Implementation of the Whooping Crane Monitoring Protocol

Fall 2008

FINAL REPORT

Prepared by

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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 2008 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 eleven technicians and conducted field work from 9 October through 10 November 2008. 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 2008 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. 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).

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. Whooping Crane movements, behavior, and diurnal habitat use was recorded when possible. All monitoring activities followed USFWS guidelines. 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 manager 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. 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 4 reports of possible Whooping Cranes from the public, Whooper Watch, NPPD, NGPC, or USFWS. Two resulted in confirmed Whooping Crane sightings on October 29; one from NPPD (2008FA03) and one from USFWS (2008FA02).

Aerial Survey.--

CONFIRMED WHOOPING CRANE SIGHTINGS-

Of a possible 33 morning flights per leg, the East Leg completed 23 (70%) flights while the West Leg flew 22 (67%). Routine maintenance, fog, low ceiling, precipitation, and high winds were factors in cancellations. We recorded 6 confirmed Whooping Crane sightings on transects (Figures 1-3).

INDEX OF USE-

We completed 90 (68%) aerial survey transects out of a possible 132. Six Whooping Crane sightings were made on these transects. This resulted in an index of use (frequency of occurrence) of .07 sightings per transect. Five sightings occurred on westbound river transects and 1 sighting occurred on the return eastbound river transect.

OPPORTUNISTIC FLIGHTS-

Four opportunistic flights were conducted when the plane deviated from the regular survey route at the request of the ground observer. This resulted in two Whooping Crane sightings. No additional flights were deployed.

OTHER WHITE OBJECT SIGHTINGS-

One on-ground follow-up was conducted on objects other than Whooping Cranes at the request of the air crew. This resulted in confirmation of American White Pelicans.

Searcher Efficiency Trials.—

Whooping Crane decoys were placed at 15 locations between October 14 and November 8 (Table 1). One decoy was lost and was placed a second time. The air observers detected a decoy at eight sites for an overall detectability rate of 53%. When broken down by strata, there was a 0% and 80% detectability rate for strata 0-3.5 and 0 respectively. Factors contributing to the poor detectability rate included decoys located in woodlands, decoys in the "blind spot" below the underbelly of the aircraft, and inexperienced observers.

Table 1. Random locations of decoys for detectability trials.

Decoy ID	Strata	Random ID	Date Placed	Detected?	Notes	Actual X	Actual Y
6	0	73	10/18/2008	yes		459857	4503806
13	0	72	10/29/2008	no		530665	4508798
1	0	71	11/1/2008	yes		441648	4506881
8	0	70	10/18/2008	yes		461384	4503893
12	0	69	10/28/2008	yes		527126	4508197
10	0	68	10/14/2008	no		507188	4501753
4	0	67	10/14/2008	yes		451276	4504265
14	0	66	11/4/2008	yes		541522	4512624
5	0	65	11/8/2008	yes	lost decoy	451798	4504135
1	0	74	10/17/2008	yes		448836	4504638
15	0-3.5	35	11/3/2008	no			
11	0-3.5	39	11/3/2008	no			
9	0-3.5	36	11/2/2008	no			
7	0-3.5	34	10/18/2008	no			
3	0-3.5	37	11/1/2008	no			

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 couple with record rainfall that occurred 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	155	154	459
Date	10/16	10/10	10/09
Maximum	2750	3310	4340
Date	10/24	10/24	10/25

The streamflow when Whooping Cranes were observed on the river and when roost channel profiles were measured are shown in Table 3.

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	10/29	8:05	11/3	1380	582
2	10/29, 10/30	17:30, 7:55	11/1	1430, 1860	772
3	11/1	8:00	11/2	834	635
4	11/3	7:05	11/9	602	1810
5	11/4	7:15	11/9	496	1830

RIVERINE USE SITES-

We collected riverine channel profile data at 5 Whooping Crane roost sites (Figures 7-11) and 10 Whooping Crane decoy locations (data entered into Microsoft Access database). A total of 858 stations (3 readings at each station) from 45 transects were surveyed. Photographs depicting the habitat used at the Whooping Crane Use Sites are shown in Figures 12-16.

DISTANCE TO VISUAL OBSTRUCTION, SUBSTRATE, AND WATER DEPTH-

Visual obstructions from Whooping Crane use sites are given in Table 4. Substrate was characterized as fine sand to small gravel. The average water depth at the Whooping Crane roost locations was -.02 $\pm$ .13m.

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 %	Small Gravel %	Roost Depth
1	516375	4504955	100	112	113	116	40	50	10	-.18
2	470632	4504085	77	183	170	147	5	90	5	+.17
3	510351	4502635	25	49	44	24	90	10		-.01
4	517200	4505288	97	40	103	151	95	5		-.02
5	517070	4505138	20	14	41	154	90	10		-.08

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	Mean Width	Standard Deviation
1	233	5
2	295	20
3	70	2
4	182	6
5	226	3

DIURNAL USE SITES-

Diurnal movements and activity data was collected when possible. We documented 5 diurnal use locations during 5 days of observation (Figures 1-3). Whooping Cranes were not observed off their riverine roost locations.

CRANE-USE DAYS

Crane-Use days were calculated by multiplying the number of Whooping Cranes by the number of days present. 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 8 (24%) of the 33 days of the survey. We documented the presence of 4 Whooping Crane groups that contained from 2 to 9 birds. A total of 42 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
2008FA01-02	9 (3 chicks)	October 28-29	2	18
2008FA03-04	7 (1 chick)	October 29-30	7	14
2008FA05-06	2	October 31- November 1	2	4
2008FA07-08	2	November 2-4	3	6
TOTAL	20 (4 chicks)			42

LAND-COVER CLASS-

Wetted Channel was the cover-type Whooping Cranes were observed using during the day. All of the known nocturnal roost locations (100%) were in Wetted Channel (Figures 1-3 and 12-16).

ACTIVITY-

A total of 6.25 hours of continuous and instantaneous use (time budget) data of Whooping Cranes was collected by ground personnel during 5 days of observation. All observations were in Wetted Channel. Twenty-seven data points of activity (time budget) were recorded. Resting (52%) was the most frequently observed activity followed by preening (26%), feeding (15%), and alert (7%).

Search Effort.--

Ground searches were initiated on 9 occasions. A total of 10.03 hours was expended in this effort and 276 miles were driven. Search duration extended from 0.3 to about 2.2 hours (mean= 1.1 $\pm$ 0.6 hours). Whooping Cranes were located on three occasions (33%) and an American White Pelican was located on 1 occasion (11%). 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 totaling 20 individuals (16 adults; 4 juveniles). Not only was this a record number of Whooping Cranes documented on the Platte River; the 9 individuals (Figure 17) was the largest group size ever documented on the Platte breaking the previous mark of 8 set in the fall of 1983 and 2002. There was 1 confirmed Whooping Crane sighting on the Platte River prior to the initiation of our survey (Martha Tacha, personal communication).

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

Program Crane ID (Prefix 2008FA)	**Program Name**	**USFWS Crane ID**	**Dates of Occurrence**	**# of cranes**
01-02	Dippel west	08B-31	10/28-29	9
03-04	NPPD diversion	08B-34	10/29-30	7
05-06	Rowe Sanctuary	08B-45	11/1	2
07-08	Dippel east	08B-55	11/3-4	2

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

The number of confirmed Whooping Crane sightings in Nebraska was 19 including those contained herein (Martha Tacha, personal communication). As of 12 December 2008, there were 81 confirmed sightings in the United States as follows: North Dakota- 7; South Dakota- 4; Nebraska-19; Kansas- 24; Oklahoma- 16, and Texas- 11. There were an estimated 270 (38 juveniles) Whooping Cranes on their wintering grounds in Texas on 8 January 2009.

Discussion and Recommendations

This was the pilot year for 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 macro in the Export Profile 11 query. It did not calculate depth.
- 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

- 225 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 75 attempts with fewer than 5 observations. Further trials will not alter these results.

- Eliminate transect 3 (especially 3N) from the aerial survey since no observations of Whooping Cranes have occurred on these transects to date and the likelihood of observing Whooping Cranes on these transects is remote given the time of day flights occur.
- Develop a contingency plan for monitoring those Whooping Cranes present in the study area outside the survey dates.

Fall 2008 Expenses

The cost of the field implementation of this project was about $50,205. The total cost of the Fall 2008 monitoring effort was about $57,335.

Supplements

Original Data Sheets

CD containing the Microsoft Access database, MS Word final report file, and project photographs.

Figure 1. Whooping Crane Use Sites 1 (red), 4 (yellow), and 5 (blue) on the Dippel property located about 2.5 miles east of the Gibbon bridge in Buffalo County.

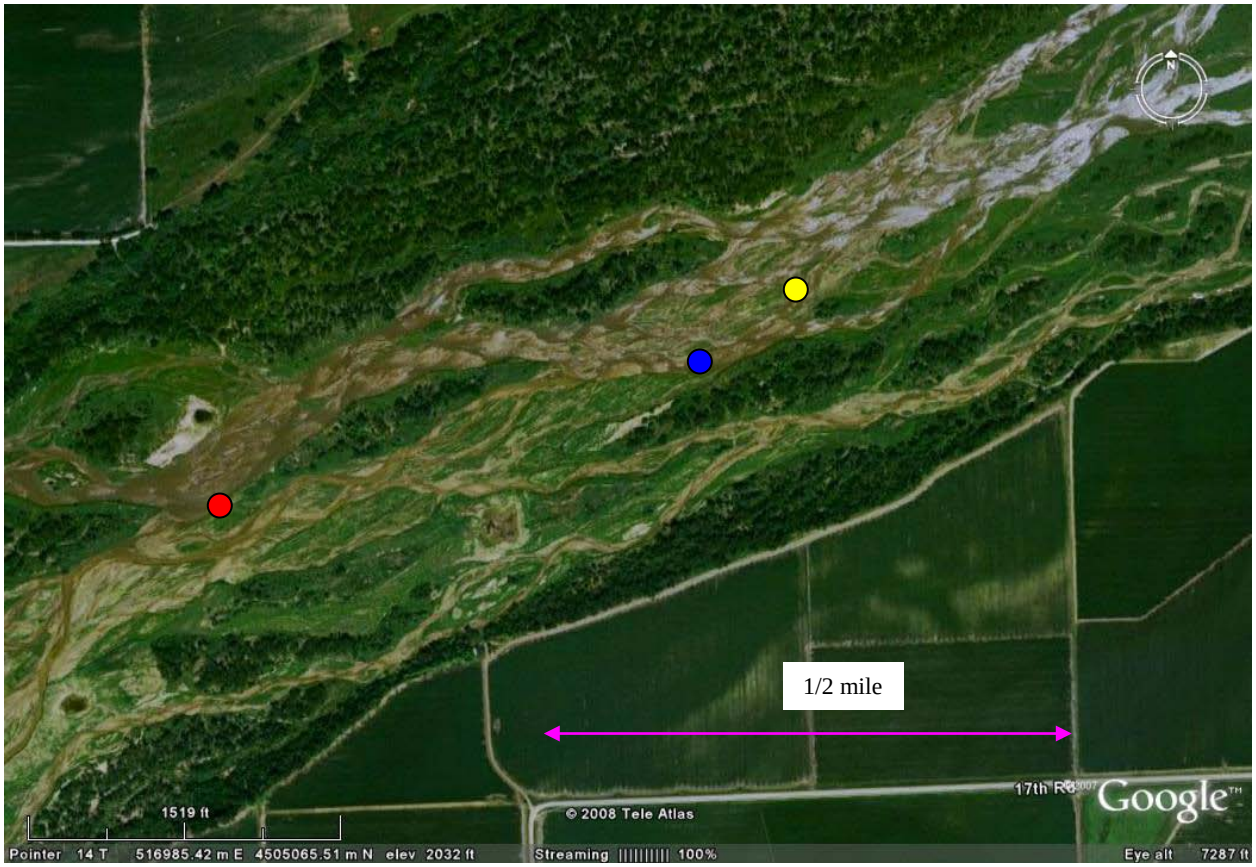

Figure 2. Whooping Crane Use Site 2 (blue) below the Kearney Canal diversion dam in Dawson County.

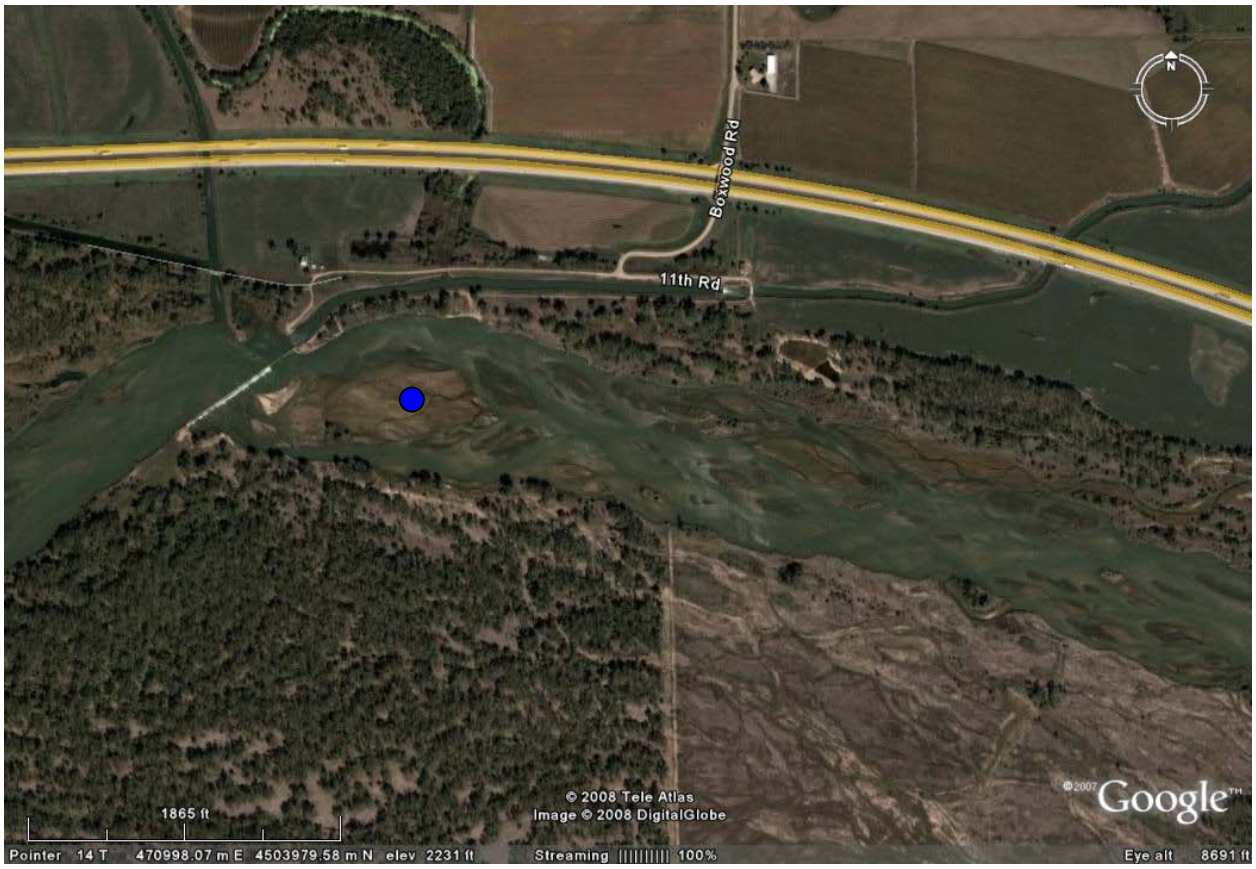

Figure 3. Whooping Crane Use Site 3 (blue) located about ½ mile downstream of the Rowe Sanctuary headquarters in Buffalo County.

Figure 4. Platte River discharge (cfs) at Grand Island.

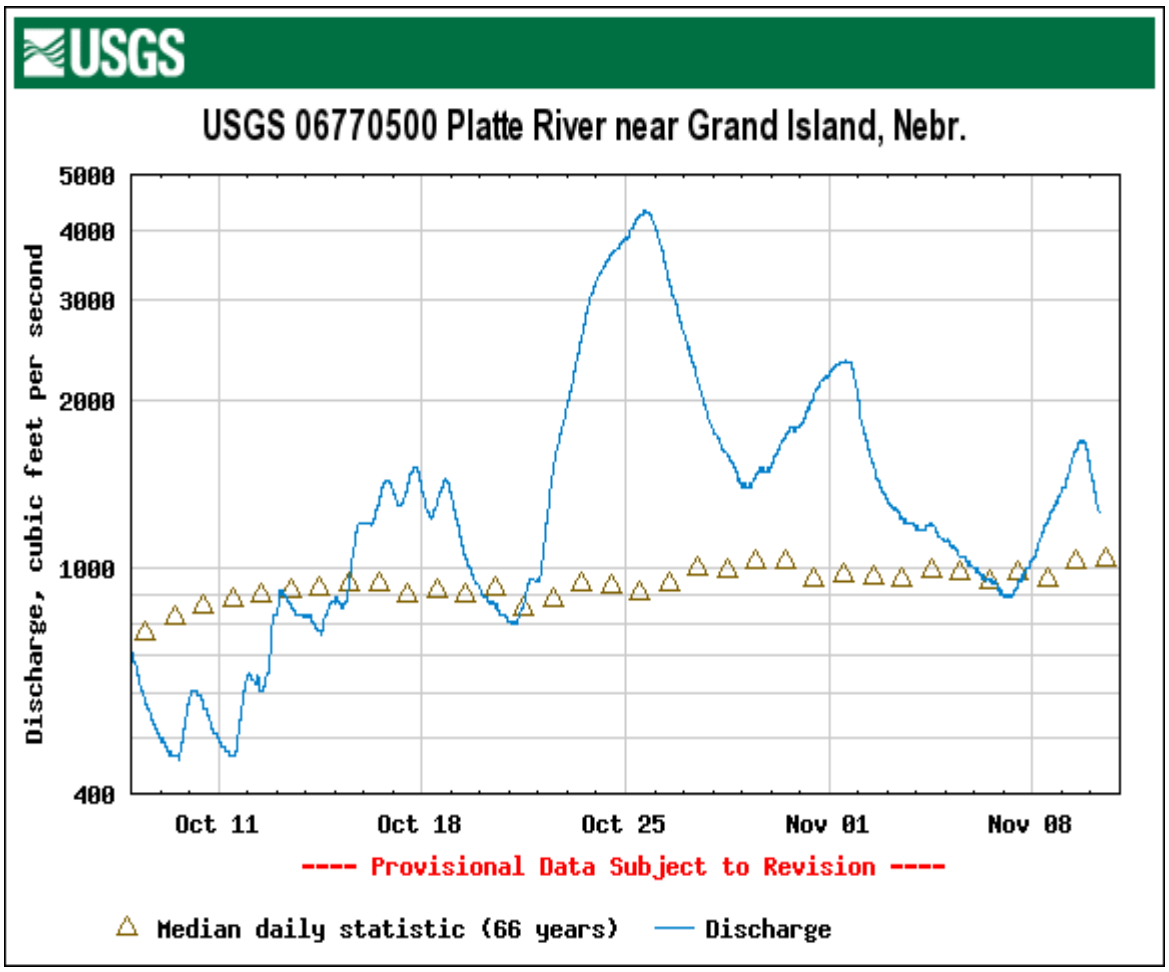

Figure 5. Platte River discharge (cfs) at Kearney.

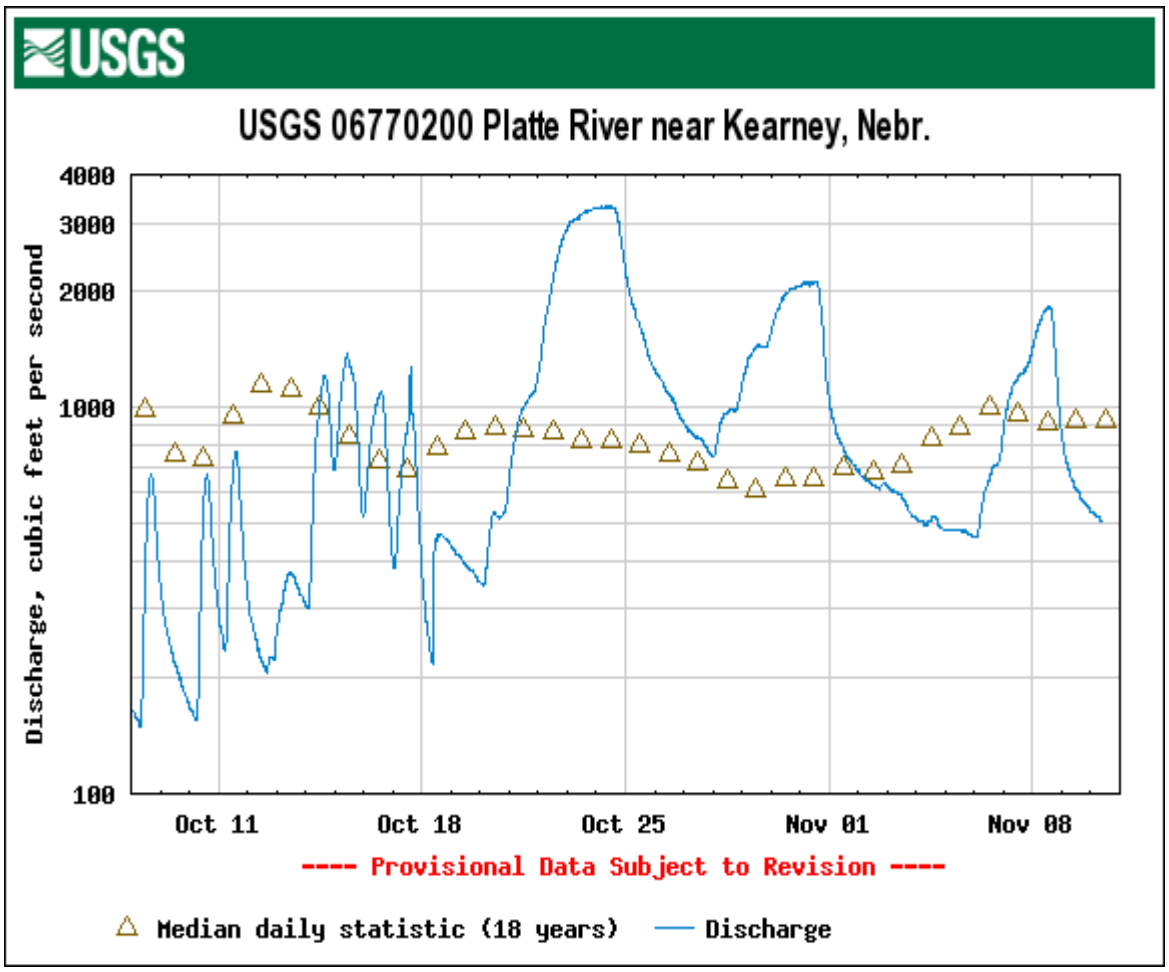

Figure 6. Platte River discharge (cfs) at Overton.

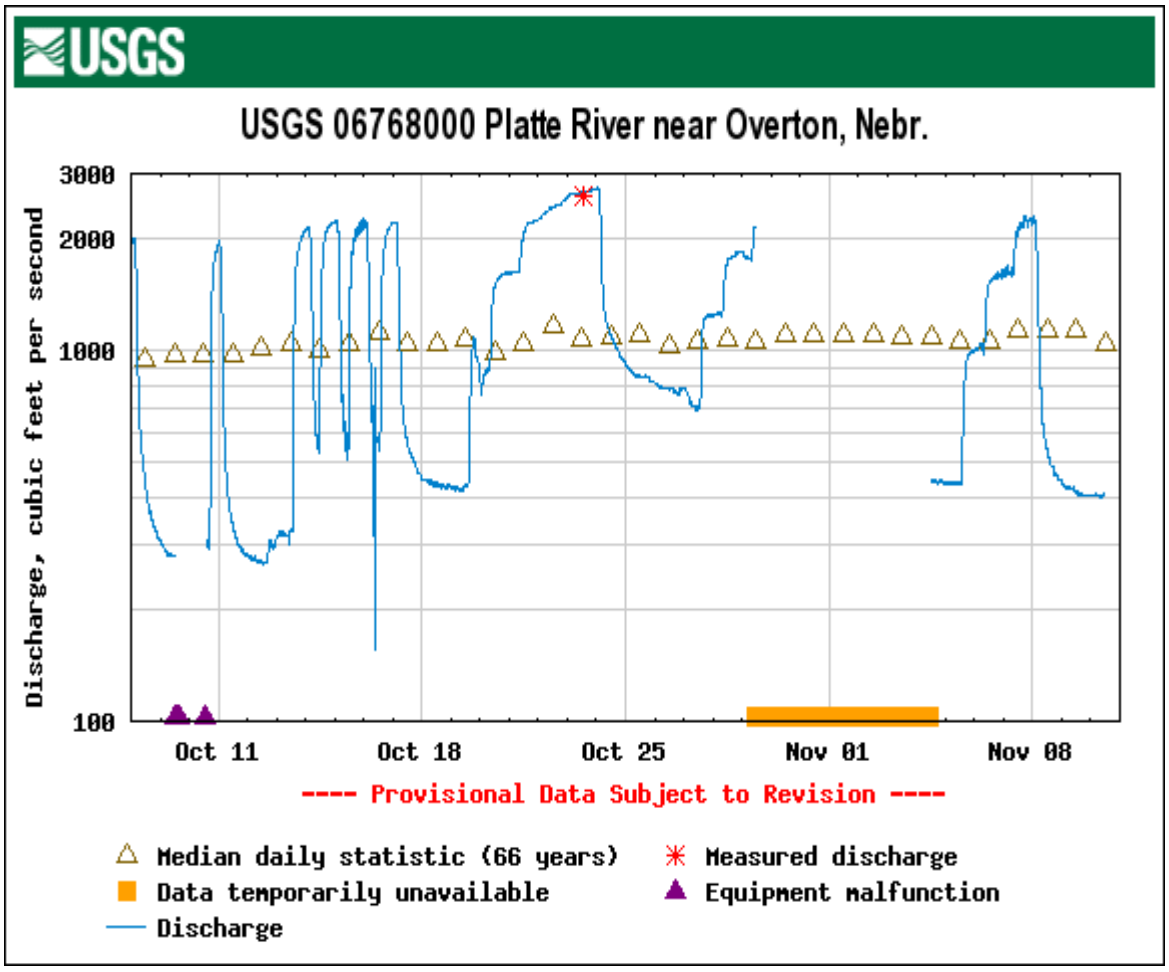

Figure 7. Roost channel profile for Use Site 1 (left to right bank).

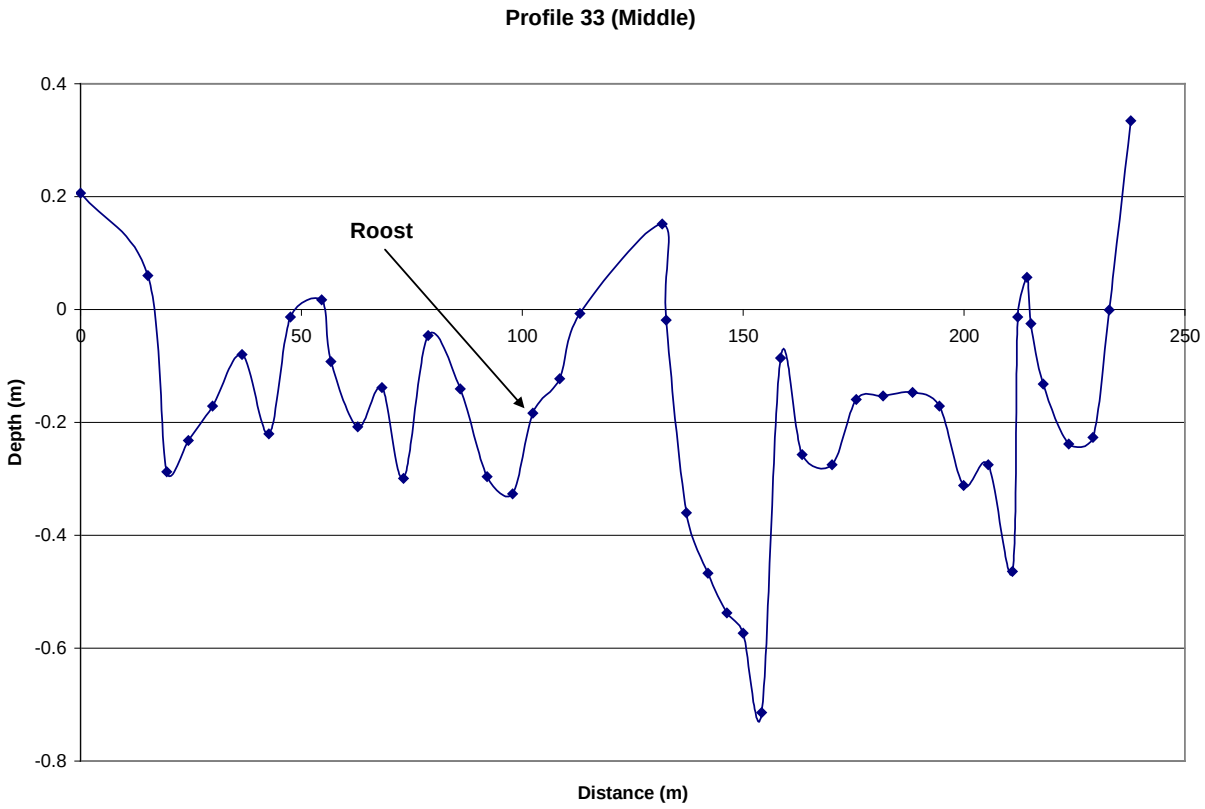

Figure 8. Roost channel profile for Use Site 2 (left to right bank).

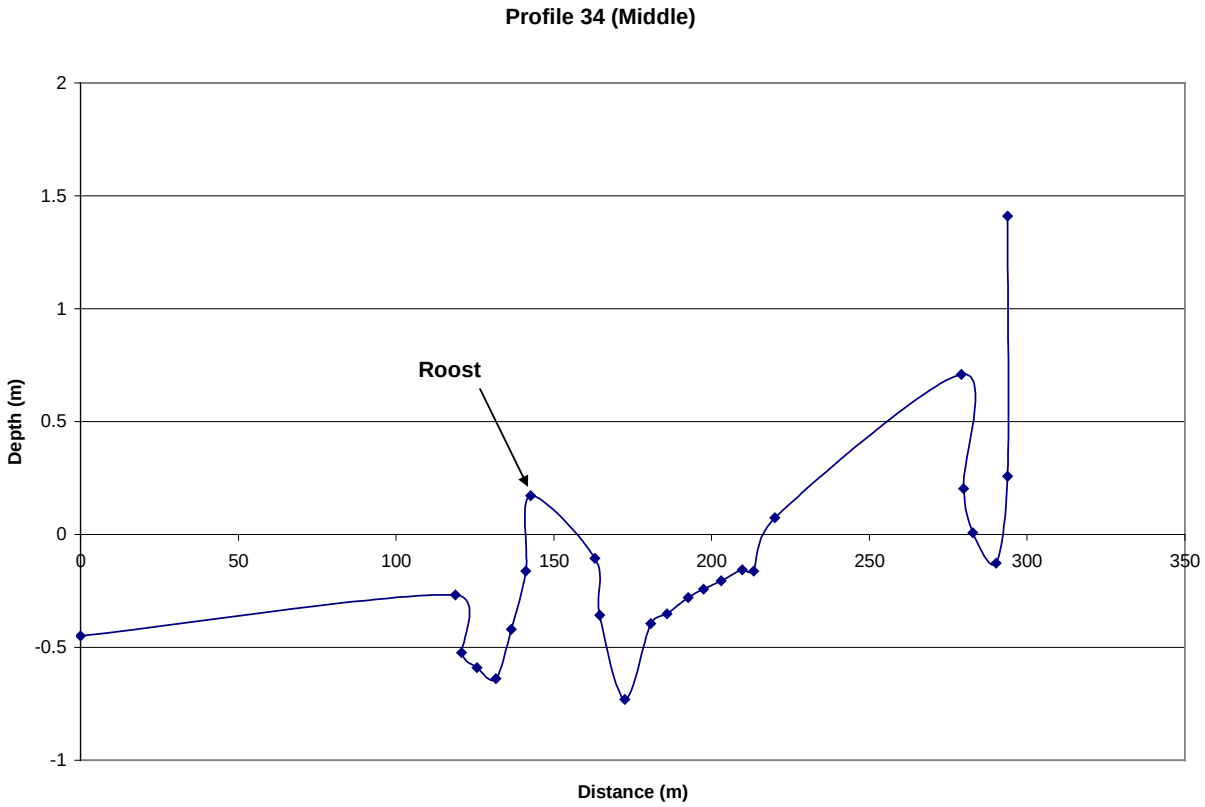

Figure 9. Roost channel profile for Use Site 3 (left to right bank).

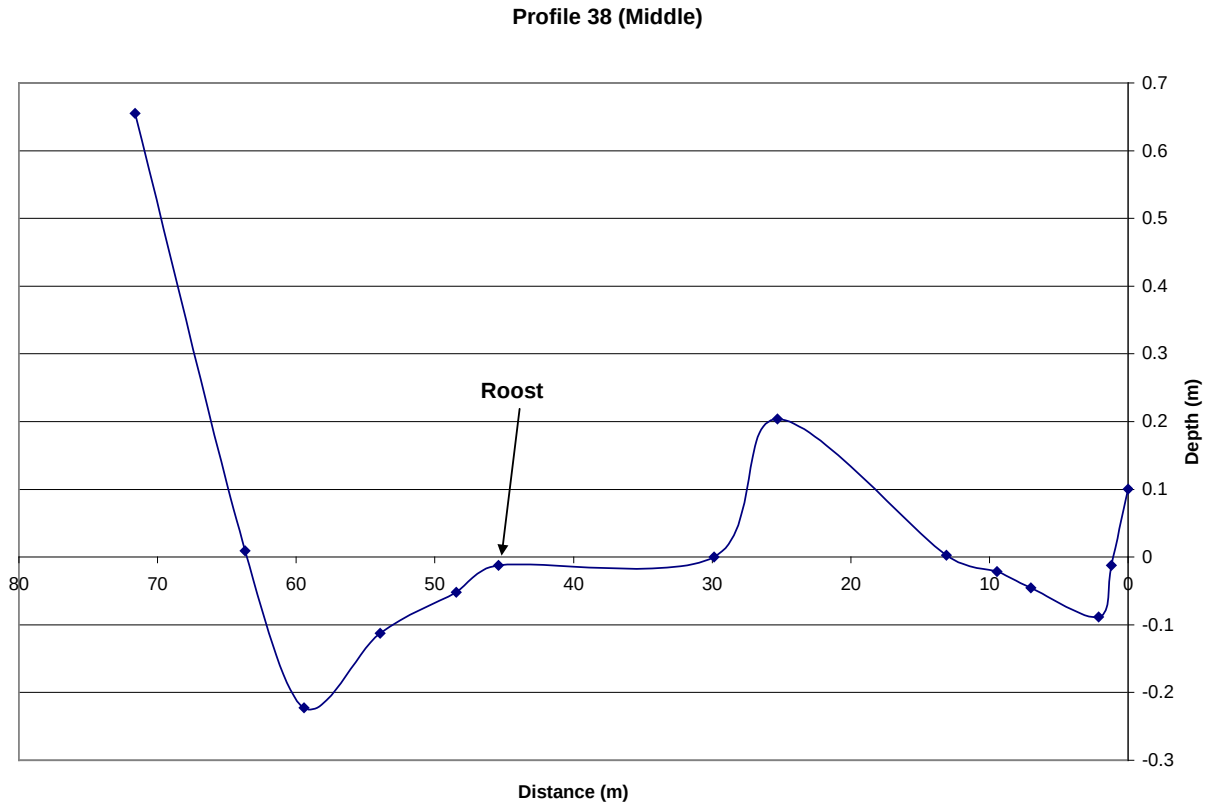

Figure 10. Roost channel profile for Use Site 4 (left to right bank).

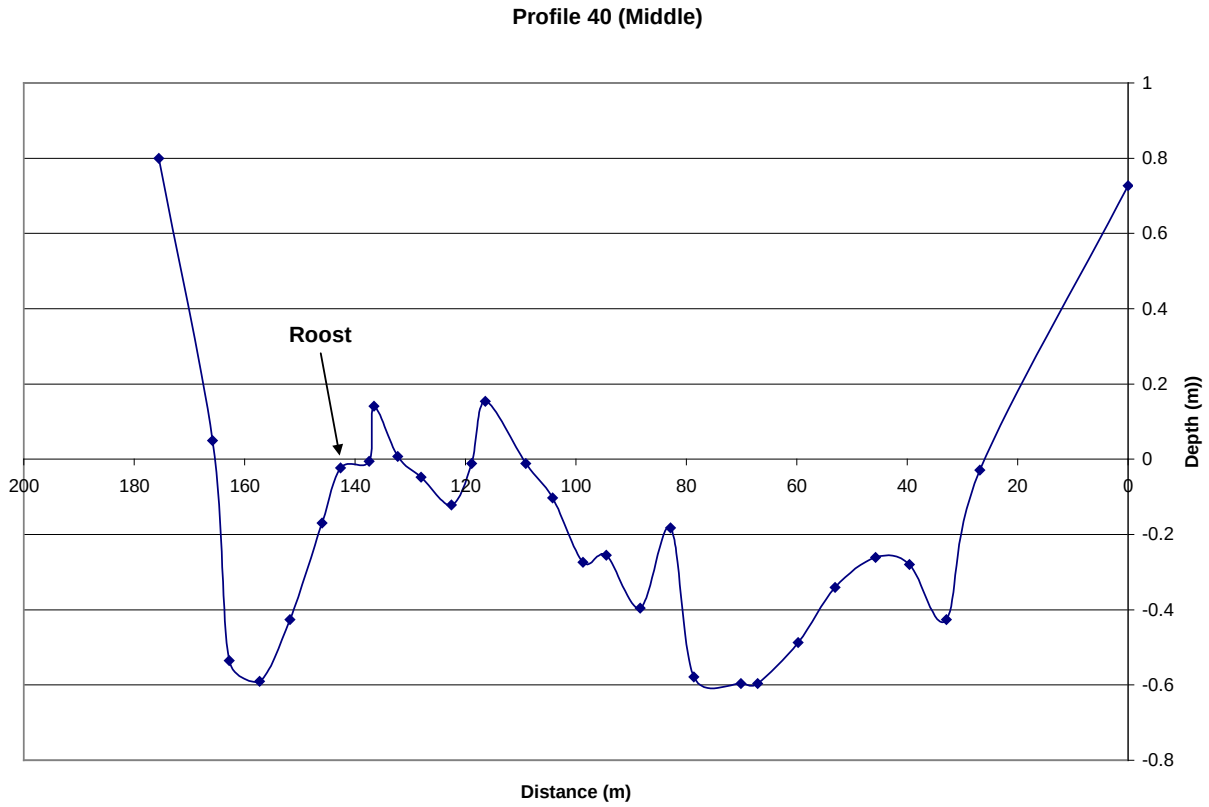

Figure 11. Roost channel profile for Use Site 5 (left to right bank).

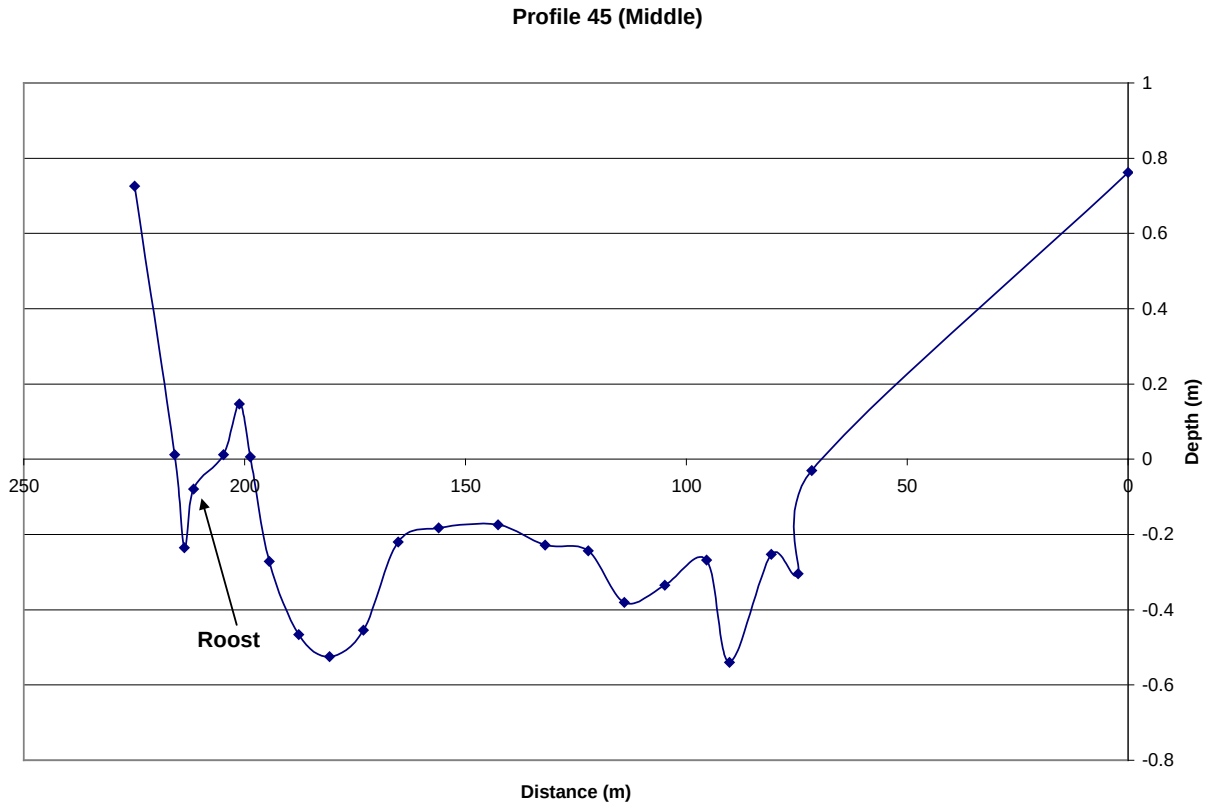

Figure 12. Whooping Crane Use Site 1 east of the Gibbon bridge (Sec 5 T8 R13 Buffalo County).

Upstream View

Left Bank View

Downstream View

Right Bank View

Figure 13. Whooping Crane Use Site 2 east of the Kearney Canal Diversion Dam (Sec 8 T8 R19 Dawson County).

Upstream View

Left Bank View

Downstream View

Right Bank View

Figure 14. Whooping Crane Use Site 3 east of the Rowe Sanctuary headquarters (Sec 10 T8 R14 Buffalo County).

Upstream View

Left Bank View

Downstream View

Right Bank View

Figure 15. Whooping Crane Use Site 4 east of the Gibbon bridge (Sec 4 T8 R13 Buffalo County).

Upstream View

Left Bank View

Downstream View

Right Bank View

Figure 16. Whooping Crane Use Site 5 east of the Gibbon bridge (Sec 4 T8 R13 Buffalo County).

Upstream View

Left Bank View

Downstream View

Right Bank View

Figure 17. Photograph of 9 Whooping Cranes (2008FA01) and 2 American White Pelicans (fourth & fifth from right) east of the Gibbon bridge. This was the largest group of Whooping Cranes documented on the Platte River.