

# **Implementation of the Whooping Crane Monitoring Protocol**

**Fall 2006**

## **FINAL REPORT**

Prepared by

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### **Draft Report Prepared by**

#### **AIM Environmental Consultants**

### **For**

#### **Committee's of the**

#### **Platte River Recovery Implementation Program**

**25 January 2007**

Assessment Impact Monitoring Environmental Consultants (AIM) was awarded a contract to assist the Governance Committee and Technical Committee in implementing the *1997 Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska* (Cooperative Agreement). Our specific task was to implement the protocol developed by the Technical Committee entitled *Monitoring Whooping Crane Migrational Habitat Use in the Central Platte River Valley* during the fall 2006 migration. The contract specified the implementation of the draft protocol dated 16 September 2005 along with guidelines presented in the *Request for Proposal*. We present the results of fall 2006 Whooping Crane migration pursuant to the *Work Order Agreement* dated 1 September 2006.

### **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. We hired and trained twelve technicians and conducted field work from 9 October through 10 November 2006. A set of six data sheets was provided by the Executive Director's Office (EDO) and all data were entered into a Microsoft Access 2000 database template developed by the EDO.

Two air services were contracted and aerial surveys were conducted along specified routes near sunrise from 9 October through 10 November 2006 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 infrared aerial photos of the river (photos were developed by WEST, Inc. and have been used since October 2001). The photos were inserted in polypropylene sheet protectors that enabled the observer to mark the roost location on the photo for later reference. Efforts were made to photograph Whooping Cranes while on the river from the air using digital cameras. In addition, a GPS reading of the roost 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).

Channel profiles were measured at Whooping Crane roost sites and three replications at three predetermined decoy locations on riverine sites using surveying equipment on loan from the Nebraska Public Power District. 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 transit and rod. Transect 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 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 were 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 weekly 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 the EDO (Table 1) for the purposes of determining survey detection rates. Five locations were off-river and the others 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.

The EDO established a toll-free telephone number for the public to report Whooping Crane sightings. The number was maintained and operated by the Platte River Whooping Crane Habitat Maintenance Trust. AIM personnel distributed flyers to prominent bird-watching centers notifying 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 did not receive any reports of Whooping Cranes via channels other than AIM personnel which were a result of our surveys.

### *Aerial Survey--*

#### CONFIRMED WHOOPING CRANE SIGHTINGS-

Of a possible 33 morning flights per leg, the west leg completed 28 (85%) flights while the east leg flew 25 (76%). Fog, low ceiling, precipitation, mechanical problems, and high winds were factors in cancellations. We recorded 12 confirmed or probable Whooping Crane sightings (Figure 1, Appendix A).

## INDEX OF USE-

We completed 106 (80%) aerial survey transects out of a possible 132. Twelve Whooping Crane sightings were made on these transects. This results in an index of use (frequency of occurrence) of 0.11 sightings per transect. All sightings were on riverine transects.

## OPPORTUNISTIC FLIGHTS-

An aerial search for Whooping Cranes was conducted following the regular surveys on November 2. A family group of 3 Whooping Cranes was observed by Kearney Air in the same cornfield they were recorded in earlier that morning by Grand Island Air. Kearney Air spotted the family group on November 4 east of Audubon's Lillian Annette Rowe Sanctuary headquarters prior to the start of their survey.

## OTHER WHITE OBJECT SIGHTINGS-

No on-ground follow-ups were conducted on objects other than Whooping Cranes.

### ***Searcher Efficiency Trials.—***

Whooping Crane decoys were placed at 15 locations between October 12 – November 2 (Table 1; Appendix A). The aerial observers detected a decoy at nine sites for an overall detectability rate of 60%. When broken down by strata, there was a 40% and 70% detectability rate for strata 0-3.5 and 0 respectively.

Table 1. Random locations of decoys for detectability trials.

Decoy ID	Strata	UTMX	UTMY	Detected
1	0	548387	4515187	Yes
2	0	500303	4501071	No
3	0	551756	4516950	Yes
4	0	458689	4503610	Yes
5	0	499179	4501045	Yes
6	0	539138	4511331	Yes
7	0	517577	4505441	No
8	0	539770	4511798	Yes
9	0	550603	4515951	Yes
10	0	444739	4505196	No
11	0-3.5	544218	4515158	Yes
12	0-3.5	448450	4504634	No
13	0-3.5	466316	4503702	Yes
14	0-3.5	458385	4500931	No
15	0-3.5	462178	4504042	No

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

**FLOW-**

Streamflow measured at the USGS gauging stations located near Grand Island, Kearney, and Overton was well below the median streamflow for each site throughout the study period (Figures 2-4). Note all flow data are provisional and subject to revision. Table 2 depicts the minimum and maximum values for unit (instantaneous) flows at each location during this study.

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

	<b>Overton</b>	<b>Kearney</b>	<b>Grand Island</b>
Minimum	154	32	183
Date	10/14 & 17	10/28	10/25
Maximum	1940	752	501
Date	11/05	11/11	11/08

Discharges when a Whooping Crane was 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 nearest upstream gauging station).

Use Site	Use Date	Use Time	Measured Date	Discharge (cfs)	
				Use	Measured
1		743 & 1121-1648 & 825-857 & 1807, 1221-1545,			
	10/24, 10/25, 10/26,	1819, 1708, 625-702,			
	10/29, 10/30, 10/31,	1731, 715-735 & 1158-			
	11/1, 11/5	1522, 705 & 906	11/7	40-402	76
2	10/29, 10/30	705, 1715-1730	11/7	131	76
3		1612-1706, 903-1505 & 1547-1715, 854-1020 &			
	10/29, 10/30, 11/2,	1109-1600 & 1722, 634-			
	11/5, 11/6	700 & 714, 712	11/7	47-256	71
4		1415-1735, 1009-1515 & 1553-1830, 845-118 &			
	10/26, 10/27, 10/29,	1145-1539, 848-1301 &			
	10/31, 11/1, 11/2,	1328-1555, 740-850 &			
	11/3	952-1144 & 1522-1545 & 1745, 700-747, 1733	11/9	36-378	80
5		1648-1837, 854-1040 &			
	10/28, 11/4, 11/5	1205-1622, 907-947	11/8	45-366	200
6	10/28	800	11/8	32	188
7	10/25	752	11/6	140	204
8	10/25	1024-1215	11/6	119	204

## RIVERINE USE SITES-

We collected riverine channel profile data at eight Whooping Crane use locations (Figures 5-12) and three decoy locations with 3 replications each (data entered into Microsoft Access database). Thirteen roost locations and 16 day use locations were recorded and these were lumped into eight Use Sites due to their close proximity to one another (Table 3). A total of 959 stations (3 readings at each station) from 51 profiles were surveyed. Photographs depicting the habitat used were taken at each Whooping Crane Use Site (Appendix A).

## DISTANCE TO VISUAL OBSTRUCTION, SUBSTRATE, AND WATER DEPTH-

Visual obstructions from Whooping Crane riverine use sites are given in Table 4. Substrate was characterized primarily as fine to coarse sand. The average water depth at the roost locations was  $-0.138 \pm 0.068$  m. The values reflect lower flows at the time measurements were taken than those during use (Table 3).

Table 4. Location, visual obstruction (vo) distance in meters, and substrate at 8 Whooping Crane riverine use 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 %	Large Gravel %
1	509965	4502442	37	14	46	256	10	90		
2	509649	4503025	145	64	90	187	20	80		
3	508538	4501853	329	192	221	223	20	30	20	30
4	507774	4501952	70	425	62	41	70	30		
5	506755	4501773	110	77	99	75	20	80		
6	505758	4501313	47	115	170	122	60	40		
7	517022	4505167	30	2	38	104	20	80		
8	516437	4504936	40	24	28	27	20	80		

#### UNOBSTRUCTED WIDTH-

Table 5 depicts average unobstructed widths as measured at riverine use locations.

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

Use Site ID	Avg Of Unobstr Width	Standard Deviation
1	270	3.2
2	250	7.1
3	400	10.2
4	383	116.1
5	237	8.6
6	227	3.5
7	122	16.7
8	48	3.5

#### DIURNAL USE SITES-

Diurnal movements and activity data was collected when possible. We documented diurnal use locations in 8 sections during 14 days of observation (Figure 1, Appendix A). Whooping Cranes were seen within 1 mile of the river.

#### CRANE-USE DAYS

Crane-Use days were calculated by multiplying the number of Whooping Cranes observed by the number of days present in the study area. Whooping Cranes were known to be present in the study area 15 (45%) of the 33 days of the survey. A total of 45 crane-use days occurred (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
Rowe Family	3	October 23- November 6	15	45

#### LAND-COVER CLASS-

Wetted Channel, Ag-Corn, Ag-Soybeans, and Upland Grasses were the cover-types Whooping Cranes were observed using during the day. Forty-three (58 %) of the 74 diurnal locations were in Wetted Channel, 24 ( 32%) in Ag-Corn, 6 ( 8%) in Ag-Soybean, and 1 (1 %) were in Upland Grasses. All 14 (100%) of the nocturnal roost locations were in Wetted Channel.

## ACTIVITY-

A total of 99.5 hours of continuous and instantaneous use data of Whooping Cranes was collected by ground personnel during 14 days of observation. Only the juvenile was monitored. Of the total time observed, 76.2 hours (76%) were in Wetted Channel, 19.2 (19%) hours in Ag-Corn, 4 hours (4%) in Ag-Soybeans, and 1 hour (1%) in Upland Grasses. All observations were in diurnal use locations. Three hundred ninety-eight data points of activity (time budget) were recorded. Feeding (72%) was the most frequently observed activity followed by preening (12%), resting (9%), alert (7%), and courtship (<1%) (Table 7).

Table 7. Activity by habitat.

Habitat	Activity	n	Total	Percentage
Ag-Corn	Alert	8	77	10.4
Ag-Corn	Feeding	65	77	84.4
Ag-Corn	Resting	4	77	5.2
Ag-SoyBean	Alert	2	12	16.7
Ag-SoyBean	Feeding	9	12	75
Ag-SoyBean	Resting	1	12	8.3
Grassland-Upland	Alert	1	4	25
Grassland-Upland	Feeding	3	4	75
Wetted Channel	Alert	19	305	6.3
Wetted Channel	Courtship	1	305	0.3
Wetted Channel	Feeding	209	305	68.5
Wetted Channel	Preening	46	305	15.1
Wetted Channel	Resting	30	305	9.8

## *Search Effort.--*

Ground searches were initiated on 5 occasions. A total of 4 hours was expended in this effort. In addition, 94 miles were driven. Search duration extended from 0.3 to 1.4 hours. Searches occurred primarily in the morning hours and were terminated when the object was found.

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

The USFWS classified Program sightings (2006FA01-29) as 06-22 in the USFWS database (Martha Tacha, personal communication). We had one family group of Whooping Cranes present in the study area. We observed a peculiar dark stain on the underbelly and legs of this group (Figure 13) and one of the adults was color-banded; therefore we were certain of their identity. The banded individual was banded as a chick in 1987 with YBY-Y color bands (Tom Stehn, pers. com.).

### ***Feather Stain Concerns and Migrational Movement***

There was concern of potential toxicity to the crane from the stains on the feathers. Photographs (Figure 13) were sent to a number of specialists and the opinion was that the stains were consistent with that of oil. Evidently the cranes waded into a wetland area that was contaminated with this brownish material. The origin was not ascertained but the exposure had to occur at some point between Wood Buffalo National Park and Nebraska. We searched for stained molted feathers on the riverbed on several occasions and found only unstained feathers and fecal material. The fecal material was collected and submitted to Martha Tacha. The identity of the stain was not determined; however, the cranes behaved “normally” and did not exhibit any unusual behavior.

The family group migrated at 9:45 CST on November 6. They were observed at 16:30 CST later that day at Salt Plains NWR in Oklahoma, a distance of about 300 miles. They migrated at a speed of about 46 mph. The group migrated from Salt Plains NWR the following morning (Nov. 7). They arrived at Aransas NWR between 8-15 November (Tom Stehn, pers. com.). Tom Stehn was able to identify this family group based on the winter territory they occupied.

### **Discussion and Recommendations**

The number of confirmed Whooping Crane sightings in Nebraska was 6 including those contained herein (Martha Tacha, personal communication). As of 6 December 2006, there were 50 confirmed sightings in the United States as follows: North Dakota-14; South Dakota-5; Nebraska-6; Kansas-15; Oklahoma-7; Texas-2; and New Mexico-1. A record 235 Whooping Cranes were accounted for either in migration (11) or on their wintering grounds in the vicinity of Aransas National Wildlife Refuge in Texas (224).

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

#### ***Data Sheets***

- Add “walking” as an activity to the “..... Instantaneous and Continuous Use Site Monitoring” sheet. Change the name of this sheet to Time Budget.

#### ***Microsoft Access Database***

- Present discharge during use and when measured including dates for both in a Table.
- Automate “instant point ids” in the Use Site Monitoring form.
- Add table to include detectability trial data.
- Add return route data in the same line in the Aerial Survey Form to avoid redundancy.
- Headings in all queries that include channel widths should be change to unobstructed rather than obstructed widths to avoid confusion.

- In the Transect ID drop-down menu of the Aerial Survey form, there are 18 options for transects and only 14 transects exist. This should be corrected.

### ***Methods***

165 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 transect 3 and possibly transect 2 from the aerial survey since no observations of Whooping Cranes have occurred on these transects to date and likelihood of observing Whooping Cranes on these transects is remote given the time of day the flights occur.

### **Fall 2006 Expenses**

The cost of the field implementation of this project was about \$45,550. The estimated cost of Draft and Final Report preparation was \$6,786 and \$4,500 respectively. The total cost for the Fall 2006 effort was about \$56,836.

### **List of Appendices**

Appendix A. Selected Photographs.

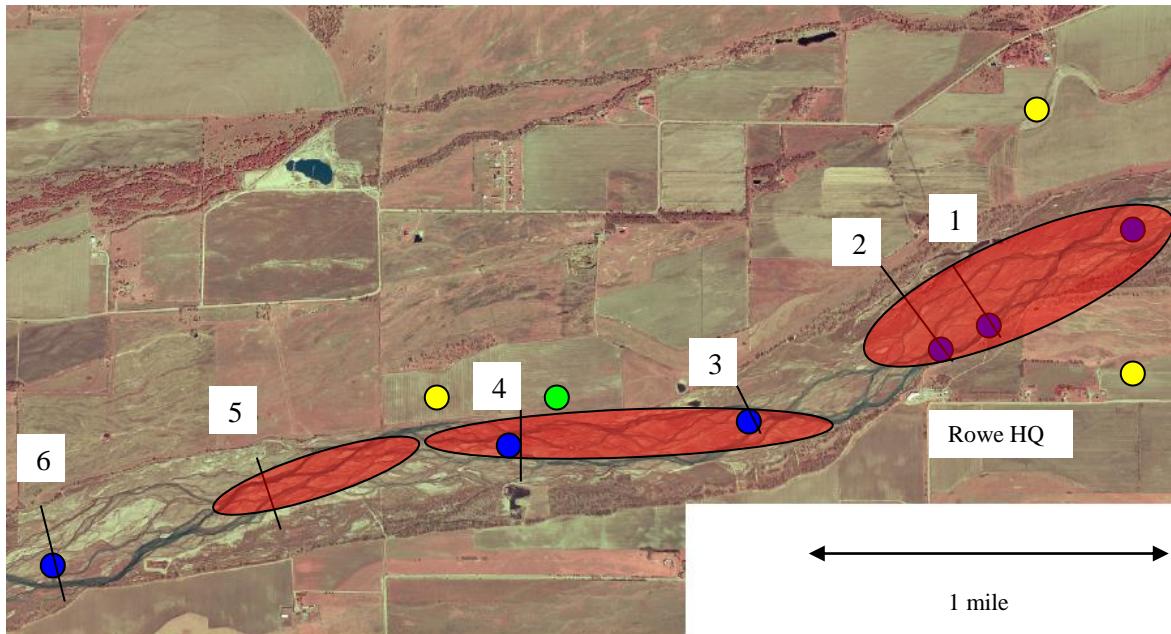
### **Supplements**

Original Data Sheets 166pp.

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

Figure 1. Whooping Crane Use Sites 1-6 in the vicinity of Rowe Audubon Sanctuary, Buffalo County above and Use Sites 7 and 8 downstream of the Gibbon Bridge below.

Rowe Sanctuary Whooping Crane Roost and Use Sites – Fall 2006



Blue = roost

Red = riverine day use

Yellow = corn field

Green = soybean field

Line = river profile

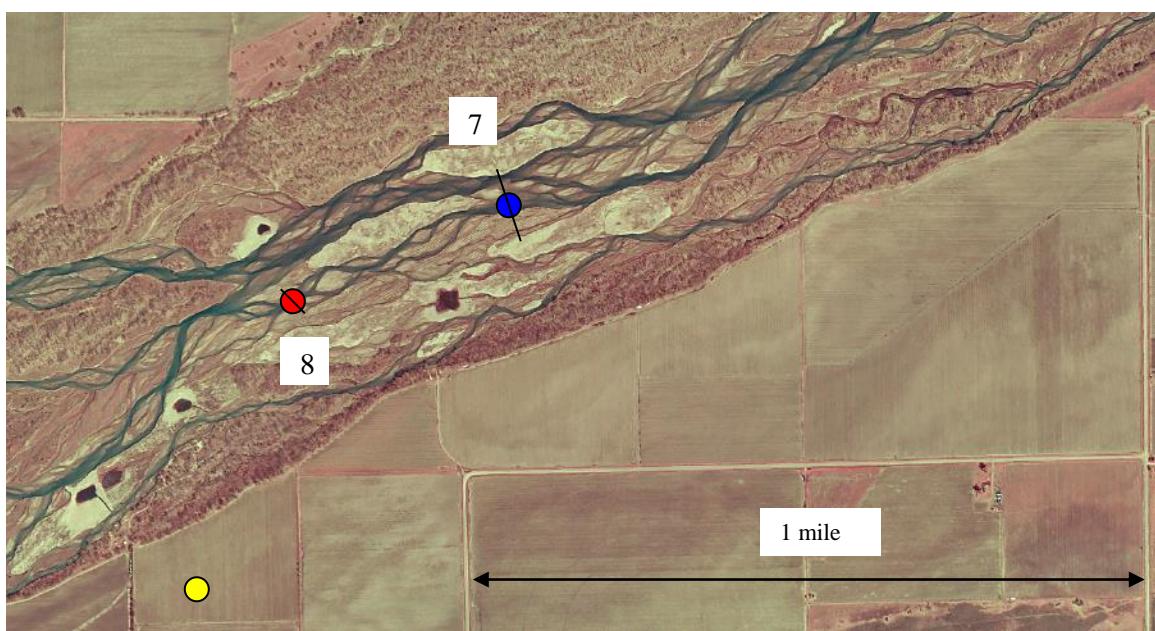


Figure 2. Platte River discharge (cfs) at Grand Island.

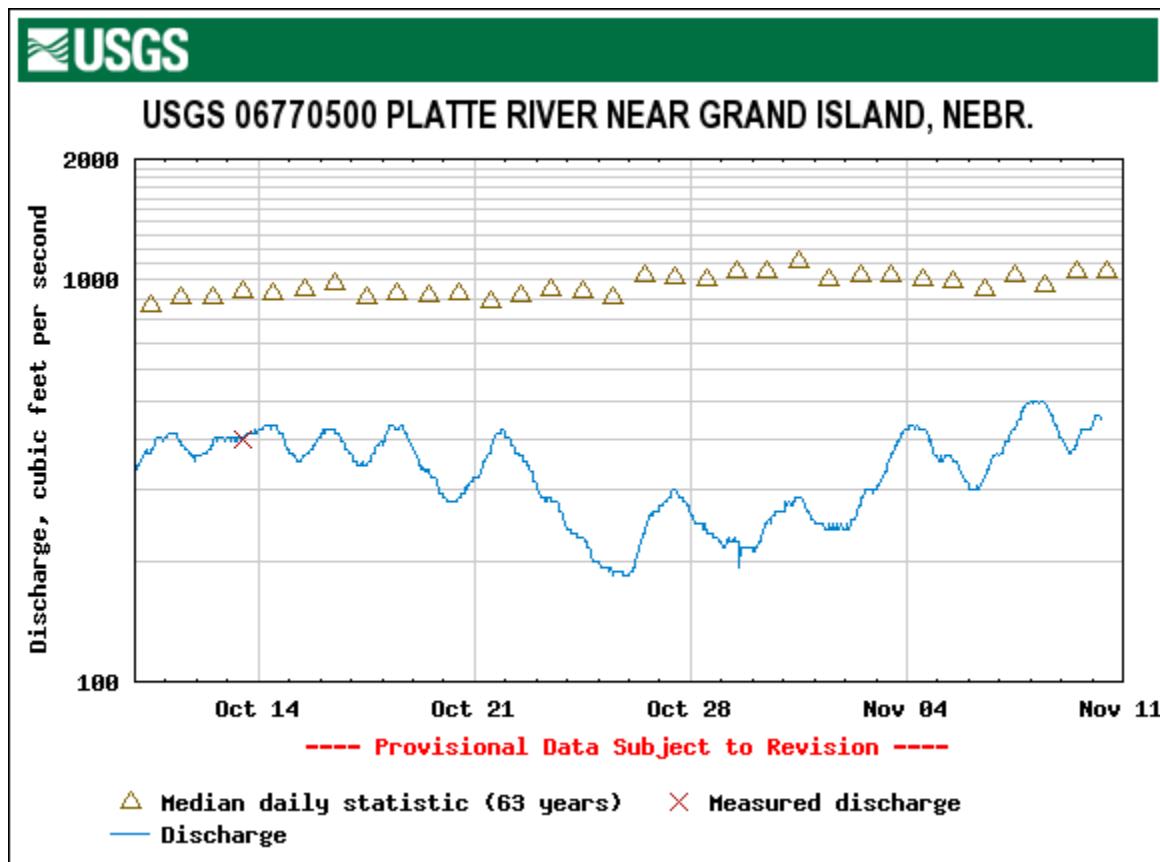


Figure 3. Platte River discharge (cfs) at Kearney.

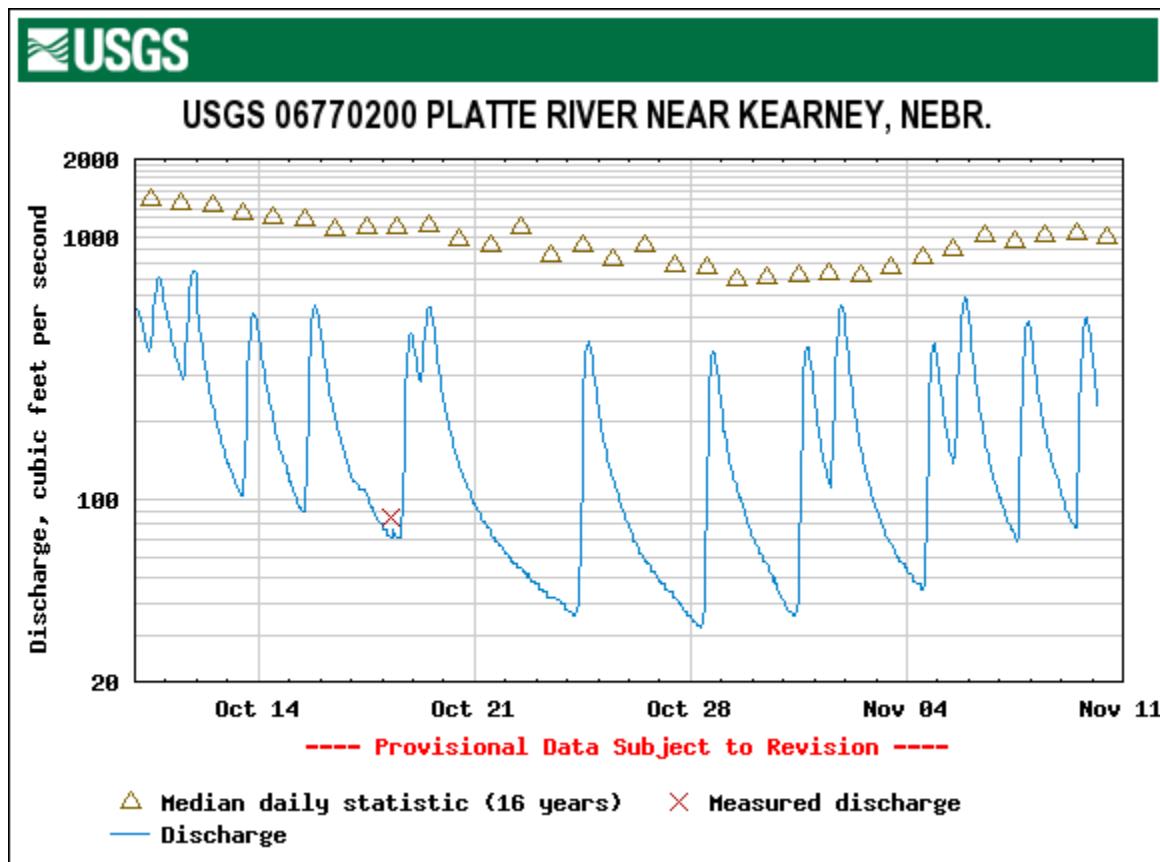


Figure 4. Platte River discharge (cfs) at Overton.

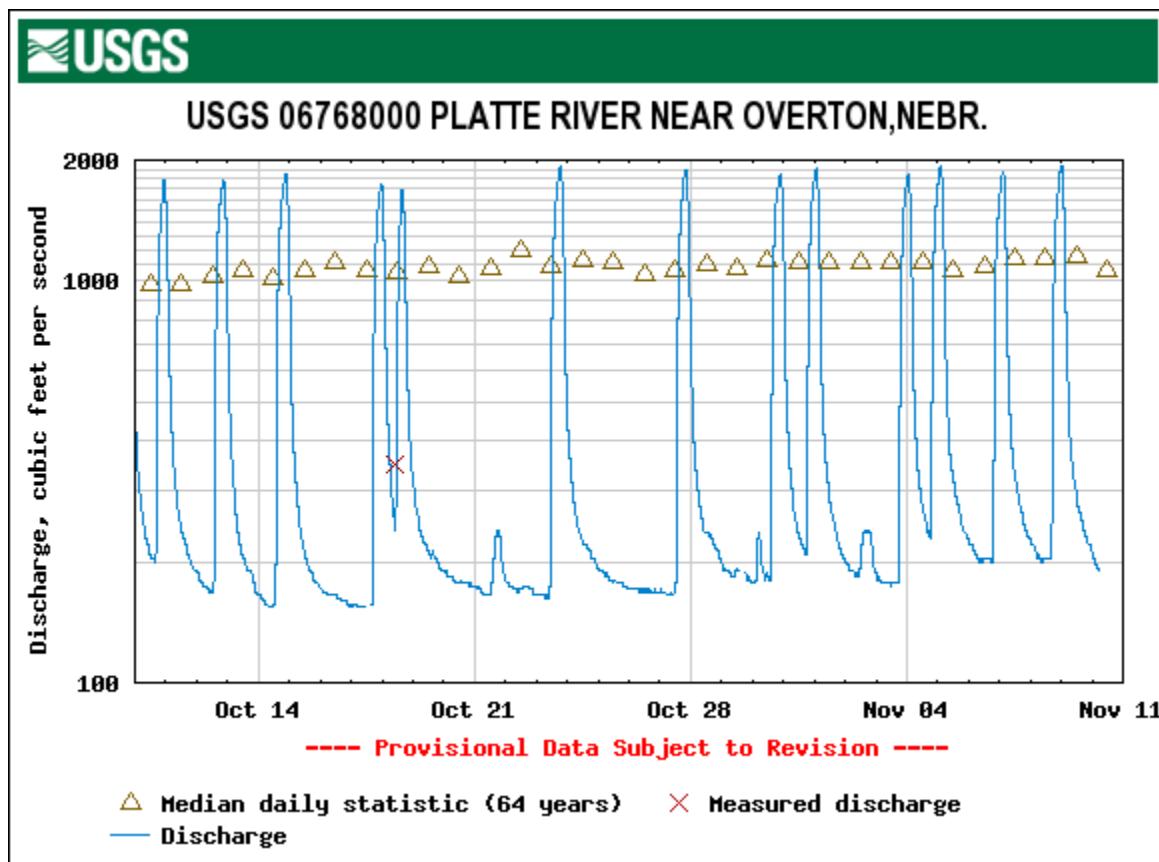


Figure 5. Roost channel profile for Use Site 1 (left to right bank). Arrow indicates roost location.

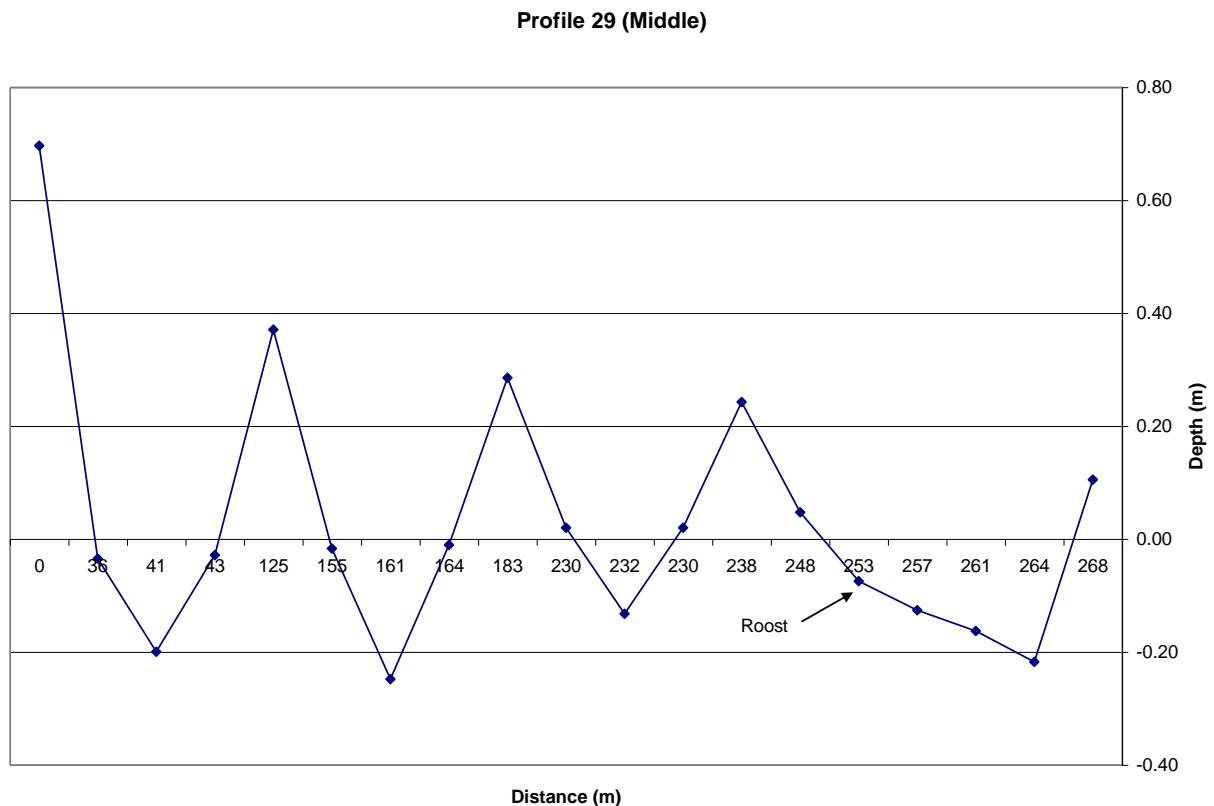


Figure 6. Roost channel profile for Use Site 2 (left to right bank). Arrow indicates roost location.

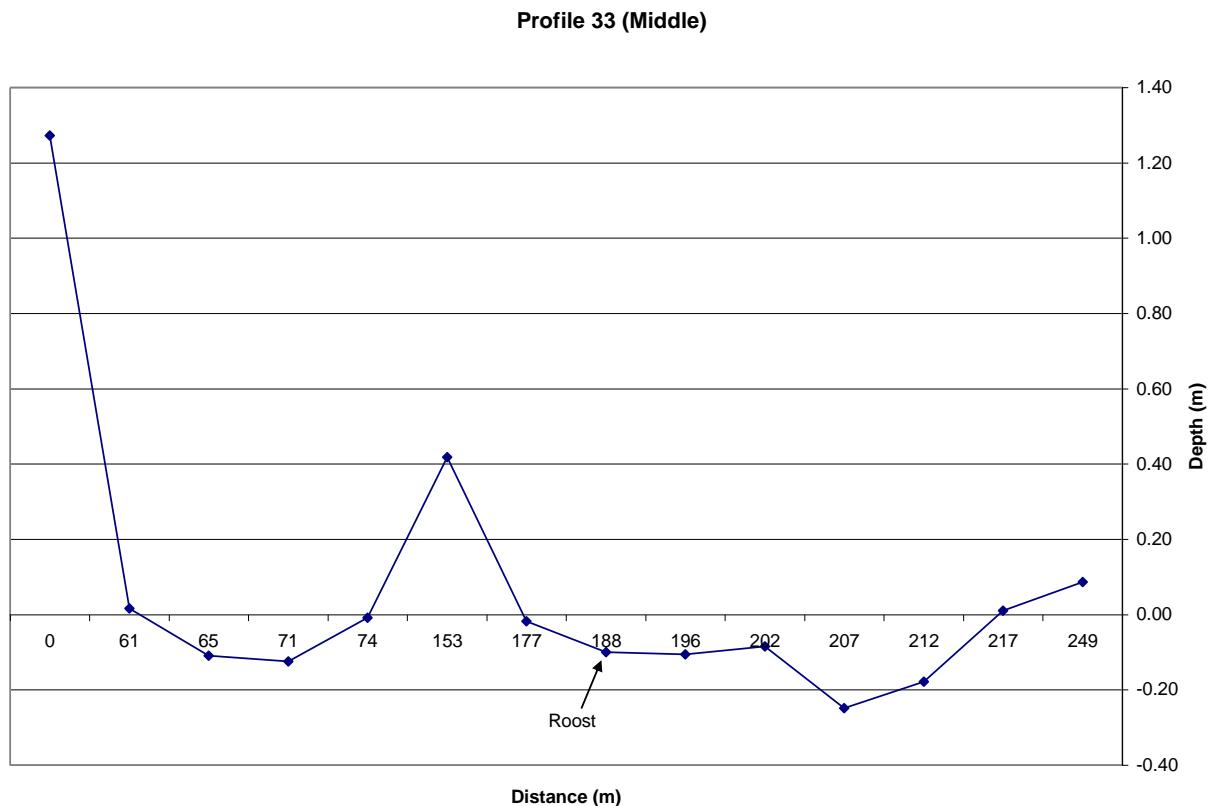


Figure 7. Roost channel profile for Use Site 3 (left to right bank). Arrow indicates roost location.

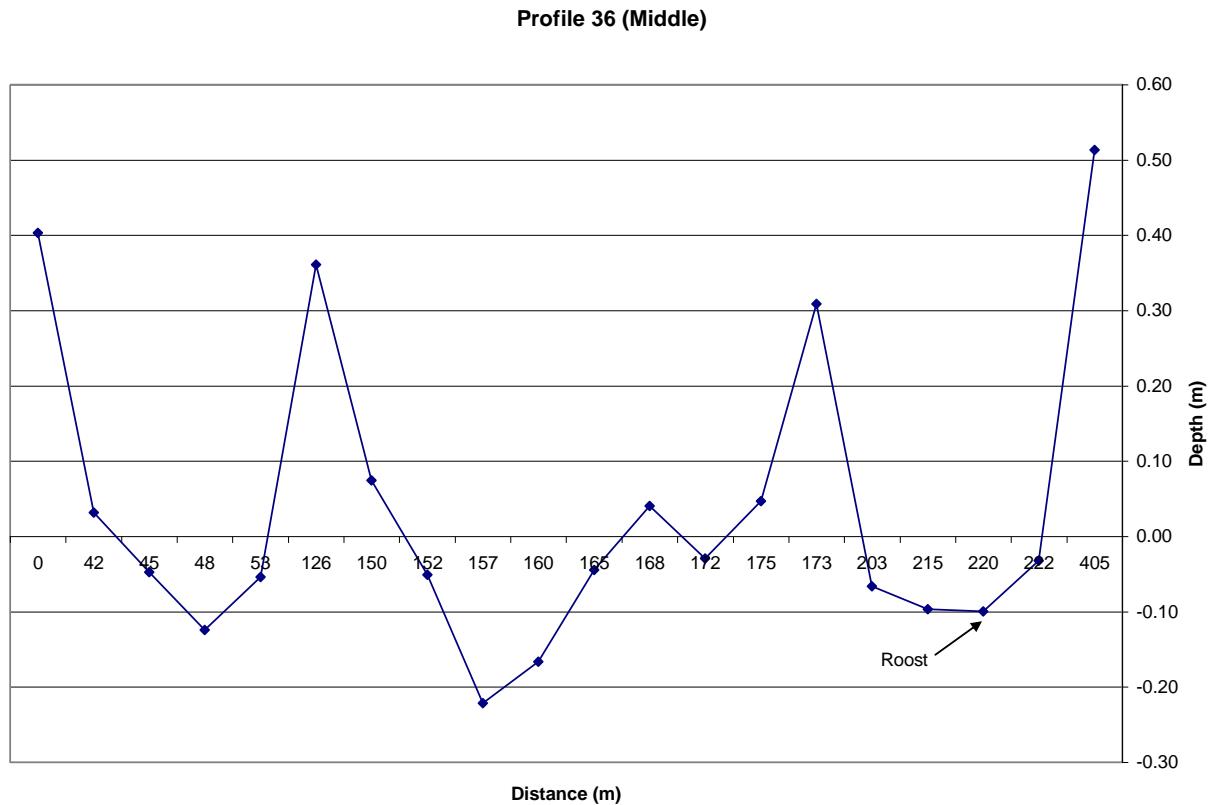


Figure 8. Roost channel profile for Use Site 4 (left to right bank). Arrow indicates roost location.

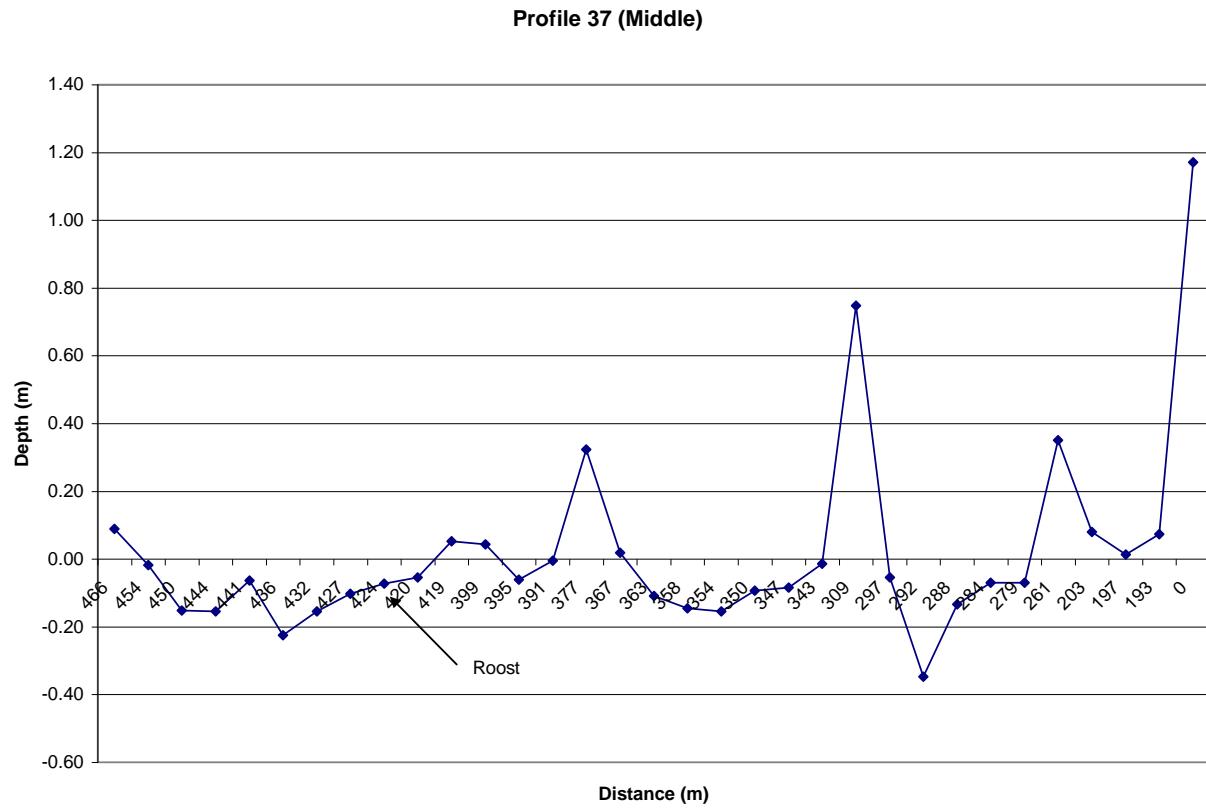


Figure 9. Roost channel profile for Use Site 5 (left to right bank). Arrow indicates roost location.

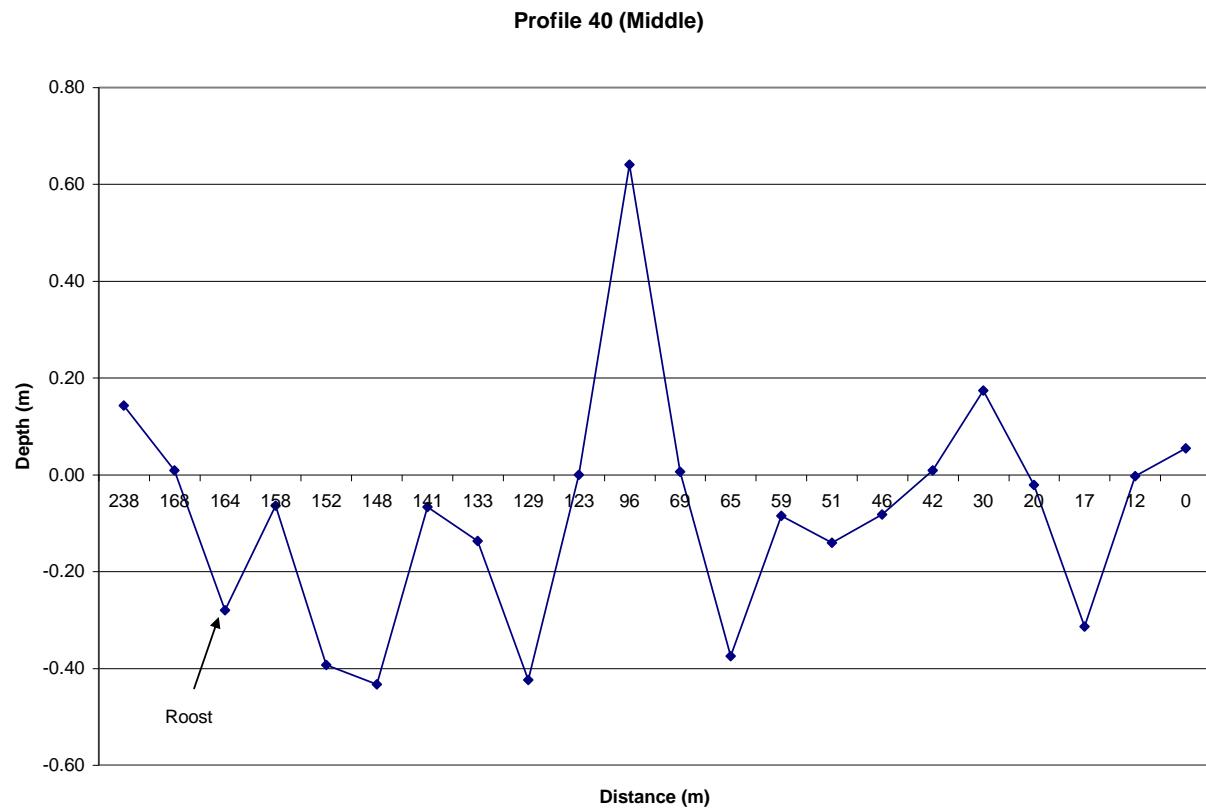


Figure 10. Roost channel profile for Use Site 6 (left to right bank). Arrow indicates roost location.

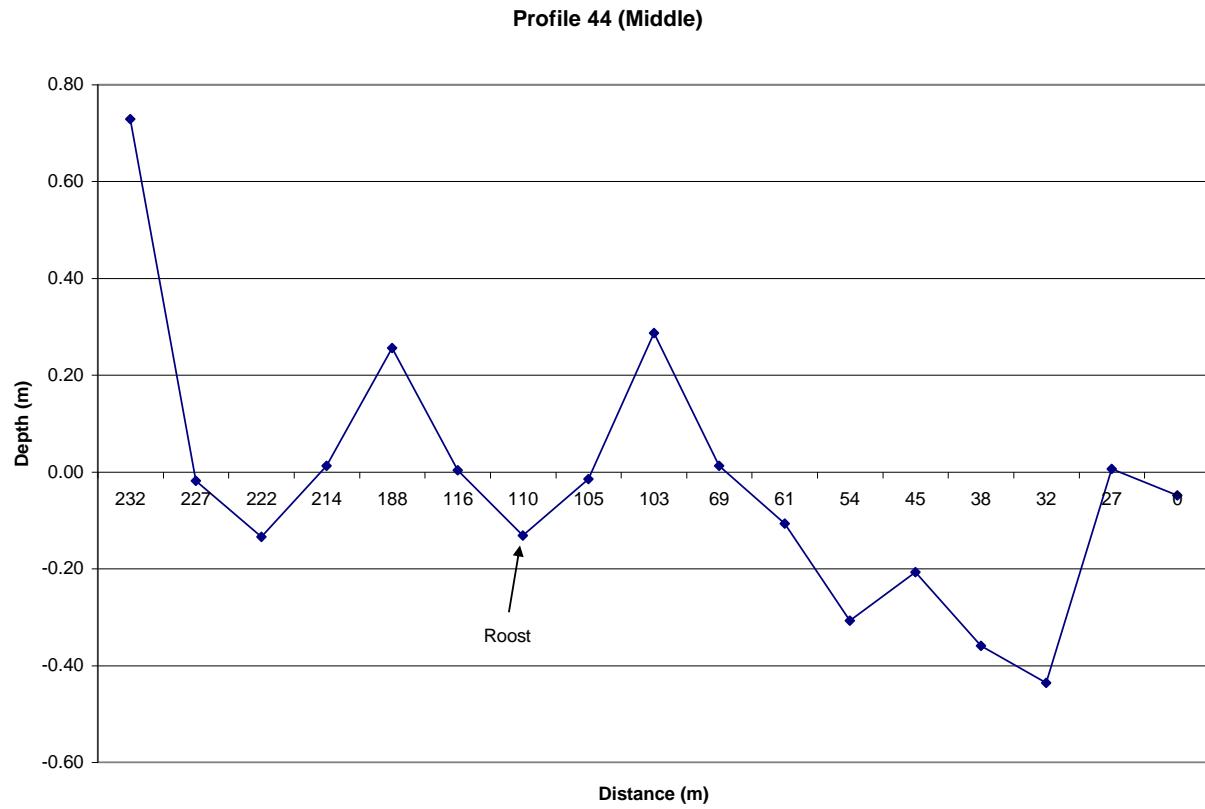


Figure 11. Roost channel profile for Use Site 7 (left to right bank). Arrow indicates roost location.

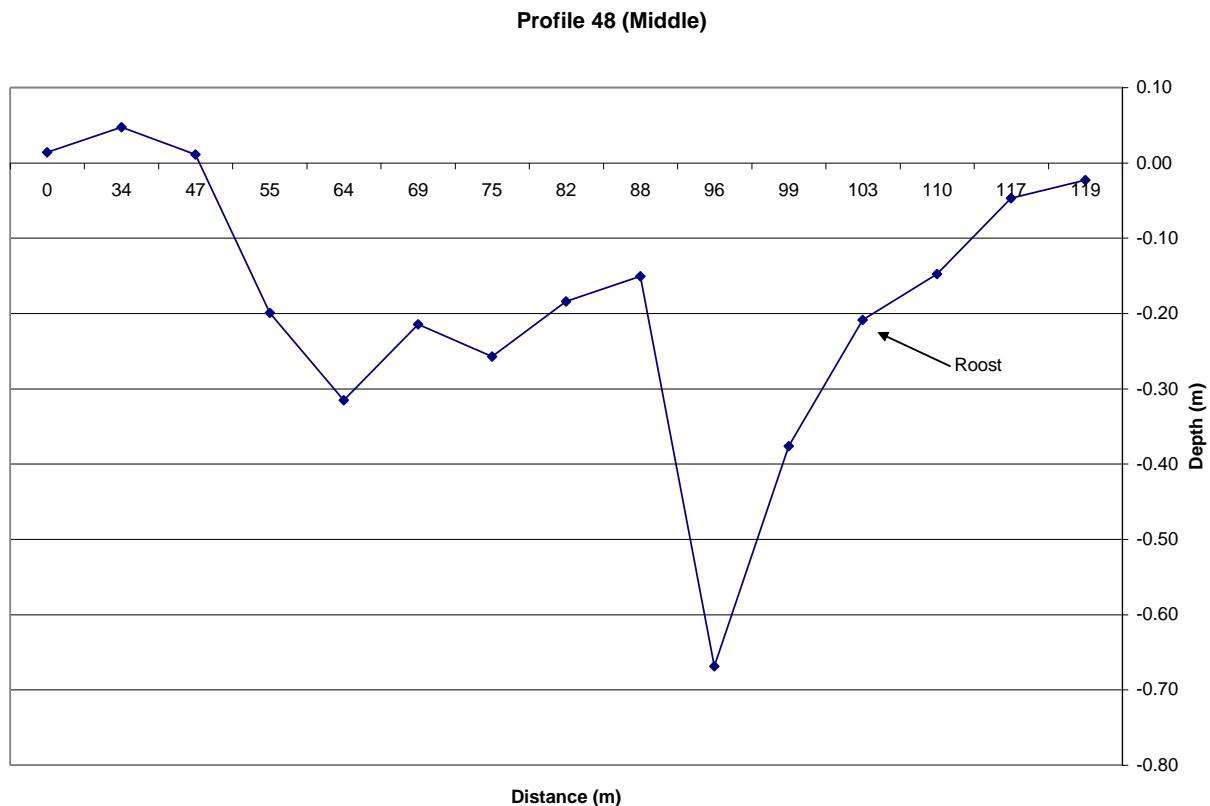


Figure 12. Roost channel profile for Use Site 8 (left to right bank). Arrow indicates location of cranes.

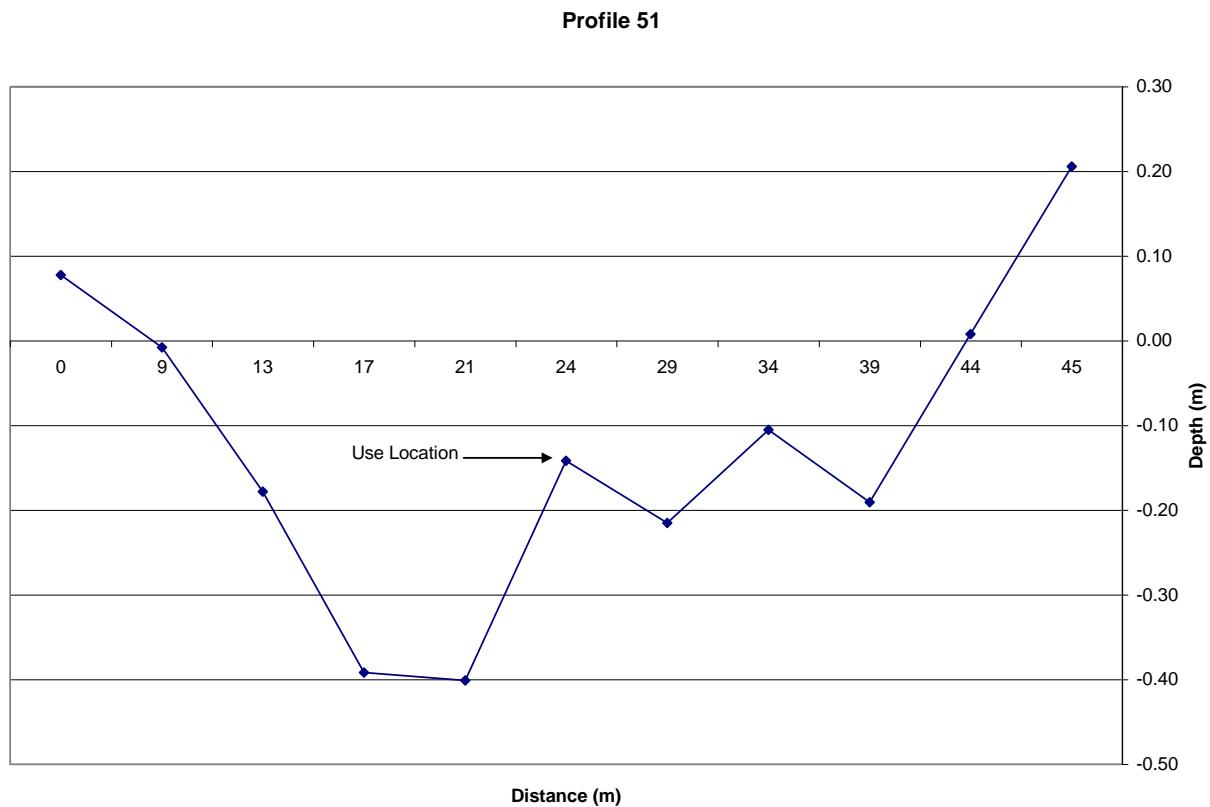


Figure 13. Family group of Whooping Cranes showing the stain on their underbelly (note bands on bird on right).

