Implementation of the Whooping Crane Monitoring Protocol

Fall 2010

FINAL REPORT

Prepared by

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For
Committee's of the
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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 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 2010 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. Twelve technicians were hired and conducted field work from 9 October through 10 November 2010. 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 2010 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 (Figure 1).

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 the air crew.

If a Whooping Crane was located by ground personnel, habitat use and activity monitoring commenced. Activity monitoring of a "focus" bird was recorded every 15 minutes using one of the following categories: courtship, preening, defensive, feeding, alert, resting, or other activity as defined by the observer. 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. 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).

Whooping Crane movements, behavior, and diurnal habitat use were 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. Landowner permission was obtained prior to entering any property.

Whooping Crane decoys were placed in the river channel at 10 randomly selected locations provided by Headwaters Corporation (Table 1) for the purposes of determining survey detection rates. 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.

Topographic profiles were measured at Whooping Crane roost 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. 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.

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.

Four changes to the protocol were made this fall as follows:

1. No off-river decoys were placed.
2. No river channel profiles were surveyed at decoy locations.
3. The rebar protocol was discontinued.
4. An aerial search for Whooping Cranes observers lost during the day was conducted.

Results

Opportunistic Locates.—

We received 2 reports of Whooping Cranes from the public, Whooper Watch, or USFWS. Both reports were confirmed as White Pelicans.

Aerial Survey.--

CONFIRMED WHOOPING CRANE SIGHTINGS-

Of a possible 33 morning flights per leg, the East Leg completed 30 (91%) flights while the West Leg flew 32 (97%). Weather and lack of a pilot were factors in cancellations. We recorded 4 confirmed Whooping Crane sightings on transects (Figures 2-4, 16).

INDEX OF USE-

We completed 124 (94%) aerial survey transects out of a possible 132. Four Whooping Crane sightings occurred on these transects. This resulted in an index of use (frequency of occurrence) of .03 sightings per transect. All of the sightings occurred on westbound river transects.

OPPORTUNISTIC FLIGHTS-

Four opportunistic flights were conducted. Three occurred when the plane deviated from the regular survey route at the request of the ground observer and resulted in three Whooping Crane sightings. One occurred when an additional flight was deployed during the day and no Whooping Cranes were sighted.

OTHER WHITE OBJECT SIGHTINGS-

Two on-ground follow-ups were conducted on objects other than Whooping Cranes at the request of the air crew. This resulted in confirmation of a Great Egret on one occasion and "object not found" on one occasion.

Searcher Efficiency Trials.—

Whooping Crane decoys were placed at 10 riverine locations between October 14 and November 8 (Table 1). The air observers detected a decoy at ten sites for an overall detectability rate of 100%. No off-river locations were used this season.

Table 1. Random locations of decoys for detectability trials.

Decoy ID	Strata	Date Placed	Detected?
49	0	10/20/2010	y
5	0	10/20/2010	y
14	0	10/15/2010	y
12	0	11/1/2010	y
8	0	11/8/2010	y
10	0	10/22/2010	y
6	0	10/15/2010	y
9	0	10/20/2010	y
4	0	10/14/2010	y
16	0	10/14/2010	y

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

FLOW-

Streamflow measured at the USGS gauging stations located near Grand Island, Kearney, and Overton was nearly double the median streamflow for each site during the survey (Figures 5-7). Median flows at Overton were not reached during a 4-day period in late October when repairs were done on CNPPID's irrigation system. 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	526	473	975
Date	10/28	10/28-29	10/30
Maximum	2870	2070	2320
Date	10/11	10/9	10/14

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	Discharge (cfs) Measured
1	10/29	7:51	10/31	487	1460
2	10/30	7:42	11/1	830	1610
3	10/30	8:36	11/2	839	1710
4	10/31	7:50	11/2	1380	1730

RIVERINE USE SITES-

We collected riverine channel profile data at 4 Whooping Crane roost sites (Figures 8-11). A total of 251 stations (3 readings at each station) from 12 transects were surveyed. Figures 12-16 depict the habitat used at Whooping Crane Use Sites.

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 to coarse sand. The average water depth at the Whooping Crane roost locations was -.15 $\pm$ .02 m.

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	539440	4511419	51	68	63	41	40	60	-.13
2	537205	4511305	30	115	72	59	70	30	-.15
3	562914	4527959	43	29	50	132	80	20	-.18
4	488356	4501724	56	67	52	36	60	40	-.14

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	126.7	10.5
2	171.3	8.8
3	164.3	21.3
4	113.6	10.6

DIURNAL USE SITES-

Diurnal movements and activity data was collected when cranes were in view. We documented 3 diurnal use locations during 3 days of observation; 1 from Crane Group 2010FA01 and 2 from Crane Group 2010FA04 (Figures 2 and 4 respectively).

Crane Group 2010FA01 consisting of 2 adult Whooping Cranes was not observed off their riverine roost location during their 3-day stay. They were observed from the air at 7:51 h and 8:28 h CDT. Ground personnel could not see them on the river but observed them taking short flights at 9:39 h, 10:33 h, and 12:00 h CDT. They immediately landed back on the river. Ground personnel continued to monitor them until 18:30 h CDT with no visual contact during the 6.5 hour period from 12:00 h until 18:30. Although it is possible that they departed unnoticed, we assumed they remained on the river the remainder of the day. This assumption was reinforced the next morning when 9 Whooping Cranes (Crane Group 2010FA02) were observed about 0.75 mi upstream from where the pair was last observed. We assumed the pair was joined by 7 additional Whooping Cranes to form the group of 9 individuals (8 adults; 1 juvenile).

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 4 (12%) of the 33 days of the survey. The time period when Whooping Cranes were present coincided with the lowest flows of the season. We documented the presence of 4 Whooping Crane groups that contained from 2 to 9 birds. A total of 32 crane-use days by 15 individuals was recorded (Table 6). If Crane Group 2010FA01 was distinct from 2010FA02, then 34 crane-use days occurred by 17 individuals.

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

Crane Group	Number of Cranes (ad:juv)	Dates of Occurrence	# of days present	Crane-Use Days
2010FA01	2:0	October 28-30	3	6
2010FA02	8:1	October 29-30	2	14*
2010FA03	2:2	October 29-30	2	8
2010FA04	2:0	October 30-31	2	4
TOTAL	12:3			32

*Crane Group 2010FA02 includes individuals from Crane Group 2010FA01.

LAND-COVER CLASS-

Wetted Channel, AG-Alfalfa, 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-

Three hours of continuous and instantaneous use (time budget) data of Whooping Cranes was collected by ground personnel during 3 days of observation (Table 7). Nine data points of activity (time budget) were recorded in Wetted Channel. Resting was recorded on 6 (67%) occasions and alert was recorded 3 times (33%) (Table 8). Two data points of activity, one each of Feeding and Alert, on adult Whooping Cranes were recorded in Ag-Corn. One data point of activity on adult Whooping Cranes was recorded in Ag-Alfalfa. The crane was alert.

Table 7. Count of instant points by habitat.

Habitat	**# of points**	**Hours**	**Percent**
Wetted Channel	9	2.25	75%
Corn	2	.5	17%
Alfalfa	1	.25	8%
TOTAL	12	3.0	

Table 8. Whooping Crane activity by habitat.

Habitat	**Activity**	**# of points**	**Total**	**Percent**
Wetted Channel	Resting	6	9	66%
Wetted Channel	Alert	3	9	33%
Corn	Feeding	1	2	50%
Corn	Alert	1	2	50%
Alfalfa	Alert	1	2	100%

***Ground Search Effort*.--**

Ground searches were initiated on 7 occasions. A total of 8.7 hours was expended in this effort and 172 miles were driven. Search duration extended from 0.6 to about 2.25 hours (mean= 1.25 $\pm$ 0.63 hours). Whooping Cranes were located on 4 occasions (57%) and a Great Egret was located on 1 occasion (14%). Searches were terminated when the object was found or after a 2-hour search effort was made.

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

Table 9 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 period.

Table 9. Comparison of Program Crane ID and USFWS Crane ID.

Program Crane ID (Prefix 2010FA)	Program Name	USFWS Crane ID	Dates of Occurrence	# of cranes
01	Shoemaker Island	10B-25	10/29	2
02	Shoemaker Island	10B-26	10/30	9
03	Kruse	10B-27	10/30	4
04	Broadfoot	10B-28	10/31	2

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 21 December 2010, there were 78 confirmed sightings in the United States as follows: North Dakota- 12; South Dakota- 11; Nebraska-14; Kansas- 20; Oklahoma- 15, Colorado-1, Missouri- 1, and Texas- 2. A record 281 (45 juveniles) Whooping Cranes were counted on their wintering grounds in Texas on February 11, 2011.

Discussion and Recommendations

The transition from the Microsoft Access database was not completed during this monitoring effort so we continued using Microsoft Access as we have previously done. 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.

Fall 2010 Expenses

The cost of the field implementation of this project was about $50,546. The total cost of the fall 2010 monitoring effort was about $63,500.

Supplements

Original Data Sheets

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

Figure 1. River flight transects and 7 return flight transects flown during the aerial surveys. Only a portion of the study area from East to West is shown (taken from *Monitoring Whooping Crane Migrational Habitat Use in the Central Platte River Valley* 16 September 2005).

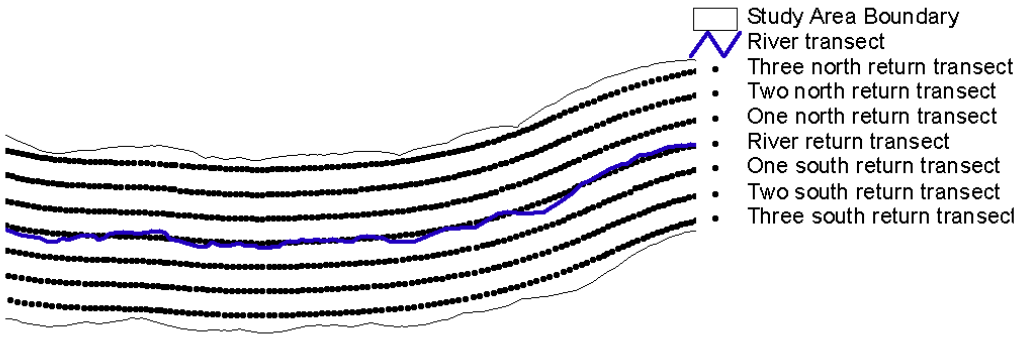
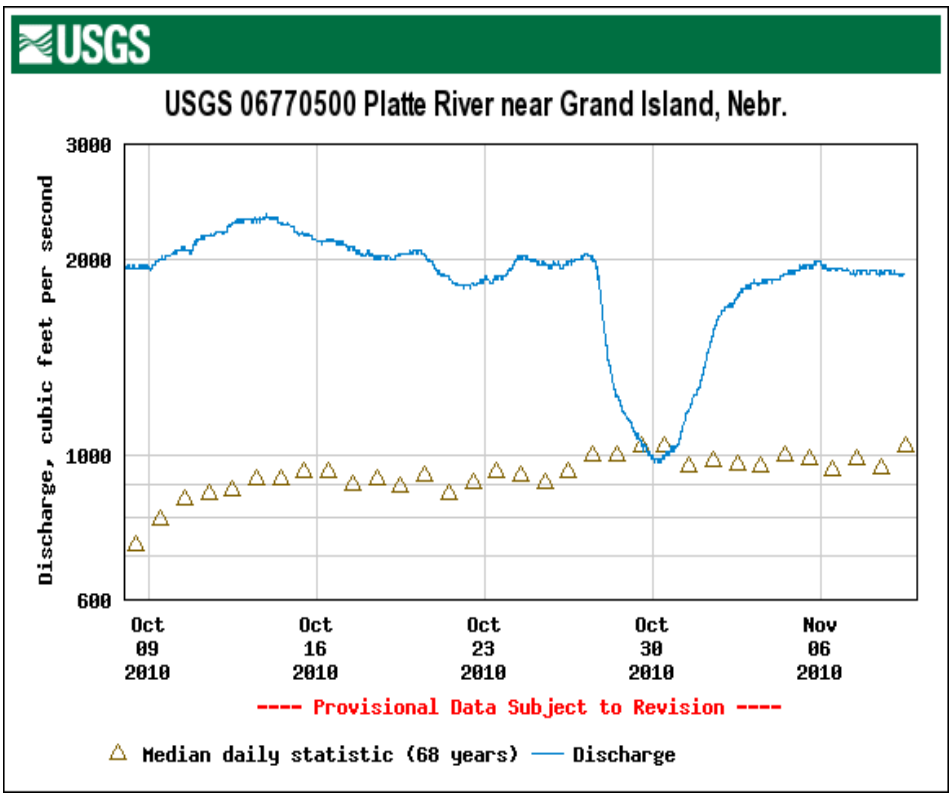


Figure 2. Whooping Crane Use Sites 1 (Crane Group 2010FA01) and 2 (Crane Group 2010FA02) on Shoemaker located east of the Wood River bridge in Hall County. Use Site 1 was also a diurnal use site.

Figure 3. Whooping Crane Use Site 3 in Merrick County 4 miles west of Phillips NE.

Figure 4. Whooping Crane Use Site 4 and off-river sites (yellow) about 2.7 miles west of the Kearney Bridge in Buffalo/Kearney Counties.

Figure 5. Platte River discharge (cfs) and gage height at Grand Island.



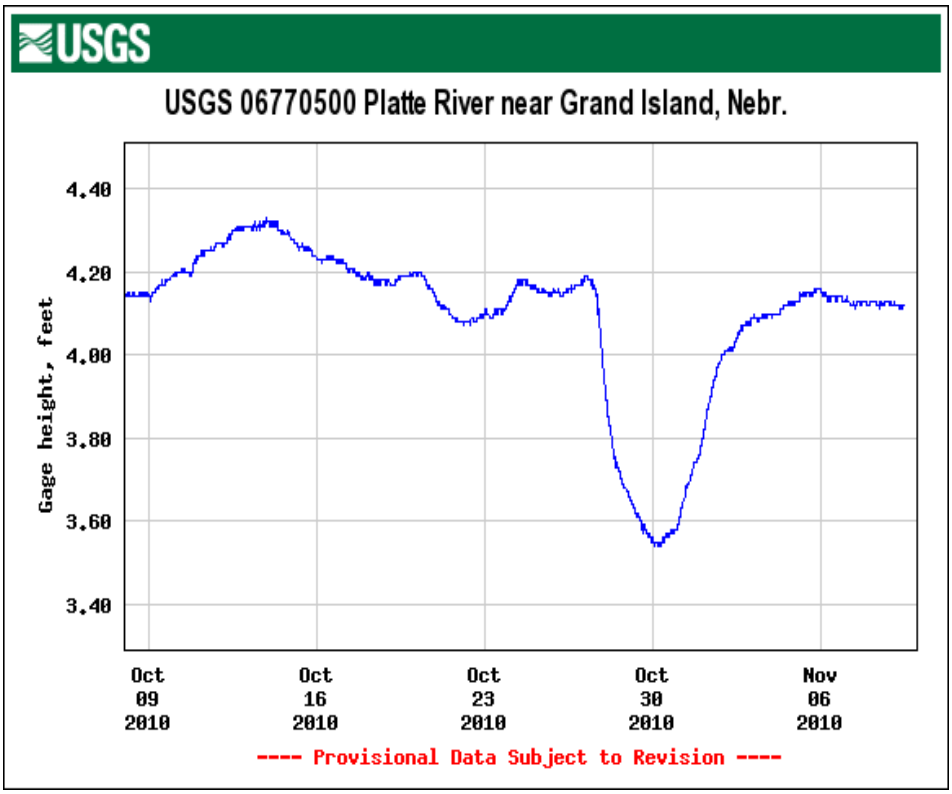
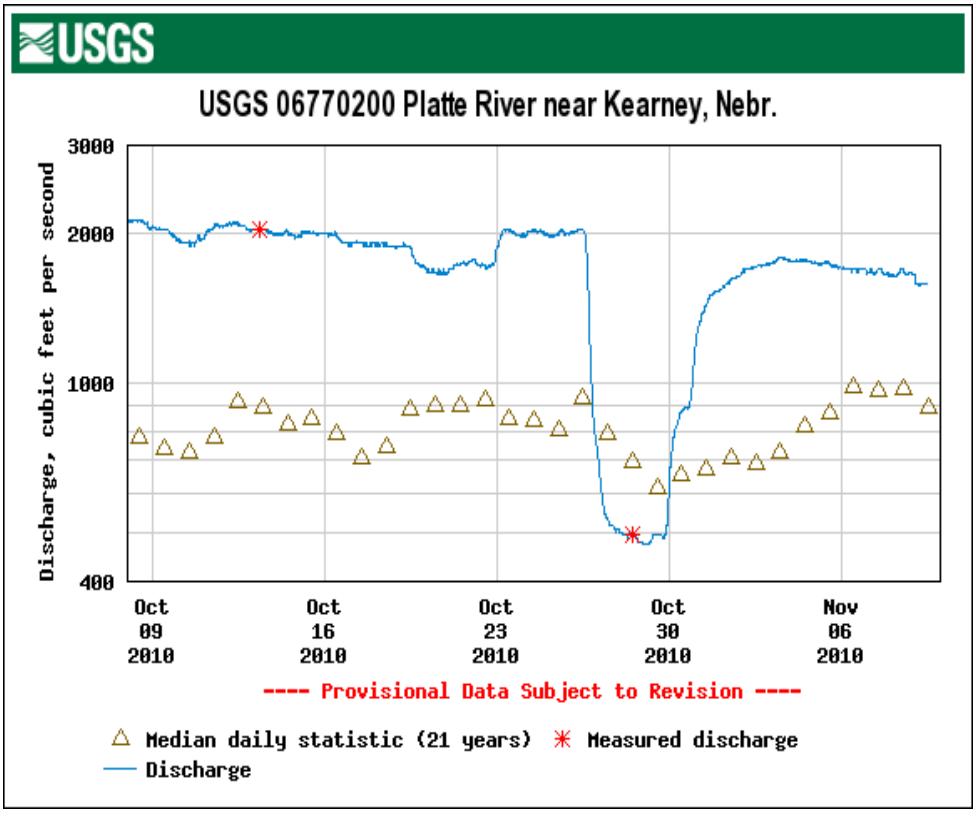


Figure 6. Platte River discharge (cfs) at Kearney.



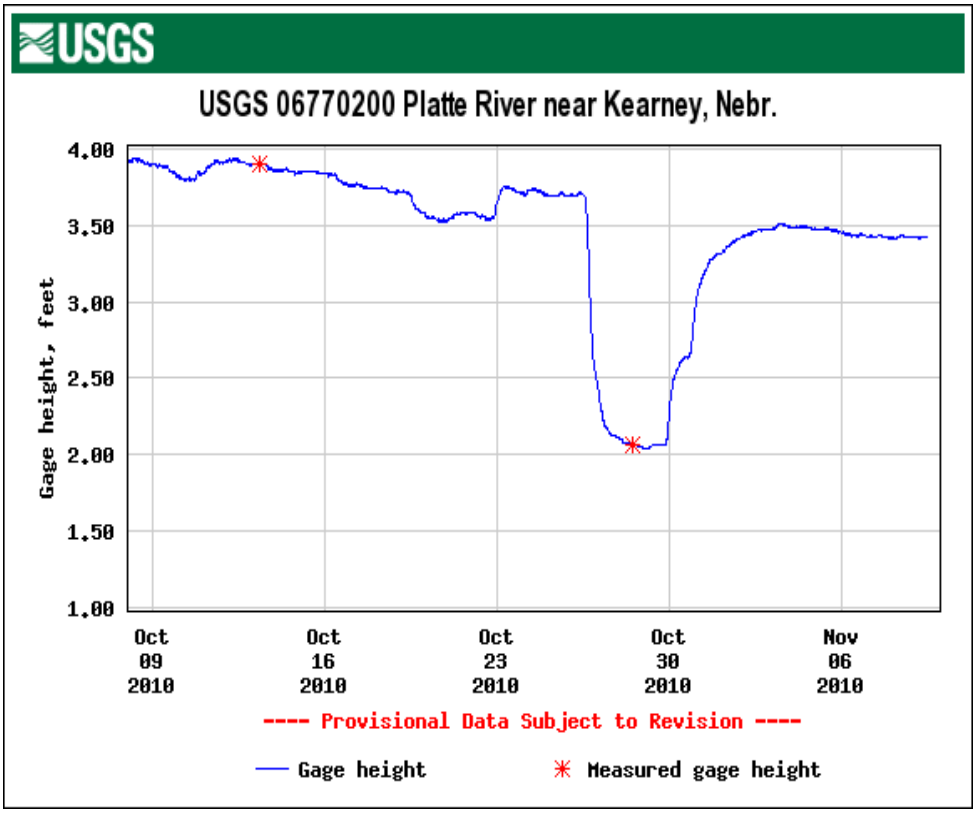
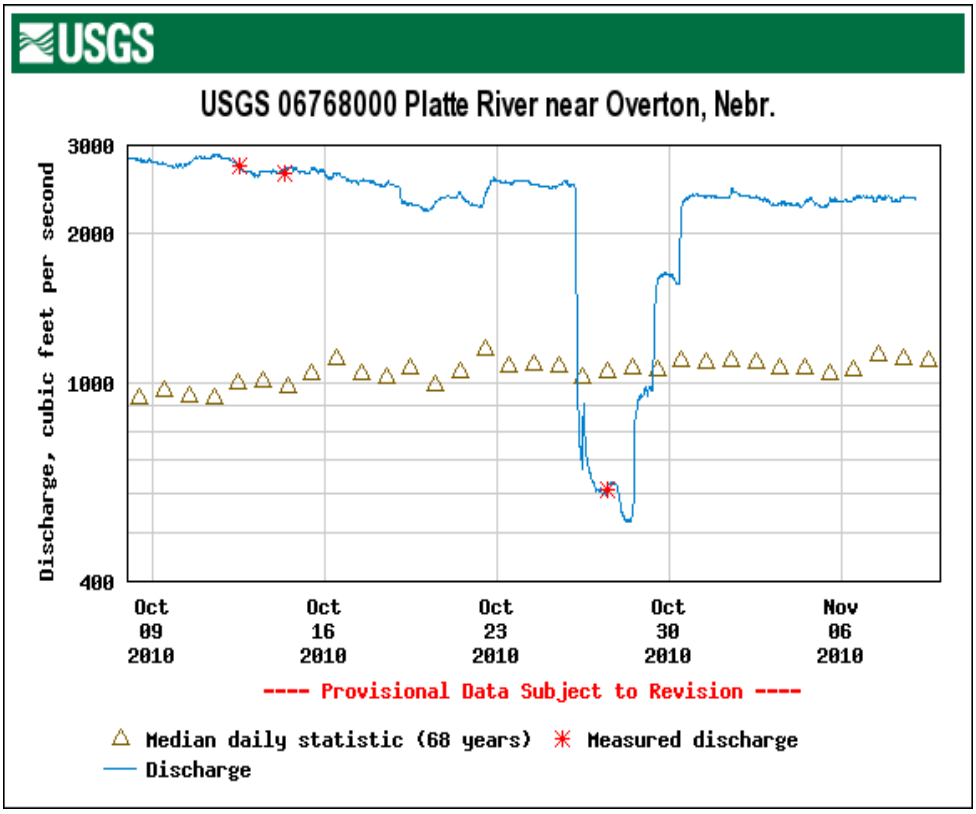


Figure 7. Platte River discharge (cfs) at Overton.



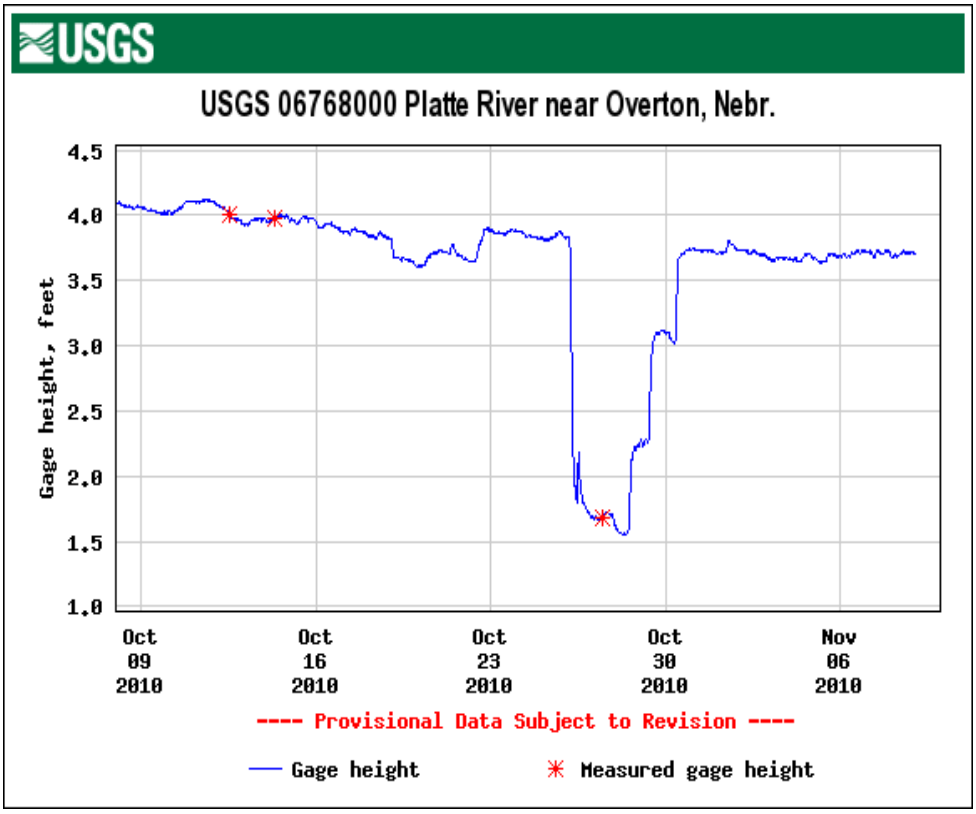


Figure 8. Roost channel profile for Use Site 1 (left to right bank).

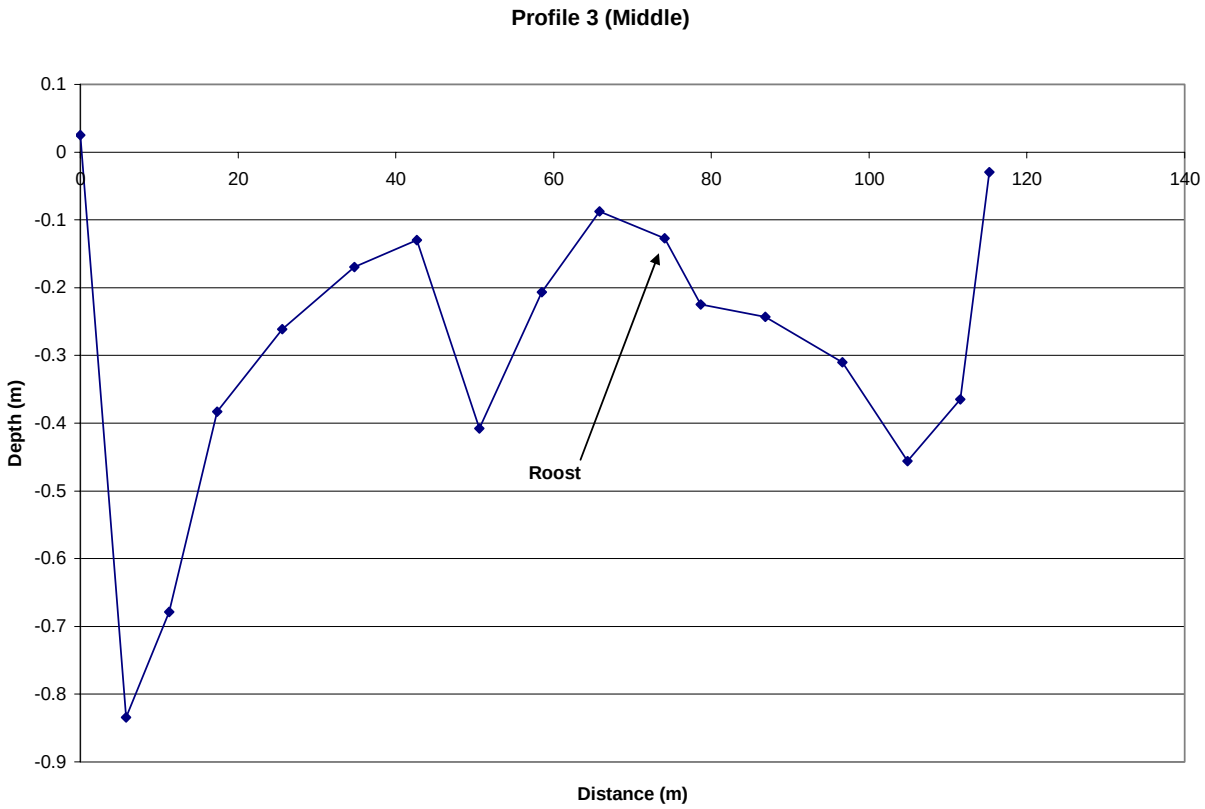


Figure 9. Roost channel profile for Use Site 2 (left to right bank).

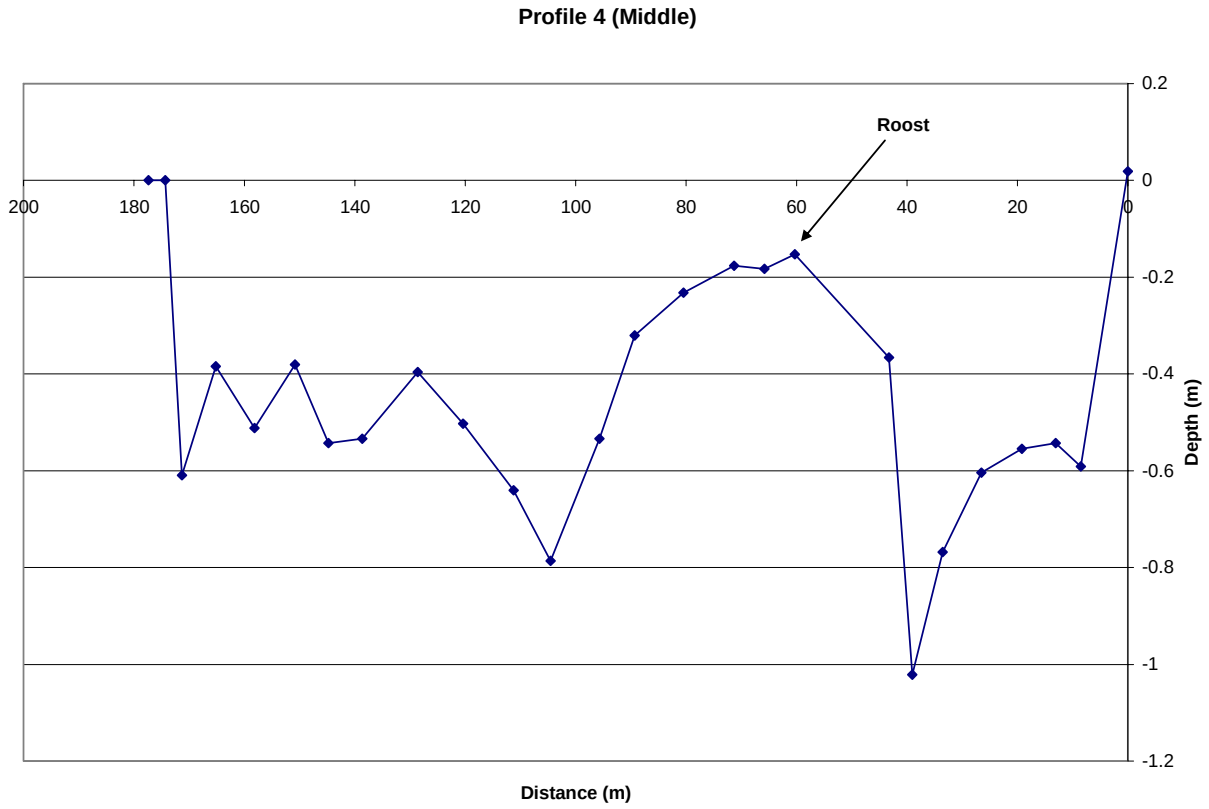


Figure 10. Roost channel profile for Use Site 3 (left to right bank).

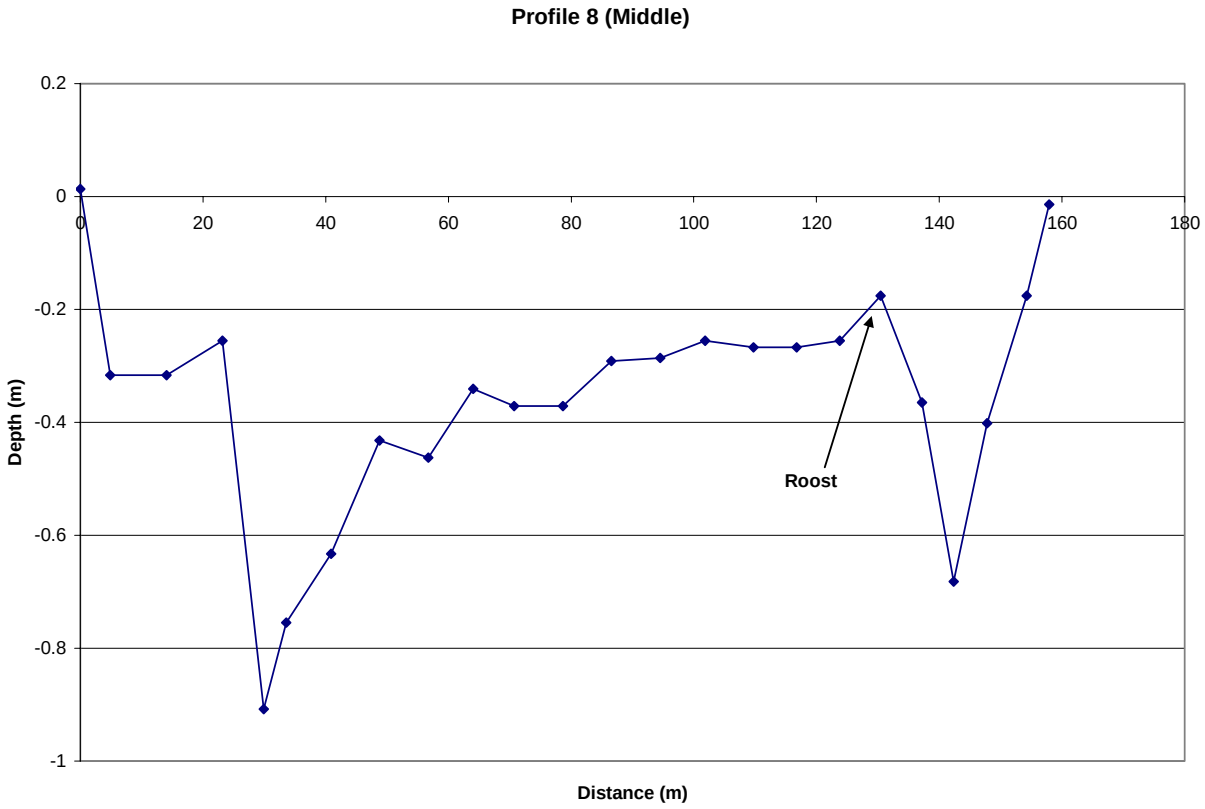


Figure 11. Roost channel profile for Use Site 4 (left to right bank).

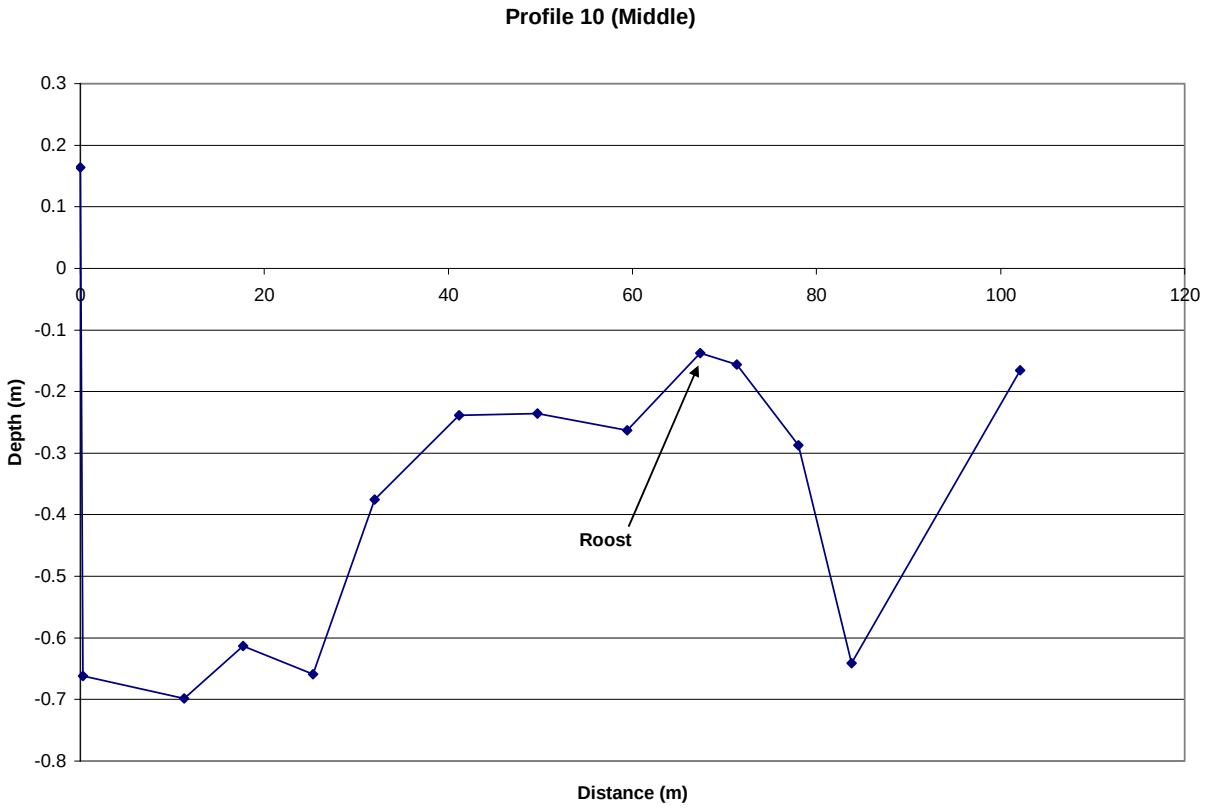


Figure 12. Whooping Crane Use Site 1 west of the Alda bridge (Sec 15 T9 R11 Hall County).

Upstream

Left Bank

Downstream

Right Bank

Figure 13. Whooping Crane Use Site 2 east of the Wood River bridge (Sec 16 T9 R11 Hall County).

Upstream

Left Bank

Downstream

Right Bank

Figure 14. Whooping Crane Use Site 3 east of the railroad bridge (Sec 29 T11 R8 Merrick County).

Upstream

Left Bank

Downstream

Right Bank

Figure 15. Whooping Crane Use Site 4 west of the Kearney bridge (Sec 16 T8 R16 Buffalo County).

Upstream

Left Bank

Downstream

Right Bank

Figure 16. Aerial photos of Whooping Cranes on the river.

Crane Group 2010FA01

Crane Group 2010FA02

Crane Group 2010FA03

Crane Group 2010FA04