

Implementation of the Whooping Crane Monitoring Protocol

Spring 2005

FINAL REPORT

Prepared by

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10 August 2005

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**Final Report Prepared by
AIM Environmental Consulting**

**For
Committee's of the
Platte River Cooperative Agreement**

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Assessment Impact Monitoring Environmental Consulting (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 2004 and spring 2005 migration. The contract specified the implementation of the draft protocol dated 14 January 2004 along with guidelines presented in the *Request for Proposal* dated 23 August 2004. We present the results of spring 2005 Whooping Crane migration pursuant to the *Work Order Agreement* dated 14 September 2004.

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 thirteen technicians and conducted field work from 21 March through 29 April 2005. Personnel from the Executive Director's Office (EDO) and the U.S. Fish & Wildlife Service office in Grand Island assisted with the training. A set of six data sheets was provided by the 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 21 March through 29 April 2005 as weather permitted. Censuses were initiated no earlier than 30 minutes before sunrise and typically were completed within 2 hours. Start times were delayed up to 2 hours 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 feet 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. 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 determine 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 sighting records in Grand Island. USFW's definition of a sighting (p. 3-3, Draft Baseline Report 5/30/2001) is:

“...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.”

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.

Channel profiles were measured at Whooping Crane roost sites and decoy locations at riverine sites using surveying equipment on loan from EDO and the Central Platte Natural Resources District. According to the protocol, “data from measurements at randomly selected locations (e.g. decoy locations) will be used as an available dataset.” 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. End points were determined when an obstruction greater than 1.5m such that a crane could not be seen through was encountered. 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 was recorded when possible. All monitoring activities followed U.S. Fish & Wildlife Service guidelines. Martha Tacha, 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.

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.—

On March 28 at 1044 CST, Whooper Watch received a report of a Whooping Crane with “lots of brown feathers” in a field about 1 mile east of the U.S. 34 bridge in Hamilton County. It was confirmed by Platte River Whooping Crane Trust, AIM, and USFWS personnel as a juvenile Whooping Crane. We monitored the bird at that location from 1530-1758 CST. It then flew northwest toward the river after being spooked and was not located. This information was passed on to the aerial survey crew who located the crane the next morning from the air (Figure 1, Appendix A).

On March 29, Martha Tacha located a juvenile Whooping Crane in the river upstream of the U.S. 34 bridge and reported it to AIM personnel at 1311 CST. The Whooping Crane remained in the river with several hundred Sandhill Cranes until 1618 CST.

Whooper Watch received a Whooping Crane report at 0950 CST on March 30 about 1 mile southeast of the U.S. 34 bridge. AIM personnel located the bird at 1020 CST and monitored it until it departed at 1912 CST.

On March 31 at about 1300 CST, Whooper Watch received a report from a Sandhill Crane researcher of a juvenile Whooping Crane about 2.5 miles east of the U.S. 34 bridge. AIM personnel located the bird at 1450 CST and monitored it until 1852 CST when it flew towards the river.

In summary, we received four Whooping Crane reports from Whooper Watch and/or USFWS that were confirmed. One additional ground search effort was initiated as a result of Whooper Watch that was not confirmed.

Aerial Survey.--

CONFIRMED WHOOPING CRANE SIGHTINGS-

Of a possible 40 morning flights per leg, the West Leg completed 29 (73%) flights while the East Leg flew 31 (78%). Fog, low ceiling, precipitation, mechanical problems, and high winds were factors in cancellations. We recorded 5 confirmed or probable Whooping Crane sightings (Figures 1 and 2). Three sightings were opportunistically located the evening before thus the air crew had prior knowledge of their presence.

INDEX OF USE-

We completed 120 aerial survey transects out of a possible 160 (75%). Five Whooping Crane sightings were made on these transects. Four of the five sightings were confirmed; the other was considered a probable sighting. This resulted in an index of use (frequency of occurrence) of 0.04 sightings per transect.

OPPORTUNISTIC FLIGHTS-

Airplanes were dispatched to search for Whooping Cranes on two occasions. The first occasion was the afternoon of March 28 following the Whooper Watch report. The crane was not located by the air crew but was found by ground personnel later in the day. The second flight was at dusk on March 29. The Whooping Crane was located on the river about a mile above the U.S. 34 bridge where it apparently roosted for the night. We were unable to fly the following morning due to inclement weather and were unsuccessful in finding the bird during a ground search. However, the crane was reported by the public later that morning and AIM personnel did monitor the bird until it departed to the river to roost that evening.

OTHER WHITE OBJECT SIGHTINGS-

We conducted 15 on-ground follow-ups of a reported unidentified white crane by the air crews. Ground personnel were able to locate the object on 3 occasions (20% of the searches).

The searches resulted in a confirmed Whooping Crane, a probable Whooping Crane, and 2 albino Sandhill Cranes (Appendix A).

SANDHILL CRANE USE OF PROJECT LANDS-

Sandhill Cranes were not observed using Cottonwood Ranch during the surveys. Cranes were observed roosting on project lands periodically but departed from the river before our aerial observers arrived (Jim Jenniges, personal communication)

Search Effort.--

Ground searches were initiated on 28 occasions. A total of 48.1 hours was expended in this effort (46.2 hours on the ground and 1.9 hours in the air). In addition, 1036 miles were driven. Search duration extended from <1 to 4.4 hours. Searches occurred primarily in the morning hours and were generally terminated when the object was found and/or the 2-hour period was reached.

Searcher Efficiency Trials.—

Whooping Crane decoys were placed at 15 locations between March 28 and April 27 (Table 1; Appendix A). The air observers detected a decoy at six sites for an overall detectability rate of 40%. When broken down by strata, there was a 0% and 60% detectability rate for strata 0-3.5 and 0 respectively.

Table 1. Random locations of decoys for detectability trials.

Decoy ID	Strata	Utmx	Utmy	Habitat	Date Placed	Detected ?
1	0-3.5	458784.4982	4504446.701	Lowland grasses	4/8	No
2	0-3.5	469427.3385	4504253.243	Open water pit	4/27	No
3	0-3.5	548618.901	4517824.166	Lowland grasses	4/3	No
4	0-3.5	499261.2091	4501457.423	Wooded river	3/28	No
5	0-3.5	459608.2394	4501906.557	Agriculture corn	4/26	No
6	0	499559.58	4501137.1	Wetted channel	3/24	No
7	0	471668.58	4503764.75	Wetted channel	4/9	Yes
8	0	470545.27	4504141.24	Wetted channel	4/8	Yes
9	0	497250.98	4501031.03	Wetted channel	3/24	No
10	0	508839.36	4501969.5	Wetted channel	4/13	Yes
11	0	539502.68	4511439.31	Wetted channel	3/31	No
12	0	517356.36	4505395.41	Wetted channel	4/1	No
13	0	527894.74	4508279.42	Wetted channel	4/3	Yes
14	0	440964.54	4507302.93	Wetted channel	4/2	Yes
15	0	547199.54	4515348.73	Wetted channel	3/31	Yes

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

FLOW-

Streamflow measured at the USGS gauging stations located near Grand Island, Kearney, and Overton (Figures 3-5) was well below the median streamflow for each site throughout the study period. Note all flow data are provisional and subject to revision. Table 2 depicts the min/max values for daily and maximum values for unit (instantaneous) flows at each location during this study.

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

	Overton	Kearney	Grand Island
Min Daily	224	153	354
Date	4/21	3/23	4/25
Max Daily	946	907	950
Date	3/29	3/20	3/31
Max Unit	1520	1010	970
Date	4/1	4/1&2	3/31 & 4/1

The streamflow when a Whooping Crane was observed on the river and when roost channel profiles were measured is shown in Table 3.

Table 3. Flow conditions during Whooping Crane use and channel profile measurements.

Use Site	Use Date	Use Time	Measured Date	Measured Time	GI Discharge (cfs)	
					Use	Measured
1	3/29	0610	4/22	1030	880	542
3	3/29	0700	4/29	0845	880	471
2	3/31	0615	4/24	1100	954	372
4	4/2	0601	4/22	1030	909	542

RIVERINE USE SITES-

We collected riverine channel profile data at 4 Whooping Crane use locations (Figures 7-10) and 10 decoy locations (data entered into Microsoft Access database). We were denied access at 1 Whooping Crane site west of the Odessa bridge. A total of 1256 stations (3 readings at each station) were surveyed. Some of these were removed due to errors. Photographs depicting the habitat used were taken at each 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 as primarily coarse sand. The average water depth at the roost

locations was 0.140 ± 0.118 m. The values reflect lower flows at the time measurements were taken (Table 3).

Table 4. Visual obstruction distance (m), substrate, and depth (m) at four 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 %	Mgmt Practices	Depth
1	561594	4526507	200	250	150	100	85		15	disked fall 2004	.096
2	560179	4524076	156	156	170	178	95		5	disked fall 2004	.052
3	549817	4515653	200	90	252	160	10	90		disked fall 2004	.099
4	561767	4526590	180	116	375	270	85	5	10	disked fall 2004	.314

UNOBSTRUCTED WIDTH-

Table 5 depicts unobstructed width as measured at riverine use locations. Since we were denied access to Use Site 5 (west of the Odessa bridge), the unobstructed width was estimated from aerial photos using Mr. Sids.

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

Use Site ID	AvgOfObstr Width	StDevOfObstr Width
1	252	42
2	225	6
3	231	43
4	295	35
5	~250	-

DIURNAL USE SITES-

Diurnal movements and activity data was collected when possible. We followed a single, unbanded juvenile Whooping Crane on 5 days. It was first observed on March 28 and was last seen on April 2 when it migrated from the area. All diurnal locations were within 3 miles of known nocturnal roost sites (Figure 6).

LAND-COVER CLASS-

Wetted channel and Ag-Corn were the only cover-types Whooping Cranes were observed using. Eleven of the 13 (85%) diurnal locations were in Ag-Corn and 2 (15%) were in Wetted Channel. Five of the 5 (100%) nocturnal roost locations were in Wetted Channel.

ACTIVITY-

A total of 21.13 hours of continuous and instantaneous use data of Whooping Cranes was collected by ground personnel. Of this total, 15.88 hours were in Ag-Corn and 5.25 hours were in Wetted Channel. All observations were in diurnal use locations. Eighty-seven data points of activity (time budget) were recorded. Feeding (80%) was the most frequently observed activity followed by resting (9%) and alert (6%) (Table 6).

Table 6. Number of instantaneous use observations by habitat.

	Feeding	Resting	Alert	Defensive	Preening	Courtship
Corn	61 (84%)	5 (7%)	5 (7%)	2 (3%)	0	0
Wetted Channel	9 (64%)	3 (21%)	0	0	1 (7%)	1 (7%)
Combined	70 (80%)	8 (9%)	5 (6%)	2 (2%)	1 (1%)	1 (1%)

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

The U.S. Fish & Wildlife Service classified Program sightings 2005SP01-05 and 08-12 as 05A-02, Program sightings 20005SP06-07 as 05A-19, and Program sighting 2005SP13 as 05A-05 in the USFWS database respectively (Martha Tacha, personal communication). Table 7 compares our numbering system with the USFWS database. A summary of Program sightings along with time, habitat, and legal description is presented in Table 8.

Table 7. Comparison of Crane Group ID between Program and USFWS during spring 2005.

Program Crane ID	USFWS Crane ID	Dates of Occurrence	# of birds	Classification
2005SP01	05A-02	3/28	1	Confirmed
2005SP02	05A-02	3/29	1	Confirmed
2005SP03	05A-02	3/29	1	Confirmed
2005SP04	05A-02	3/29	1	Confirmed
2005SP05	05A-02	3/29	1	Confirmed
2005SP06	05A-19	3/29	1	Probable
2005SP07	05A-19	3/29	1	Probable
2005SP08	05A-02	3/30	1	Confirmed
2005SP09	05A-02	3/31	1	Confirmed
2005SP10	05A-02	3/31	1	Confirmed
2005SP11	05A-02	4/2	1	Confirmed
2005SP12	05A-02	4/2	1	Confirmed
2005SP13	05A-05	4/7	2	Confirmed

Table 8. Summary of Whooping Crane observations during spring 2005.

Program Crane ID	Date	Time	Habitat	Legal Description
2005SP01	3/28	1530-1758	Corn	32-11-8 Hamilton Co.
2005SP02	3/29	0610	Wetted Channel	29-11-8 Hamilton Co.
2005SP03	3/29	1300-1618	Wetted Channel	1-10-9 Hall Co.
2005SP04	3/29	1815-1840	Corn	7-10-8 Hamilton Co.
2005SP05	3/29	1900	Wetted Channel	1-10-9 Hall Co.
2005SP06	3/29	0621	Wetted Channel	35-10-10 Hall Co.
2005SP07	3/29	0800	Wetted Channel	35-10-10 Hall Co.
2005SP08	3/30	1020-1912	Corn	6,7,8-10-8 Hamilton Co.
2005SP09	3/31	0615	Wetted Channel	1-10-9 Hall Co.
2005SP09	3/31	0730-0927	Wetted Channel	1-10-9 Hall Co.
2005SP10	3/31	1450-1852	Corn	4-10-8 Hamilton Co.
2005SP11	4/2	0601-0703	Wetted Channel	29-11-8 Hamilton Co.
2005SP12	4/2	0822-0912	Corn	28-11-8 Hamilton Co.
2005SP13	4/7	0700	Wetted Channel	12-8-18 Buffalo Co.

Discussion and Recommendations

The number of confirmed Whooping Crane sightings in Nebraska this spring was four including the three contained herein (Martha Tacha, personal communication). As of 10 August 2005, there were 18 confirmed sightings in the United States as follows: Kansas- 9; Nebraska- 4; North Dakota- 4; and Montana- 1. A record 217 Whooping Cranes were counted on their wintering grounds in the vicinity of Aransas National Wildlife Refuge in Texas. Of these, 2 died during the winter leaving a total of 215 Whooping Cranes in the Aransas-Wood Buffalo flock prior to the 2005 nesting season.

We believe the thirteen Whooping Crane ID records (Table 7) constitute a minimum of three unique Whooping Crane sightings this spring. This concurred with USFWS records. The lone juvenile Whooping Crane located east of Grand Island made up ten of these records (2005SP01-05 and 08-12), the Mormon Island Crane Meadows sightings of a single Whooping Crane made up two (20005SP06-07), and the third sighting was that of 2 adult plumaged birds west of Odessa (2005SP13). The MICM sighting was classified as “probable” while the others were “confirmed”.

The proximity of Use Site 4 this spring to Use Site 1 from fall 2004 was about 103 m apart. The fall 2004 group was comprised of 2 chicks and 4 adult Whooping Cranes. It is possible that the juvenile that visited Use Site 4 this spring could have been one of the chicks that used this same location last fall.

The diurnal use of the river by both Whooping Cranes and Sandhill Cranes was believed to be the result of the paucity of water in upland areas due to the drought. Cranes require water midday and will seek it out in fields if possible or they will return to the river to drink. The lack of water in upland areas forced the birds to return to the river to drink and loaf.

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

Microsoft Access Database

- Summarize “miles” driven and “hours” searched in a Table.
- Summarize activity data in a Table.
- Add a Table that summarizes discharge during use and when measured including dates for both.

Methods

120 decoys have been placed since the inception of the whooping crane monitoring protocol. Consider the need to continue collecting river profile information at decoy locations from a statistical standpoint.

Add “walking” and “drinking” to the list of behaviors in the activity codes. In particular, “feeding” was given more weight than it deserved because any walking behavior was classified as “feeding”.

Examine whether assigning a fixed return route on the flights, as is done with the starting point, would be statistically different than assigning a sequential return route as required in the protocol. If the number of replications is similar, then change the protocol accordingly to minimize confusion. If not, then leave it as is.

Spring 2005 Expenses

The cost of the field implementation of this project was about \$47,510. The estimated cost of Draft and Final Report preparation was \$4,915 and \$3,500 respectively. The total cost for the Spring 2005 effort was about \$55,925 (78% of the approved budget).

List of Appendices

Appendix A. Selected Photographs.

Supplements

Original Data Sheets 151 pp.

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

Figure 1. Whooping Crane Riverine Use Sites 1 (magenta), 2 (red), and 4 (yellow). (UTM Use Site 1 = 561767, 4526590; Use Site 2 = 560179, 4524076; Use Site 4 = 561594, 4526507).

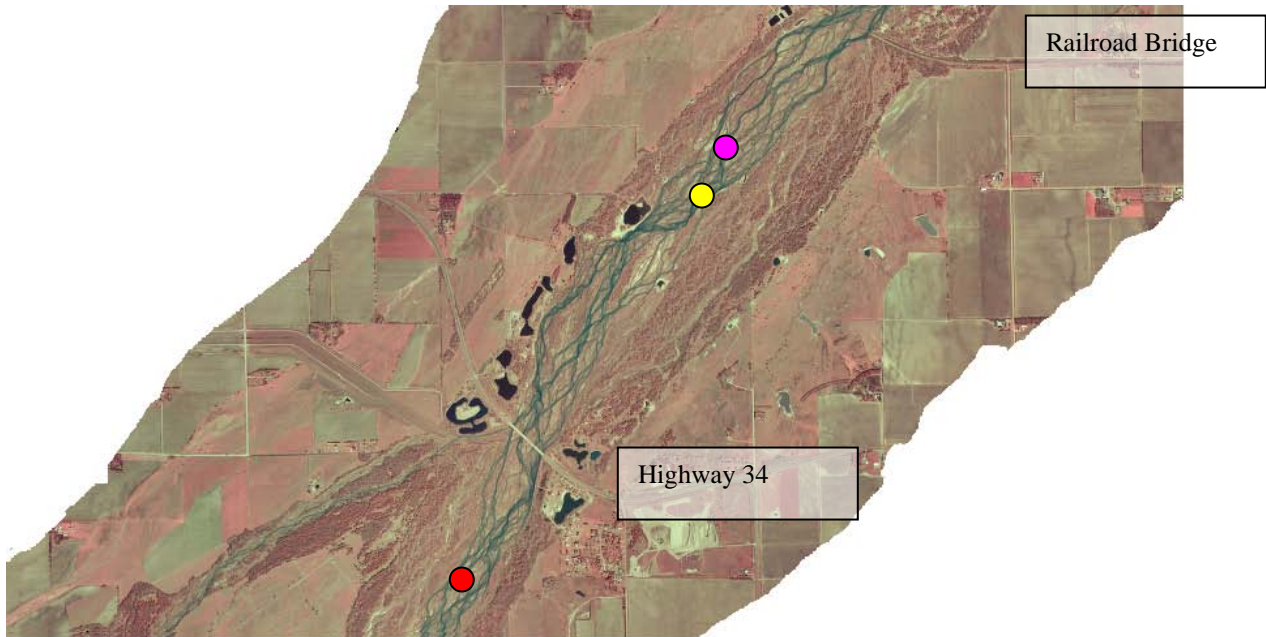


Figure 2. Whooping Crane Use Site 5 west of the Odessa bridge above (UTM= 473962, 4503131) and Use Site 3 on MICM below (UTM= 549817, 4515653).



Figure 3. Platte River mean daily flows (top) and total discharge (below) at Grand Island.

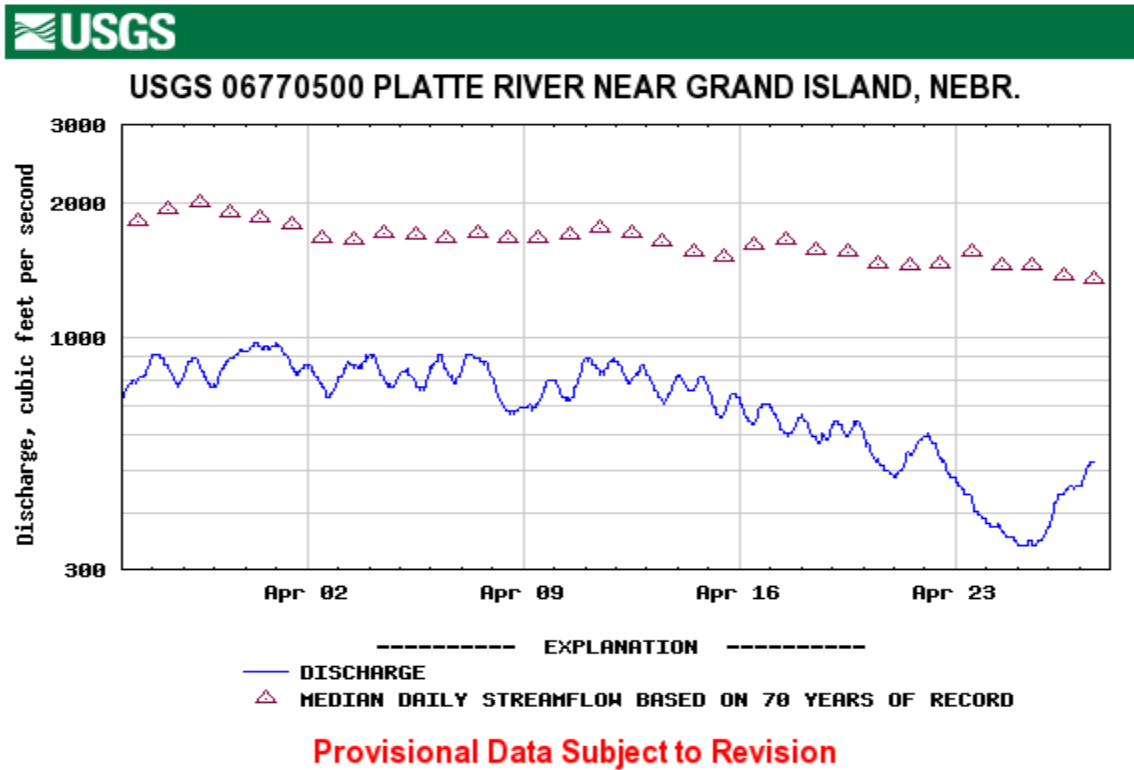
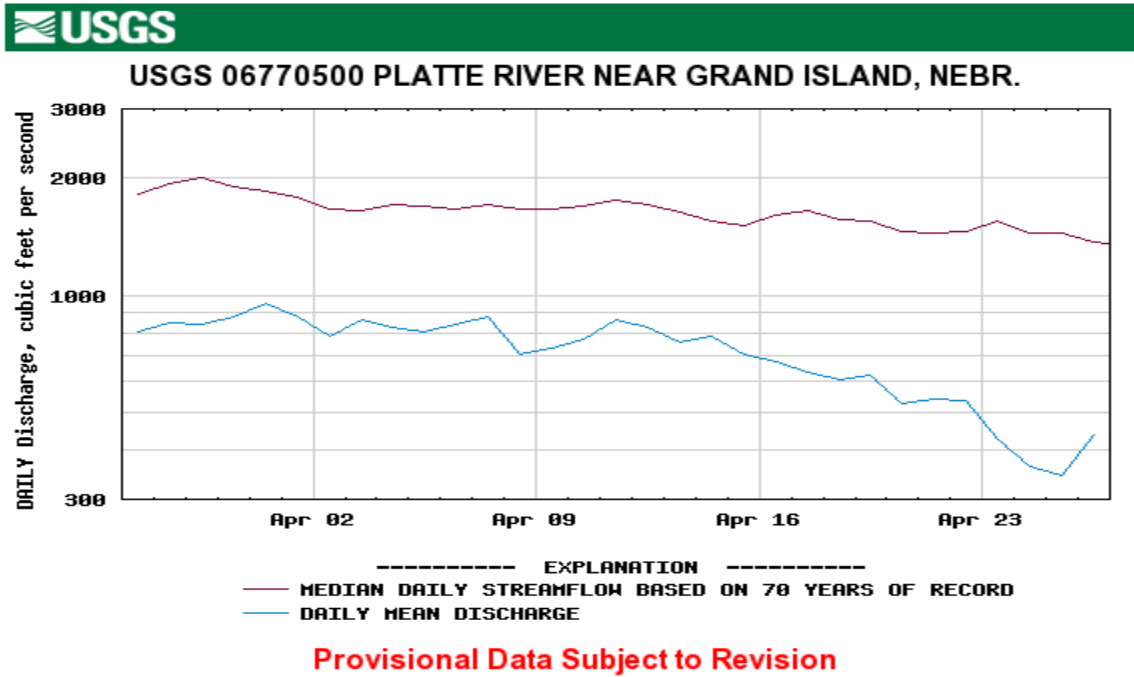


Figure 4. Platte River mean daily flows (top) and total discharge (below) at Kearney.

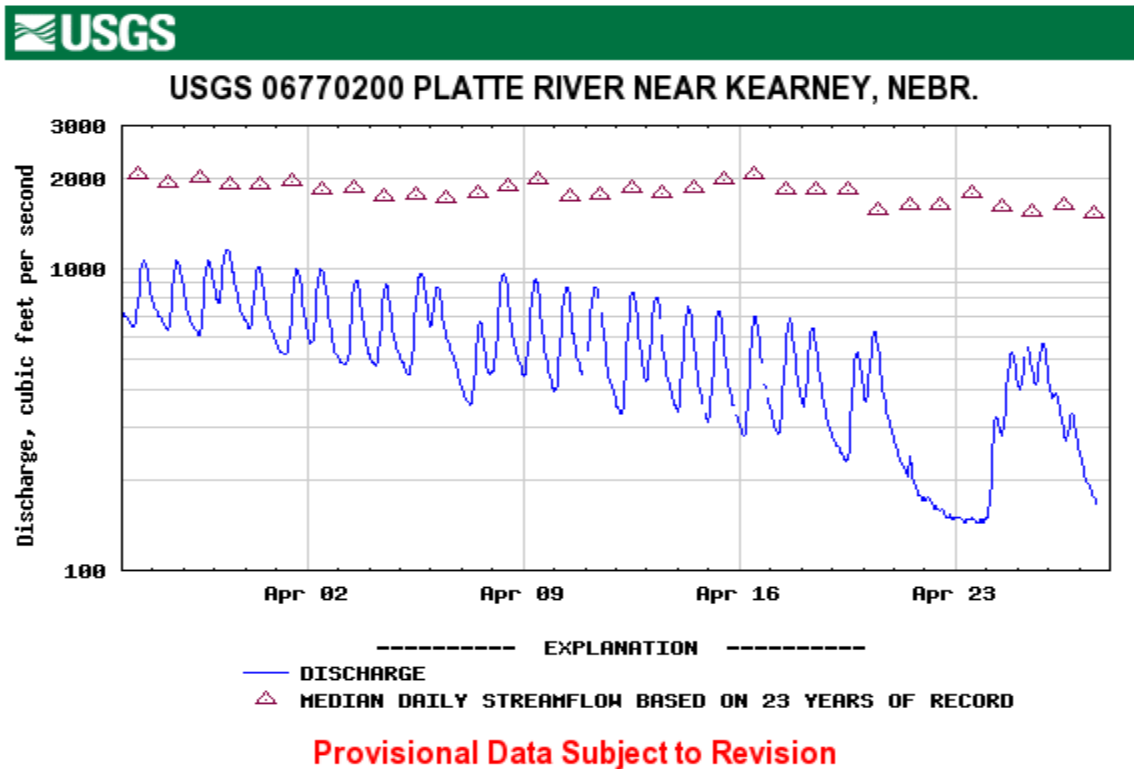
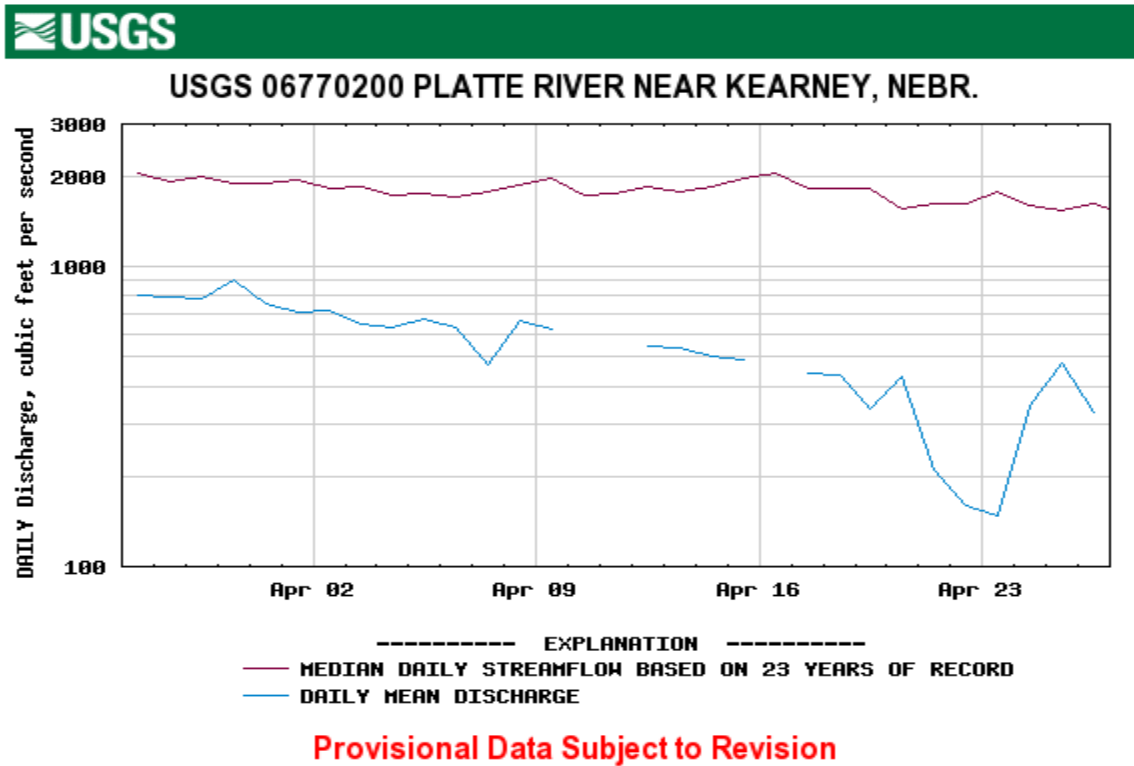


Figure 5. Platte River mean daily flows (top) and total discharge (below) at Overton.

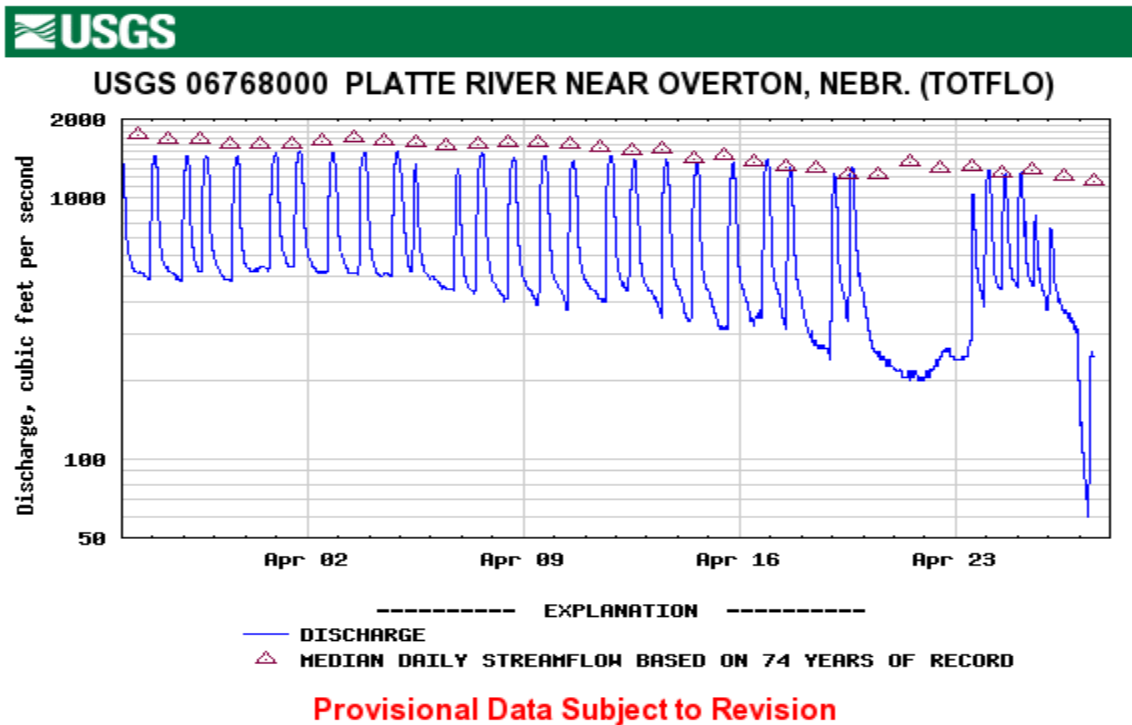
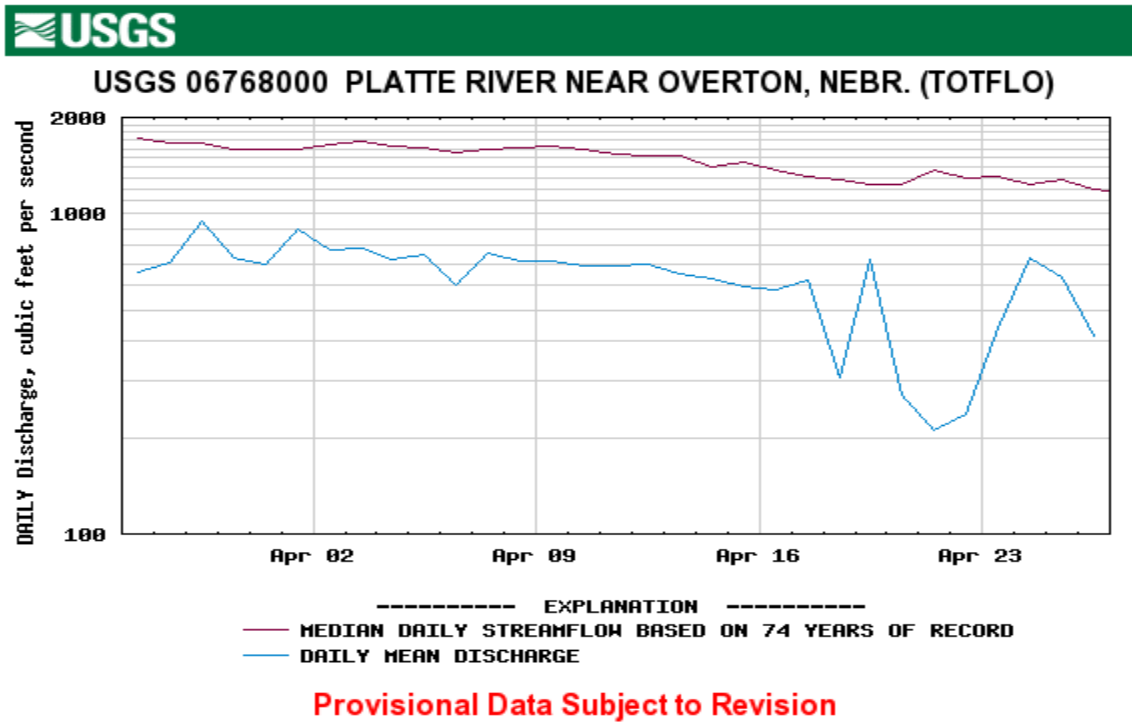


Figure 6. Diurnal Whooping Crane locations (yellow= Ag-Corn; blue= Wetted Channel) east of Grand Island. (Roost locations in red).

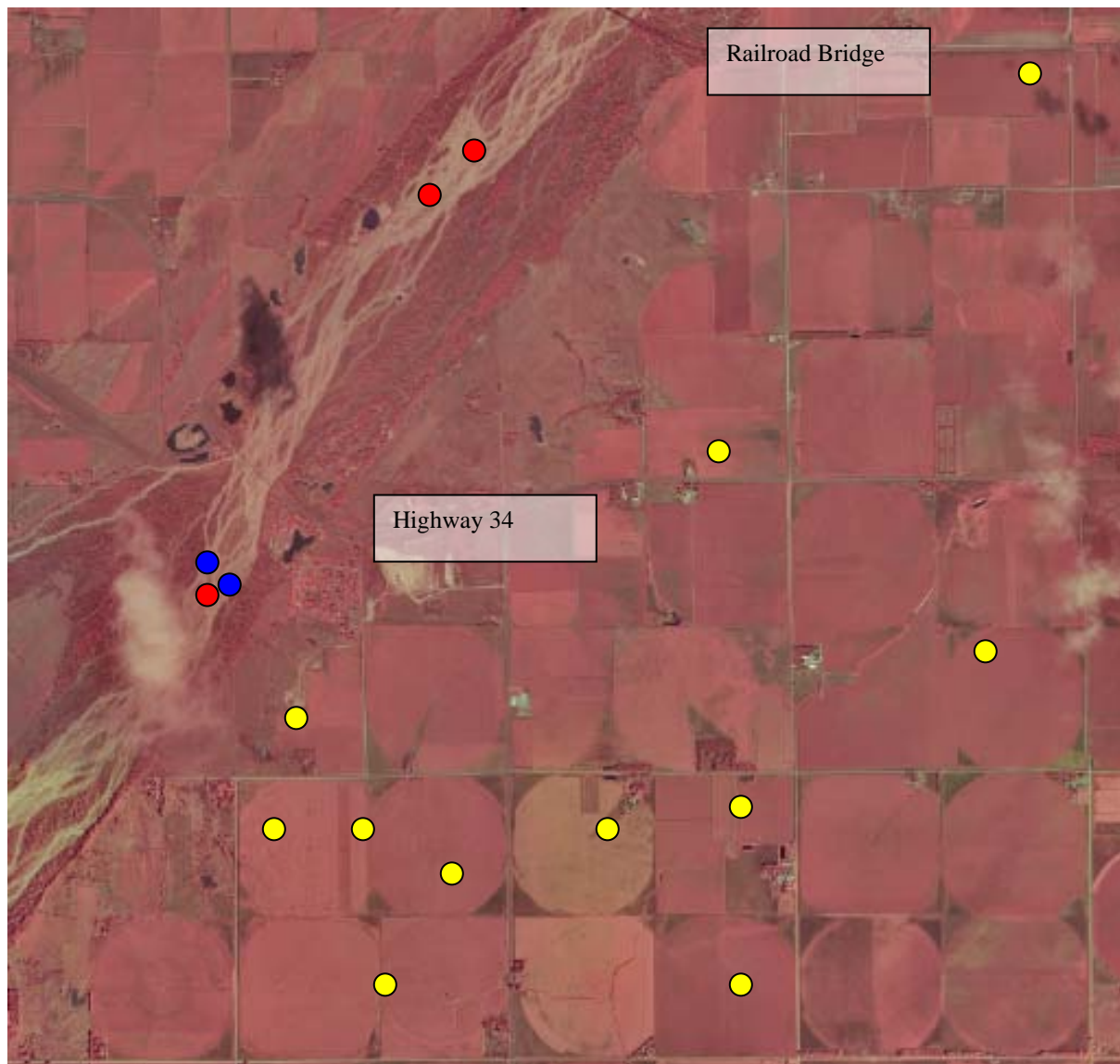
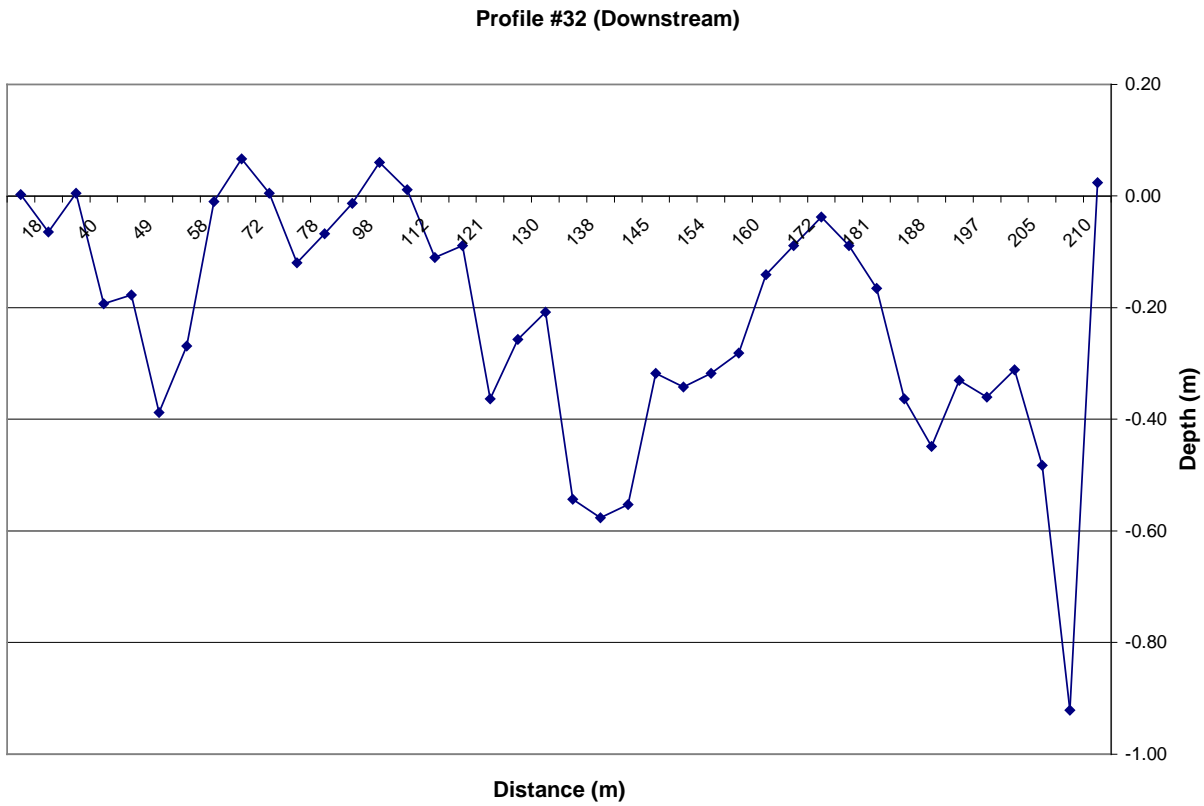
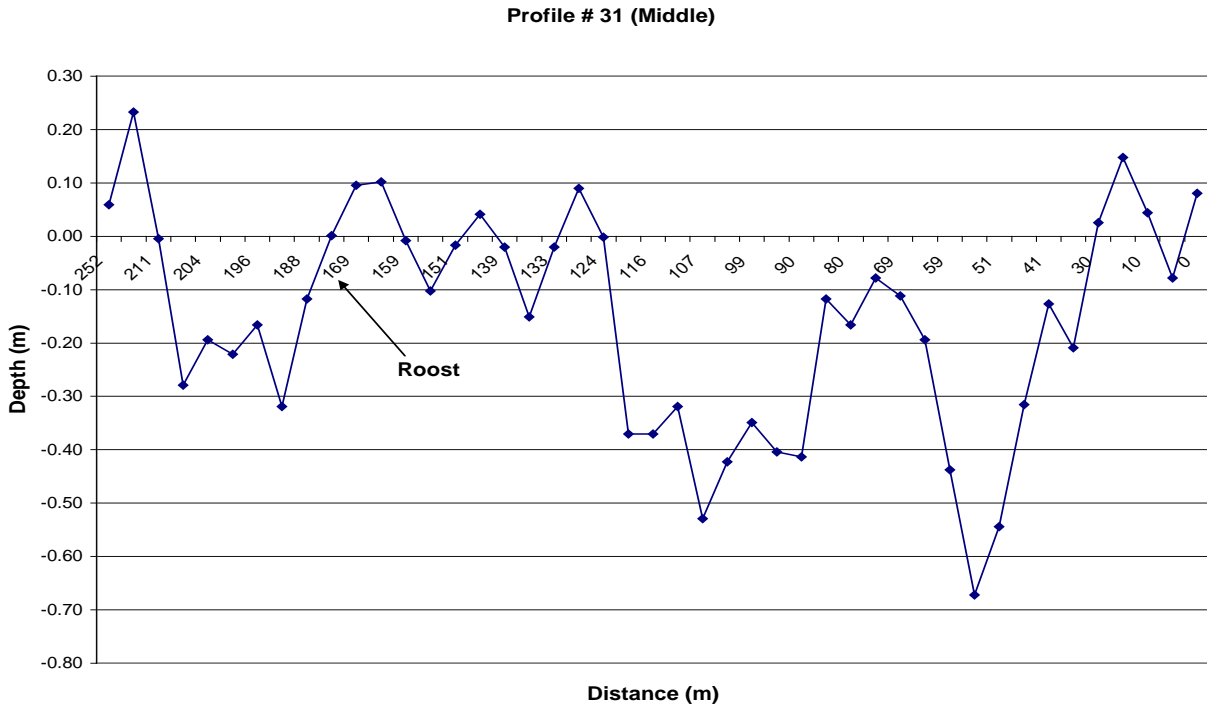


Figure 7. Roost channel profile for Use Site 1 (left to right bank). Arrow indicates roost location.



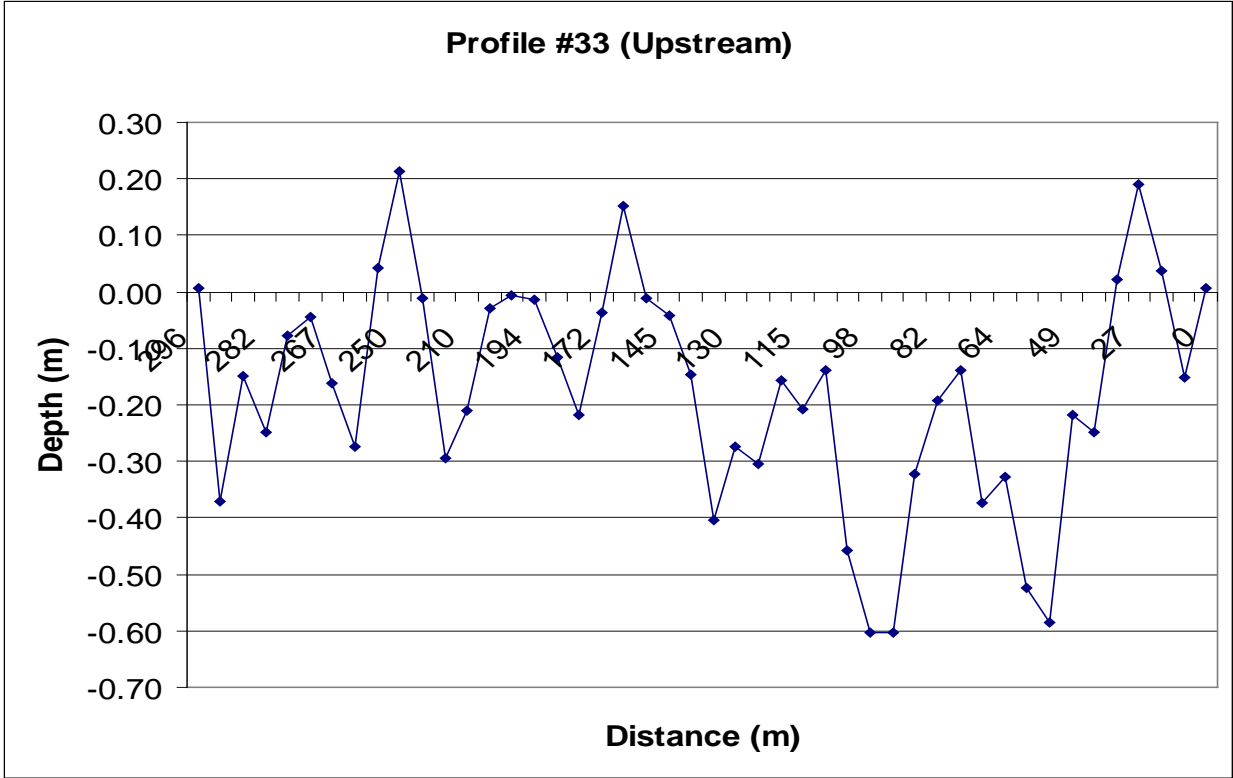
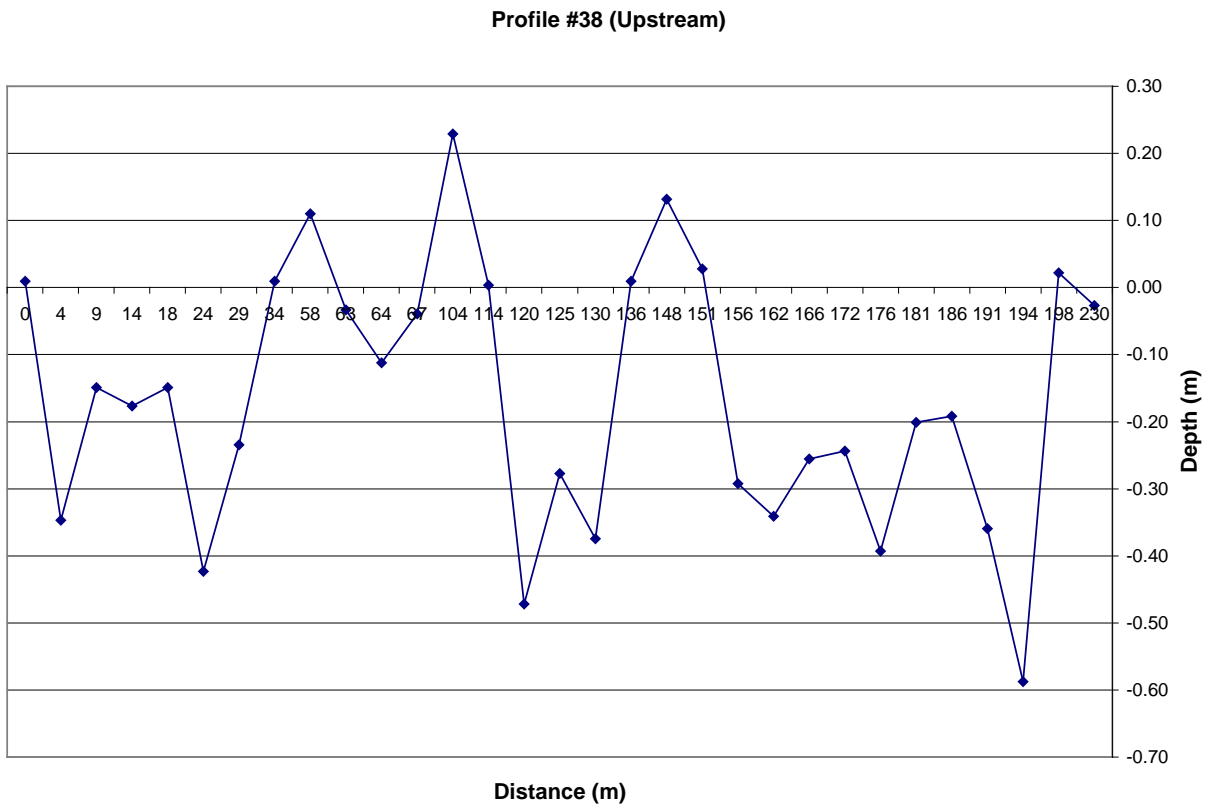
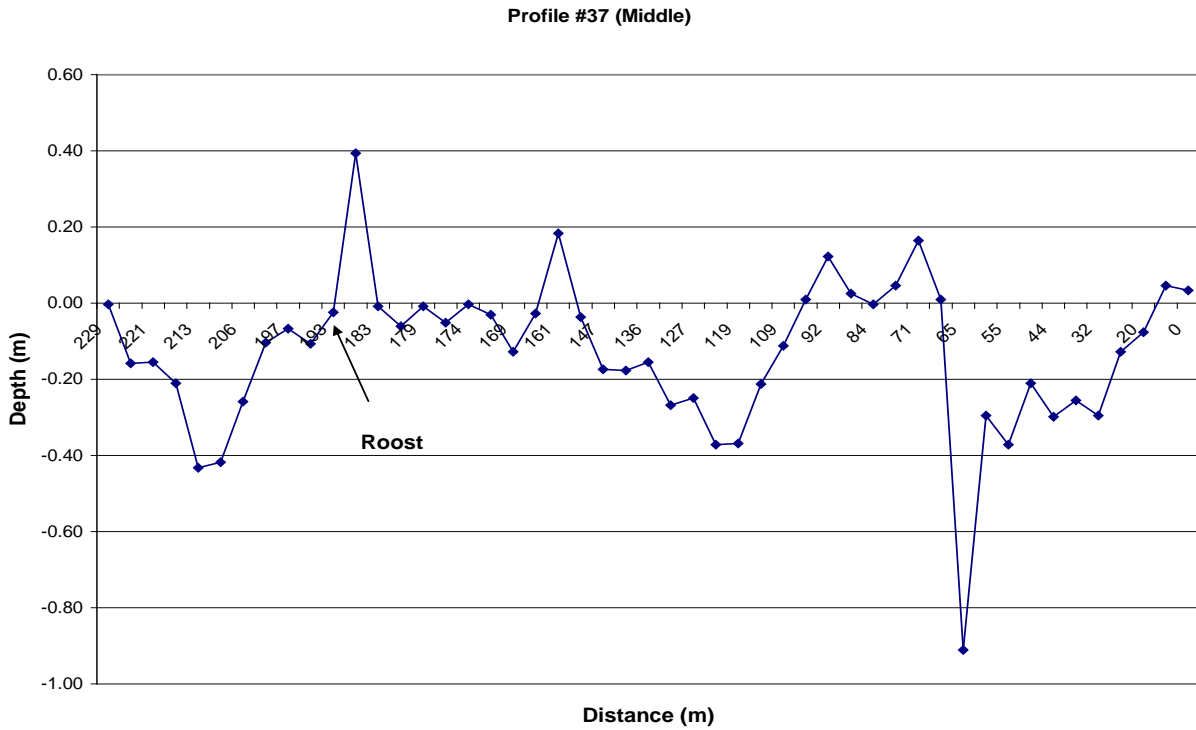


Figure 8. Roost channel profile for Use Site 2 (left to right bank). Arrow indicates approximate location of cranes.



Profile #39 (Downstream)

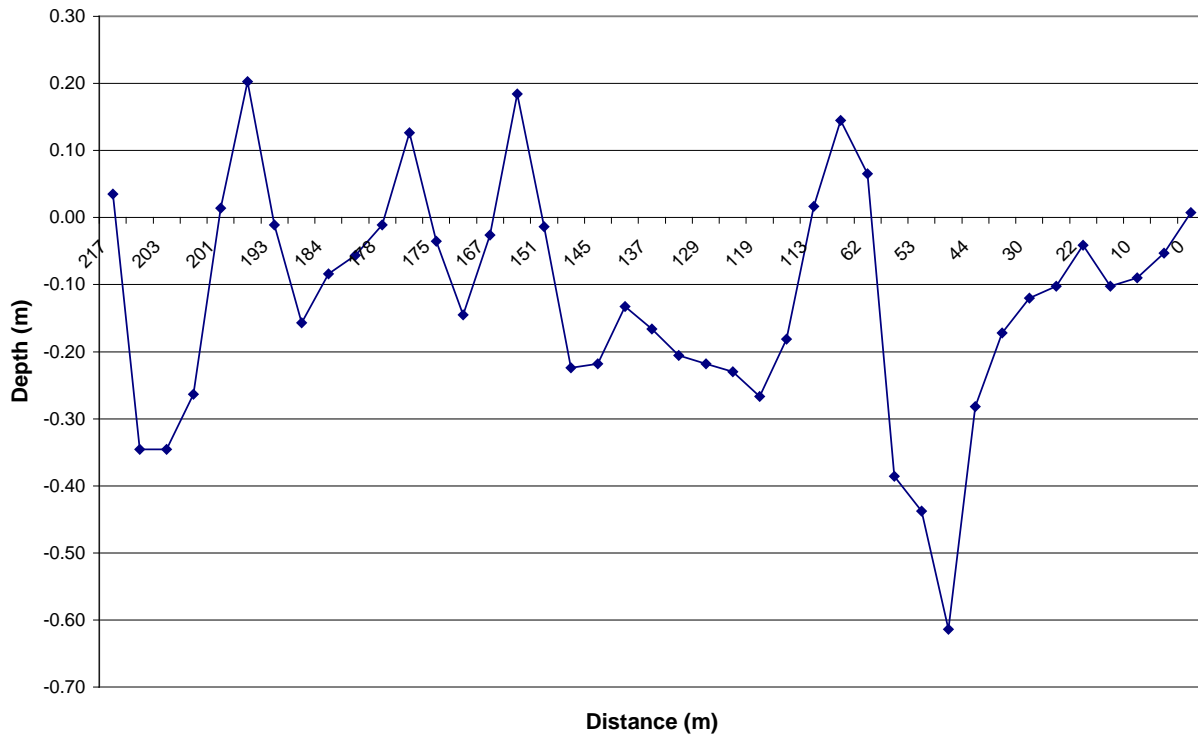
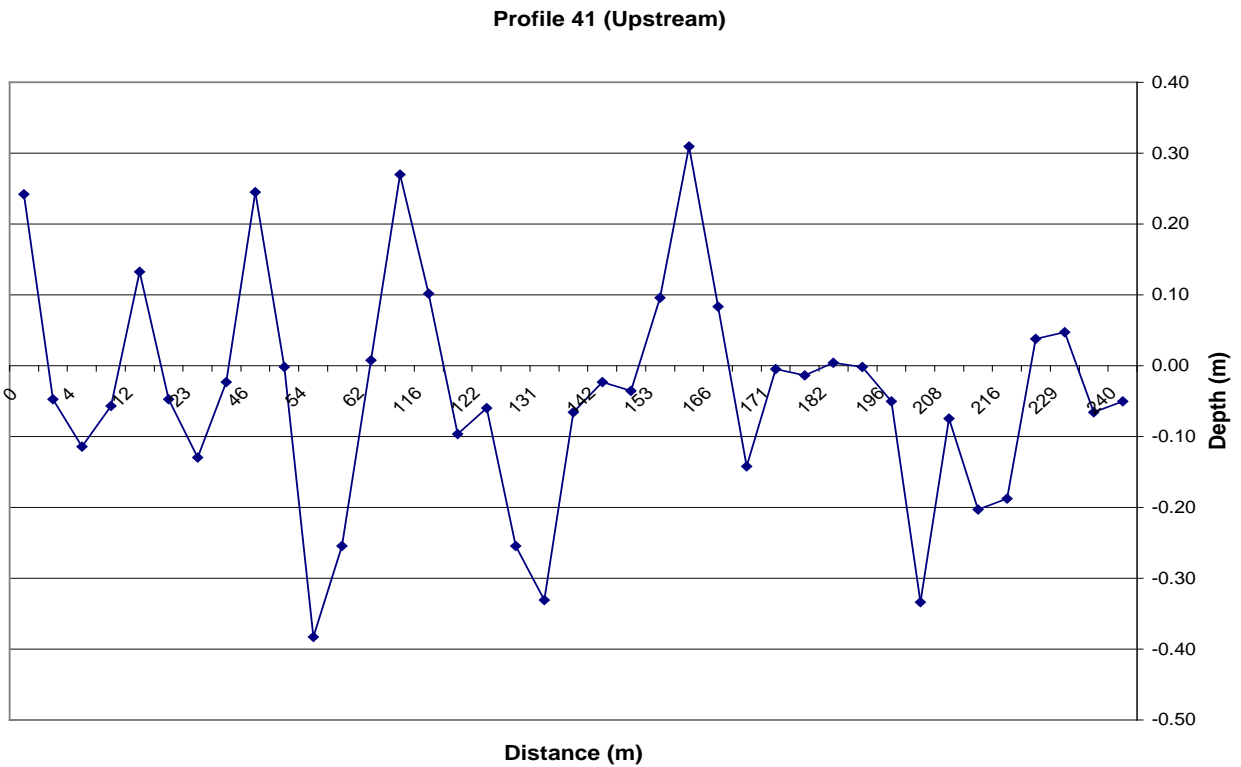
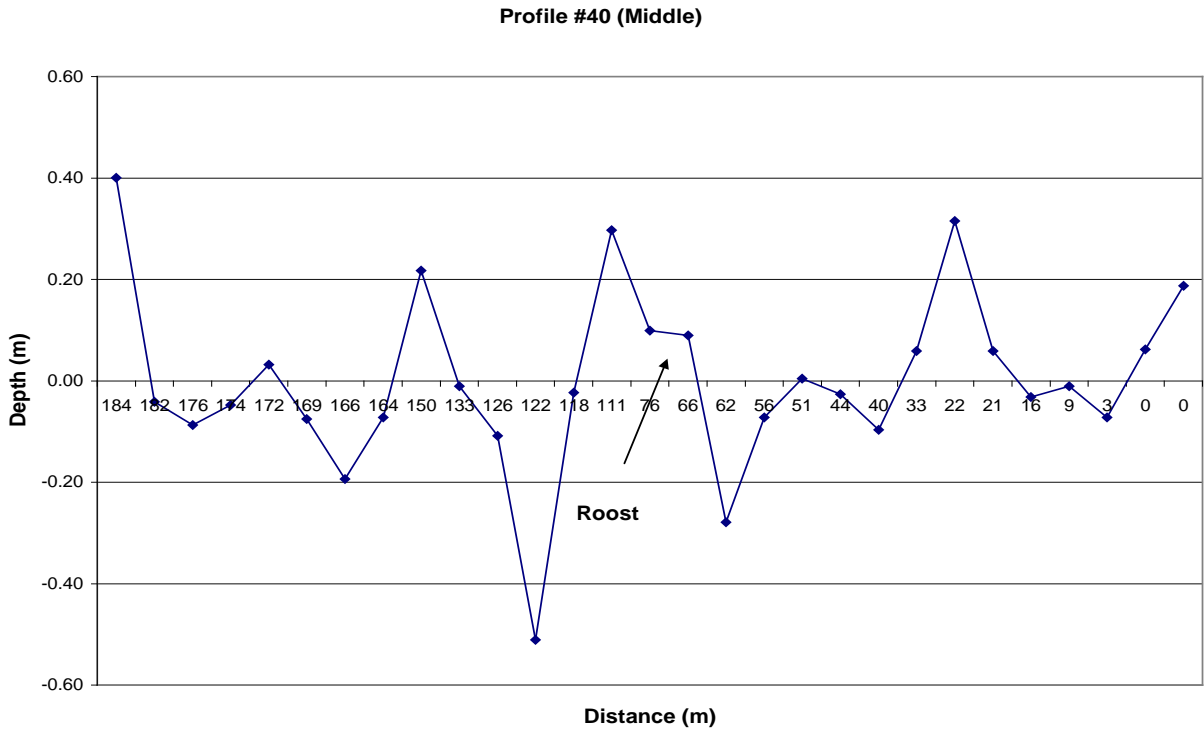


Figure 9. Roost channel profile for Use Site 3 (left to right bank). Arrow indicates approximate location of cranes.



Profile #42 (Downstream)

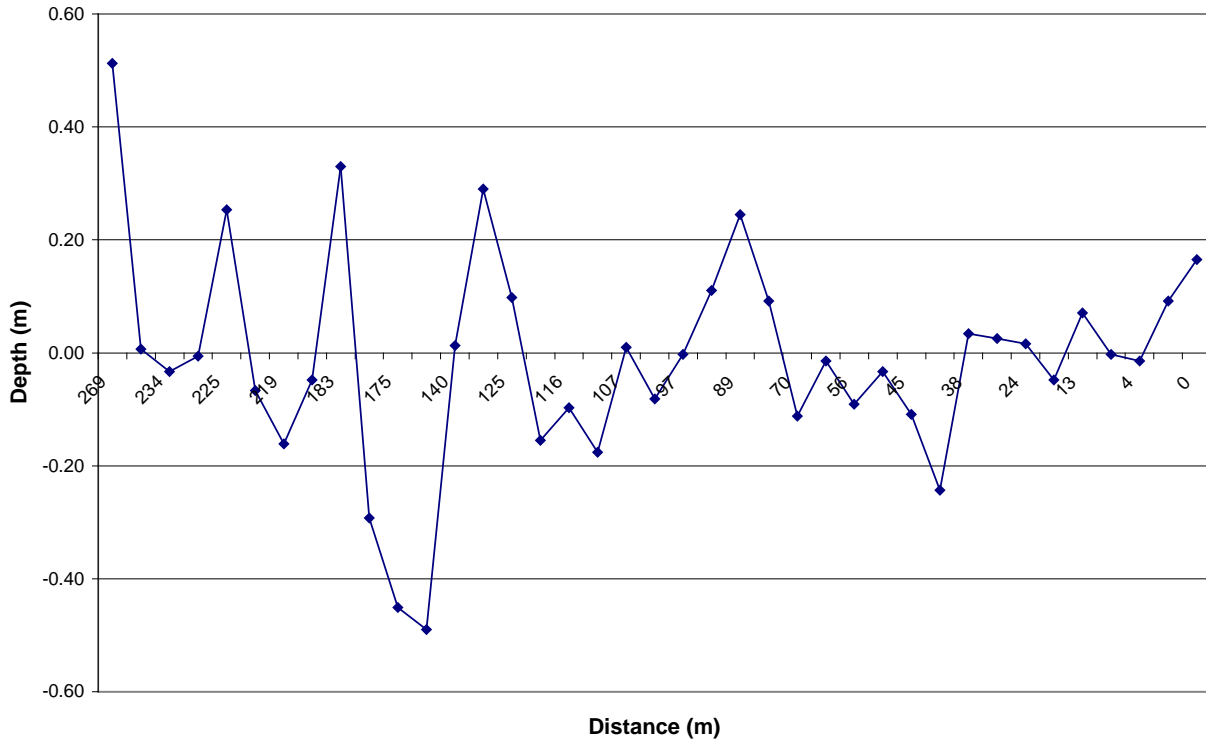
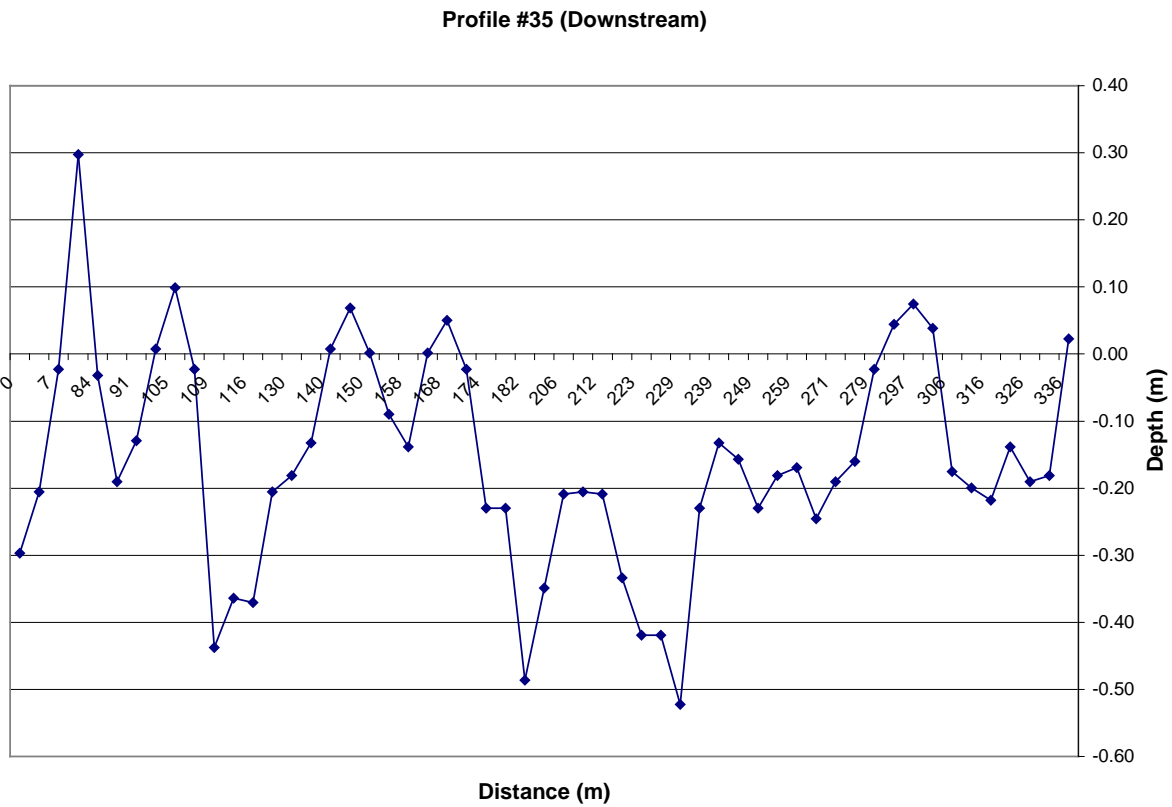
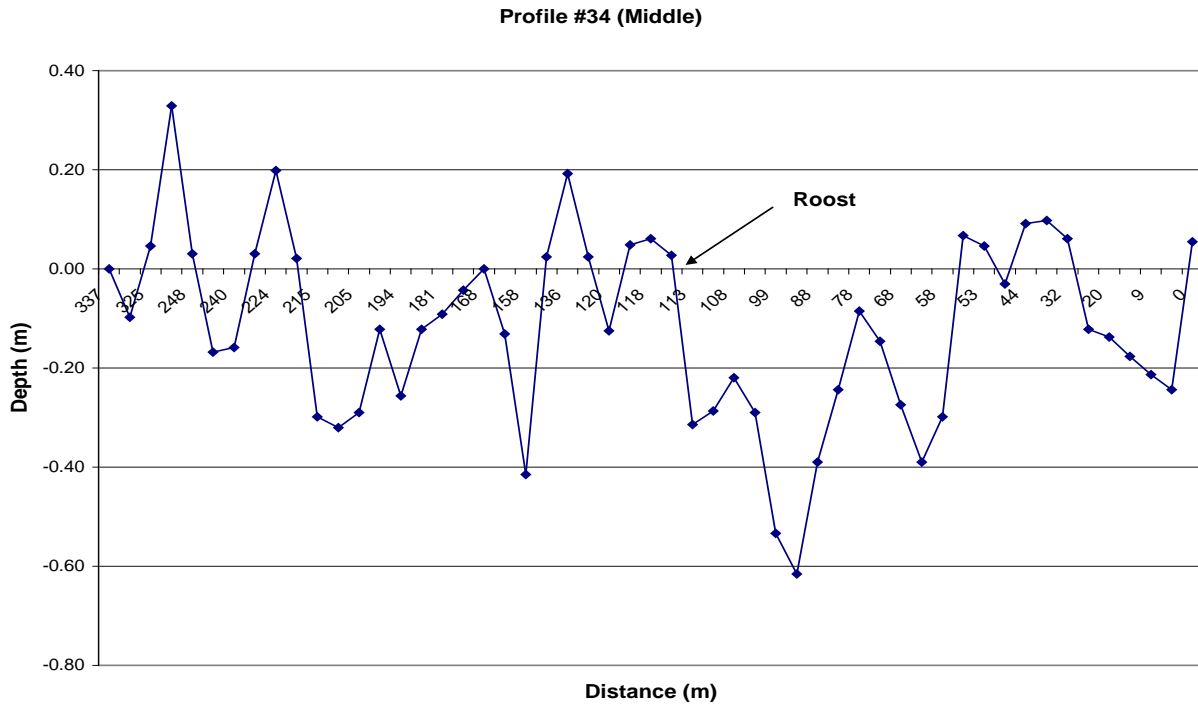


Figure 10. Roost channel profile for Use Site 4 (left to right bank). Arrow indicates approximate location of cranes



Profile #36 (Upstream)

