Implementation of the Whooping Crane Monitoring Protocol

Spring 2007

FINAL REPORT

Prepared by

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For
Committee's of the
Platte River Implementation Program

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Assessment Impact Monitoring Environmental Consultants (AIM) was awarded a contract to assist the Governance Committee and Technical Committee in implementing the *Platte River Recovery Implementation Program*. The 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 spring and fall 2007 migration. The contract specified the implementation of the draft protocol dated 16 September 2005 along with guidelines presented in the *Request for Proposal*. I present the results of spring 2007 Whooping Crane migration pursuant to the *Work Order Agreement* dated 1 March 2007.

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 fourteen technicians and conducted field work from 21 March through 13 May 2007. 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 2007 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 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 ten predetermined decoy locations on riverine sites using surveying equipment on loan from the Nebraska Public Power District and Central Platte Natural Resources 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. 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 was recorded when possible. All monitoring activities followed U.S. Fish & Wildlife Service 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 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.—

On March 15 at 0830 CST, AIM personnel observed a single Whooping Crane north of Interstate 80 east of mm 320 in Hamilton County (southeast of 10th and D Roads). The sighting was reported to USFWS which had received reports in this vicinity on March 14 and earlier on March 15. Since this occurred prior to the initiation of our field work, no further action was taken by AIM personnel.

On March 18, AIM personnel received a report of 2 Whooping Cranes seen from the Hike-Bike trail near Ft. Kearney on the evening of March 17. Since this occurred prior to the initiation of our field work, no further action was taken by AIM personnel.

On March 20, USFWS reported a juvenile Whooping Crane southeast of Gibbon in Kearney County observed by a graduate student from the Platte River Whooping Crane Trust. It was not relocated. Since this occurred prior to the initiation of our field work, no further action was taken by AIM personnel.

On March 20 at 0925 CST, AIM personnel received a report of a single Whooping Crane northeast of 20th and V Roads in Kearney County from the public. We monitored this individual on March 21 (2007SP01).

On March 21 at 1100 CST, Whooper Watch reported a single Whooping Crane northwest of V and 23 Roads. AIM personnel located this bird at 1108 CST and monitored this bird until dusk (2007SP01).

On the morning of March 30, a single Whooping Crane was observed from a crane-viewing blind at Rowe Sanctuary. This information was forwarded to AIM by USFWS. AIM personnel conducted a ground search and did not locate this crane.

On 10 April, AIM received a report of a single Whooping Crane ¼ mi east of Ft. Kearney from USFWS. AIM personnel located this bird at 1335 and monitored it until dusk (2007SP54).

On 13 April, USFWS reported a single Whooping Crane in Hall County near the Alda bridge and a group of 3 Whooping Cranes near Ft. Kearny. AIM personnel located the single crane near Alda and monitored it until dusk (2007SP65). A ground search was conducted for the Ft. Kearny Whooping Cranes and they were not located until the following morning by AIM's air crew (2007SP66).

In summary, we received seven reports of Whooping Cranes from the public, Whooper Watch, or USFWS that were considered confirmed or probable plus three additional sightings that occurred prior to March 21, the start of our survey.

Aerial Survey.--

CONFIRMED WHOOPING CRANE SIGHTINGS-

Of a possible 40 morning flights per leg, the West Leg completed 24 (60%) flights while the East Leg flew 30 (75%). Fog, low ceiling, precipitation, mechanical problems, and high winds were factors in cancellations. We recorded 37 confirmed Whooping Crane sightings (Figures 1-4).

INDEX OF USE-

We completed 105 (65%) aerial survey transects out of a possible 160. Thirty-seven Whooping Crane sightings were made on these transects. This results in an index of use (frequency of occurrence) of .35 sightings per transect. Thirty-six of these sightings occurred on river transects. The only sighting off-river was on Transect 1NE and the Whooping Crane could be seen on the river.

OPPORTUNISTIC FLIGHTS-

Eight Whooping Crane sightings were considered opportunistic during the regular aerial surveys. These sightings occurred either before the official survey began or when the plane deviated from the return route to determine whether the Whooping Crane group sighted previously had departed from the river. No additional flights were deployed. All sightings were assigned a Crane Group ID and were included in the database.

OTHER WHITE OBJECT SIGHTINGS-

Several on-ground follow-ups were conducted on objects other than Whooping Cranes at the request of the air crew. These resulted in confirmation of partial albino Sandhill Cranes, White Pelicans, or no finding. We recorded 14 partial albino Sandhill Crane sightings during the surveys. Several additional sightings were not recorded. Some of these may have been Whooping Cranes; however, at least 6 partial albino Sandhill Cranes were known to be in the area.

Searcher Efficiency Trials.—

Whooping Crane decoys were placed at 15 locations between March 26 – April 23 Table 1). The air observers detected a decoy at eight sites for an overall detectability rate of 53%. When broken down by strata, there was a 20% and 70% detectability rate for strata 0-3.5 and 0 respectively. Four of the non-detected decoy locations were on Jeffery's Island where the observers were distracted by hundreds of goats in the vicinity of the decoys.

Table 1. Random locations of decoys for detectability trials.

ID	Strata	UTMX	UTMY	Random ID	Date Placed	Detected
1	0	446623.16	4504956.15	33	4/18/2007	No
2	0	511755.59	4502955.81	34	4/28/2007	Yes
3	0	542497.97	4513292.15	35	4/17/2007	Yes
4	0	469458.09	4503722.79	36	4/14/2007	Yes
5	0	549873.45	4515632.14	37	4/3/2007	Yes
6	0	517014.94	4505187.01	38	3/26/2007	Yes
7	0	516660.43	4505005.43	39	3/26/2007	Yes
8	0	449175.58	4504519.3	40	4/18/2007	No
9	0	445496.45	4504983.91	41	4/18/2007	No
10	0	552148.92	4517029.3	42	4/3/2007	Yes
11	0-3.5	445627.454223384	4505505.18436486	16	4/18/2007	No
12	0-3.5	530398.815064672	4508217.69781976	17	4/19/2007	No
13	0-3.5	544067.978345295	4514594.93010002	19	4/15/2007	Yes
14	0-3.5	460081.860712364	4503323.42385564	20	4/4/2007	No
15	0-3.5	542830.773379167	4515205.15672602	21	4/15/2007	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 through April 23 (Figures 5-7). Widespread heavy rains resulted in flows exceeding the median flows at Kearney and Grand Island from April 24 through May 3. This was the first time flows exceeded the median flows during this project since it began in 2001. 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 during this study.

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

	Overton	**Kearney**	**Grand Island**
Minimum	436	372	586
Date	4/19, 4/22	4/19-20	4/18
Maximum	2890	5620	6330
Date	4/26-27	4/25	4/26

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. (Discharge is at the Platte River near Kearney gauging station).

Use Site	Use Date	Measured Date	Discharge (cfs) Use	Measured
2	3/22	4/18	1230-1380	1530
4	4/1, 4/7, 4/9, 4/10	4/23	662-1560	496
5	3/25, 4/1, 4/2	4/17	1350-1620	1420
7	3/22-23,3/25-27,4/2,4/3,4/6,4/11-12,4/14-15	4/18	595-1770	1370
8	3/26,4/4	4/15	1230-1480	503
10	4/4	5/2	1480	1860
12	4/8	5/9	1270	1980
13	4/9	5/13	662	653
14	4/10	4/30	1050	2320
15	4/9	4/12	662	1060
16	4/11	4/15	595	510
17	4/11	4/30	595	2200
18	4/12	5/2	861	1980
19	4/12,4/14	4/20	1140	1140
20	4/14	4/17	1140	1300

RIVERINE USE SITES-

We collected riverine channel profile data at 15 Whooping Crane use locations (Figures 8-22) and eight decoy locations (data entered into Microsoft Access database). High flows in late April made collecting these data problematic. We were denied access to Use Sites 3 and 22 by the landowner. Thirty-five roost locations were recorded and these were lumped into 17 Use Sites due to their close proximity to one another (Table 3). A total of 1408 stations (3 readings at each station) from 63 transects were surveyed. Photographs depicting the habitat used were taken at each Whooping Crane Use Site (see attached CD for photos).

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 -0.13 ± 0.18 m. The values reflect the differences in flows at the time measurements were taken compared to those during use (Table 3).

Table 4. Location, visual obstruction distance (m), substrate, and roost depth (m) at 15 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 %	Large Gravel %	Roost Depth
2	489235	4501152	63	49	111	96	80	20			-.38
4	544990	4514622	225	120	130	180	20	80			-.18
5	490793	4500738	65	55	84	53	53	30	15	2	.02
7	540618	4512220	68	34	136	244	20	80			-.17
8	490279	4500840	55	27	33	49	90	5	5		.08
10	541862	4512893	163	106	144	234	20	80			-.28
12	543612	4513787	225	76	125	202	20	80			-.52
13	519249	4506258	139	144	186	90	30	70			-.13
14	512081	4502876	193	71	218	121	20	80			-.20
15	502436	4501335	29	35	78	33	70	20	10		.22
16	510708	4502828	90	57	73	319	0	80	20		-.03
17	509063	4502083	292	163	227	132	20	80			-.12
18	515289	4504072	154	79	62	60	20	80			-.11
19	506149	4501441	186	68	94	258	60	35	5		-.16
20	499084	4501057	56	171	51	38	60	40			.01

UNOBSTRUCTED WIDTH-

Table 5 depicts unobstructed width as measured from aerial photos versus surveying at riverine use locations. Use Sites 3 and 22 were measured from aerial photographs only because access was denied by the landowners. The surveyed width was the average of the 3 river profiles

measured at each Use Site. Eleven of 15 sites (73%) measured from photos were within 1 standard deviation of the mean.

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

Use Site ID	Surveyed Mean Width ± SD	Width from Photos
2	132 ± 12.3	120
3	--	250
4	261 ± 7.0	255
5	93 ± 4.1	101
7	350 ± 13.5	352
8	77 ± 11.9	74
10	278 ± 6.3	266
12	258 ± 9.1	231
13	256 ± 44.0	272
14	214 ± 42.0	229
15	101 ± 45	128
16	329 ± 55.8	287
17	370 ± 0.9	363
18	144 ± 24.9	172
19	324 ± 5.5	323
20	156 ± 67.8	189
22	--	117

DIURNAL USE SITES-

Diurnal movements and activity data was collected when possible. We documented diurnal use locations in 35 sections during 26 days of observation (Figures 1-4). Whooping Cranes were observed within 6 miles from 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 known to be present in the study area 26 (65%) of the 40 days of the survey. We documented the presence of 5 Whooping Crane groups; 3 contained 1 bird and 2 contained 3 birds each for a total of 9 Whooping Cranes minimum. A total of 71 crane-use days was recorded during the survey period (Table 6). Consult the USFWS in Grand Island, NE for a complete record of crane-use on the Platte River.

Table 6. Whooping Crane dates of occurrence and crane-use days during the survey period.

Crane Group	Number of Cranes	Actual Dates Observed	Assumed Dates of Occurrence	# of days present	Crane-Use Days
Banded Family	3	April 14	April 12 - 14	3	9
Overton Family	3	April 15	April 14 - 15	2	6
Alda WC	1	March 22 – April 15	March 21 – April 15	26	26
Kearney WC	1	March 21 – April 14	March 21 – April 14	25	25
Shelton WC	1	April 9 – 12	April 8 – 12	5	5
TOTAL	9				71

LAND-COVER CLASS-

Wetted Channel, Ag-Corn, Ag-Soybeans, Ag-Barren, Ag-Alfalfa, Ag-Other, Lowland Grassed, Open Water Pit/Pond/Lake, and Open Water Slough were the cover-types Whooping Cranes were observed using during the day. Sixty-seven (76 %) of the 88 diurnal locations were in Ag-Corn, 5 (5.7%) in Ag-Soybeans, 4 (4.5%) in Ag-Alfalfa and Wetted Channel, 3 (3.4%) in Ag-Other, 2 (2.3%) in Lowland Grasses, and 1 (1 %) were in Ag-Barren, Open Water Slough, Open Water Pit/:Pond/Lake. All of the nocturnal roost locations (100%) were in Wetted Channel.

ACTIVITY-

A total of 222.25 hours of continuous and instantaneous use (time budget) data of Whooping Cranes was collected by ground personnel during 26 days of observation. In some cases, more than one crane group was observed on a particular day. All observations were in diurnal use locations. The breakdown of observation time in various habitats is depicted in Table 7. Most (83%) of the diurnal activity recorded occurred in cornfields. Eight hundred eighty-nine data points of activity (time budget) were recorded. Feeding (76%) was the most frequently observed activity followed by resting (8%), alert (7%), preening (6%), defensive (2%), and courtship (1%) (Table 8).

Table 7. Count of instant points by habitat.

Habitat	n	Hours	Percent
Ag-Alfalfa	73	18.25	8.2
Ag-Barren	1	.25	.1
Ag-Corn	739	184.75	83.1
Ag-Other	8	2	.9
Ag-SoyBean	31	7.75	3.5
Lowland Grasses	7	1.75	.8
Open Water pit/pond/lake	4	1	.4
Open Water Slough	13	3.25	1.5
Wetted Channel	13	3.25	1.5
TOTAL	889	222.25	

Table 8. Whooping Crane activity by habitat.

Habitat	Activity	n	Total	Percent
Ag-Alfalfa	Alert	3	71	4.2
Ag-Alfalfa	Defensive	1	71	1.4
Ag-Alfalfa	Feeding	53	71	74.6
Ag-Alfalfa	Preening	11	71	15.5
Ag-Alfalfa	Resting	3	71	4.2
Ag-Corn	Alert	41	734	5.6
Ag-Corn	Courtship	9	734	1.2
Ag-Corn	Defensive	13	734	1.8
Ag-Corn	Feeding	577	734	78.6
Ag-Corn	Preening	35	734	4.8
Ag-Corn	Resting	59	734	8.0
Ag-Other	Alert	2	7	28.6
Ag-Other	Feeding	5	7	71.4
Ag-SoyBean	Alert	1	29	3.4
Ag-SoyBean	Feeding	27	29	93.1
Ag-SoyBean	Preening	1	29	3.4
Lowland Grasses	Feeding	7	7	100
Open Water pit/pond/lake	Feeding	1	1	100
Open Water Slough	Alert	1	13	7.7
Open Water Slough	Feeding	5	13	38.5
Open Water Slough	Preening	3	13	23.1
Open Water Slough	Resting	4	13	30.8
Wetted Channel	Alert	2	13	15.4
Wetted Channel	Defensive	2	13	15.4
Wetted Channel	Feeding	6	13	46.2
Wetted Channel	Resting	3	13	23.1

Search Effort.--

Ground searches were initiated on 51 occasions. A total of 61.5 hours was expended in this effort and 1,368 miles were driven. Search duration extended from 0.25 to 7 hours (mean= 1.2 hours). Objects were located on 35 occasions (69%) and resulted in Whooping Cranes on 34 occasions (67%). Ninety percent of the searches were initiated before noon and 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 9 compares the Program numbering system with the USFWS database (Martha Tacha, personal communication). We had two family groups of Whooping Cranes present in the

study area. One group had a banded adult and was the same group documented last fall on the Platte River about 5 miles downstream from this location. The banded individual was banded as a chick in 1987 with YBY-Y color bands. The other family group had no banded individuals. USFWS had an additional 3 confirmed sightings that were not included in this database either because they occurred outside the dates of this survey (07A02, 07A04) or we did not observe them (07A06).

Table 9. Comparison of Program Crane ID and USFWS Crane ID during the survey period.

Program Crane ID (Prefix 2007SP)	**Program Name**	**USFWS Crane ID**	**Dates of Occurrence**	**# of cranes**
66	Banded family	07A20	4/12 – 4/14	3
70	Overton family	07A22	4/14 – 4/15	3
3,7,8,10,13,15,19,21,24,25, 28,29,33,34,35,39,40,41,43 ,44,45,47,48,53,56,59,62, 65,67,69	Alda WC	07A01	3/21 – 4/15	1
1,4,5,6,9,11,12,14,16,17,18 ,20,22,23,26,27,30-32,36-38,42,46,54,55,58,63,64,68	Kearney WC	07A03	3/21 – 4/14	1
49-52,57,60,61	Shelton WC	07A13	4/8 – 4/12	1

Partial Albino Sandhill Cranes

Six partial albino Sandhill Cranes were documented including a set of twins (Figure 23). Behavioral observations of the twins confirmed they were juveniles. Their parents accompanied them and both were of normal coloration. We are not aware of any documentation of twin albino Sandhill Cranes in the scientific literature.

The presence of these color morphs hindered identification of cranes from the air. Although there are obvious differences in size between the 2 species, size criteria alone can be very difficult to determine particularly during turbulent weather. It is possible that Whooping Cranes were occasionally misidentified as “albino” Sandhill Cranes and vice versa.

Sandhill Crane Mortality due to Afflatoxin Poisoning

Eighteen Sandhill Cranes were found dead between 1-4 April (Martha Tacha, personal communication). Necropsy revealed the cause of death as afflatoxin poisoning, a mold that can be present in waste grain when warm, wet conditions persist. These cranes were found about 1 mile from the area frequented by a single Whooping Crane near Kearney. USFWS raised concerns about the possibility of the Whooping Crane ingesting moldy corn and advised AIM personnel to be cognizant of any usual behavior exhibited by Whooping Cranes or associated

Sandhill Cranes under observation. We did not observe any lethargic behavior by the Whooping Crane or any of the Sandhill Cranes associated with it.

Discussion and Recommendations

The number of confirmed Whooping Crane sightings in Nebraska was 16 including those contained herein (Martha Tacha, personal communication). As of 5 June 2007, there were 32 confirmed sightings in the United States as follows: North Dakota- 5; South Dakota- 4; Nebraska-16; Kansas- 2; Oklahoma- 2; Texas- 1; and Minnesota- 2. A record 234 Whooping Cranes were expected to migrate from their wintering grounds in the vicinity of Aransas National Wildlife Refuge in Texas this spring.

We offer the following comments/suggestions to the Technical 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 "…..Continuous Use Site Monitoring" sheet.
- Change "….. Instantaneous and Continuous Use Site Monitoring" to Time Budget.

Microsoft Access Database

- Present discharge during use and when measured including dates for both in a Table.
- Add "Crane Group ID" to the Use Characteristics form.
- Change Ground Monitoring to Ground Search.
- Add "Use Site ID" and "Crane Group ID" to the Aerial Observations form and link it to the Whooping Crane locations table.
- 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.
- Incorporate additional USFWS confirmed sightings of Whooping Cranes on the Platte River into this database so that it is all inclusive.

Methods

- 180 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 only 1 observation of Whooping Cranes have occurred on these transects to date (Transect 2SE) and the likelihood of observing Whooping Cranes on these transects is remote given the time of day the flights occur.

Spring 2007 Expenses

The cost of the field implementation and data entry for this project was about $63,770. The estimated cost of Draft and Final Report preparation was $7,883 and $1,578 respectively. The total cost of the Spring 2007 effort was about $73,231.

Supplements

Original Data Sheets 238pp.

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

Figure 1. Whooping Crane Use Sites 7, 10, 12, 4 (left to right) (blue) and diurnal use areas (yellow) in the vicinity of the Alda bridge.

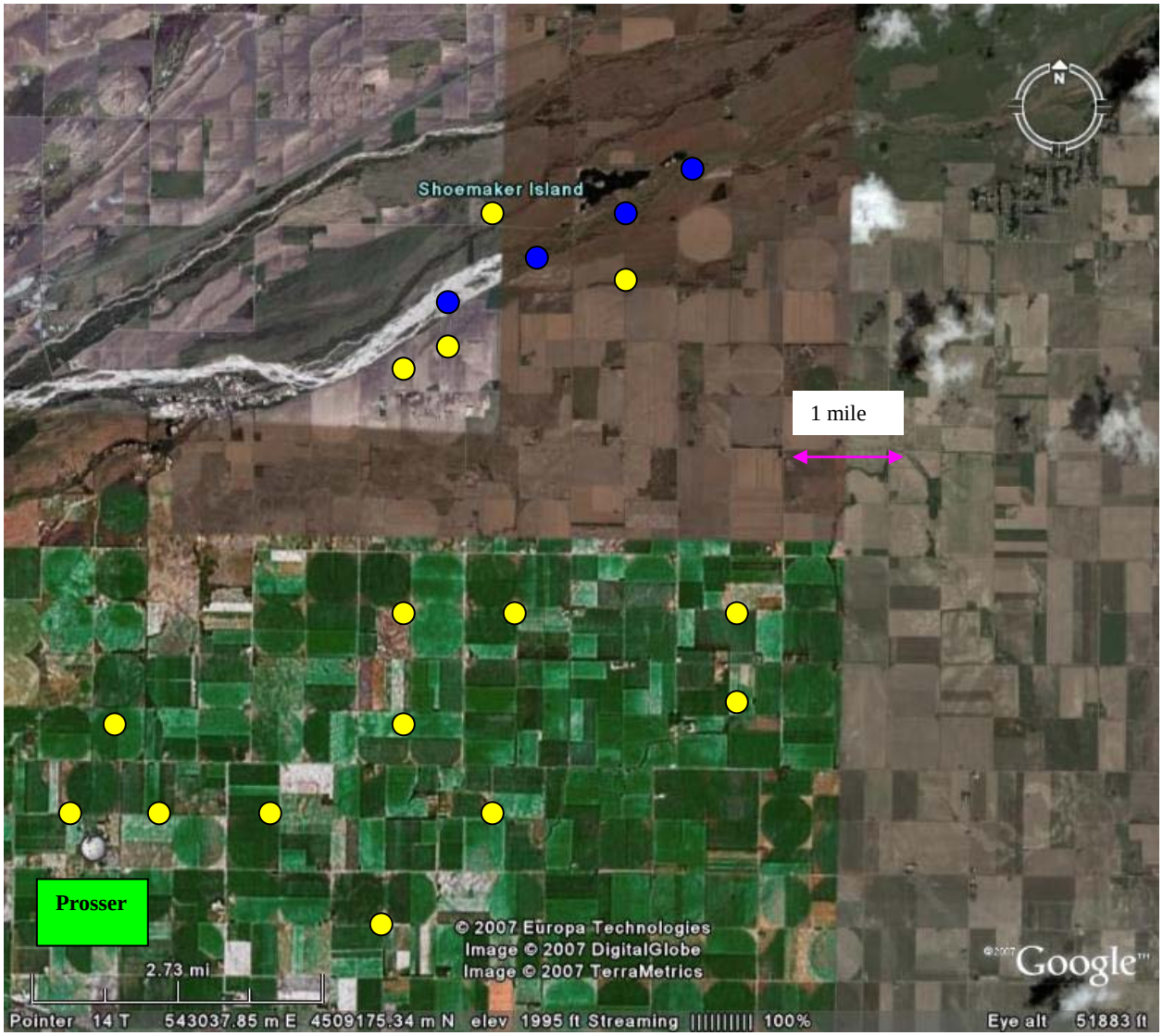


Figure 2. Whooping Crane Use Sites 16, 14, 18, and 13 (left to right) (blue) and diurnal use areas (yellow) in the vicinity of the Gibbon-Shelton bridges.

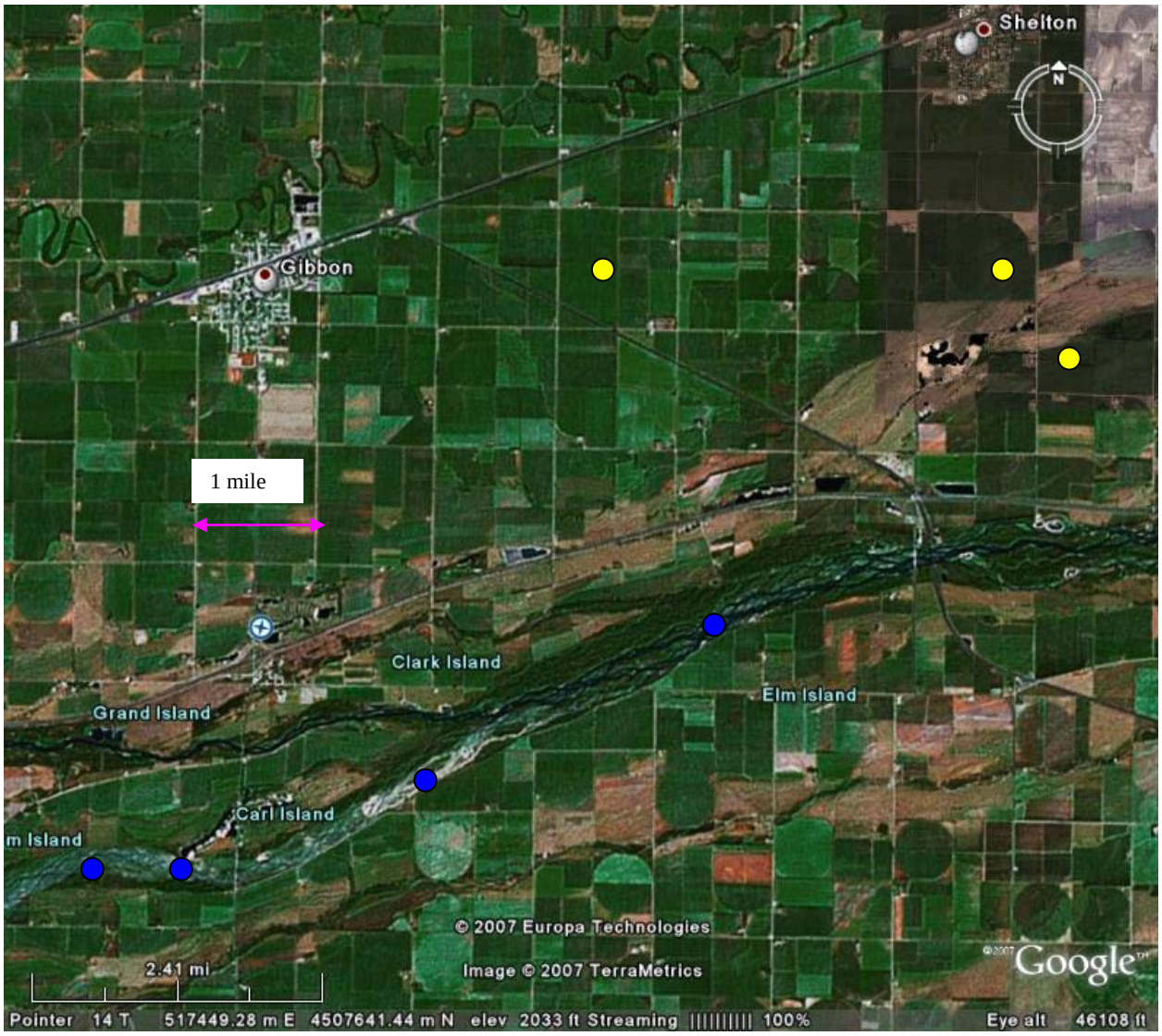


Figure 3. Whooping Crane Use Sites 3, 2, 5, 20, 15, 19 and 17 (left to right) (blue) and diurnal use areas (yellow) in the vicinity of the Kearney-Minden bridges.

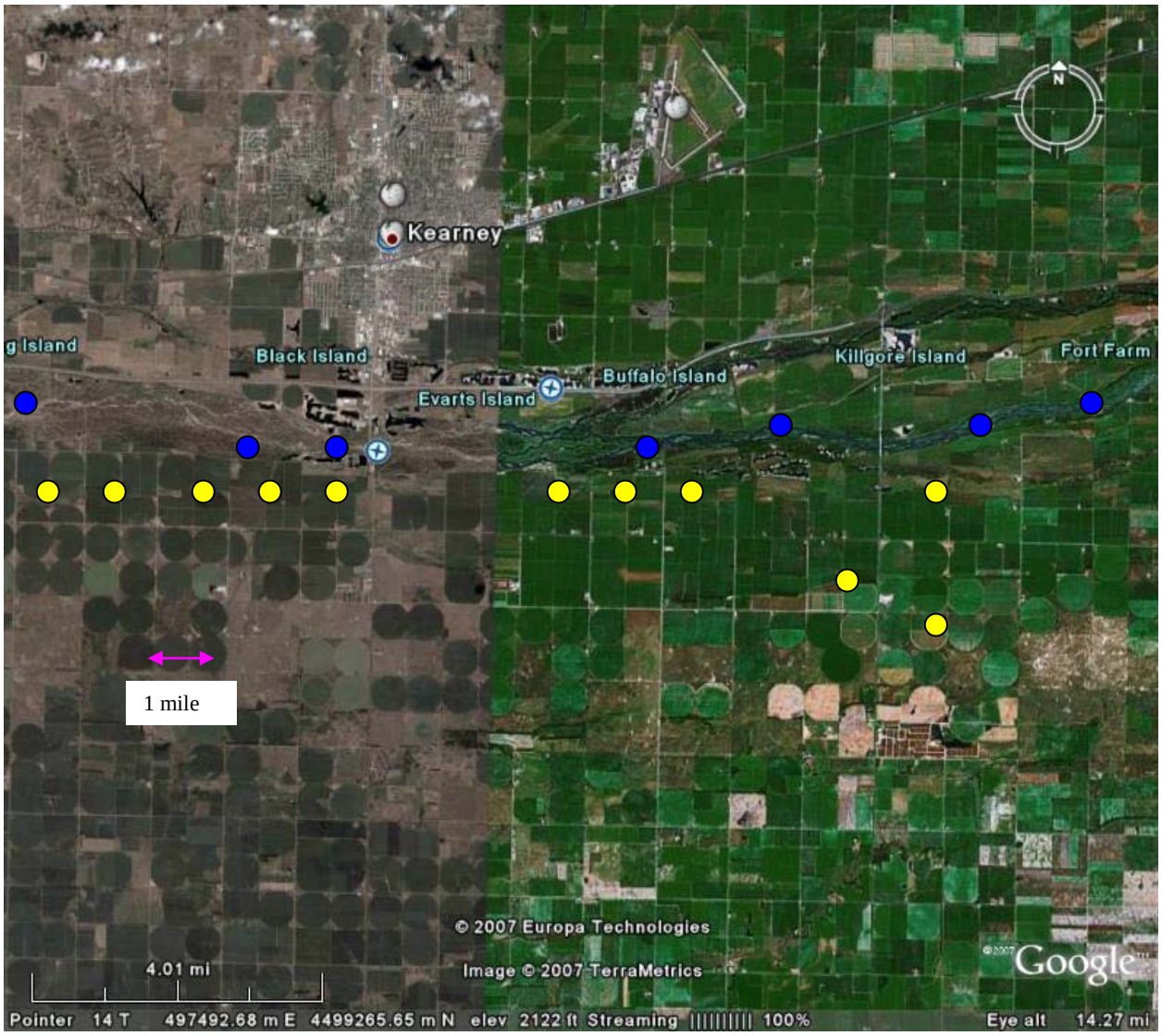
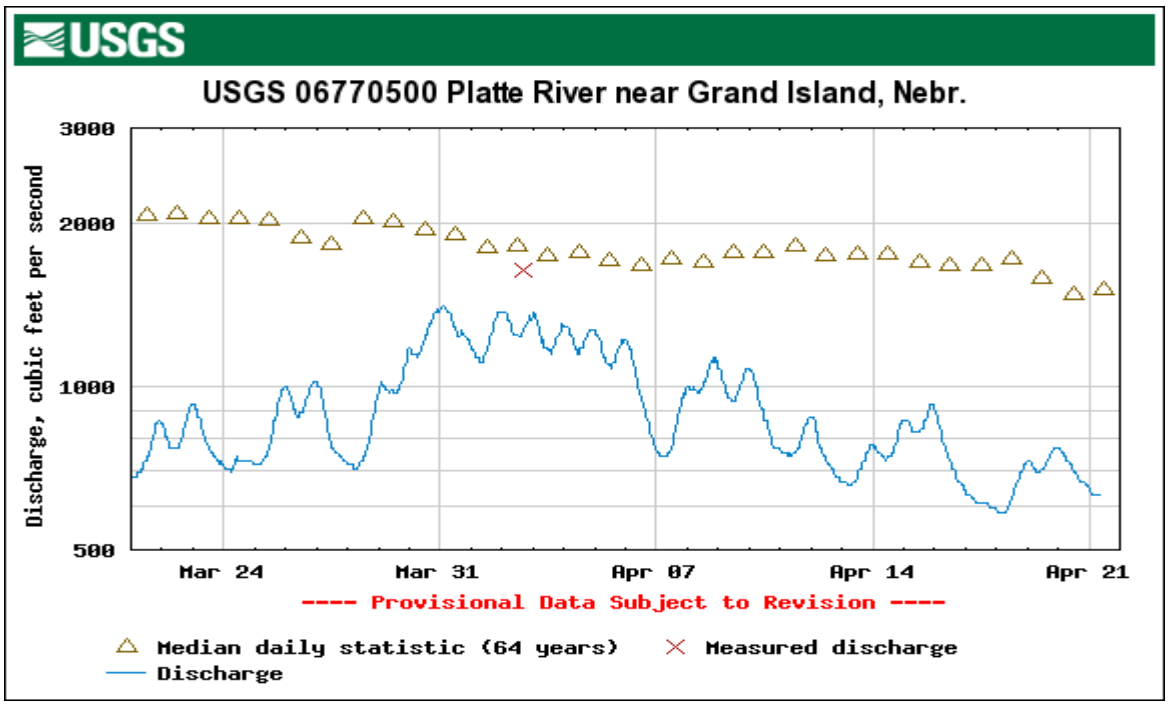


Figure 4. Whooping Crane Use Site 22 (blue) and diurnal use area (yellow) in the vicinity of the Overton Bridge.

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



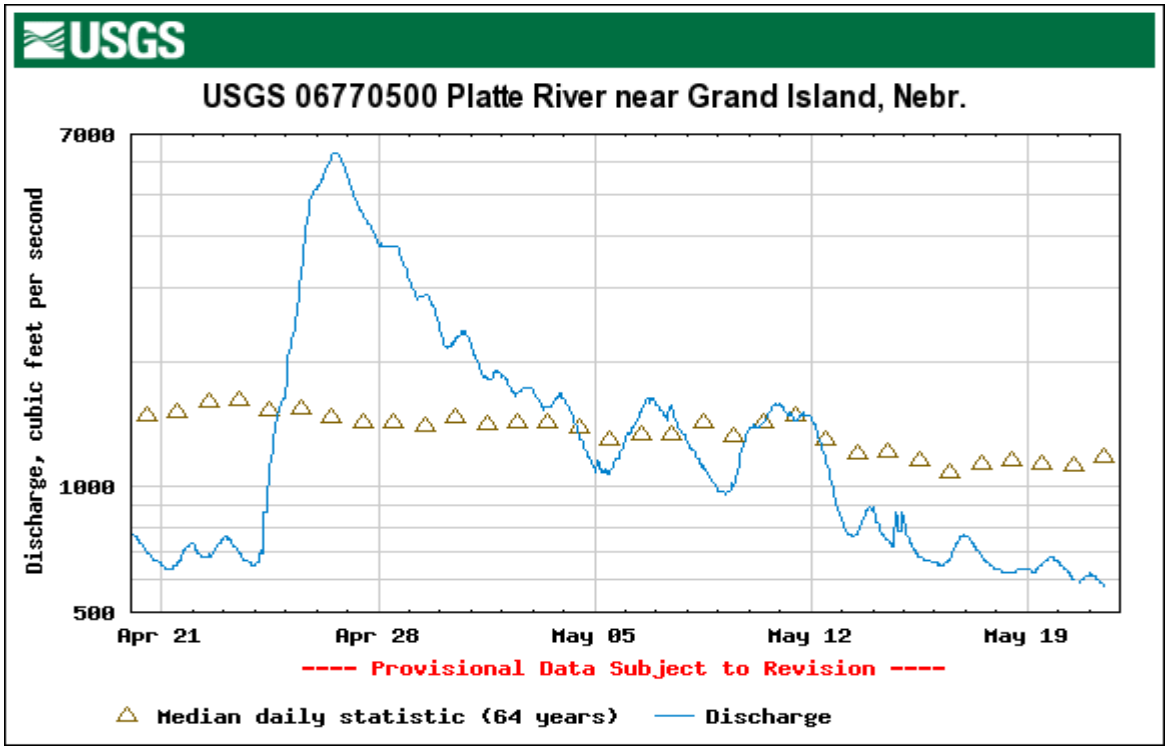
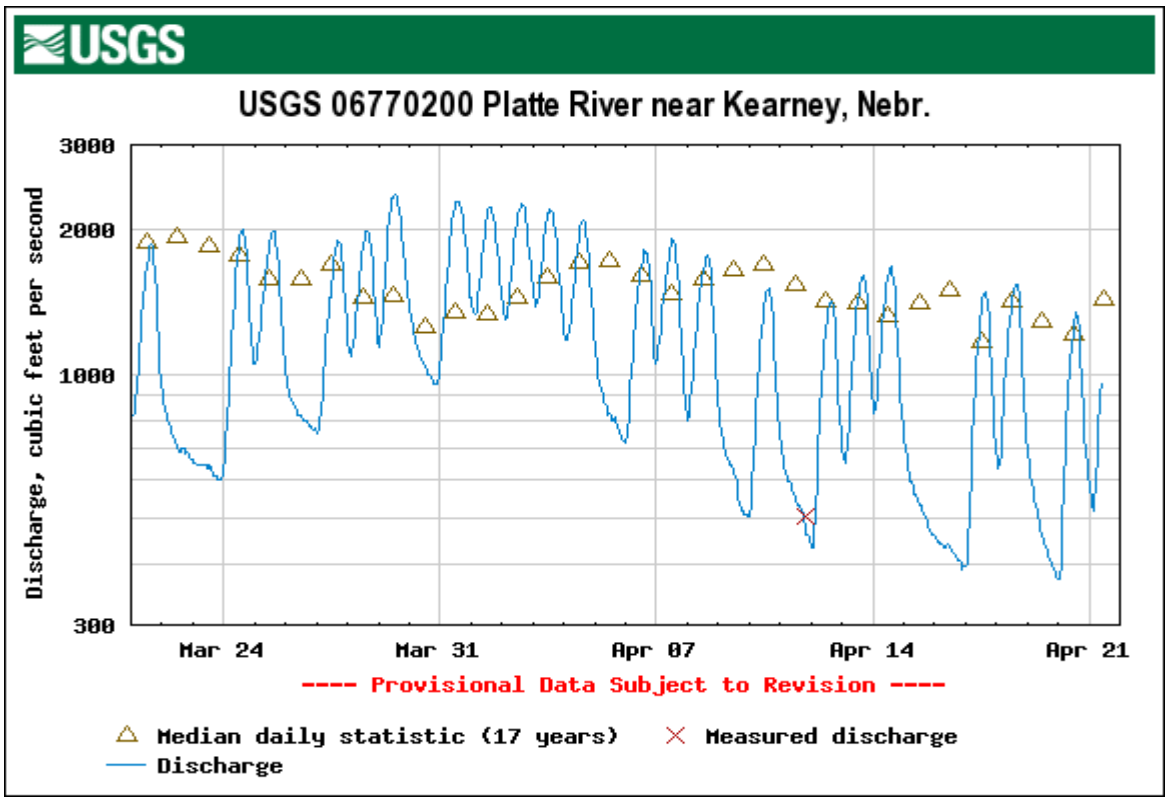


Figure 6. Platte River discharge (cfs) at Kearney.



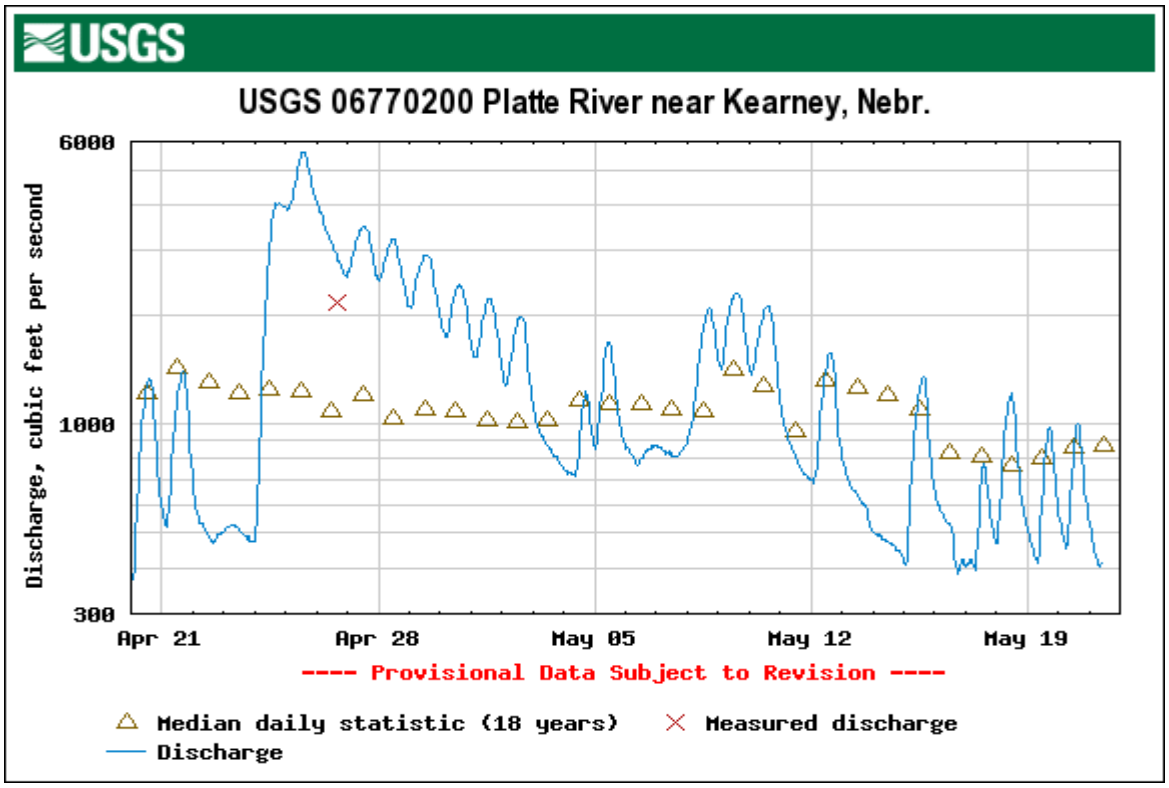
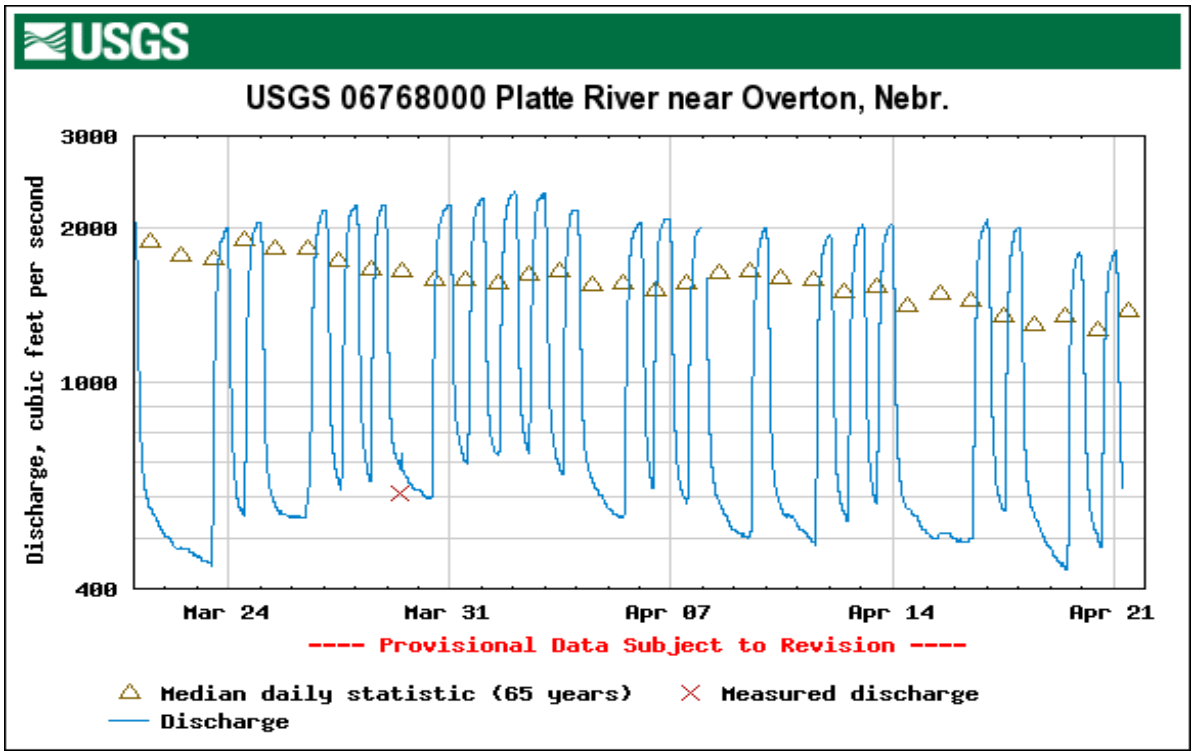


Figure 7. Platte River discharge (cfs) at Overton.



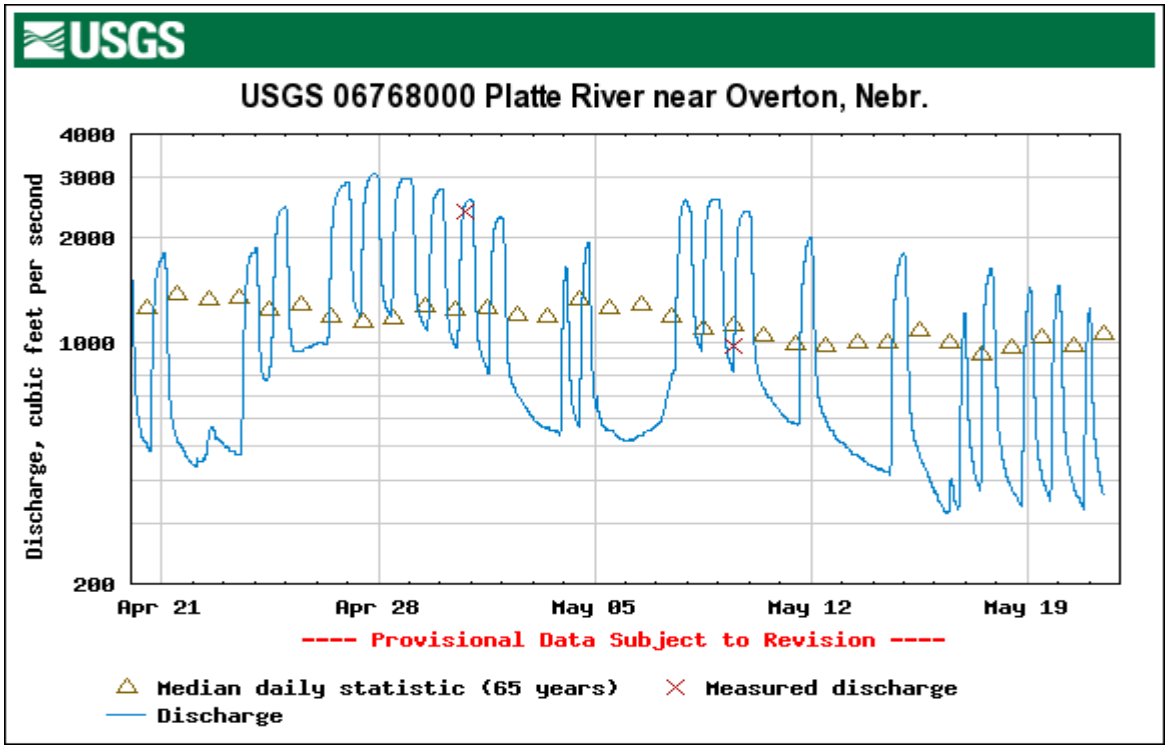


Figure 8. Roost channel profile for Use Site 2 (left to right bank).

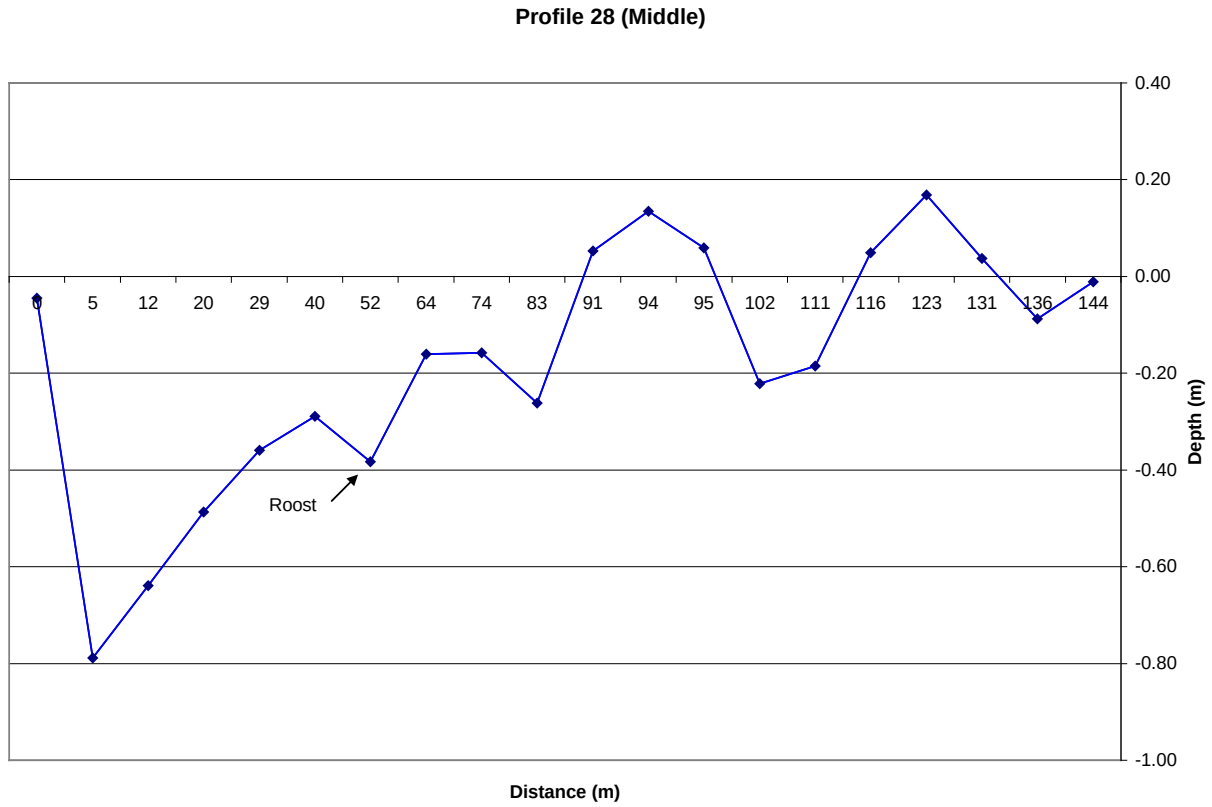


Figure 9. Roost channel profile for Use Site 4 (left to right bank).

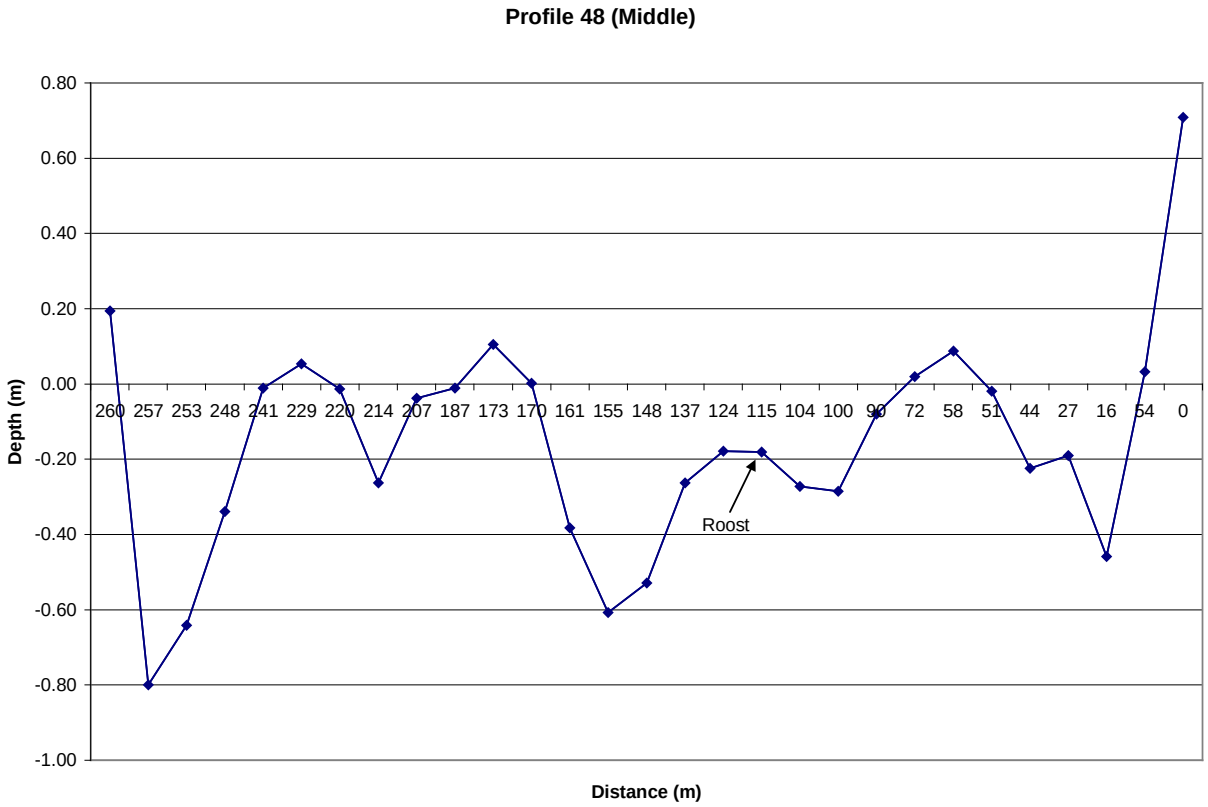


Figure 10. Roost channel profile for Use Site 5 (left to right bank).

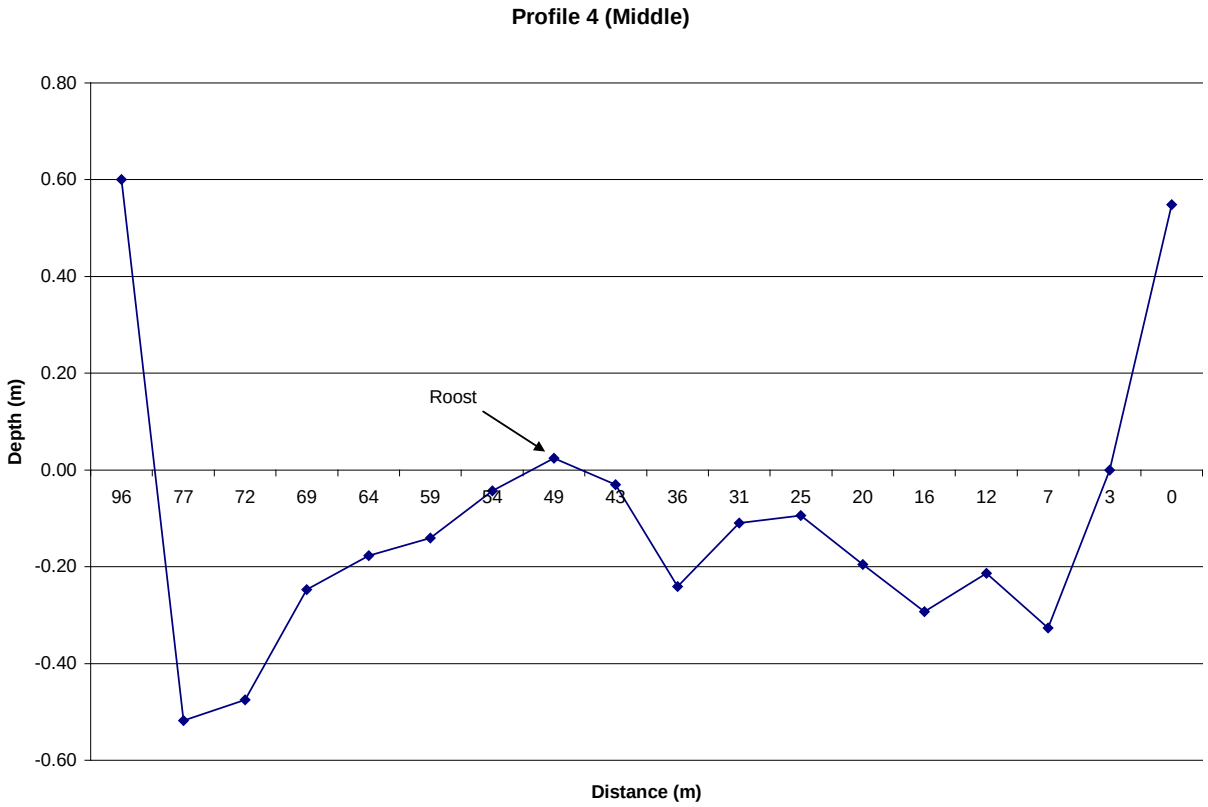


Figure 11. Roost channel profile for Use Site 7 (left to right bank).

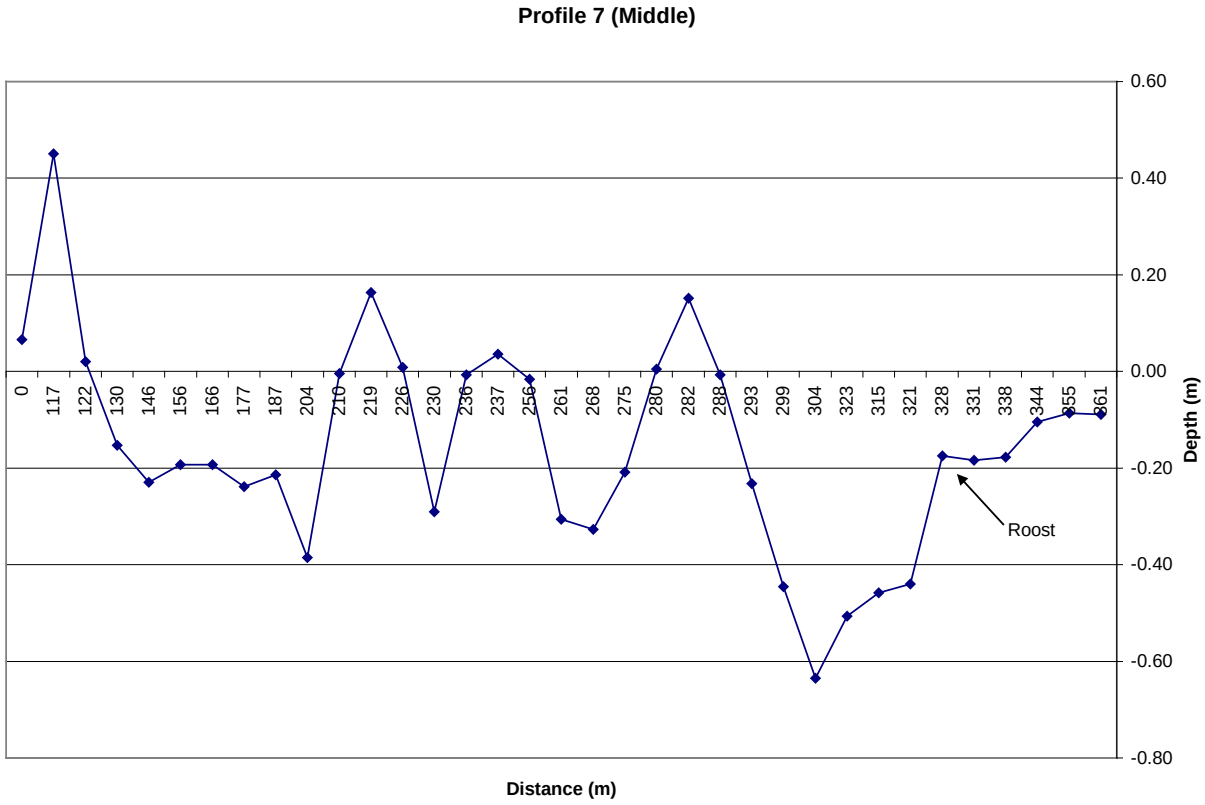


Figure 12. Roost channel profile for Use Site 8 (left to right bank).

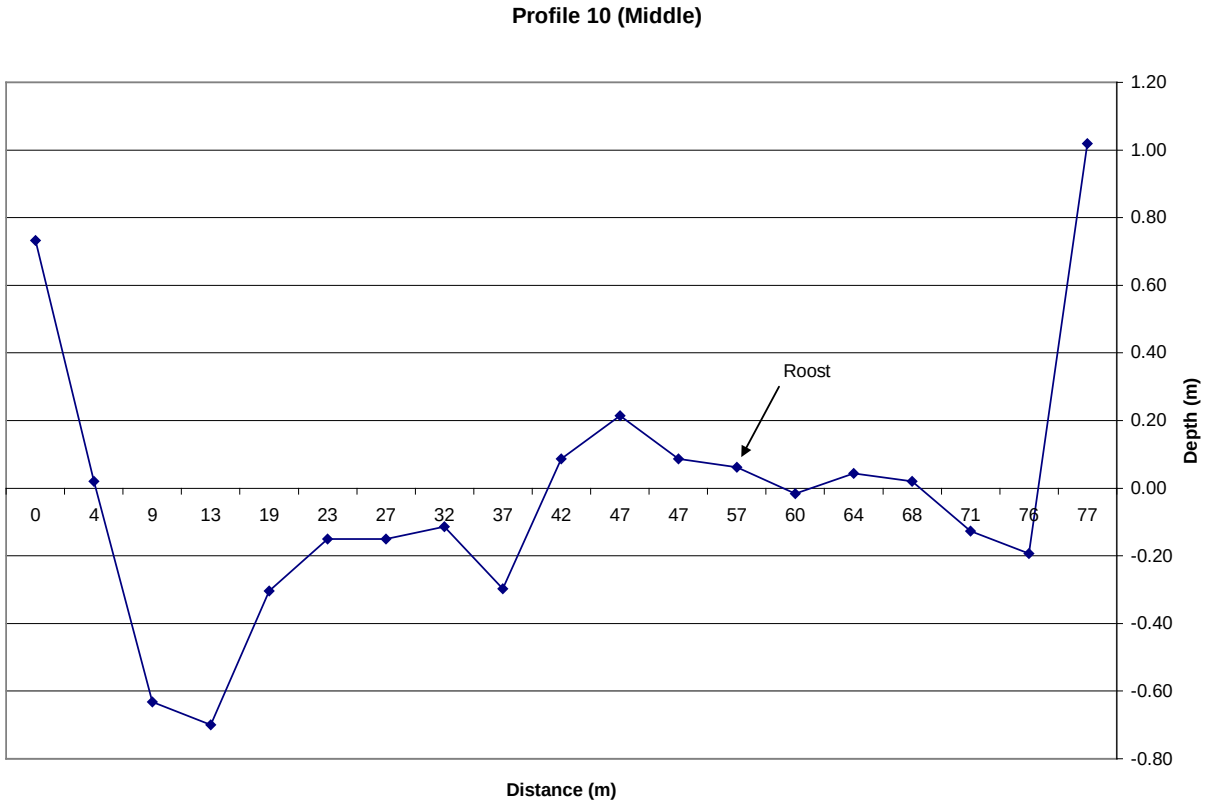


Figure 13. Roost channel profile for Use Site 10 (left to right bank).

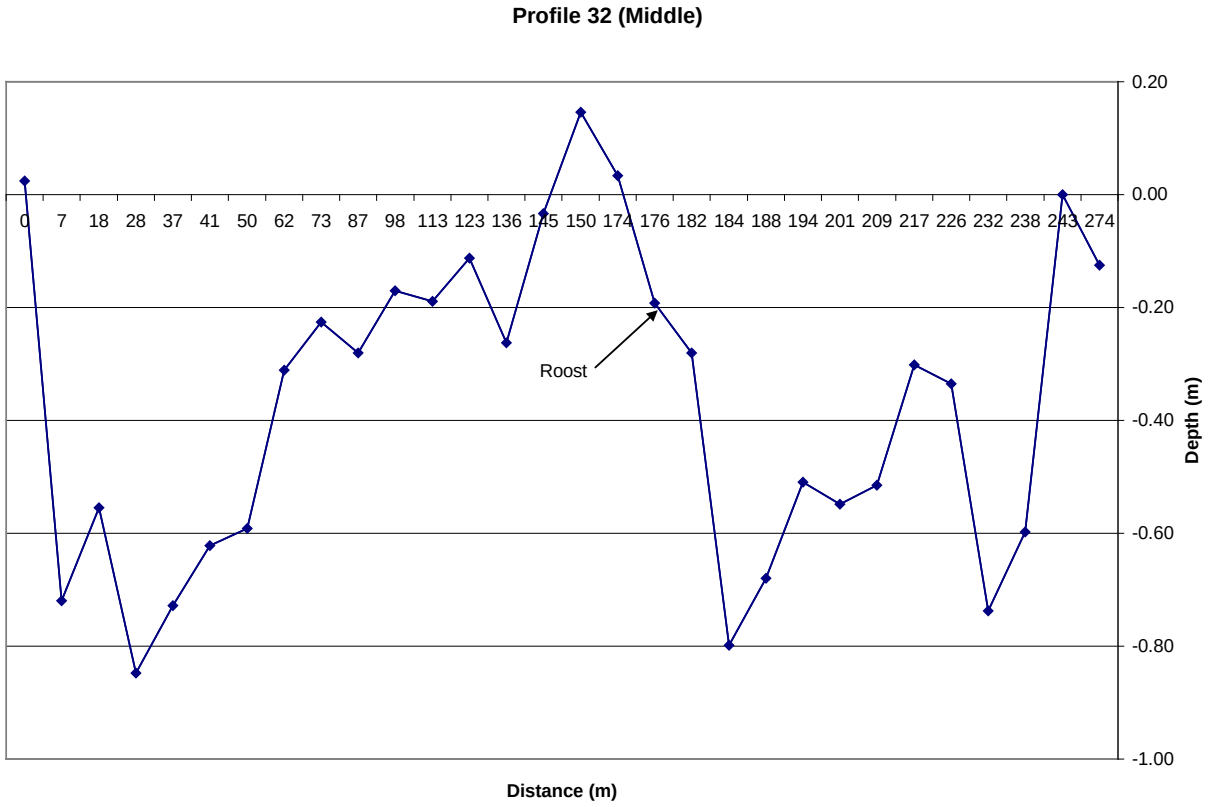


Figure 14. Roost channel profile for Use Site 12 (left to right bank).

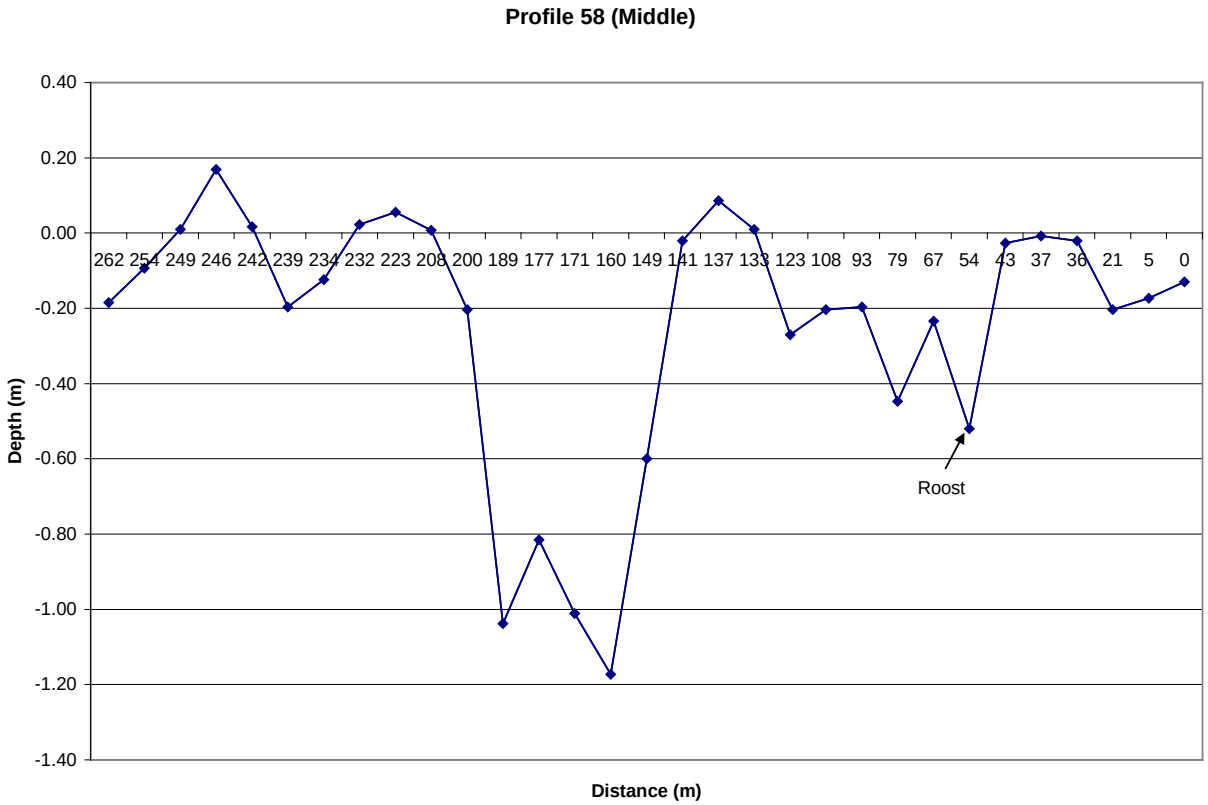


Figure 15. Roost channel profile for Use Site 13 (left to right bank).

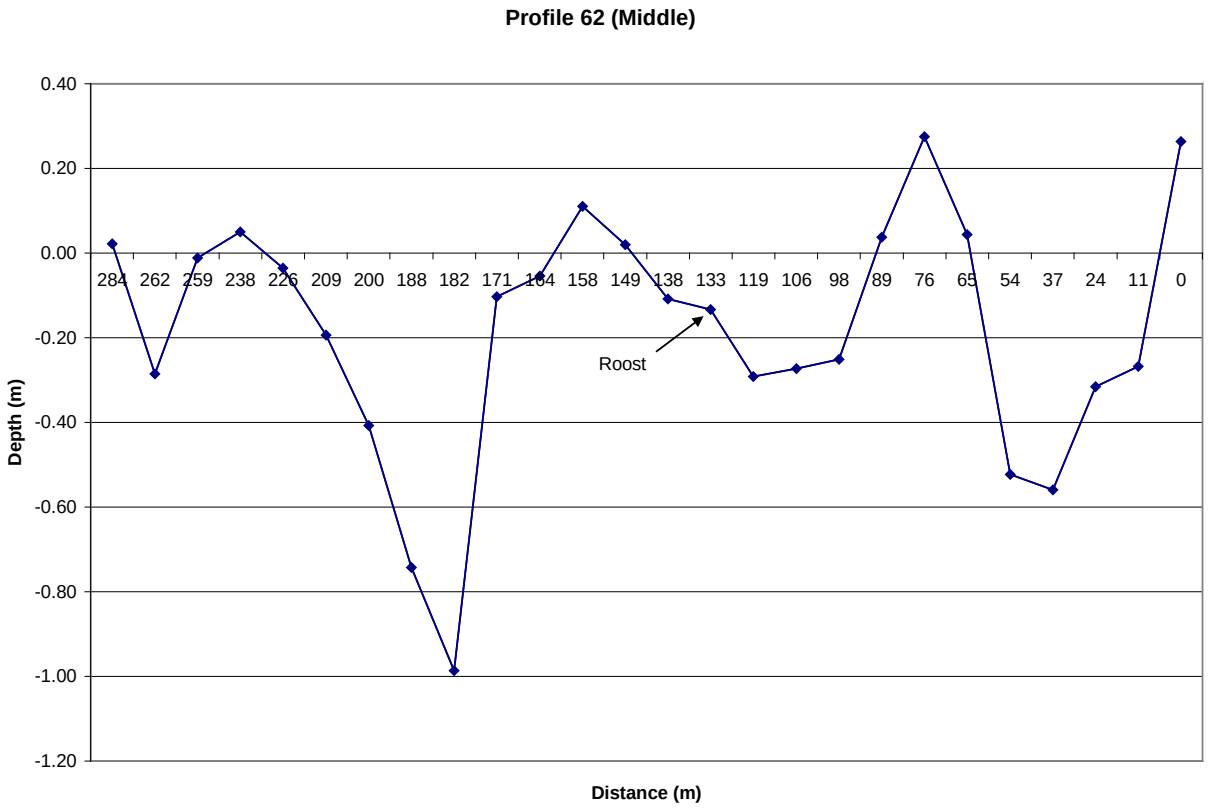


Figure 16. Roost channel profile for Use Site 14 (left to right bank).

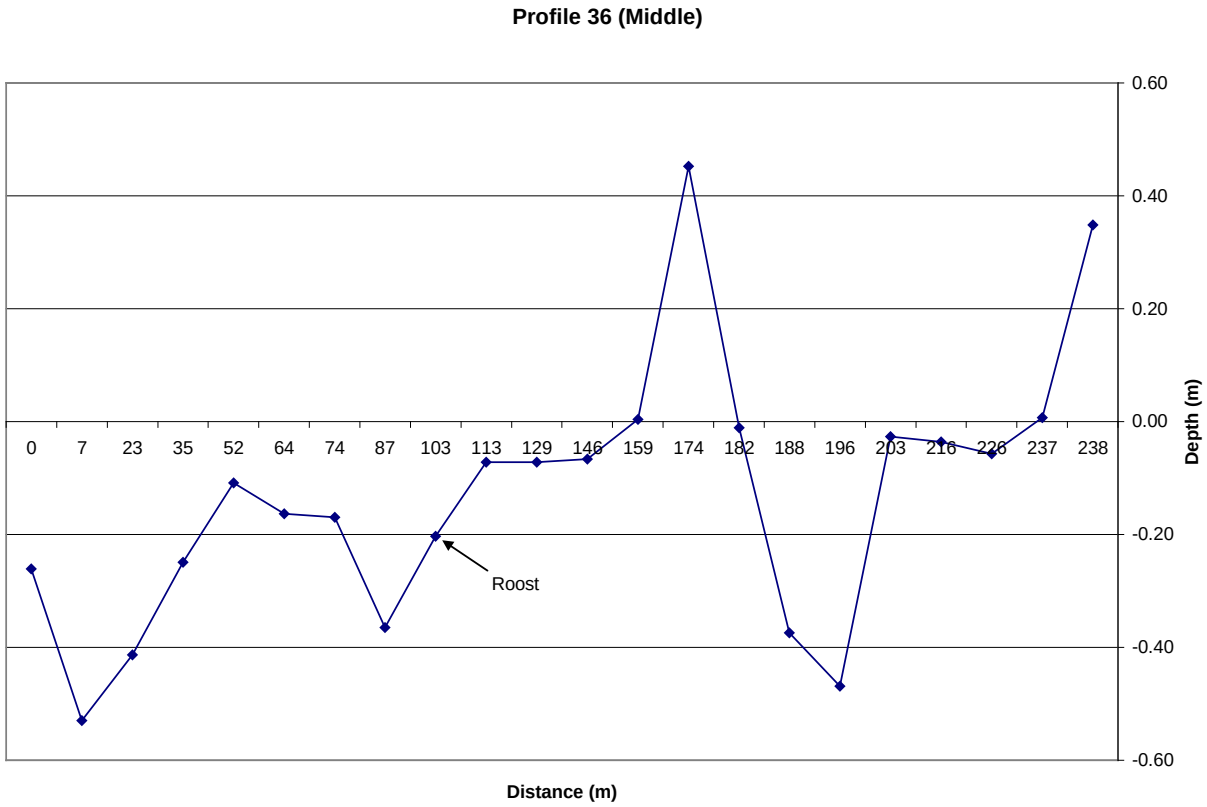


Figure 17. Roost channel profile for Use Site 15 (left to right bank).

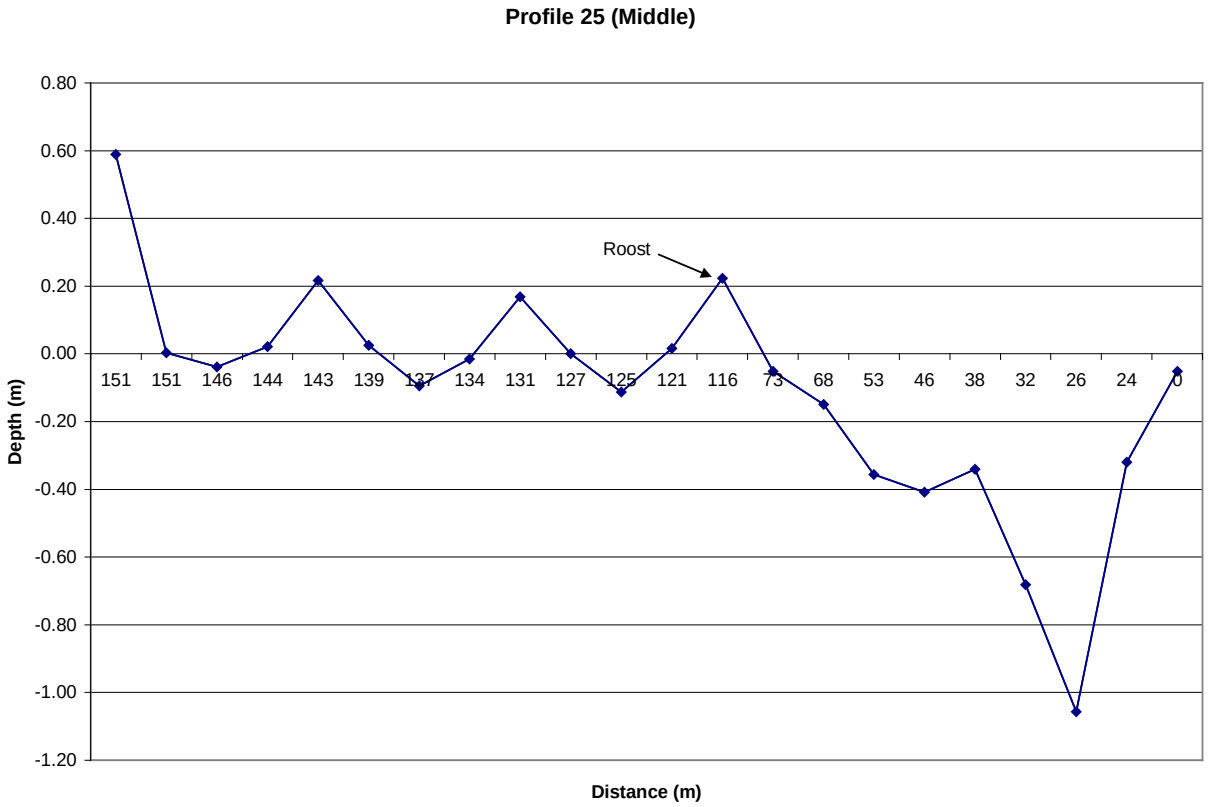


Figure 18. Roost channel profile for Use Site 16 (left to right bank).

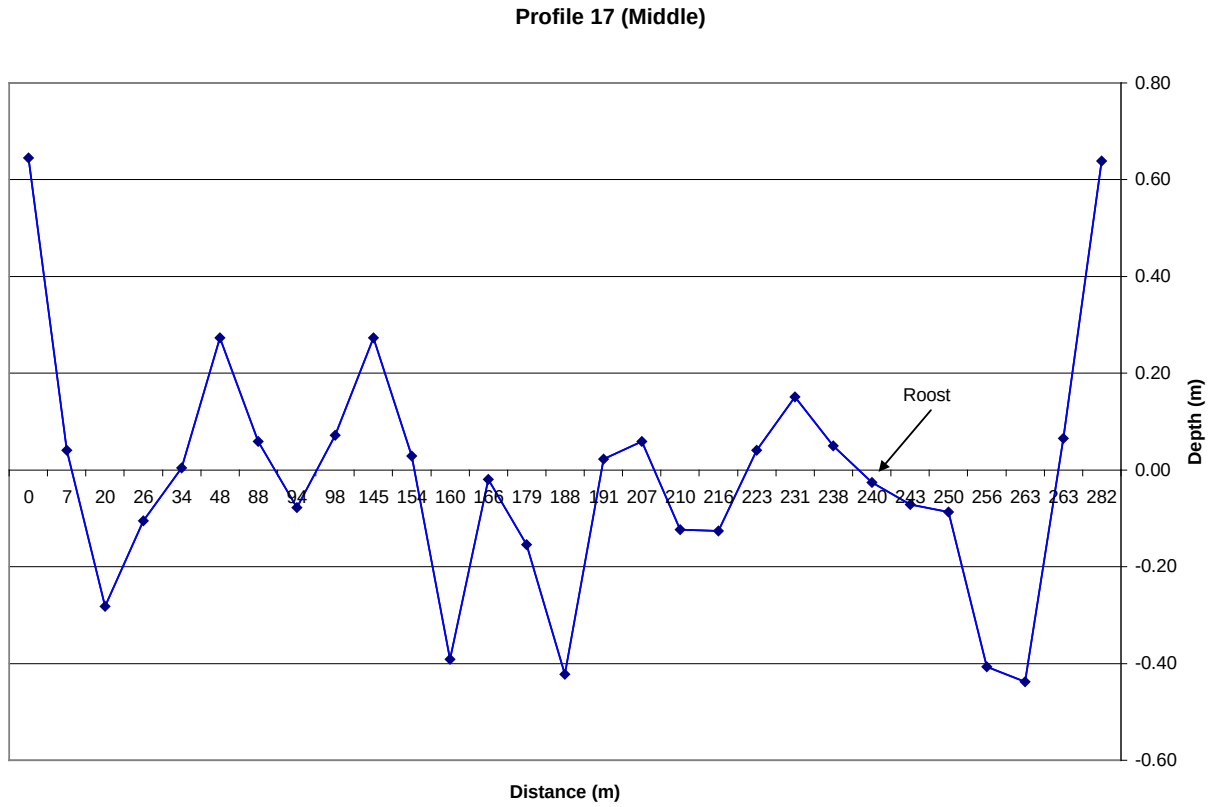


Figure 19. Roost channel profile for Use Site 17 (left to right bank).

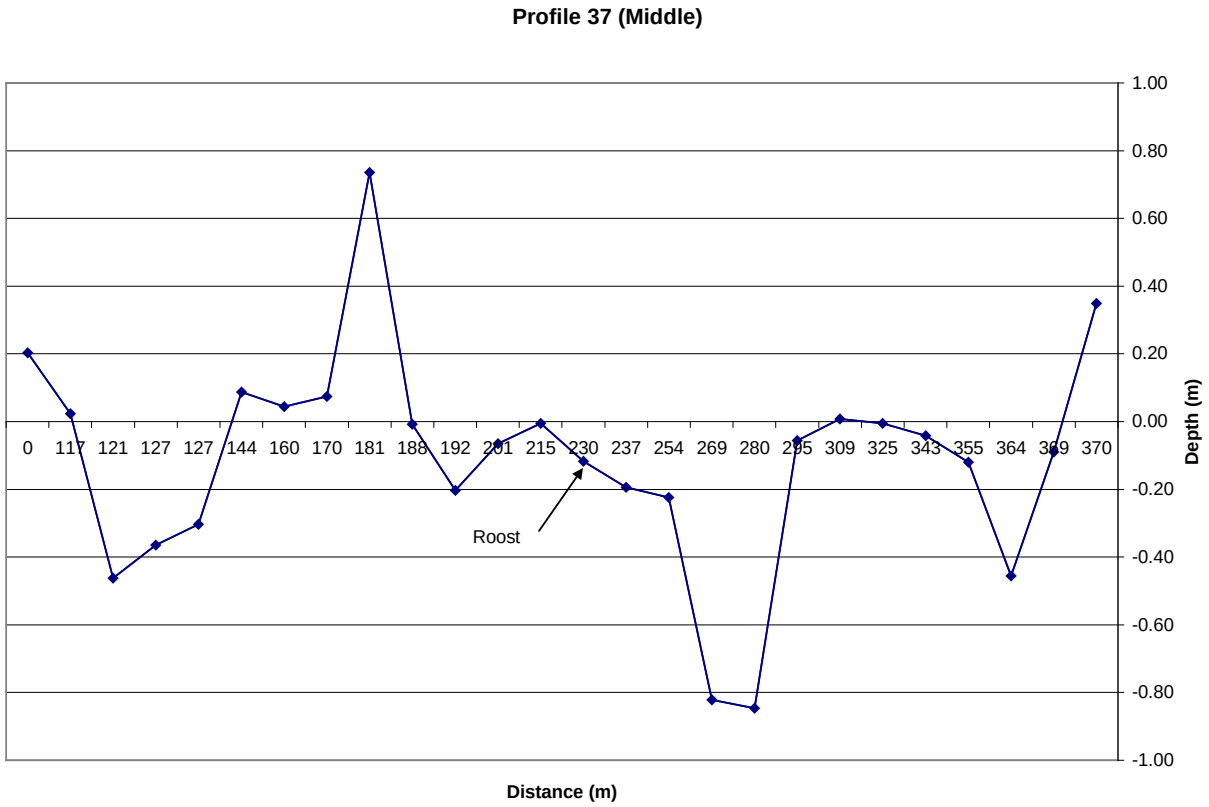


Figure 20. Roost channel profile for Use Site 18 (left to right bank).

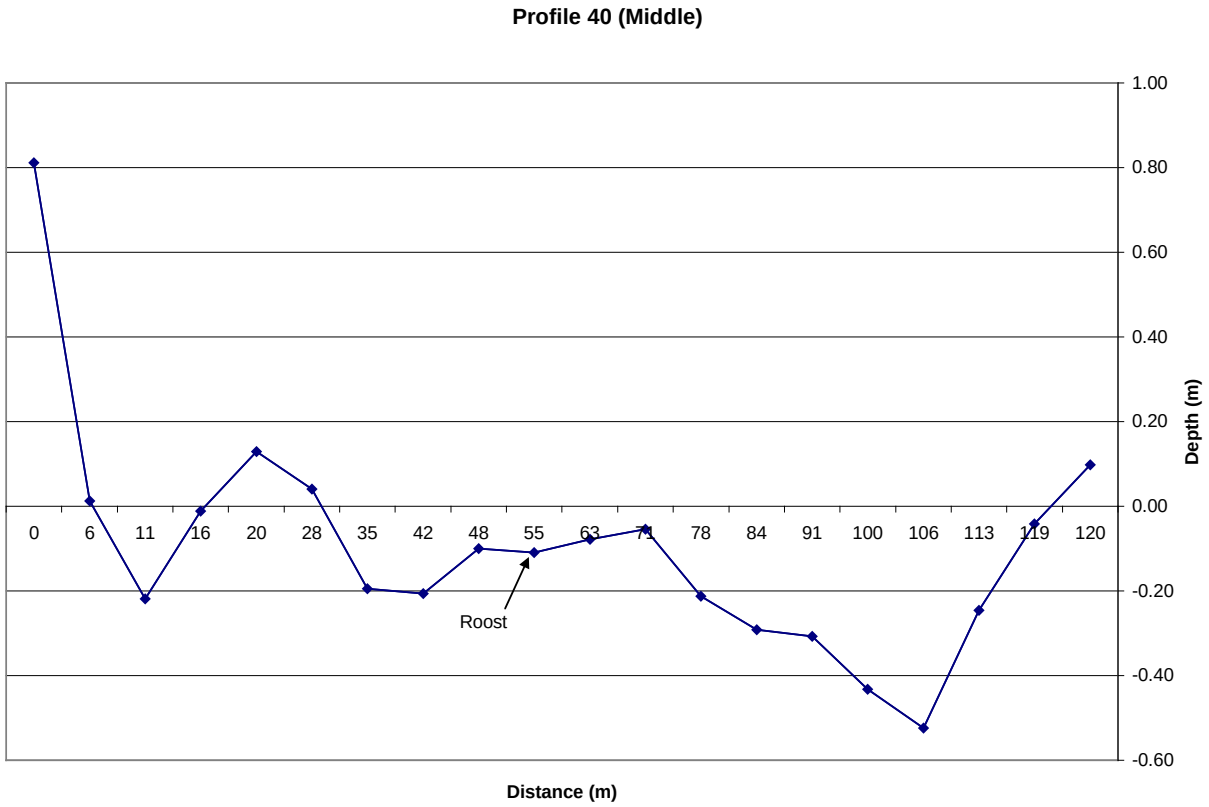


Figure 21. Roost channel profile for Use Site 19 (left to right bank).

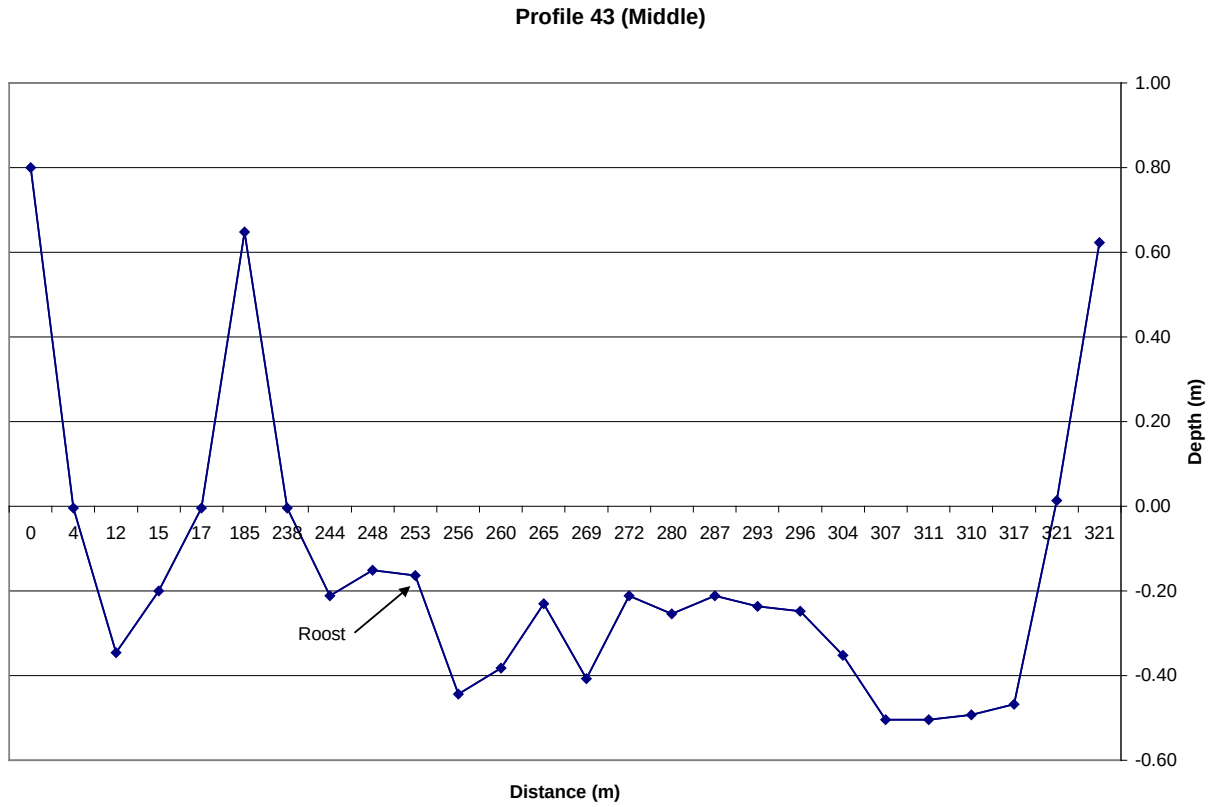


Figure 22. Roost channel profile for Use Site 20 (left to right bank).

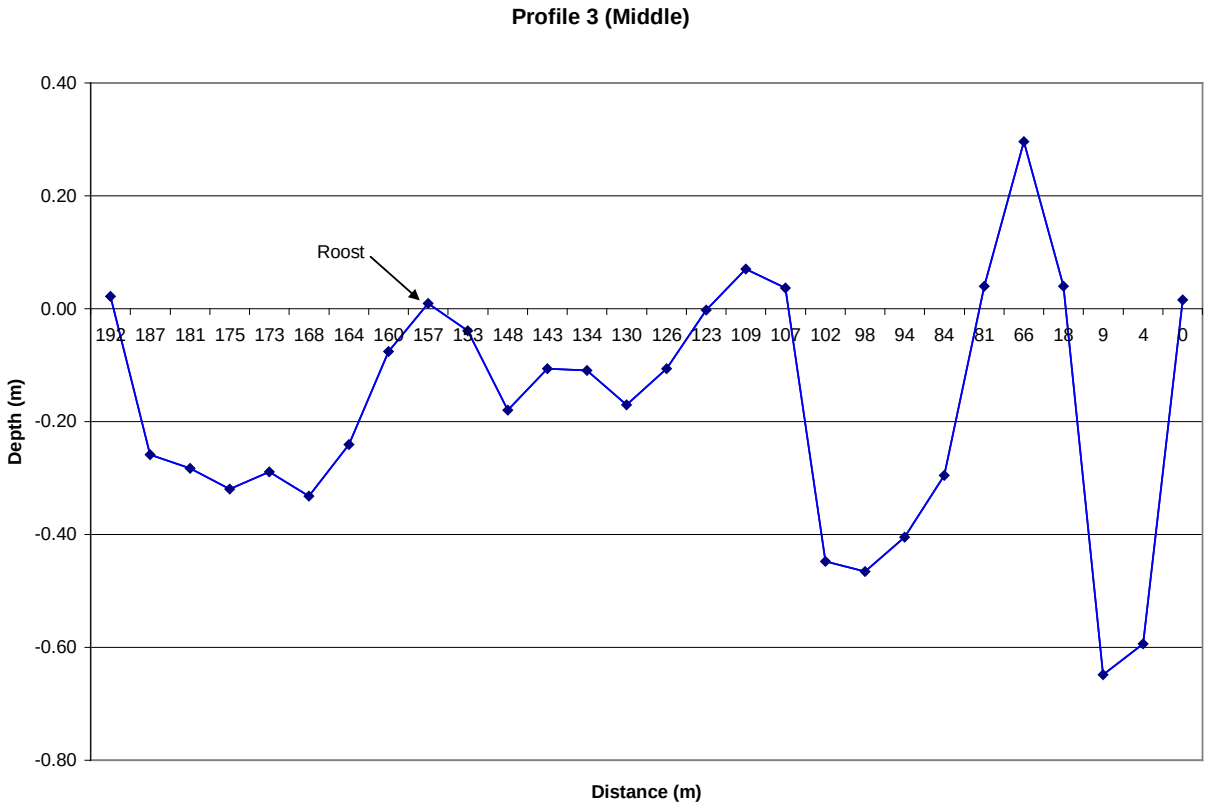


Figure 23. Partial albino Sandhill Cranes (twins above; single below).