

Implementation of the Whooping Crane Monitoring Protocol

Fall 2009

FINAL REPORT

Prepared by

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**Final Report Prepared by
AIM Environmental Consultants**

**For
Committee's of the
Platte River Recovery and Implementation Program**

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Assessment Impact Monitoring Environmental Consultants (AIM) was awarded a contract to assist the Governance Committee in implementing specific monitoring associated with the *Platte River Recovery and Implementation Program*. The specific task was to implement the protocols developed by the Technical Advisory Committee entitled *Monitoring Whooping Crane Migrational Habitat Use in the Central Platte River Valley* dated 16 September 2005 and *Rebar Marker Placement Protocol* dated 14 February 2008 during the spring and fall migrations. The contract specified the implementation of the draft protocols along with guidelines presented in the *Request for Proposal*. The term of the contract was January 1, 2008 through December 31, 2010. I present the results of fall 2009 Whooping Crane migration pursuant to the *Contract for Services Agreement between the Nebraska Community Foundation, PRRIP, and AIM Environmental Consultants* dated 22 February 2008.

Study Area and Methods

The study area was the Platte River reach between U.S. Highway 283 (near Lexington) and Chapman, Nebraska. This reach was about 90 miles long and included an area extending 3.5 miles either side of the outermost banks of the Platte River. I hired and trained ten technicians and conducted field work from 9 October through 10 November 2009. A set of six data sheets was provided by Headwaters Corporation and all data were entered into a Microsoft Access 2000 database template developed by the former Executive Director's Office.

Two air services were contracted and aerial surveys were conducted along specified routes near sunrise from 9 October through 10 November 2009 as weather permitted. Censuses were initiated no earlier than 30 minutes before sunrise and typically were completed within 2 hours. Start times were delayed when weather/visibility conditions dictated. Flights were cancelled due to unsafe weather or mechanical problems. Cessna 172's were equipped with GPS units and each had two observers to conduct the surveys. Waypoints for each survey route were programmed into the GPS units onboard the aircraft. Surveys were flown at an altitude of 750' and at a speed of about 100 mph.

The study area was divided into two legs. The east leg surveyed the Platte River reach between Chapman and the Minden (Highway 10) bridges and the west leg surveyed from the Minden to the Lexington (Highway 283) bridges. Each census began flying upstream (east to west) along the south side of the main river channel with both observers looking out the passenger side of the aircraft. This provided optimum light conditions such that observers looked away from the rising sun thereby minimizing glare off reflective surfaces. Start points were alternated for each leg to address the concern that one end of the river transect would always be flown earlier than the other end. On the east leg, day one began at Chapman, flew the river west to Minden then flew a predetermined route back to Chapman. Day two began at Wood River, flew the river to Minden, returned along a predetermined route back to Chapman, then flew the rest of the river transect from Chapman to Wood River. The start points for the west leg were Minden and Odessa bridges. Day one began at Minden, flew the river west to Lexington then flew a predetermined route back to Minden. Day two began at Odessa, flew the river to Lexington, returned along a predetermined route back to Minden, then flew the rest of the river transect from Minden to Odessa. When the initial portion of the river transect was completed, one of 7 possible return routes located along the centerline of the main channel and 1, 2, and 3 miles north and south of the river respectively was flown with observers looking out opposite sides of the aircraft.

Four ground observers were stationed along the survey routes. Communication between the ground observers and the aircraft was accomplished through the use of two-way radios. In the event of a possible Whooping Crane sighting by the air crew, the ground person nearest the sighting was contacted and immediately dispatched to the location in an effort to confirm the identity of the white object. Each technician had a set of color aerial photos of the river (photos were developed by Headwaters Corporation and have been used since October 2008). The photos were inserted in polypropylene sheet protectors that enabled the observer to mark sighting locations on the photo for later reference. Efforts were made to photograph Whooping Cranes from the air using digital cameras. In addition, a GPS reading of the location was taken by air crew.

If a Whooping Crane was located by ground personnel, habitat use and activity monitoring commenced. These observations were continuous until the bird was either lost from view or went to roost for the night. If a group was lost, observers spent a minimum of 2 hours attempting to re-locate the group in the suspected area. Each Whooping Crane sighting was assigned a unique number and later compared with the U.S. Fish and Wildlife Service's (USFWS) sighting records in Grand Island. A Whooping Crane sighting was defined as:

“...the observation of a single whooping crane or a group of whooping cranes that are migrating together through the area. Confirmed sightings in the same general area (within a reasonable distance of daily crane activities) along the Platte and within one to several days of another sighting is assumed to be the same bird/bird group, unless: 1) the number of birds differs, 2) the bird(s) constitute a bird/bird group in addition to those already known to be in the general area, or 3) the original birds were observed to migrate from the valley or are known to have moved to a different area of the valley. This assumption is necessary because individual cranes cannot be distinguished; very few birds are marked and continuous surveillance of a crane or crane group using the study area is not possible.” (Aransas – Wood Buffalo Population

Whooping Crane Contingency Plan 2006, Whooping Crane Committee of the Central Flyway Council).

River channel profiles were measured at Whooping Crane roost sites and ten predetermined decoy locations on riverine sites using surveying equipment owned by the Program. Three parallel transects 25m apart were established perpendicular to the general flow of the river at each site such that the middle transect crossed the crane or decoy location. Elevation measurements were taken about every 3m along each transect using a stadia and transit. End points were determined when an obstruction greater than 1.5 m in height was encountered such that it formed a visual barrier to a crane. A 24-inch long steel rebar stake was driven level with the ground into the high bank or other location along one of the transects so that water elevation could be determined at a later date. A second rebar marker was driven level with the ground in case the first stake was lost due to bank sloughing. A GPS location was recorded for each stake. Stream flow data was collected from the U.S. Geological Survey (USGS) at gauging stations located at Overton, Kearney, and Grand Island. Leica laser rangefinders were used to measure the length of sandbars and distance to visual obstructions >1.5m above the water surface. Whooping Crane movements, behavior, and diurnal habitat use was recorded when possible. All monitoring activities followed USFWS and Nebraska Game & Parks Commission guidelines. Jeanine Lackey, USFWS biologist, or Martha Tacha, USFWS Coordinator for the Cooperative Whooping Crane Tracking Project, kept our team apprised of the latest sighting reports and census results from the wintering grounds on a regular basis. Tom Stehn, refuge biologist of Aransas National Wildlife Refuge in Texas, conducted surveys on the wintering grounds and provided the results via email. Landowner permission was obtained prior to entering any property.

Whooping Crane decoys were placed at 15 randomly selected locations provided by Headwaters Corporation (Table 1) for the purposes of determining survey detection rates. Five locations were off-river and 10 were in the river channel. The air crew did not know when or where the decoys were placed. Decoys were placed either the morning of the flights or the day before. Observations of Whooping Crane decoys by the air crew were reported to the ground crew for confirmation.

A toll-free telephone number for the public to report Whooping Crane sightings was sponsored by the Platte River Whooping Crane Habitat Maintenance Trust. This volunteer effort was known as *Whooper Watch*. AIM personnel distributed *Whooper Watch* flyers to prominent bird-watching centers alerting the public of this number. All Whooping Crane sightings reported to officials by the public were classified as opportunistic locates. Following a report, ground crew procedures were implemented as outlined above.

Results

Opportunistic Locates.—

We received one report of two Whooping Cranes from the public, Whooper Watch, or USFWS. We were already monitoring these birds (2009FA03).

Aerial Survey.--

CONFIRMED WHOOPING CRANE SIGHTINGS-

Of a possible 33 morning flights per leg, the East Leg completed 21 (64%) flights while the West Leg flew 22 (67%). Fog, low ceiling, precipitation, and high winds were factors in cancellations. We recorded 10 confirmed Whooping Crane sightings on transects (Figures 1-3).

INDEX OF USE-

We completed 86 (65%) aerial survey transects out of a possible 132. Ten Whooping Crane sightings were made on these transects. This resulted in an index of use (frequency of occurrence) of 0.12 sightings per transect. Nine sightings occurred on westbound river transects and 1 sighting occurred on the return eastbound transect one mile south of the river (1SE). The eastbound sighting on 1SE was a re-sighting of that seen earlier on the westbound transect. All sightings were on the East Leg.

OPPORTUNISTIC FLIGHTS-

One opportunistic flight was conducted when the plane deviated from the regular survey route at the request of the ground observer. This resulted in one Whooping Crane sighting. No additional flights were deployed.

OTHER WHITE OBJECT SIGHTINGS-

Four on-ground follow-ups were conducted for objects other than Whooping Cranes at the request of the air crew. This resulted in confirmation of American White Pelicans on three occasions and "object not found" on one occasion.

Searcher Efficiency Trials.—

Whooping Crane decoys were placed at 14 locations between October 19 and November 10 (Table 1). Two decoys were lost due to hydro releases and were placed a second time. The air observers detected a decoy at nine sites for an overall detectability rate of 64%. When broken down by strata, there was a 0% detectability rate for off-channel decoys (N= 4) and 90% detectability rate for in-channel decoys (N= 10). Factors contributing to reducing the detectability rate included decoys located in woodlands and standing corn as well as poor light conditions.

Table 1. Random locations of decoys for detectability trials.

Decoy ID	Strata	Date Placed	Detected?	Notes
95	0	10/27/2009	y	
46	0-3.5	11/6/2009	n	
92	0	10/24/2009	y	Lost decoy
94	0	11/9/2009	y	
88	0	11/9/2009	y	
49	0-3.5	10/27/2009	n	
48	0-3.5			not placed due to standing corn
91	0	10/23/2009	n	overcast
50	0-3.5	10/31/2009	n	in trees
93	0	10/19/2009	y	
87	0	10/19/2009	y	
89	0	11/2/2009	y	Lost decoy
90	0	11/9/2009	y	
85	0	11/9/2009	y	
45	0-3.5	11/10/2009	n	

Use-Site Characteristics, Diurnal Movements, and Activity.--

FLOW-

Streamflow measured at the USGS gauging stations located near Grand Island, Kearney, and Overton was generally above the median streamflow for each site during the survey (Figures 4-6). Median flows were exceeded when hydropower generation releases occurred coupled with record rainfall throughout the study area in October. Note all flow data are provisional and subject to revision. Table 2 depicts the minimum and maximum values for unit (instantaneous) flows at each station.

Table 2. Discharge values (cfs) at USGS gauging stations (provisional data).

	Overton	Kearney	Grand Island
Minimum	362	514	866
Date	10/12	10/12	10/09
Maximum	2270	2640	2950
Date	11/3&5	11/4&5	11/7&8

The streamflow at the nearest gauge when Whooping Cranes were observed on the river and when roost channel profiles were measured are shown in Table 3. High flows and ice prevented

us from measuring one of the roost sites and two of the decoy sites. This was the first time since this project began in 2001 that adverse physical conditions prohibited data collection.

Table 3. Flow conditions during Whooping Crane use and channel profile measurements. (Discharge is at the Platte River near Kearney gauging station).

Use Site	Use Date	Use Time	Measured Date	Discharge (cfs)	
				Use	Measured
1	10/31	7:56	12/5	1180	1380
2	11/1	6:38	10/19	1720	977
3	11/1,2,3	6:48,6:51,6:44	NA	1720,2250,2500	NA
4	11/3,4,6,7	7:10,7:00,7:06,6:42	11/12	2500,2610,2610,2550	1120
5	11/5	6:56	10/16	2630	1120

RIVERINE USE SITES-

We collected riverine channel profile data at 4 Whooping Crane roost sites (2 of the 4 roost sites were also decoy locations) (Figures 6-9) and 8 Whooping Crane decoy locations (data entered into Microsoft Access database). Decoy 85 was about 225 m downstream of Use Site 2 (Figure 1) and Decoy 90 was about 375 m upstream of Use Site 5 (Figure 2). A total of 561 stations (3 readings at each station) from 30 transects were surveyed. Photographs depicting the habitat used at the Whooping Crane Use Sites are shown in Figures 10-13.

DISTANCE TO VISUAL OBSTRUCTION, SUBSTRATE, AND WATER DEPTH-

Visual obstructions from Whooping Crane use sites are given in Table 4. (Use Site 3 was not measured due to adverse conditions.) Substrate was characterized as fine to coarse sand. The average water depth at the Whooping Crane roost locations was $-.23 \pm .03$ m at the time transects were measured and do not necessarily reflect the depth when Whooping Cranes were present.

Table 4. Location, visual obstruction distance (m), substrate, and roost depth (m) at the Whooping Crane riverine roost sites.

Use Site ID	UTM X	UTM Y	VO Upstream Distance	VO Right Distance	VO Downstream Distance	VO Left Distance	Fine Sand %	Coarse Sand %	Roost Depth
1	537811	4511387	50	44	87	153	70	30	-.21
4	531321	4509170	95	72	80	119	85	15	-.25
2 (Decoy 85)	540848	4512497	112	114	87	77	10	90	NA
5 (Decoy 90)	530066	4508422	84	38	313	142	100		NA

UNOBSTRUCTED WIDTH-

Table 5 depicts unobstructed width as measured at riverine use locations. The width was the average of the 3 river profiles measured at each Use Site.

Table 5. Unobstructed channel width at riverine use sites (units in m).

Use Site ID	Unobstructed Width	Standard Deviation
1	206.7	32.1
4	191.2	6.7
2 (Decoy 85)	195.9	5.2
5 (Decoy 90)	162.9	19.2

DIURNAL USE SITES-

Diurnal movements and activity data was collected when possible. We documented 4 diurnal use locations during 8 days of observation (Figures 1-3). The group of 7 Whooping Cranes was not observed off their riverine roost locations during their 4-day stay. We monitored them on the river from 06:57 h through 13:00 h on Nov 5 when they flew and were not re-located in adjacent fields. On Nov 6, we monitored them from 7:04 h until 14:00 h and they did not leave the river. On Nov 7, they were spotted at 6:52 h and migrated from the river at 9:10 h.

CRANE-USE DAYS

Crane-Use days were calculated by multiplying the number of Whooping Cranes by the number of days present within the dates of this survey. For this calculation, we assumed that a Whooping Crane observed during the morning aerial survey was present the previous day. Whooping Cranes were believed to be present in the study area 9 (27%) of the 33 days of the survey. We documented the presence of 4 Whooping Crane groups that contained from 1 to 7 birds. A total of 44 crane-use days was recorded (Table 6).

Table 6. Whooping Crane dates of occurrence and crane-use days.

Crane Group	Number of Cranes	Dates of Occurrence	# of days present	Crane-Use Days
2009FA01	2	October 30-31	2	4
2009FA02	1	October 31- November 1	2	2
2009FA03-06	2	October 31- November 4	5	10
2009FA07-09	7	November 4-7	4	28
TOTAL	12			44

LAND-COVER CLASS-

Wetted Channel and AG-Corn were the cover-types Whooping Cranes were observed using during the day. All of the known nocturnal roost locations (100%) were in Wetted Channel.

ACTIVITY-

A total of 11.75 hours of continuous and instantaneous use (time budget) data of Whooping Cranes was collected by ground personnel during 6 days of observation. Thirty-one data points (7.75 hours) of activity (time budget) were recorded on the juvenile Whooping Crane in Wetted Channel. Feeding (61%) was the most frequently observed activity followed by resting (19%), preening (16%), and alert (3%). Sixteen data points (4.0 hours) of activity on adult Whooping Cranes were recorded in Ag-Corn. Feeding (56%) was the most frequently observed activity followed by alert (38%), and courtship (6%).

Search Effort.--

Ground searches were initiated on 7 occasions. A total of 6.7 hours was expended in this effort and 243 miles were driven. Search duration extended from 0.3 to about 2.2 hours (mean = 0.95 ± 0.64 hours). Whooping Cranes were located on 3 occasions (43%) and American White Pelicans were located on 3 occasions (43%). Searches were terminated when the object was found or after a sufficient search effort was made.

Program ID and U.S. Fish & Wildlife Service ID Comparisons.--

Table 7 compares the Program numbering system with the USFWS database (Martha Tacha, personal communication). We had four groups of Whooping Cranes present in the study area during the survey.

Table 7. Comparison of Program Crane ID and USFWS Crane ID.

Program Crane ID (Prefix 2009FA)	Program Name	USFWS Crane ID	Dates of Occurrence	# of cranes Ad:Chick
01	Shoemaker Island	09B-39	10/31	2:0
02	Shoemaker Island	09B-40	11/1	1:0
03-06	Uridil	09B-41	11/1-4	2:0
07-09	Uridil	09B-42	11/5-7	6:1

Occurrence Outside Survey Dates.—

Whooping Cranes were not present within the study area beyond the dates of this survey (Jeanine Lackey, pers. comm.).

Summary of Confirmed Sightings in the U.S.--

The number of confirmed Whooping Crane sightings in Nebraska was 14 including those contained herein (Jeanine Lackey, personal communication). As of 18 December 2009, there were 81 confirmed sightings in the United States as follows: North Dakota- 25; South Dakota- 2; Nebraska-14; Kansas- 16; Oklahoma- 21, and Texas- 3. An estimated 265 (21 juveniles) Whooping Cranes have been accounted on their wintering grounds.

Discussion and Recommendations

This was the fourth season for implementation of the *Rebar Marker Placement Protocol*. The placement of rebar added additional time and expense to the project; however, it was minimal. We estimate that implementation of this protocol added about 30 minutes to the amount of time it took to survey each river channel profile location. Feedback from follow-up surveys of these sites by the surveying team will aid the Technical Advisory Committee in determining the efficacy of this effort.

We offer the following comments/suggestions to the Technical Advisory Committee as a result of this season's effort.

Data Sheets

- Add "Use Site ID" and "Crane Group ID" to the Aerial Observations form.
- Add "walking" as an activity to the "..... Instantaneous and Continuous Use Site Monitoring" sheet.
- Change "..... Instantaneous and Continuous Use Site Monitoring" to Time Budget.

Microsoft Access Database

- Correct the "Aerial Surveys II" form so that the correct number of flights appears in the "WC Flight Surveys" table. Currently, an extra line is added in the table.
- Correct the "Use Site Monitoring" form so that the correct number of records appears in the "WC Use Instantaneous Points" table.
- Present discharge during use and when measured including dates for both in a Table.
- Add "Crane Group ID" to the Use Characteristics form.
- Add "Use Site ID" and "Crane Group ID" to the Aerial Observations form and link it to the Whooping Crane locations Table.
- Change Ground Monitoring to Ground Search
- Delete "activity" in locations subform of Use Site Monitoring form.
- Delete "vegetation" in the instant points subform of the Use Site Monitoring form.
- Automate "instant point ids" in the Use Site Monitoring form.
- Round the UTM's to whole numbers in the Decoy Information table.
- Add a query to calculate count and percent of time in various habitats from the Use Locations table.

Methods

- 255 decoys have been placed since the inception of the Whooping Crane monitoring protocol. Consider whether it is necessary to continue collecting river profile information at decoy locations.
- Eliminate the placement of off-river (0-3.5 mi) decoys. We have a statistically significant sample of 85 attempts with fewer than 5 observations. Further trials will not alter these results.
- Develop a contingency plan for monitoring those Whooping Cranes present in the study area outside the survey dates.
- Decide whether to continue rebar placement.

Fall 2009 Expenses

The cost of the field implementation of this project was about \$50,546. The total cost of the Fall 2009 monitoring effort was about \$60,550.

Supplements

Original Data Sheets

CD containing the Microsoft Access database, MS Word final report file, and a complete set of electronic photographs.

Figure 1. Whooping Crane Use Sites 1 (red) and 2 (blue) on Shoemaker located west of the Alda bridge in Hall County. Decoy 85 (yellow) 225 m downstream of Use Site 2.



Figure 2. Whooping Crane Use Site 3-5 (blue) and off-river sites (yellow) about 2.5 miles west of the Wood River Bridge in Hall County. Decoy 90 (red) 375 m upstream of Use Site 5.

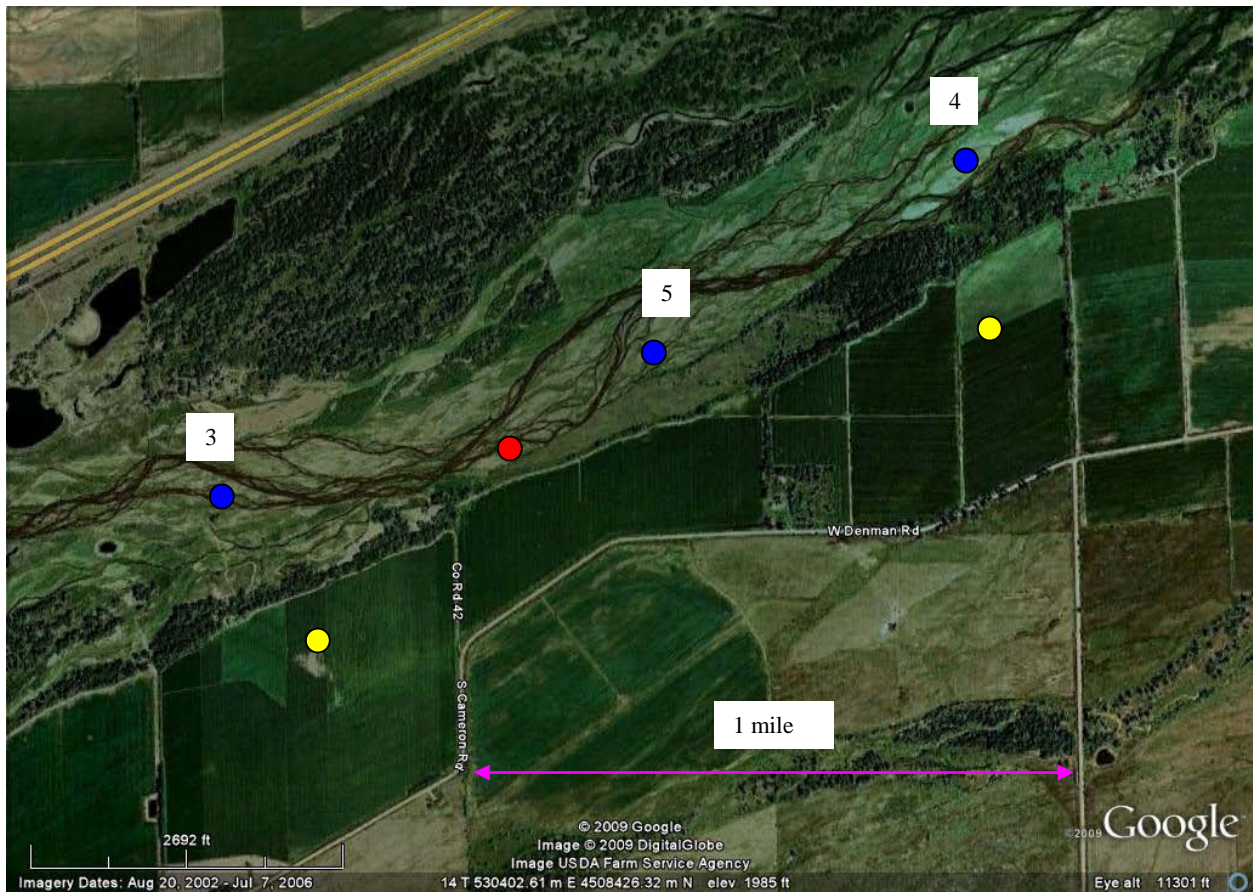


Figure 3. Platte River discharge (cfs) at Grand Island.

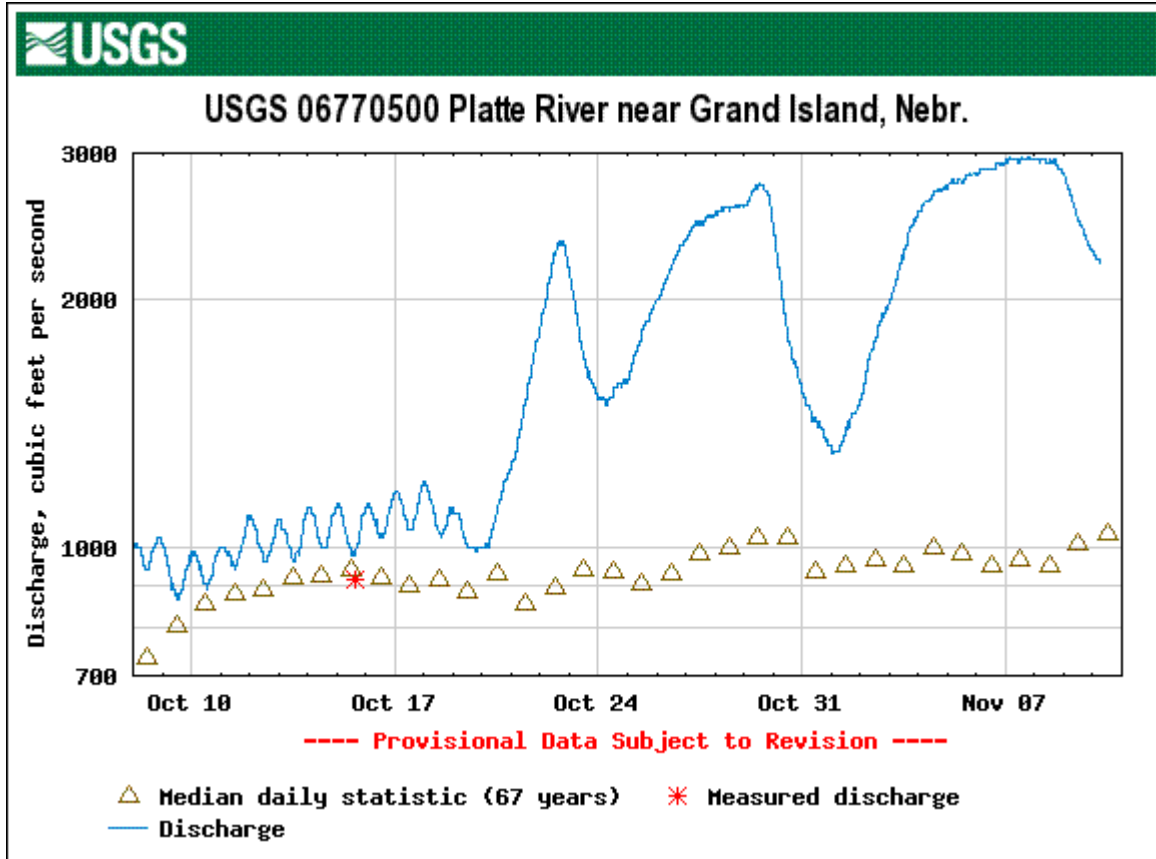


Figure 4. Platte River discharge (cfs) at Kearney.

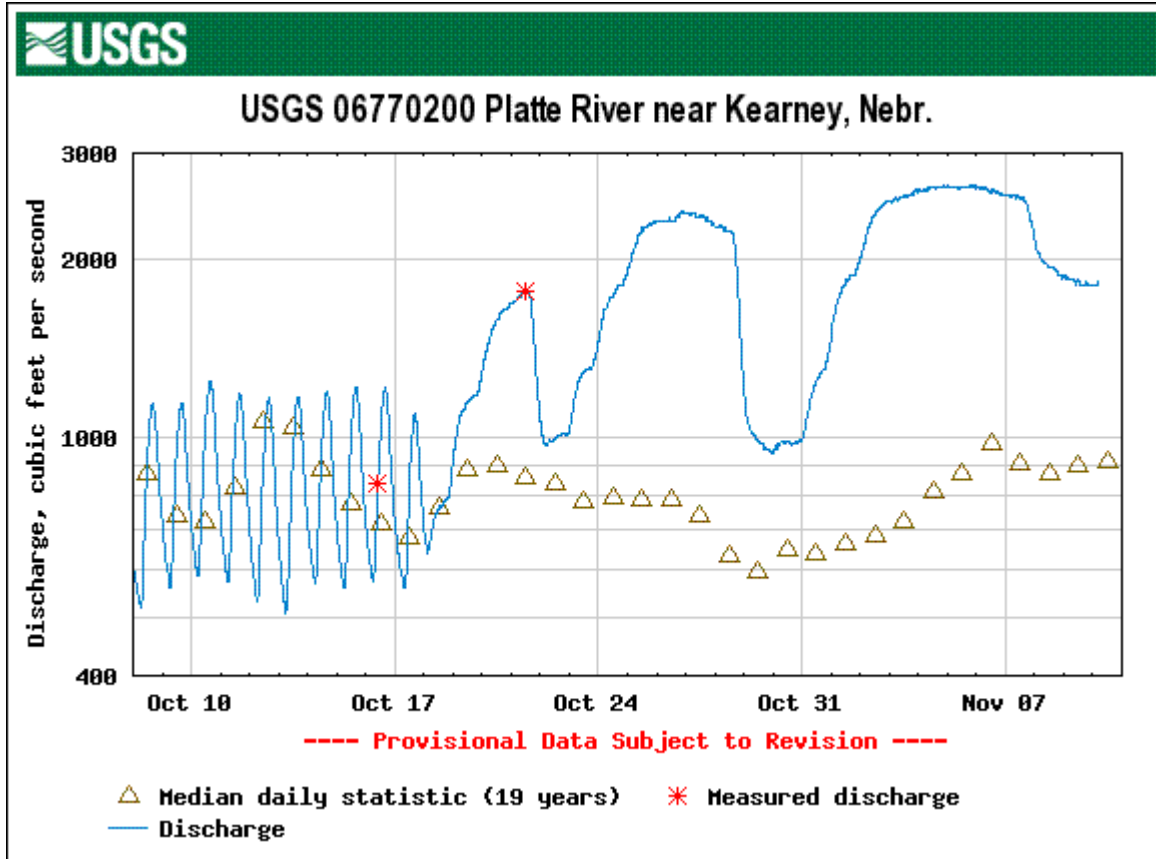


Figure 5. Platte River discharge (cfs) at Overton.

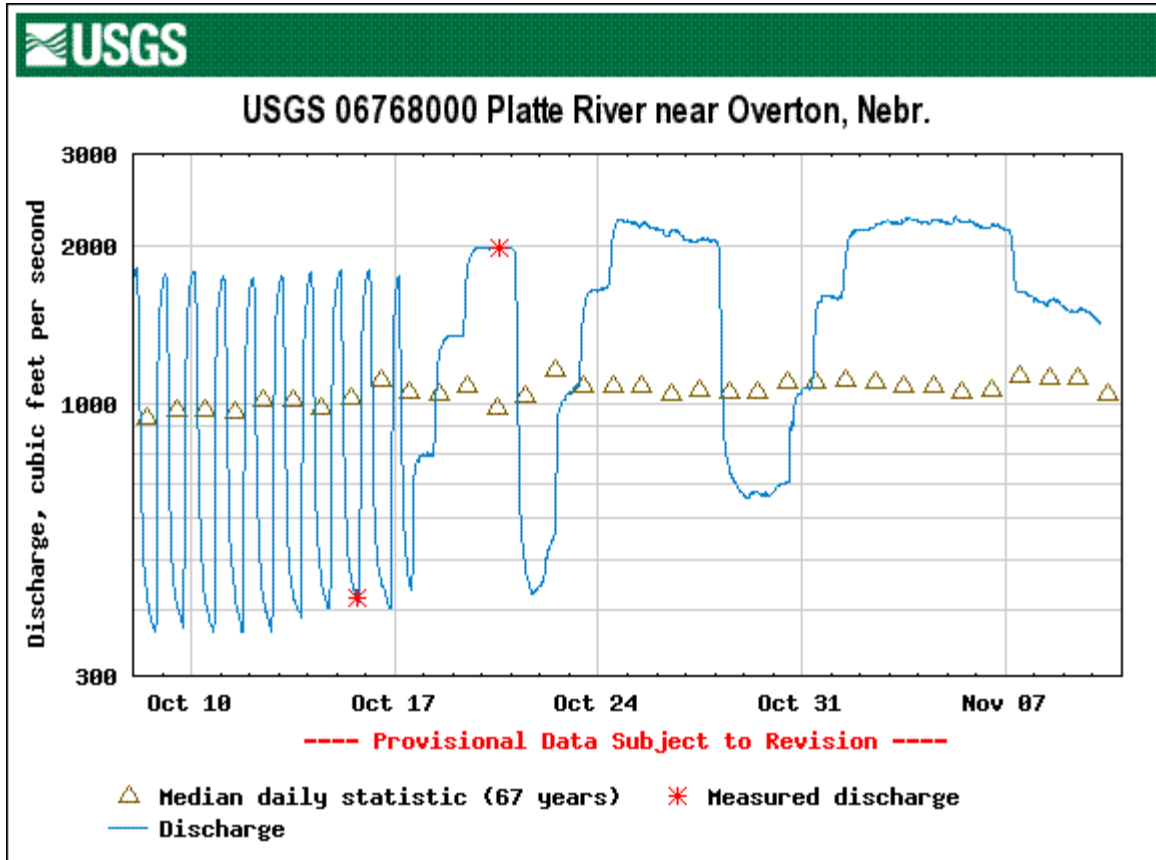


Figure 6. Roost channel profile for Use Site 4 (left to right bank).

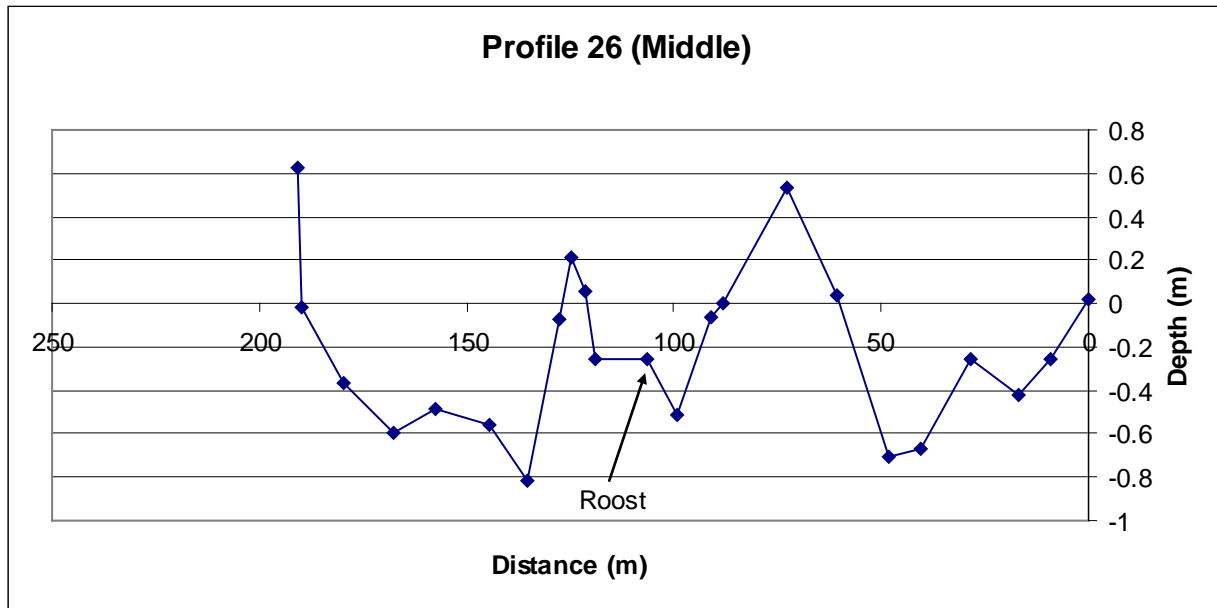


Figure 7. Roost channel profile for Use Site 1 (left to right bank).

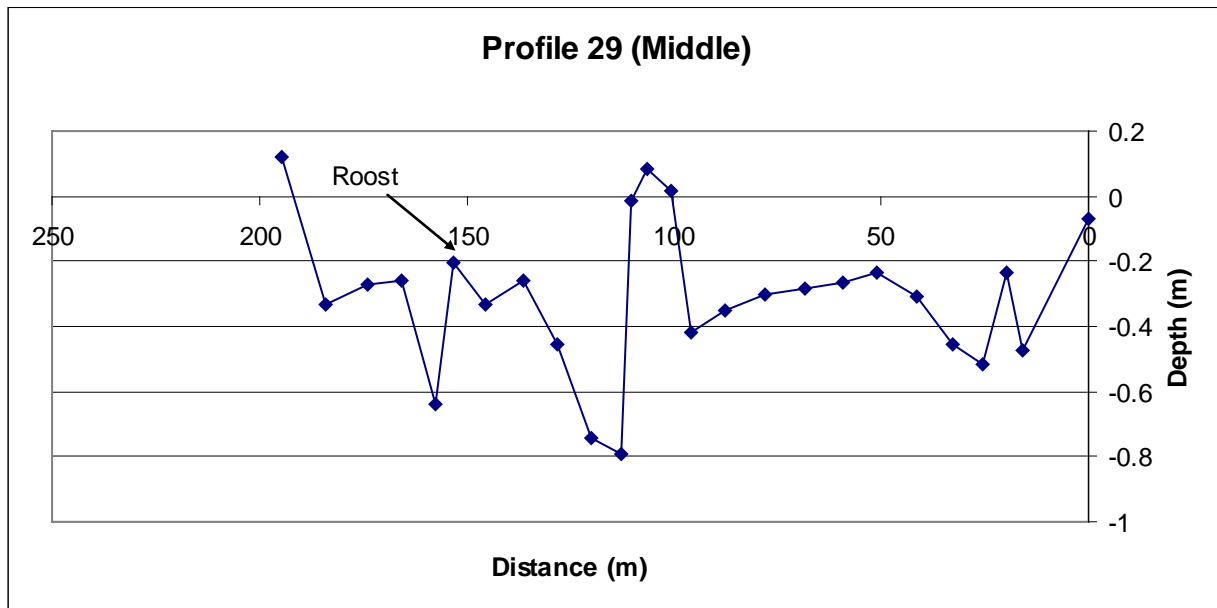


Figure 8. Decoy 85 channel profile 225 m downstream of Use Site 2 (left to right bank).

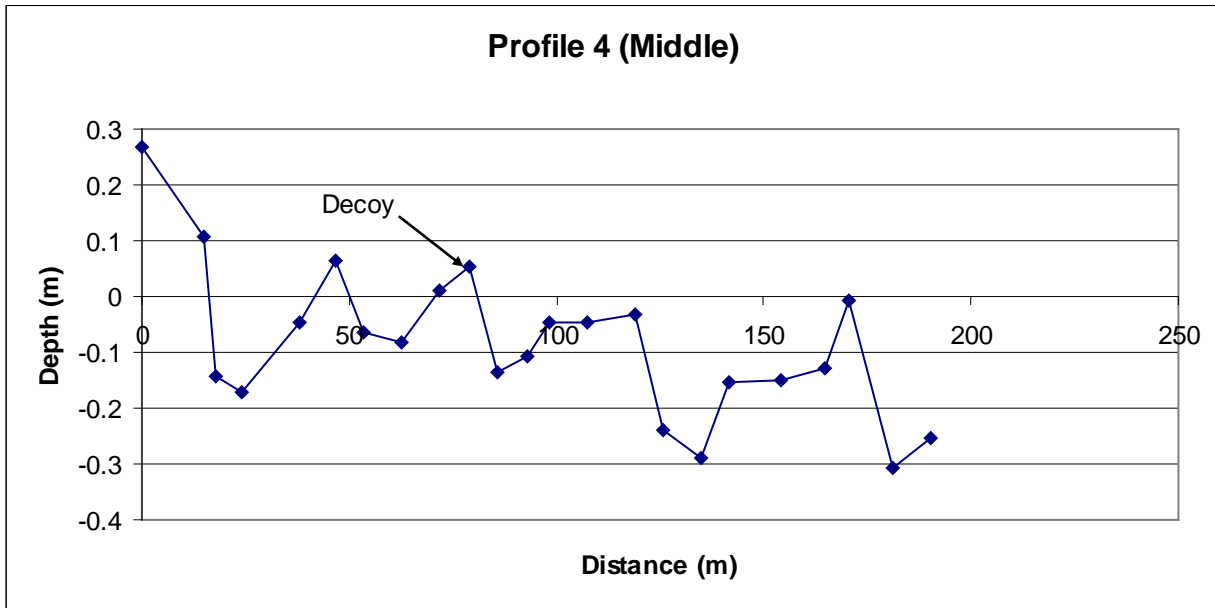


Figure 9. Decoy 90 channel profile 375 m upstream of Use Site 5 (left to right bank).

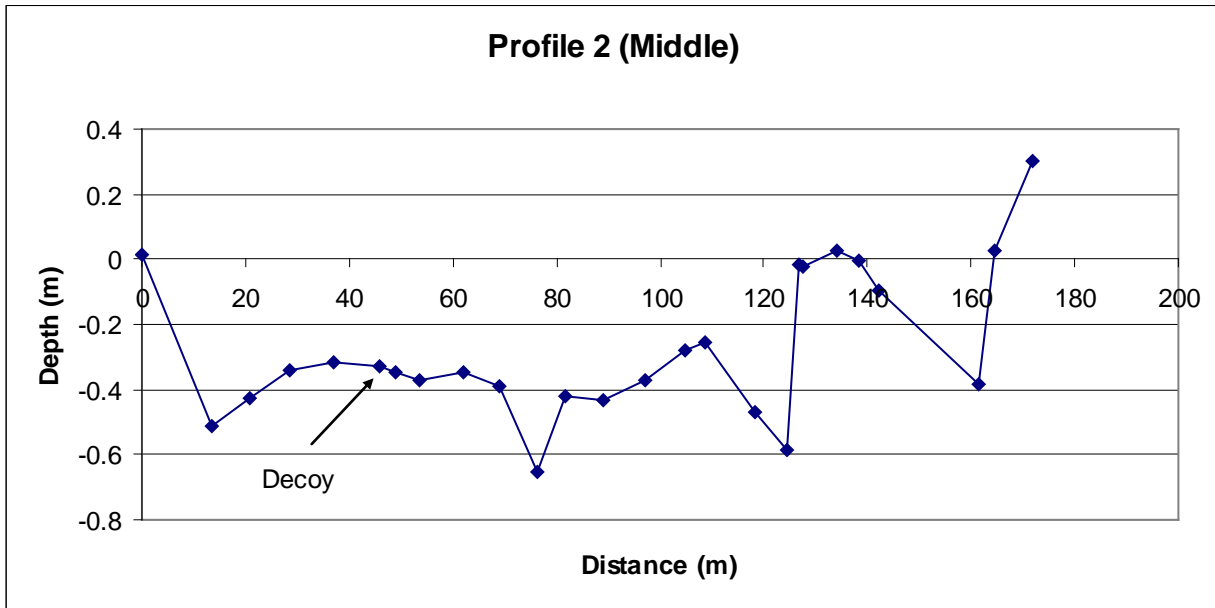


Figure 10. Whooping Crane Use Site 1 west of the Alda bridge (Sec 16 T9 R11 Hall County).



Upstream View



Left Bank View



Downstream View



Right Bank View

Figure 11. Whooping Crane Use Site 2 (Decoy 85) west of the Alda bridge (Sec 11 T9 R11 Hall County).



Upstream View



Left Bank View



Downstream View



Right Bank View

Figure 12. Whooping Crane Use Site 4 west of the Wood River bridge (Sec 23 T9 R12 Hall County).



Upstream View



Left Bank View



Downstream View



Right Bank View

Figure 13. Whooping Crane Use Site 5 (Decoy 90) west of the Wood River bridge (Sec 23 T9 R12 Hall County).



Upstream View



Left Bank View



Downstream View



Right Bank View