

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

**Fall 2007**

**FINAL REPORT**

Prepared by

Gary Lingle



**ASSESSMENT IMPACT MONITORING  
ENVIRONMENTAL CONSULTANTS**

1568 L Road  
Minden NE 68959

14 December 2007

# **Implementation of the Whooping Crane Monitoring Protocol Fall 2007**

**Final Report Prepared by  
Gary R. Lingle**

**For  
Committee's of the  
Platte River Recovery Implementation Program**

**14 December 2007**

Assessment Impact Monitoring Environmental Consultants (AIM) was awarded a contract to assist the Governance Committee and Technical Advisory Committee in implementing monitoring associated with the *Platte River Recovery Implementation Program*. The specific task was to implement the protocol developed by the Technical Advisory 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 fall 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 eleven technicians and conducted field work from 9 October through 10 November 2007. 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 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 and increasing the ability to detect white birds. 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 sighting locations on the photo for later reference. Efforts were made to photograph Whooping Cranes while on the river from the air using digital cameras. However, ground observers did not approach the cranes on foot in order to obtain photographs of the roost location in order to avoid disturbance of the birds. 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. If the bird flew to another location, the observer made an effort to relocate the group. The search effort continued until the birds were found or 2 hours of search effort was made. 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. The USFW defined a Whooping Crane sighting 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 owned by the Program or 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. 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. Whooping Crane movements, behavior, and diurnal habitat use was recorded when possible. All monitoring activities followed USFWS guidelines. Martha Tacha, USFWS Coordinator for the Cooperative Whooping Crane Tracking Project, kept our team apprised of the latest sighting reports and census results from the wintering grounds on a regular basis. Tom Stehn, refuge manager of Aransas National Wildlife Refuge in Texas, conducted 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 received no reports of Whooping Cranes occurring in the study area from the public, Whooper Watch, or USFWS that were considered confirmed or probable.

### ***Aerial Survey.--***

#### **CONFIRMED WHOOPING CRANE SIGHTINGS-**

Of a possible 33 morning flights per leg, the West Leg completed 27 (82%) flights while the East Leg flew 29 (88%). Fog, low ceiling, precipitation, mechanical problems, and high

winds were factors in cancellations. We recorded 3 confirmed Whooping Crane sightings (Figures 1-3, Appendix A).

#### INDEX OF USE-

We completed 112 (85%) aerial survey transects out of a possible 132. Three Whooping Crane sightings were made on these transects. This resulted in an index of use (frequency of occurrence) of .02 sightings per transect. All of these sightings occurred on river transects.

#### OPPORTUNISTIC FLIGHTS-

Three Whooping Crane sightings were considered opportunistic during the regular aerial surveys. They were repeat observations of known groups. On November 1 at 7:43 CDT, a sighting was recorded while enroute to the starting point before the official survey began. On November 1 at 8:10 CDT and on November 2 at 8:20 CDT a sighting was recorded when the plane deviated from the return route to determine whether the Whooping Crane previously observed had departed from the river. No additional flights were deployed.

#### 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 Great Egrets or no finding.

#### *Searcher Efficiency Trials.—*

Whooping Crane decoys were placed at 15 locations between October 8-31 (Table 1). Decoy 3 and Decoy 10 were either washed away or vandalized prior to the detectability trial and therefore were omitted from calculations. The air observers detected a decoy at eight sites for an overall detectability rate of 62%. When broken down by strata, there was a 0% and 100% detectability rate for strata 0-3.5 and 0 respectively.

Table 1. Random locations of decoys for detectability trials.

Decoy ID	Strata	Date Placed	Detected?	Notes	Actual X	Actual Y
1	0	10/10/2007	yes		551162	4516489
2	0	10/25/2007	yes		516537	4505128
3	0	10/8/2007	no	decoy disappeared prior to trial.	471200	4503851
4	0	10/24/2007	yes		442378	4506419
5	0	10/24/2007	yes		448038	4504790
6	0	10/11/2007	yes		549073	4515294
7	0	10/23/2007	yes		462981	4503881
8	0	10/19/2007	yes		527663	4508293
9	0	10/15/2007	yes		507638	4501870
10	0	10/8/2007	no	decoy disappeared prior to trial.	472845	4503423
11	0-3.5	10/30/2007	no			
12	0-3.5	10/12/2007	no			
13	0-3.5	10/31/2007	no			
14	0-3.5	10/20/2007	no			
15	0-3.5	10/12/2007	no			

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

FLOW-

Streamflow measured at the USGS gauging stations located near Grand Island, Kearney, and Overton was generally below the median streamflow for each site during the survey (Figures 2-4). Median flows were exceeded when hydropower generation releases occurred. 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	232	285	397
Date	10/9 & 24	10/9	10/10
Maximum	1820	1810	1440
Date	10/20	10/20 & 27	10/22

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	Use Time	Measured Date	Discharge (cfs)	
				Use	Measured
1	10/29	7:53	10/31	461	321
2	11/1, 11/2	7:43, 7:49	11/8	532, 501	390

RIVERINE USE SITES-

We collected riverine channel profile data at 2 Whooping Crane use locations (Figures 5-6) and 10 decoy locations (data entered into Microsoft Access database). Three roost locations were recorded and these were lumped into 2 Use Sites due to their close proximity to one another (Figure 1). A total of 676 stations (3 readings at each station) from 36 transects 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  $-0.12 \pm 0.02$  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 %	Roost Depth
1	541344	4512828	220	307	282	155	20	80	-.13
2	540726	4512385	211	96	178	272	30	70	-.10

UNOBSTRUCTED WIDTH-

Table 5 depicts unobstructed width as measured at riverine use locations. The width was the average of the 3 river profiles measured at each Use Site.

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

Use Site ID	Mean Width	Standard Deviation
1	460	11.0
2	346	9.7

#### DIURNAL USE SITES-

Diurnal movements and activity data was collected when possible. We documented diurnal use locations in 3 sections during 3 days of observation (Figure 1, Appendix A). Whooping Cranes were observed within 3 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 5 (15%) of the 33 days of the survey. We documented the presence of 2 Whooping Crane groups; 1 contained 7 birds and 1 contained 3 birds for a total of 10 Whooping Cranes. A total of 23 crane-use days was recorded (Table 6).

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

Crane Group	Number of Cranes	Dates of Occurrence	# of days present	Crane-Use Days
2007FA01	7	October 28-29	2	14
2007FA02	3	October 31 – November 2	3	9
TOTAL	10			23

#### LAND-COVER CLASS-

Wetted Channel, Ag-Corn, and Ag-Soybeans were the cover-types Whooping Cranes were observed using during the day. Two (50 %) of the 4 diurnal locations were in Ag-Corn, 1 (25%) in Ag-Soybeans, and 1 (25%) in Wetted Channel. All of the nocturnal roost locations (100%) were in Wetted Channel.

#### ACTIVITY-

A total of 10.5 hours of continuous and instantaneous use (time budget) data of Whooping Cranes was collected by ground personnel during 3 days of observation. Only the juvenile Whooping Crane was monitored since it was the only individual that could be positively identified. This bird constituted the “focus” crane as per the protocol. All observations were in diurnal use locations. The breakdown of observation time in various habitats is depicted in Table 7. Most (57%) of the diurnal activity recorded occurred in wetted channels. Forty-two data points of activity (time budget) were recorded. Feeding (78%) was the most frequently observed activity followed alert (17%), preening (2%), and courtship (2%) (Table 8).



Table 7. Count of instant points by habitat.

Habitat	n	Hours	Percent
Ag-Corn	16	4	38
Ag-SoyBean	2	0.5	5
Wetted Channel	24	6	57
TOTAL	42	10.5	

Table 8. Whooping Crane activity by habitat.

Habitat	Activity	n	Total	pct
Ag-Corn	Alert	3	16	18.8
Ag-Corn	Feeding	12	16	75
Ag-Corn	Preening	1	16	6.2
Ag-SoyBean	Alert	2	2	100
Wetted Channel	Alert	2	24	8.3
Wetted Channel	Courtship	1	24	4.2
Wetted Channel	Feeding	21	24	87.5

***Search Effort.--***

Ground searches were initiated on 5 occasions. A total of 5.75 hours was expended in this effort and 218 miles were driven. Search duration extended from 0.25 to 3.2 hours (mean= 1.3 hours). Objects were located on 4 occasions (80%) and resulted in Whooping Cranes on 3 occasions (60%). All of the searches were initiated before noon and were terminated when the object was found or after 2 hours of 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 groups of Whooping Cranes present in the study area during the survey.

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

Program Crane ID (Prefix 2007FA)	Program Name	USFWS Crane ID	Dates of Occurrence	# of cranes
01	Alda group	07B-26	10/28-29	7
02, 03	Alda family	07B-35	10/31-11/2	3

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

The number of confirmed Whooping Crane sightings in Nebraska was 7 including those contained herein (Martha Tacha, personal communication). As of 4 December 2007, there were 46 confirmed sightings in the United States as follows: North Dakota- 10; South Dakota- 2; Nebraska-7; Kansas- 10; Oklahoma- 13; and Texas- 4. As of December 4, the Central Flyway flock was consisted of a record 266 whooping cranes, including an estimated 140 adults, 87 subadults, and 39 juveniles.

## **Discussion and Recommendations**

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.
- 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.
- Incorporate additional USFWS confirmed sightings of Whooping Cranes on the Platte River into this database so that it is all inclusive.

### ***Methods***

- 195 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 the likelihood of

observing Whooping Cranes on these transects is remote given the time of day the flights occur.

### **Fall 2007 Expenses**

The cost of the field implementation of this project was about \$41,360. Draft and Final Report preparation cost was estimated at \$10,229. The total cost of the Fall 2007 effort was about \$51,589.

### **List of Appendices**

Appendix A. Selected Photographs.

### **Supplements**

Original Data Sheets 74pp.

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

Figure 1. Whooping Crane Use Sites 1 & 2 (right to left) (blue) and diurnal use areas (yellow) in the vicinity of the Alda bridge.

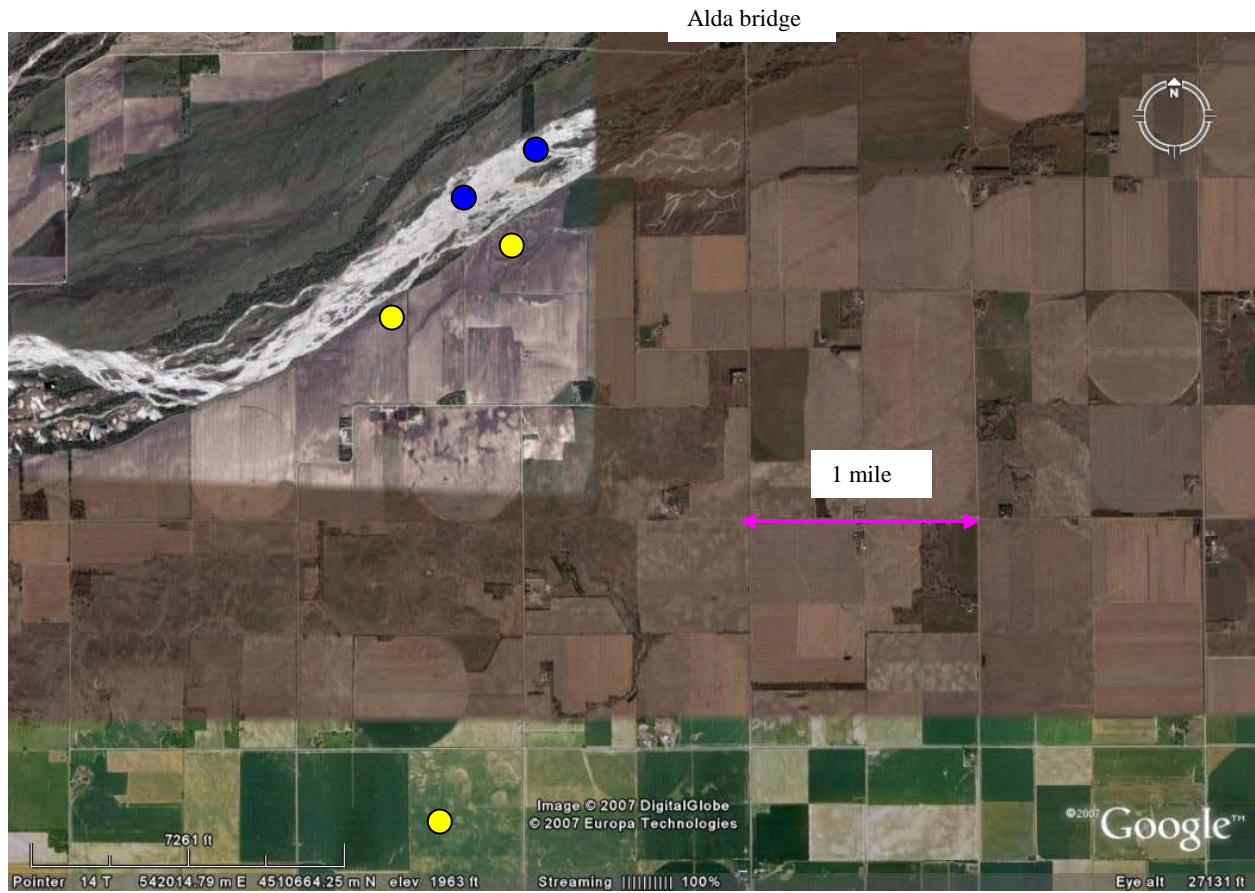


Figure 2. Platte River discharge (cfs) at Grand Island.

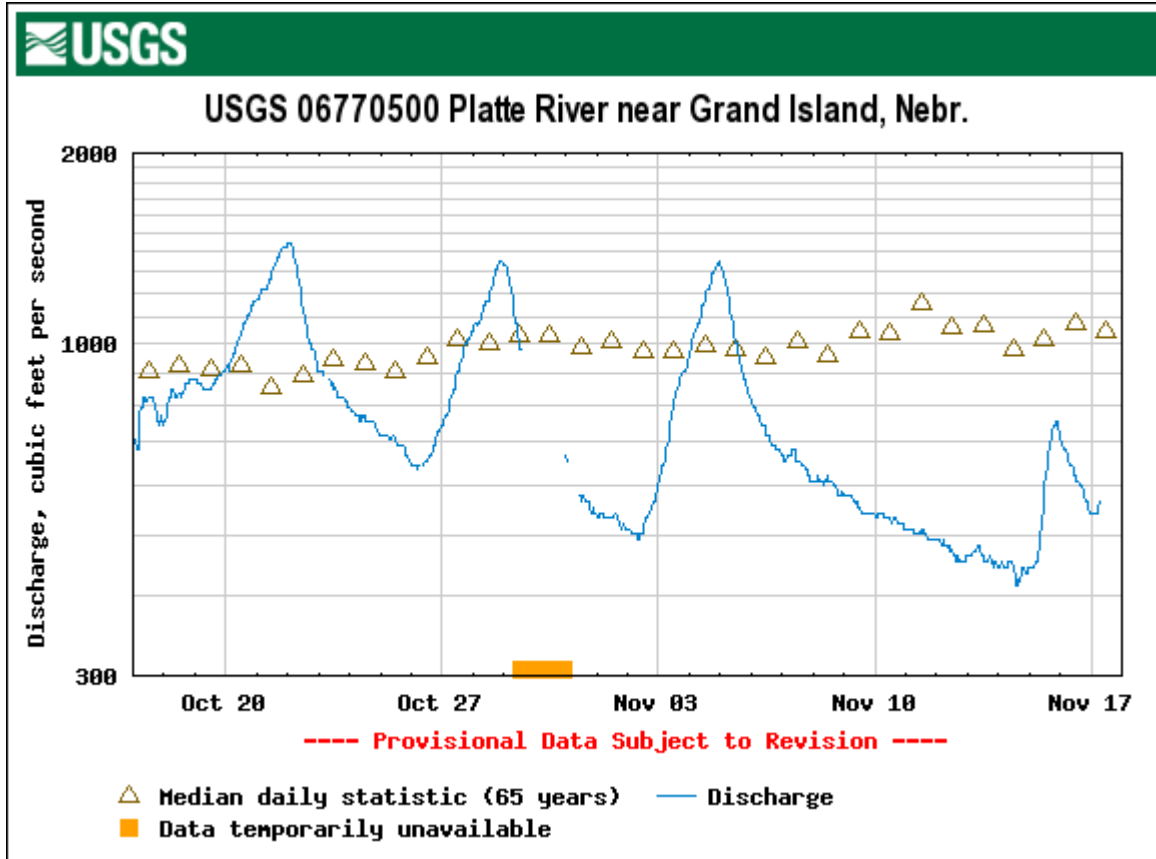


Figure 3. Platte River discharge (cfs) at Kearney.

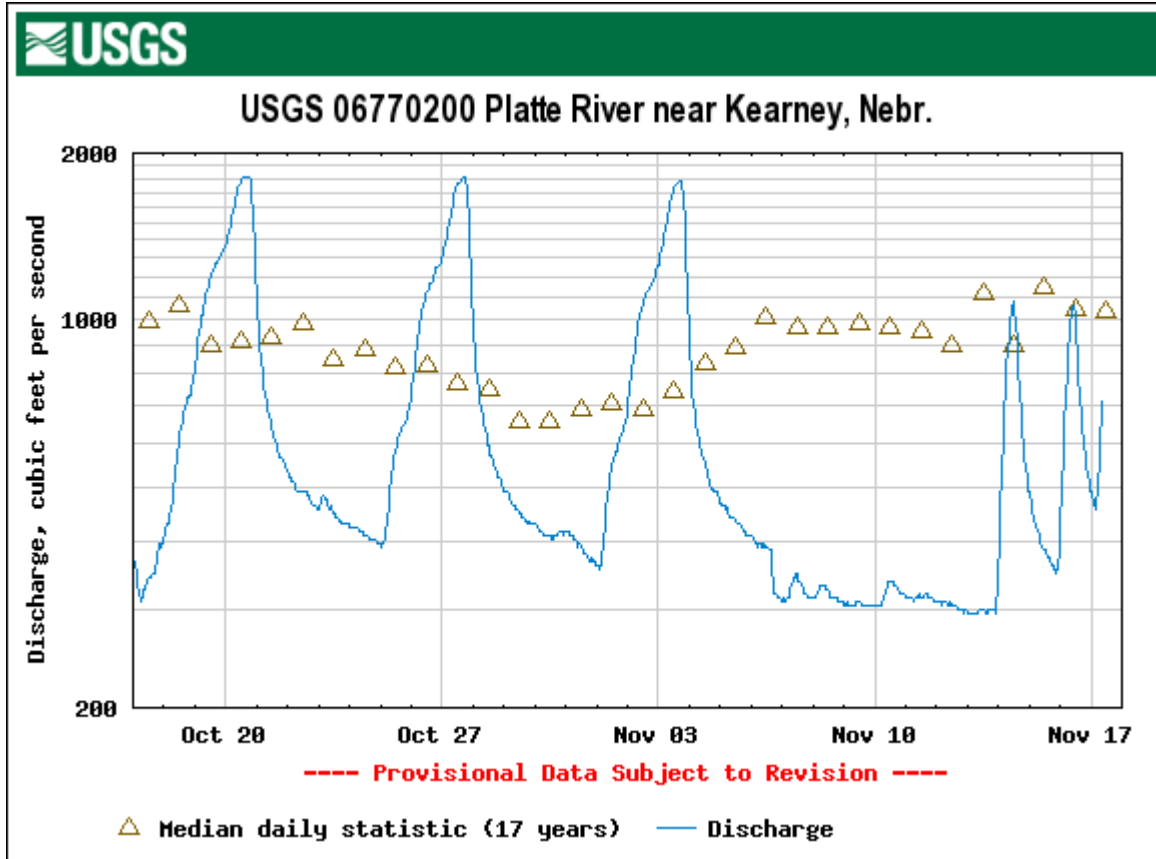


Figure 4. Platte River discharge (cfs) at Overton.

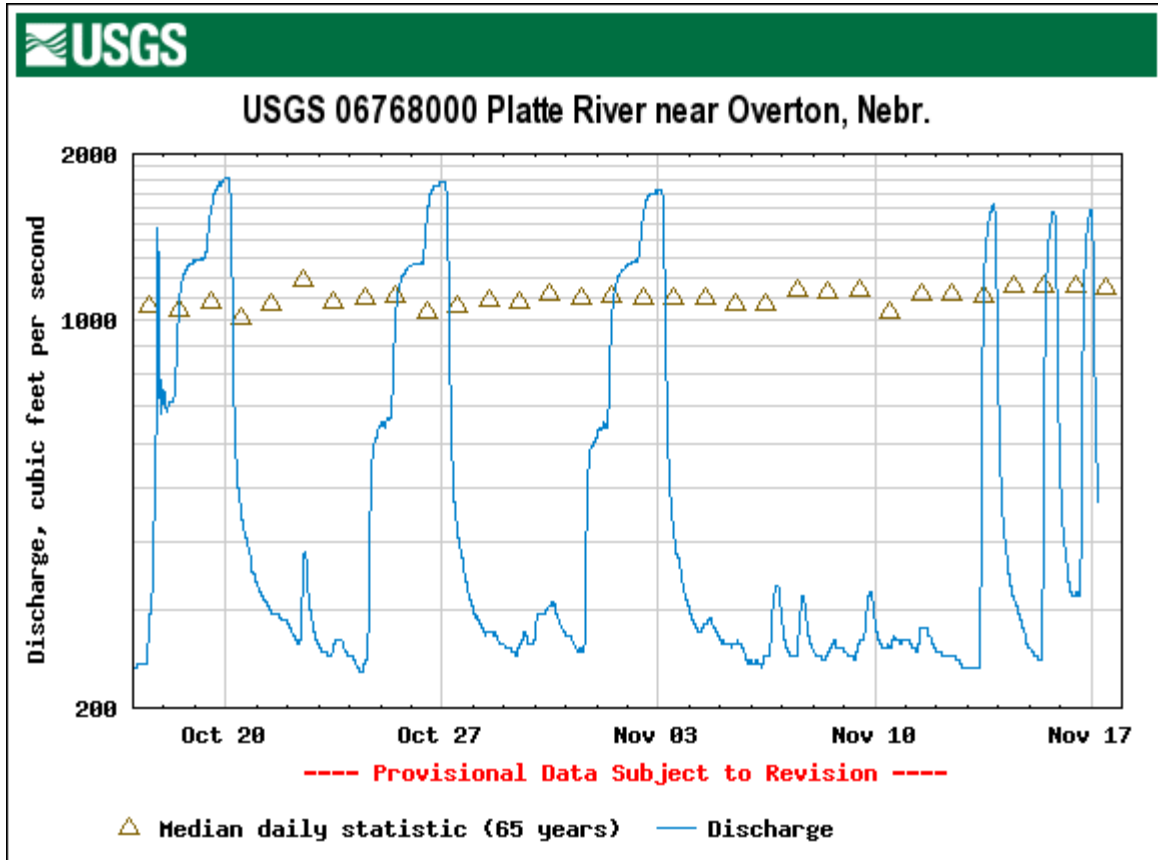


Figure 5. Roost channel profile for Use Site 1 (left to right bank).

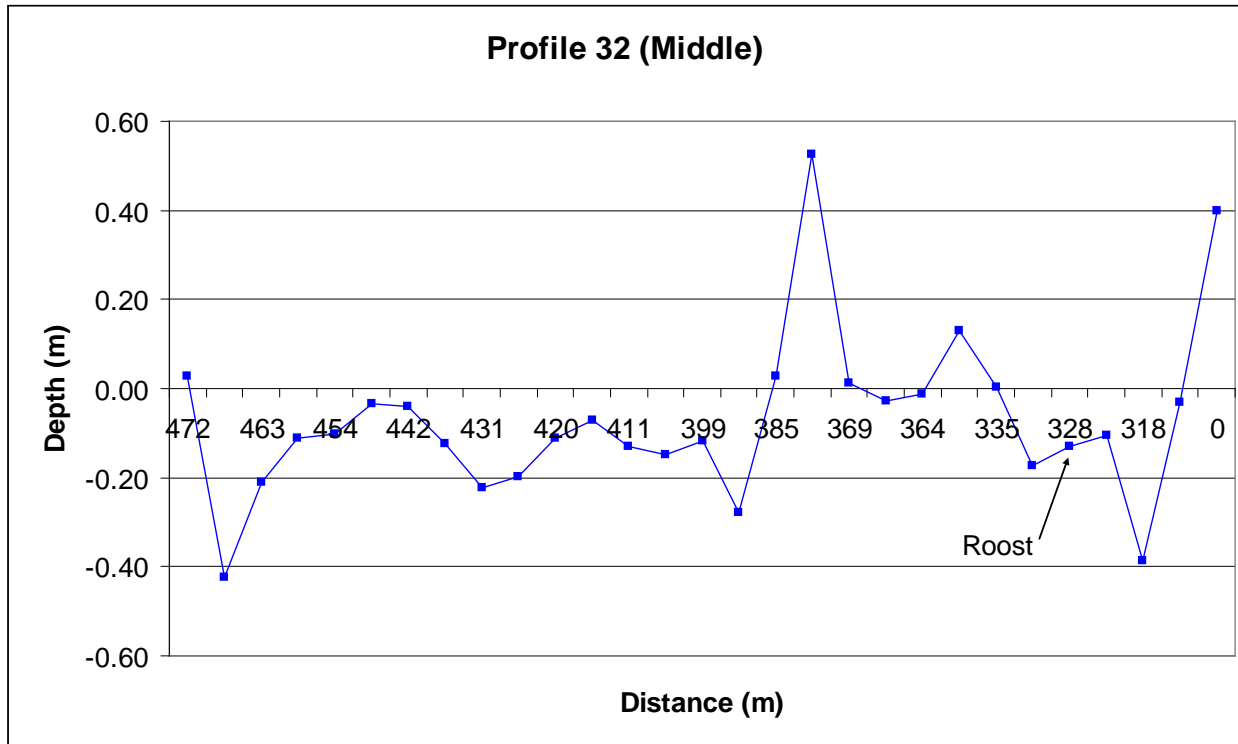




Figure 6. Roost channel profile for Use Site 2 (left to right bank).

