandhills near Bay City, Texas north of Aransas. It is the 215th documented in the flock this fall.

Approximately 235 whooping cranes are hoped to arrive at Aransas this winter. Thus, an estimated 91% of the flock has completed the migration. Peak flock counts are normally not obtained until December. However, I'm getting worried since there have been no recent reports of whooping cranes in migration and severe weather in the Flyway should have pushed the cranes south. The last report was of 2 whooping cranes in flight south of Canyon, Texas located in the Panhandle on Nov. 25th.

Recap of cranes observed on the flight: (214)

	adults + young	change from previous flight
Refuge	55 + 8	0
Lamar	4 + 0	0
San Jose	45 + 5	+ 4 subadults
Matagorda	64 + 11	- 1
Welder Flats	17 + 5	+ 1
Totals	185 + 29 = 210	+ 4

Remarks: Excellent viewing conditions were present in the morning, but skies were dark in the afternoon making it much harder top find cranes. All of the crane winter area except for Burgentine Lake was flown in an 8.0-hour census.

An estimated 4 + 0 = 4 whooping cranes have arrived from migration since the previous flight on November 23. A Pacific cold front provided excellent migration conditions November 28-29.

Whooping cranes on today's flight were located in salt marsh habitat (199), open bays (10), and at ponds thought to be somewhat fresher than nearby salt marsh (5). Heavy rains that fell November 26 has freshened up the marsh somewhat. Salinities were measured at 20 ppt in the bays and 11 ppt in cut-off salt marsh on November 29. No whooping cranes were found on recent prescribed burns done on the refuge and at Welder Flats. Tides levels were low at 2.0 mlt, up 0.3 feet from last week's flight. Tidal flats on San Jose were dry over about 60% of the island. A crab count done Nov. 29 indicated blue crabs were still plentiful, although 27% reduced from levels one month ago. Wolfberries are currently abundant and are being fed upon extensively.

Three subadult whooping cranes were visible from the refuge observation tower, the largest subadult flock seen on today's flight. This sighting indicates that the territorial pair at Mustang Lake has not yet returned to Aransas. Other territories for which pairs have not yet returned are "W" on San Jose, and the Middle Matagorda Island territory. The family group that last week on Panther Point was observed as 3+1 was back to a typical 2+1 grouping on today's flight. Three cranes were found on the extreme north end of Matagorda Island, the first documented crane use in that area since a single crane was reported present on November 12.

December 6, 2005

An aerial census on 06 December, 2005 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at Aransas as 187 adults + 29 young = 216 total. One additional whooping crane is in extreme South Texas in Hidalgo County near Hargill. This is believed to be the 2004 juvenile that had separated from its parents last fall and had spent the 2004-05 winter with sandhills near Bay City, Texas north of Aransas. It is the 217th documented in the flock this fall. Numbers counted have tied last winter's record peak population of 217.

Approximately 230 whooping cranes are hoped to arrive at Aransas this winter. Thus, an estimated 94% of the flock has completed the migration. Peak flock counts are often obtained in December. However, I'm getting worried since there have been no recent reports of whooping cranes in migration and severe weather in the Flyway should have pushed the cranes south. However, 3 whooping cranes were reported today with sandhills near Palacious, Texas located 23 miles north of Matagorda Island. If this report can be confirmed, the flock size would be at a record 220!

Recap of cranes observed on the flight: (213)

	adults + young	change from previous flight
Refuge	60 + 8	+ 5
Lamar	3 + 0	- 1
San Jose	42 + 5	- 3
Matagorda	66 + 11*	+ 2
Welder Flats	14 + 4**	- 4
Total	185 + 28 = 213	- 1

* a record numer.
** One family group was overlooked.

Remarks: Fair viewing conditions were present throughout the day with partly cloudy, high overcast skies and light east winds. Skies were dark and conditions difficult at the beginning and end of the flight. All of the crane winter area except for Burgentine Lake and the upper end of Copano Creek was flown in an 8.0-hour census.

An estimated 2 + 0 = 2 whooping cranes have arrived from migration since the previous flight on November 30. A Pacific cold front provided excellent migration conditions December 05. Cranes that were known to be overlooked on today's flight were one family group at Welder Flats (either Dewberry Island or South Shoalwater), and possibly the N. Allyn's Bight pair on San Jose.

Whooping cranes on today's flight were located in salt marsh habitat (n=195), in the shallow edge of the GIWW (3), prescribed burns (5), and ponds believed to be somewhat fresher than nearby salt marsh (10). Tides levels were relatively low, with many exposed mudflats on San Jose.

There was lots of movement observed on today's flight. Most were cranes chasing other cranes, with subadults retreating outside territory boundaries. On the refuge, yesterday's prescribed burn on Unit C6 caused some of the refuge cranes to be located in high marsh next to the burn with movements back and forth between the marsh and the edge of burn. Most movements required subjective judgments as to which cranes had already been counted with some crane sightings considered as duplications. The estimate of 216 currently at Aransas is thus a conservative figure which could increase by a few birds if visibility is ideal and the birds move less.

The most surprising find on the flight was the "twin" family in Sundown Bay present with only 1 chick. A lone juvenile was found about 3 miles to the south just south of Sundown Cut and must have been one of the twins. I have no explanation for why one of the twin juveniles is now on its own.
It acted quite nervous as the airplane approached. Later in the day, two cranes believed to be a territorial pair were standing right where the juvenile had been in the morning, and thus the juvenile presumably got displaced to an unknown location. This young bird certainly may be okay, but it will have a tougher winter compared with if it had stayed with its parents.

One subadult whooping cranes were visible from the refuge observation tower, again indicating that the territorial pair at Mustang Lake has not yet returned to Aransas. Other territories for which pairs have not yet returned are "W" and N. Spalding Point on San Jose, North Pump Canal on the refuge, and the Middle Matagorda Island territory. The family group that several week's ago on Panther Point was observed as 3+1 was back to a typical 2+1 grouping on today's flight. A band was read on one adult in this family as g-nil, indicating it is the traditional territorial pair on Panther Point that has brought a chick to Aransas.

Previously I had mistakenly thought this family was unbanded since the banded adult was first seen in a group of 2 adults. No cranes were found on the extreme north end of Matagorda Island, but a pair and a duo were found at the south end of Pringle Lake that last week had been on the extreme north end.

December 14, 2005

An aerial census on 14 December, 2005 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at Aransas as 186 adults + 28 young = 214 total. One additional whooping crane is in extreme South Texas in Hidalgo County near Hargill. This is believed to be the 2004 juvenile that had separated from its parents last fall and had spent the 2004-05 winter with sandhills near Bay City, Texas north of Aransas. The number of cranes that have arrived (217) equals last winter's peak population, but one adult and one juvenile have died this winter, leaving 215 in the flock.

Approximately 230 whooping cranes were expected to arrive at Aransas this winter. Presumably all the cranes have completed the migration, but we have not had good enough visibility on our two flights conducted so far in December to get a complete count of cranes present. There have been no recent reports of whooping cranes in migration, and 3 whooping cranes could not be confirmed as reported December 6 near Palacious, Texas located 23 miles north of Matagorda Island. An extremely strong low pressure system that reached the Texas Coast December 8th pushed wind chills into the 20's and could have enabled any lingering whooping cranes to complete the migration. However, this front did not move out the one flamingo that has been here all fall, sighted most recently 12-13-05 on the south end of the refuge near Dunham Bay along the GIWW.

Recap of cranes observed on the flight: (206)

	adults + young
Refuge	58 + 9
Lamar	4 + 0
San Jose	37 + 4
Matagorda	63 + 11
Welder Flats	16 + 4
Total	178 + 28 = 206

Remarks: Difficult viewing conditions were present throughout the day with dark clouds present, making it impossible to find every crane. All of the crane winter area except for Burgentine Lake, the upper end of Copano Creek and the north end of Matagorda Island was flown in a 6.8-hour census. Fog delayed the start of the census until 0930 hrs. With limited time available to cover all areas completely, a modified search was made of Matagorda Island north of Panther Point, basically checking the areas where cranes had been the previous week. This technique enabled us to find all the known territorial pairs in the modified search area. A cold front with strong winds crossed the coast at 3:30 PM, making for about 30 minutes of moderately turbulent flight conditions.

Two whooping cranes turned up missing on today's flight and are believed dead. Adult male BwB-YbY (1987) from the N. Pipeline Flats family was missing, with just his mate (W-nil) and juvenile sighted together on the territory. Ground observations the following day confirmed the loss of the male, but a limited search failed to find any sign of the carcass. On Dewberry Island, the pair was found but their juvenile was not present.
Last week, this juvenile was also not located, with possibly the pair moving down into the main crane range last week at Welder Flats. On today's flight, the pair was back on Dewberry Island. The loss of cranes at Aransas and the apparent failure of quite a few cranes to arrive are very disappointing.

The family with twin chicks was back together sighted as 2+2. Last week, one of the juveniles had separated off by about a distance of 4 miles for three days before returning to his parents and sibling.

Cranes that were known to be overlooked on today's flight were N. Allyn's Bight, Cottonwood, N. Cottonwood, and Behind Middle Pond. Two subadult whooping cranes were visible from the refuge observation tower, again indicating that the territorial pair at Mustang Lake has not yet returned to Aransas. Other pairs that have failed to arrive this fall include Mustang Lake, N. Pump Canal, Middle Matagorda Island, and possibly the duo that last winter consistently used an area on N. Spalding Point.

Interesting observations of habitat use on today's flight included no cranes on prescribed burns or at freshwater sources, with 7 cranes in open bay habitat. These 7 included the N. Lamar pair far from shore in the shallow water's of St. Charles Bay, a family group foraging presumably for clams in the GIWW at Welder Flats, and a pair in Cedar Lake on Matagorda also presumably eating clams. All other cranes were in salt marsh habitat believed foraging primarily on wolfberries with some use of crabs. Tides levels were somewhat higher than last week, measured at 2.1 mlt on 12-15. Most mudflats on San Jose were submerged. Marsh salinities measured December 15th ranged between 13 and 20 ppt, with bay waters at 20 ppt measured at the refuge boat canal.

December 21, 2005

An aerial census on 21 December, 2005 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present at Aransas as 187 adults + 29 young = 216 total. One additional whooping crane is in extreme South Texas in Hidalgo County near Hargill brings the current estimated flock size to 217. This is believed to be the 2004 juvenile that had separated from its parents last fall and had spent the 2004-05 winter with sandhills near Bay City, Texas north of Aransas. One adult and one juvenile have died this fall at Aransas, accounting for a peak population of 189 + 30 = 219. In additional, two reports from good birders were received on December 21 of whooping crane pairs in flight near El Campo and west of Blessing, Texas, both locations north of Aransas by about 30 miles. If these reports can be confirmed, and presuming they were of different pairs based on the distance between reported sightings, the peak flock size for the winter may reach 193 + 30 = 223. Last winter's peak population was a record 217. On December 14, three whooping cranes in flight were reported by birders between Green and Mission lakes on the Guadalupe Delta Wildlife Management Area located about 15 miles north of Aransas. Thus, although I think the flock has completed the migration, there may be a handful of whooping cranes currently with sandhills north of Aransas in south Texas.

Recap of cranes observed on the flight: (216)

	adults + young
Refuge	60 + 10
Lamar	4 + 0*
San Jose	40 + 4
Matagorda	67 + 11**
Welder Flats	16 + 4
Total	187 + 29 = 216

* The movement of the Long Reef family from San Jose to Lamar put 7 cranes on Lamar.
** Sets the all-time record for whooping cranes on Matagorda Island by one crane.

Remarks: Good to excellent viewing conditions were present throughout the day with scattered clouds present for only part of the morning. All of the crane winter area except for Burgentine Lake was flown in an 8.0-hour census. An additional area searched was marshlands north of Hynes Bay near Tivoli.

With very good viewing conditions, uncertainty about the numbers of cranes present was caused primarily by crane movements. Uncertainties included 2 cranes on San Jose in the Fenceline territory that moved during the transects and could not be re-located, and 2 cranes on the refuge seen in flight soaring above the census aircraft. In addition, although the number of cranes at Welder Flats remained the same as last week, the distribution of cranes made it possible that the Dewberry Island pair was overlooked. I included 4 of these 6 uncertainties into the flock total and will try to confirm totals sighted on the next census flight. On any given census flight, there are always movements that create uncertainty, and only by doing multiple census flights can an accurate flock total be derived. On today's flight, the banded family group seen on its Long Reef territory on San Jose Island at 0810 hours had flown across Aransas Bay and was found on the Lamar peninsula south of Holiday Beach at 1130 hours. Major movements such as this can really hurt the accuracy of a census count, but in this instance, reading the bands on the family allowed me to document the movement and prevent duplication on the count.

The big surprise of today's flight was the apparent recent arrival of a new single unbanded adult with a juvenile. This 1+1 grouping was sighted on Bludworth Island across from the Lobstick territory. Nearby were 2 subadult cranes. Two additional subadults flew in, forming a group of 4. The 4 walked towards the 1+1, with the lead bird in the 4 in definite threat postures. Later on in the flight, the grouping of 1+1 had moved and was located close to the north end of Dunham Bay. Reports from a tour boat on December 22 placed this 1+1 group in Sundown Bay just north of the Pump Canal. The other group of 1+1 containing a banded adult female has remained on her territory at N. Pipeline Flats. The 1+1 group added to the 214 cranes estimated present at Aransas last week gives a total of 216 at Aransas, the number seen on today's flight.

Interesting locations on today's flight included a single visible from the refuge's observation tower at Mustang Lake, an indication that the resident territorial pair has either not arrived or is wintering elsewhere in the crane area. The family group that in the fall roamed around the north end of San Jose Island was for the second straight week located on the refuge, this week in South Sundown Bay. The Middle Sundown Bay pair was apparently located in the empty territory to their north situated north of the Pump Canal.

Interesting observations of habitat use on today's flight included 8 cranes on a prescribed burn conducted at the refuge's Dunham Bay on December 15th, 13 cranes at freshwater sources, and 6 cranes on gravel roads. Six cranes were in open bay habitat, all at Welder Flats. Fourteen additional cranes were on different kinds of upland habitat, including 2 at a game feeder on Lamar, 3 in feral hog rootings on Matagorda Island, 3 in upland prairie, 3 in oak brush habitat at Welder Flats, and 3 on dry sandflats. The amount of upland use including use of a prescribed burn was a notable difference from last week's flight. This change in type of habitat being used by the cranes is an indication that the main food sources (crabs and wolfberries) are diminished and the cranes are having to scramble to find other food items. This type of change in habitat use is normally seen in most winters in late December through mid-February. The relatively high salinities may also be promoting cranes to use upland areas as some cranes fly to uplands to get fresh water to drink. Tides levels were somewhat higher than last week, measured at 2.7 mlt on December 19. Limited areas of mudflats on San Jose Island were exposed.

January 11, 2006

An aerial census on 11 January, 2006 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present in the Aransas-Wood Buffalo flock at 189 adults + 29 young = 218 total. This total includes one whooping crane in extreme South Texas in Hidalgo County, and one whooping crane last seen east of Pierre, South Dakota on January 3rd. One adult and one juvenile have died this fall at Aransas, accounting for a peak flock size of 190 + 30 = 220. One whooping

crane was reported January 8th at Muleshoe National Wildlife Refuge in the Texas Panhandle. This report looks promising but hasn't been confirmed.
Could it be the whooping crane that had been in South Dakota?

Recap of cranes observed on the flight: (211)

	adults + young
Refuge	57 + 8
Lamar	5 + 0
San Jose	24 + 4
Matagorda	44 + 11
Welder Flats	15 + 3
Total	145 + 26 = 171

Remarks: Flight conditions and visibility were excellent allowing for a complete census. Crane numbers in all parts of their range were as anticipated except for coming up short about 5 subadults on the south end of Matagorda Island. These were presumably overlooked. Movements of the cranes to freshwater and/or uplands made the census more difficult.
However, with the excellent visibility and thorough census, I am convinced I have a reasonably accurate picture of the flock. With 30 chicks that made it to Aransas (one died after arrival), the population of 215 in the spring of 2005 could have reached 245 if there had been no mortality.
Instead, the estimated peak population of 220 this fall indicates that 25 whooping cranes at Aransas in the spring of 2005 failed to return in the fall. That is 11.6 % of the spring, 2005 population. With annual mortality averaging about 9.8%, it is apparent that mortality between spring and fall was higher than average and resulted in only the small increase in flock size. Only one carcass was recovered during this period of a 28-year-old female crane in Saskatchewan in the fall. I have no explanation for why mortality was greater than average.

Today's flight really helped to finalize the presence of territorial pairs, including two new duos expected to nest in 2006. In addition to documentation of habitat use, there were three important findings on today's flight about specific cranes.

a) The juvenile in the N. Pipeline Flats territory, not located last week and feared dead, has re-appeared and was right next to the widowed adult. Last week, it must have been separated from the female and/or been sitting down in the marsh and overlooked. Thus, mortality documented at Aransas this fall equals one adult and one juvenile, and not a second juvenile as reported in last week's report.

b) The single adult family first documented present December 21st may have re-paired. They were seen on today's flight as two adults with the juvenile with typical spacing of a family group. They were first seen on the refuge uplands south of Sundown Bay and then flew to the edge of the marsh near Big Lake. This juvenile seems to have more rusty body feathers than some of the other juveniles and can be identified from most other family groups.

c) A pair of banded cranes has re-paired since last winter. Male crane nil-hs (formerly RwR-nil 1978 with an unbanded mate) is now paired with y/g-Y (1987) and has a juvenile. They are staying on the extreme north end of nil-hs's traditional Middle Matagorda Island winter territory. This territory is located next to the Panther Point territory where y/g-Y used to winter with Y-nil (formerly Y-G 1985). I have not seen Y-nil this winter. However, there is an unbanded duo wintering in the traditional Panther Point territory, so perhaps the one remaining band has fallen off Y-nil and the crane is still alive with a new mate. Perhaps nil-hs lost his mate and re-paired with a younger female from an adjacent territory.

Many cranes were located on today's flight in places they normally don't use. Observations of habitat use on today's flight included 12 cranes at freshwater sources, 12 cranes foraging on uplands, and 61 cranes in open bay habitat, nearly triple the amount of open bay use documented the previous week. No cranes were on prescribed burns despite one recent burn on San Jose. The amount of open bay use has increased substantially as tides have remained low and were the lowest observed so far this winter on any aerial flight. Large areas of mudflats on San Jose Island were exposed, as were pond margins throughout the wintering range. Cranes are out in open bays presumably foraging on clams and other invertebrates such as blood worms and mud shrimp buried in the substrate. Fifteen of the 21 cranes at Welder Flats were in open bay habitat, including 11 foraging on the shallow edge of the GIWW. Six whooping cranes were associated with sandhills cranes on bare dirt areas rooted up feral hogs on Matagorda Island uplands, and 1 crane on San Jose was on a disked firebreak with sandhills. Salinities are very high due to the drought experienced by central Texas the past 9 months that has been related to the global weather pattern known as La Nina. Cranes are being forced to fly to freshwater sources to drink. This is a tough part of the winter for the whooping cranes, but with conditions similar to what they have faced before, typical of January.

February 01, 2006

An aerial census on 01 February, 2006 of the Aransas National Wildlife Refuge and surrounding areas estimated the number of whooping cranes present in the Aransas-Wood Buffalo flock at 189 adults + 29 young = 218 total. This total includes one whooping crane in extreme South Texas in Hidalgo County, and one whooping crane last seen east of Pierre, South Dakota on January 3rd. One adult and one juvenile have died this fall at Aransas, accounting for a peak flock size of 190 + 30 = 220.

Recap of cranes observed on the flight: (203)

	adults + young
Refuge	55 + 9
Lamar	6 + 0
San Jose	37 + 5
Matagorda	60 + 11
Welder Flats	16 + 4
Total	174 + 29 = 203

Remarks: Visibility was difficult throughout most of the flight due to overcast skies and haze. We had to make two extra landings to clean the haze of the windshield. With these conditions, I anticipated finding only about 90% of the cranes. This was the case with only 203 whooping cranes located. Two adult pairs and 10subadults were believed overlooked. All 29 family groups were located.

Interesting locations on today's flight included the following:

a) The single adult family first documented present December 21st apparently has re-paired. They were seen on today's flight as two adults with the juvenile south of the refuge's Mustang Slough. They apparently have not carved out a territory.

b) The unknown family group first sighted this winter on San Jose was back on San Jose on today's flight. After spending November and early December on San Jose, they had moved to the refuge where they were located on several flights from Dec. 14-Jan. 11th. They also apparently do not yet have a winter territory which they defend.

c) A single subadult has started using the Big Tree marsh / Johnson Ranch area on the Lamar Peninsula. It has been seen at a game feeder along with the territorial pair. Today, the single was in the Big Tree Marsh and the pair was at the feeder on the uplands. A different single subadult continues to winter by itself in the marsh south of Holiday Beach on Lamar.

Food resources continue to be considered suboptimal for the whooping cranes. Late-December through mid-February is usually a difficult time for the flock. Tides have come up a little, but are still considered low. Thus, most of the blue crabs are in the deeper bay waters and unavailable to the cranes. One of the tour boat naturalists reported seeing the cranes catching only a few crabs, but also gigging flounder. The marshes on San Jose Island were particularly dry with large expanses of dry mudflats.

The 42 whooping cranes located on San Jose is a drop from the 46 seen on the January 11th flight, and is believed to be a response to the amount of water available. The drought in Texas is continuing with rainfall deficits continuing into 2006. Habitat use on today's flight included 18 cranes in open bays (compared to 61 on the January 11th flight), 15 on uplands, 3 on a green-up in a prescribed burn, and 6 near sources of fresh water. The upland use included 4 foraging in bare soil turned up by feral hogs, and 2 at a game feeder. No cranes were on prescribed burns conducted January 30th on the refuge (Unit C1), San Jose Island, and Welder Flats.

APPENDIX C—U.S. FISH AND WILDLIFE SERVICE FALL 2005 WHOOPING CRANE MIGRATION REPORTING

Provisional data provided by Ms. Martha Tacha, USFWS-GI via emails.

Date	State/Provence	Observation
September 11-14	Saskatchewan	Forgan:1 adult: 1 mile E
September 16-23	Saskatchewan	N end Last Mountain Lake: 3 adults LML National Wildlife Area
September 17	Saskatchewan	Broderick:1 adult: 2 miles E 6 S
September 22	Saskatchewan	Dafoe: 1 adult: 2 miles N
September 23-24	North Dakota	7 mi. S and 3 mi. E of Palermo, Mountrail County, ND
Sept 24-Oct 10	Saskatchewan	Cheviot Lake: 2 adults:1 juv:1 mile N
Sept 26-Oct 10	Saskatchewan	Radisson Lake: 2 adults:1 juv: 1W side of Radisson Lake 1 mile N of Hwy 16
Sept 27-Oct 10	Saskatchewan	Bradwell: 3 adults: 6 miles S
Sept 29-Oct 9	Saskatchewan	N end Last Mountain Lake: 1 adult: E side of LML, National Wildlife Area
September 30	Saskatchewan	Leask: 6 adults: 1 Juv: 1 mile S 1 W
September 30-October 3	North Dakota	Long Lake NWR, Burleigh County, ND
Sept 30-Oct 10	Saskatchewan	Alan: 2 adults:1 juv: 6 miles S 2 E
Oct 1-3	Saskatchewan	Cudworth: 2 adults: 5.5 miles S
Oct 1-12	Saskatchewan	Muskiki Lake: 10 adults: 3 juv: south end of lake
October 2	Montana	4 mi. west of Laurel, MT
Oct 2-7	Saskatchewan	Dafoe: 2 adults: junction of HWY 6 and 16
Oct 2-3	Saskatchewan	Lake Lenore: 6 adults: N of Marysburg and West of Lake Lenore
Oct 3-4	Saskatchewan	Cudworth: 2 adults: 6 miles S
Oct 4-5	Saskatchewan	Krydor: 6 adults: 2 juv: south end of Blaine Lake
Oct 8-11	Saskatchewan	Strasbourg: 2 adults: E of Strasbourg
Oct 8-26	Saskatchewan	Leask: adults 13: 4 juv: 0.5 miles West of Hutterite Colony just SW of Leask (17:4 obs on Oct 26)
Oct 11-12	Saskatchewan	Wishart: 6 adults: 4 miles W and 6 miles S
October 14	North Dakota	Flying with sandhill cranes, 1 mile N of Braddock, Emmons County, ND
October 15	North Dakota	1 adult: Mountrail County, ND: 9 miles S and 4 miles E of Palermo
October 16	North Dakota	Seen flying with sandhill cranes over the Missouri River at Mandan, Morton County, ND.
October 16	North Dakota	1 adult: Emmons County, ND: 2 miles S and 2 miles W of Linton
October 16	North Dakota	2 adults: Dunn County, ND: 2.5 miles E of Dunn Center
October 16	North Dakota	4 adults: Mountrail County, ND:4 miles

		N and 3 miles W of Stanley (White Lake)
October 16	North Dakota	12 adults: Sheridan County, ND:3 miles S and 1.5 miles W of Pickardville
October 16	South Dakota	2 adults: Sully County, SD: 9.5 miles E and 1 mile S of Agar
October 17	North Dakota	Both were of bird(s) flying with sandhill cranes; seen at a distance and not seen on ground.
October 18	Saskatchewan	19 adults Muskiki Lake, Saskatchewan
October 18	South Dakota	2 adults: Gregory County, SD, 6 miles SW of Pickstown
October 20	Kansas	2 adults: Just west of Quivira NWR
October 20 - 21	South Dakota	2 adults: Reno Cnty, 2 miles E and 0.5 miles S of Quivira NWR
October 21	South Dakota	2 adults: Hughes County, 1 mile S of Blunt
October 22	South Dakota	3 adults: Hughes County, 2 miles NE of Pierre
October 22	North Dakota	4 adults: 1 juv: Mercer Cnty, 10 miles N, 3 miles E and 0.75 miles S of Hazen
October 22	North Dakota	13 adults: 4 juv: Mercer Cnty, 10 miles N, 3 miles E and 0.75 miles S of Hazen
October 22	North Dakota	4 adults: McLean County, 10 miles S 1 mile W of Ryder
October 22	Nebraska	4 adults: Rock/Keya Paha County, NE Niobrara River, 1.5 miles upstream of Cairns Bridge
October 22-November 10	Saskatchewan	G-nil (1987) with her unbanded mate and 2 young are at Buffer Lake northeast of Saskatoon.
October 23	Kansas	2 adults: Stafford Cnty, Quivira NWR
October 23-24	Okalahoma	11 adults: 4 juv: Alfalfa Cnty, Salt Plains NWR
October 24	Okalahoma	2 adults: Tillman County, Hackberry Flat WMA
October 25	Okalahoma	2 adults: Alfalfa County, Salt Plains NWR
November 3	North Dakota	2 adults:1 juv: Burleigh County, ND 4.5 miles S, 1 mile W of Driscol.
November 3	North Dakota	2 adults: Wells County, ND 9 miles S, 1 mile E of Sykeston
November 4	Nebraska	4 adults: Rock/Keya Paha Counties, NE 11 miles N and 2 miles E of Bassett, in Niobrara River E of Carns bridge
November 4	Kansas	2 adults: Quivira NWR, KS
November 4	Okalahoma	3 adults: Salt Plains NWR, OK
November 4 - 6	Texas	1 adult: Nueces County, TX SE part of Corpus Christi, SW of Oso Bay (on Moore Ranch)
November 5	Saskatchewan	2 adults:1 juv: Serath east of Last Mountain Lake
November 5	South Dakota	2 adults:1 juv: Edmunds County, SD 7 miles S, 2 miles W of Roscoe

November 8	Kansas	5 adults: McPherson County, KS McPherson Valley Wetlands
November 9-10	Saskatchewan	2 adults:1 juv: Filmore
November 10	Kansas	2 adults:1juv:Cheyenne Bottoms WMA, KS
November 10	Okalahoma	2 adults:1juv: Salt Plains NWR, OK
November 13	North Dakota	3 adults: Burleigh County, ND Missouri River bottoms, east of river and WSW of Wilton
November 13-14	Kansas	2 adults: 2 juv: Quivira NWR Stafford County, KS
November 29	Texas	2 adults: 8 miles south of Canyon, along I-27 (Canyon is just south of Amarillo, TX), Randall County, TX
January 3, 2006	South Dakota	1 adult: Pierre, SD

APPENDIX D—SUMMARY OF PROBABLE AND CONFIRMED WHOOPING CRANE SIGHTINGS FOR THE CENTRAL PLATTE RIVER, FALL 2005

Date: 19 October 2005

Location: Platte River between the Nebraska Public Power District's (Kearney) Canal diversion structure and the Odessa Bridge.

Observation: A duck hunter reported a whooping crane to a landowner on 18 October. While working with this land owner to conduct a river profile, our crew observed a glimpse of a large white bird, but was unable to see neck or black wing-tips. The crew searched for several hours, but was unable to observe any white birds again.

Resolution of observation: Probability of this being a whooping crane is unknown and unconfirmed.

Date: 3 November 2005

Location: 1.5 miles west of the Shelton Bridge on private property.

Observation: A pair of large white birds observed with a pelican. Birds spread wings and black primaries and long necks observed. Ground crew member observed the birds in flight about 1.75 hours later. He observed long necks and black primaries as well. Birds gained altitude and left area in a southerly direction and appeared to be migrating south out of the study area. USFWS number for confirmed sighting - 05B-26 (2005FA01). Two photos provided below.

Resolution of observation: Confirmed Whooping Crane sighting per protocol.

Photo D-1. Two adult whooping cranes (mid photo, left) in wetted channel approximately 1.5 miles west of the Shelton Bridge. Photo taken with zoom lens on 3 November 2005.

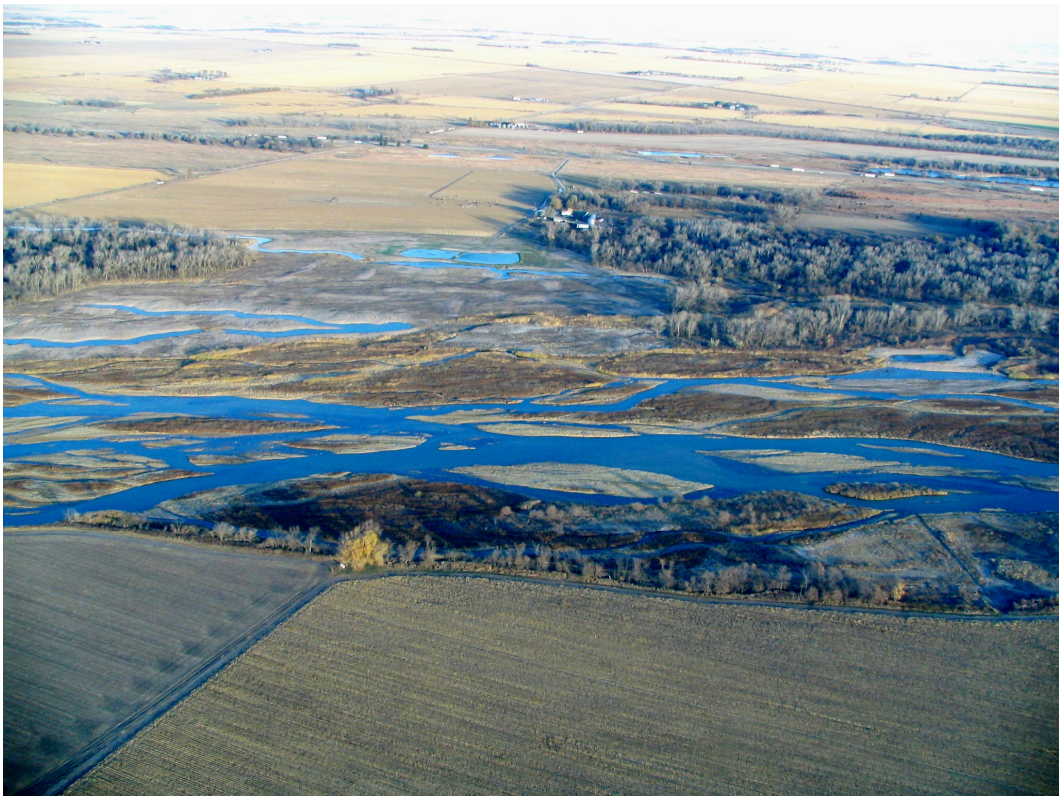


Photo D-2. Photo of roost site (2005FA01) from south side of channel. Note pond and river slough of recent river clearing project in upper portion of photo.