

**IMPLEMENTATION OF THE WHOOPING CRANE
MONITORING PROTOCOL
2017 FALL/WINTER – FINAL REPORT**



Prepared by

Dave Fehlhafer and
Brian Peterson

Ecological Solutions
203 W. Bartelt Ave
Doniphan, NE 68832

Date May 8, 2017

Implementation of the Whooping Crane Monitoring Protocol Fall 2017

**Prepared by
Ecological Solutions**

**For
The Committees of the
Platte River Recovery Implementation Program**

Date May 8 2018

Summary

The Ecological Solutions (ES) team conducted the whooping crane (WC) monitoring effort for the 2017 fall migration following the protocols detailed in the *Platte River Recovery Implementation Program – Whooping Crane Monitoring Protocol – rev. May 2015*.

In addition to the regular fall migration, which was scheduled from October 9th – November 15th, seven more days were added and classified as part of a winter migration, which ran through November 22nd, due to the continued presence of crane groups. The data in this report is separated into fall and winter migrations, as well as combined migrations to give a better overall picture of the findings. Surveys were conducted using systematic flight transects along the Platte River from Chapman to Lexington. Systematic and opportunistic sightings resulted in 23 individual whooping cranes observed within the transect boundaries during the 45-day survey period. Below includes survey methodology, results, and supporting data.

Equipment/Materials, Personnel, and Study Area

Two Cessna 172 aircrafts, crewed by a pilot and two observers, were used to make observations along predetermined flight transects. The pilot utilized a GPS unit to follow the pre-loaded route, as well as to mark any observed objects with a waypoint. The aerial observers utilized binoculars, a Canon EOS 6D camera equipped with a 24 x 105 mm lens, and mobile phones for communication.

Ecological Solutions documented information using data sheets provided by the Platte River Recovery Implementation Program (PRRIP) Executive Director's Office (EDO), which included aerial flight logs, aerial observations, ground search efforts, and use site monitoring logs.

The area of study ran from the Highway 283 Platte River bridge near Lexington, NE to the Platte River bridge near Chapman, NE and focused on the Platte River channels and the adjacent wetlands, ponds, and waterways extending 3.5 miles out on each side of the outermost

channels. The total length of the coverage area was approximately 90 miles and was divided into two routes, an east route and a west route. Any observations outside the study area were not included in the data.

Implementation and Methodology

Systematic aerial transects were flown daily, conditions permitting, at an air speed of approximately 100 miles per hour and at an altitude of approximately 750 feet unless conditions demanded higher altitudes. Two flights were initiated each morning, one from Grand Island (east route) and one from Kearney (west route). Planes were required to be at the transect starting points ½ hour before sunrise. Flights were typically completed in less than two hours. In the event of adverse weather, crews were required to wait up to two hours after sunrise for conditions to improve before cancelling the flight, that is unless the pilot cancelled the flight for the day prior to that using their best judgement. River transects were flown east to west and the plane was oriented south of the southern-most river channel to reduce the effect of sun glare. Each riverine transect had two daily alternating starting points. The alternating starting points were implemented to allow different sections of the study area to be observed as early as possible in the flight times.

The east route day one started at the Platte River bridge near Chapman (Chapman bridge) and followed the river transect (OSE) to the Highway 10 bridge (Minden bridge). The pilots would then follow the targeted Primary Wetland Return Transect (PWRTE) back to the Chapman bridge, turn and follow the targeted Secondary Wetland Return Transect (CSRT) to the Highway 34 bridge. For the east route day two, flights would start at the Platte River bridge near Wood River (Wood River bridge) and follow the OSE to the Minden bridge, then follow the PWRTE back to the Chapman bridge. Pilots would then follow the OSE to the Wood River bridge, then return on the Secondary Wetland Return Transect (WSRT) that stretched from HWY 10 near Wood River to the Highway 34 – Platte River bridge.

The west route day one started at the Minden bridge and followed the river transect (OSW) to the Highway 283 bridge (Lexington bridge). They would then follow the targeted Primary Wetland Return Transect (PWRTW) back to the Minden bridge. For the west route day two, flights would start at the Platte River bridge near Odessa (Odessa bridge) and follow the OSW to the Lexington bridge. They would turn and follow the PWRTW back to the Minden bridge and then return on the OSW to the Odessa bridge. Pilots would then follow the Secondary Wetland Return Transect (ESRT) from HWY 183 near Elm Creek to the HWY 40 near the Platte River bridge.

At the beginning of each transect and at turn around points, the aerial crews would relay their position via mobile phone to nearby ground crews so the ground crews could maintain a relatively close proximity. If an aerial crew spotted any potential whooping crane(s), they would take photos of the object(s) and the surrounding area to confirm the identity and location. If additional confirmation was needed, they would contact the nearest ground observer, who would then position themselves to make a positive identification of the object without disturbance. If the object was determined to be a whooping crane(s), personnel at the EDO as well as the U.S.

Fish and Wildlife Service (USFWS) would be immediately notified so they could take appropriate measures to minimize disturbance if needed. Otherwise, they were notified of results of surveys on a daily basis following the completion of both flights.

In addition to the systematic flights, the aerial and ground crews also confirmed opportunistic sightings. Immediately after receiving a report, depending on the situation, either a plane would be deployed from the airport and/or ground personnel would systematically survey the area until the cranes were located and confirmed or sufficient search time was allocated to confirm the cranes had left and/or were not present in the immediate area.

Using metrics developed by the EDO, in conjunction with a Geographic Information System (GIS), and facilitated by the in-flight photos and/or GPS waypoints, UTM coordinates were determined for each crane or crane group and recorded with the rest of the data.

All data was later translated from the completed data sheets to the program database via electronic form on a web-based server using Microsoft SharePoint software that was developed for PRRIP by Riverside Technology, Inc. It was then subjected to Quality Assurance/Quality Control (QA/QC) checks by Ecological Solutions to insure accuracy.





























Results

Confirmed Whooping Crane Sightings

A total of 23 unique whooping cranes were confirmed during the 45-day monitoring effort. Twenty-eight crane groups, comprised of 6 unique groups, were observed and each was given an individual crane group ID (e.g. 2017FA01 = date-season-number). A crane group consisted of any individual or group of whooping cranes observed once daily and would be re-counted as a new group and given a new crane group ID the next day if they were still in the area. Table 1 includes unique crane group ID icons, the dates of observation, the number of cranes in each group, crane group ID's, use site ID's (if available), whether the group was observed systematically or opportunistically, and total crane use days. All groups associated with a larger group, as well as the larger group itself were assigned the same color icon (e.g. – The 2:0 and 1:0 groups observed on 11/10 were also observed on 11/11 as a 3:0 group, so all were assigned a light blue/light blue icon). To facilitate cross-referencing, the crane group ID icons can be found in Tables 1, 2 and 3 as well as the collective crane group location maps in Figures 6 – 8 and the individual crane group location maps, shown along with a photo of each unique crane group, in Figures 9 – 26.

Of note, crane groups: 2017FA07 – 2017FA09, 2017FA13 – 2017FA17, and 2017WI01, 03, & 08 were ground observations only. Additionally, 2017FA04 (2:0) & 2017FA05 (1:0) were observed as a 2017FA08 3:0 crane group on 11/11, then a short time later were observed feeding with the 2017FA07 (7:0) group and were considered a 2017FA09 10:0 group. Although the 3:0 group was roosting alone on 11/12, they were observed with the 7:0 group from 11/13 to 11/15. It was assumed the 2017FA04 (2:0) group migrated on 11/15 leaving the 8:0 group which migrated on 11/21.

TABLE 1

	Unique Group ID	Obs. Dates	# of Cranes Adult:Juv	Group ID #	Use Site #	UTMx	UTMy	Flight Type	See Figure
FALL		11/2/17	2:0	2017FA01	1	468894	4503722	Systematic	9, 10
		11/8/17	4:2	2017FA02	2	471839	4503628	Systematic	11, 12
		11/9/17	4:2	2017FA03	2	471839	4503628	Systematic	11, 12
		11/10/17	2:0	2017FA04	3	451583	4503050	Systematic	13, 14
		11/10/17	1:0	2017FA05	4	451982	4503085	Systematic	15, 16
		11/10/17	4:2	2017FA06	5	473314	4503315	Systematic	11, 12
		¹ 11/10/17	7:0	2017FA07	Corn/ag	454060	4501995	Opp/ground	17, 18
		¹ 11/11/17	3:0	2017FA08	Corn/ag	451613	4502671	Opp/ground	19, 20
		¹ 11/11/17	10:0	2017FA09	Corn/ag	451494	4502835	Opp/ground	21, 22
		11/12/17	4:2	2017FA10	6	471627	4503710	Systematic	11, 12
		11/12/17	5:0	2017FA11	7	460675	4503948	Systematic	23,24
		11/12/17	3:0	2017FA12	8	453411	4503618	Systematic	19, 20
		¹ 11/13/17	4:2	2017FA13	Corn/ag	470448	4501856	Opp/ground	11, 12
		¹ 11/13/17	10:0	2017FA14	Corn/ag	451520	4502622	Opp/ground	21, 22
		¹ 11/14/17	4:2	2017FA15	Corn/ag	470812	4501932	Opp/ground	11, 12
		¹ 11/14/17	5:0	2017FA16	Corn/ag	461956	4502158	Opp/ground	23,24
		¹ 11/14/17	10:0	2017FA17	Corn/ag	451520	4502622	Opp/ground	21, 22
		11/15/17	4:2	2017FA18	9	470971	4503996	Systematic	11, 12
		11/15/17	5:0	2017FA19	10	461047	4503917	Systematic	23,24
		11/15/17	10:0	2017FA20	11	452652	4503326	Systematic	21, 22
	Crane use days		138						
WINTER		¹ 11/16/17	4:2	2017WI01	Corn/ag	470373	4501717	Opp/ground	11, 12
		11/16/17	8:0	2017WI02	1	453337	4503529	Systematic	25, 26
		¹ 11/17/17	8:0	2017WI03	Corn/ag	451519	4502704	Opp/ground	25, 26
		11/18/17	4:2	2017WI04	2	471839	4503628	Systematic	11, 12
		11/18/17	8:0	2017WI05	Corn/ag	451657	4502811	Systematic	25, 26
		11/19/17	8:0	2017WI06	3	451384	4503166	Systematic	25, 26
		11/20/17	8:0	2017WI07	4	452792	4503526	Systematic	25, 26
		¹ 11/21/17	8:0	2017WI08	Corn/ag	451757	4502625	Opp/ground	25, 26
	Crane Use Days		60						
	Total Crane Use Days		198						

¹Spotted by the ground crew only

Crane use days were calculated by multiplying the number of individual cranes in each group by the number of days the group was observed plus one day, as each group was assumed to have been present the evening prior to the morning of first observation. This resulted in a total

of 198 crane use days during the fall/winter survey. Whooping cranes were observed on 15 of the 45 days of the survey effort (33.3% of the days; Table 1).

According to the surveys conducted by the U.S. Fish and Wildlife Service in the winter of 2017 – 2018, the Aransas – Wood Buffalo migratory whooping crane population was estimated to be 505 birds (See the following web link for source). The 23 individuals observed by this monitoring effort constitutes approximately 4.55% of the migratory population using the Platte River survey area during the fall/winter migration.

<https://www.fws.gov/uploadedFiles/WHCR%20Update%20Winter%202017-2018.pdf>

Observed whooping crane use of the Great Bend region of the Platte River during fall systematic surveys of the associated habitat reach for the PRRIP has increased, but not significantly ($P=0.20$) since the initiation of monitoring efforts in 2001 (Figure 1).

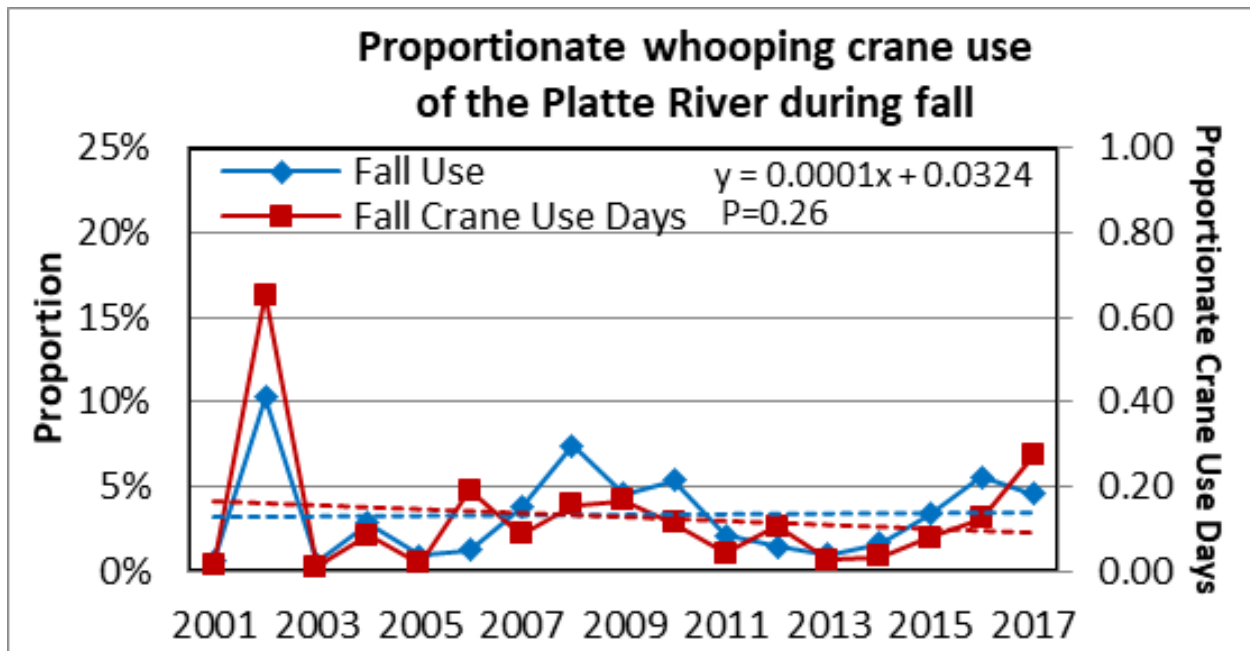


















Figure 1. Observed use of the central Platte River during fall migration seasons, 2001-2017.

Streamflow and Unobstructed Channel Width at Whooping Crane Use Locations

According to USGS streamflow data, the Platte River streamflow was at or above the median daily levels (75 years at Overton, 15 years at Cottonwood, and 9 years at Kearney, 76 years at Grand Island) on 14 instances during the survey period (Figures 2-5). The discharge rates used in Table 2 were obtained from the USGS gauging station nearest in location and time of measurement to each associated crane group and its time of observation. The discharge ranged from a high of 2,140 cubic feet per second (cfs) at Grand Island on 10/09 to a low of 170 cfs at Cottonwood on 11/10, during the survey period. At the specific crane group observation times,








streamflow ranged from 299 cfs – 666 cfs. Table 3 includes unobstructed channel width, as measured in GIS, at each in-channel use location.









TABLE 2

Stream flow conditions at Crane Use Sites						
Unique group ID	Date	Gauging Station	Discharge (cfs)	Crane Group ID	Use site #	# of cranes Adults:Juv
	11/2/17	Cottonwood	373	2017FA01	1	2:0
	11/8/17	Cottonwood	381	2017FA02	2	4:2
	11/9/17	Cottonwood	305	2017FA03	2	4:2
	11/10/17	Cottonwood	299	2017FA06	5	4:2
	11/12/17	Cottonwood	578	2017FA10	6	4:2
	11/15/17	Cottonwood	368	2017FA18	9	4:2
	*11/18/17	Cottonwood	666	2017WI04	WI02	4:2
	11/10/17	Overton	333	2017FA04	3	2:0
	11/10/17	Overton	333	2017FA05	4	1:0
	11/12//17	Overton	599	2017FA12	8	3:0
	11/12/17	Overton	599	2017FA11	7	5:0
	11/15/17	Overton	585	2017FA19	10	5:0
	11/15/17	Overton	585	2017FA20	11	10:0
	*11/16/17	Overton	645	2017WI02	WI01	8:0
	*11/19/17	Overton	576	2017WI06	WI03	8:0
	*11/20/17	Overton	535	2017WI07	WI04	8:0

*Winter use sites have been appended with WI to differentiate from same numbered fall season use sites.

TABLE 3

Unique group ID	Group ID #	Use Site #	UTMx	UTMy	Unobstructed Channel Width (ft)
	2017FA01	1	468894	4503722	1,328
	2017FA02 & 03	2	471839	4503628	810
	2017FA06	5	473314	4503315	773
	2017FA10	6	471627	4503710	982
	2017FA18	9	470971	4503996	868
	*2017WI04	WI02	471839	4503628	834
	2017FA04	3	451583	4503050	343
Continued on next page					
Continued from previous page					
Unique group icon	Group ID #	Use Site #	UTMx	UTMy	Unobstructed Channel Width (ft)

	2017FA05	4	451982	4503085	369
	2017FA12	8	453411	4503618	739
	2017FA11	7	460675	4503948	681
	2017FA19	10	461047	4503917	715
	2017FA20	11	452652	4503326	756
	*2017WI02	WI01	453337	4503529	649
	*2017WI06	WI03	451384	4503166	338
	*2017FA07	WI04	452792	4503526	577

*Winter use sites have been appended with WI to differentiate from same numbered fall season use sites.

Figure 2

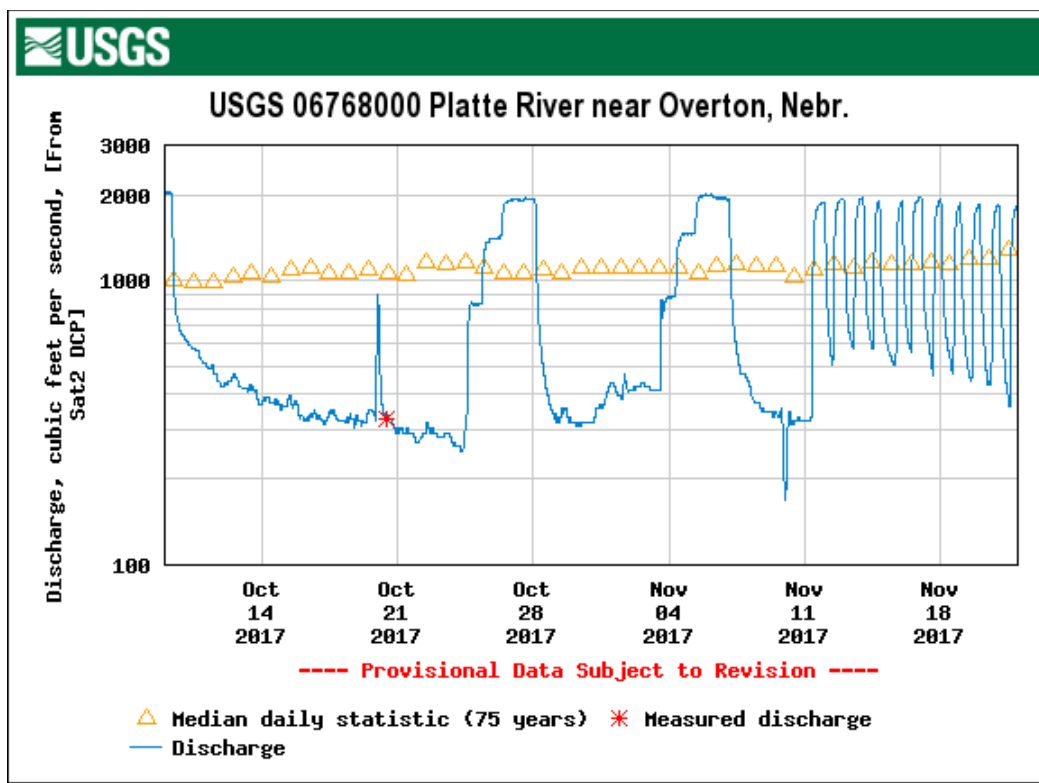


Figure 3

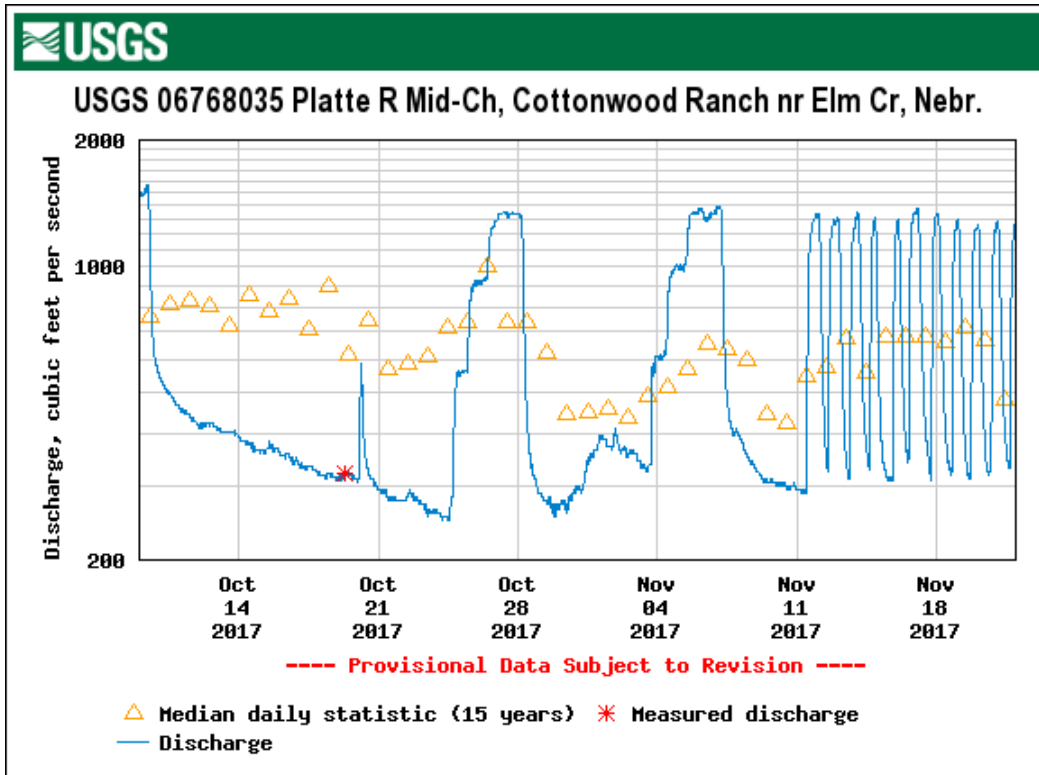


Figure 4

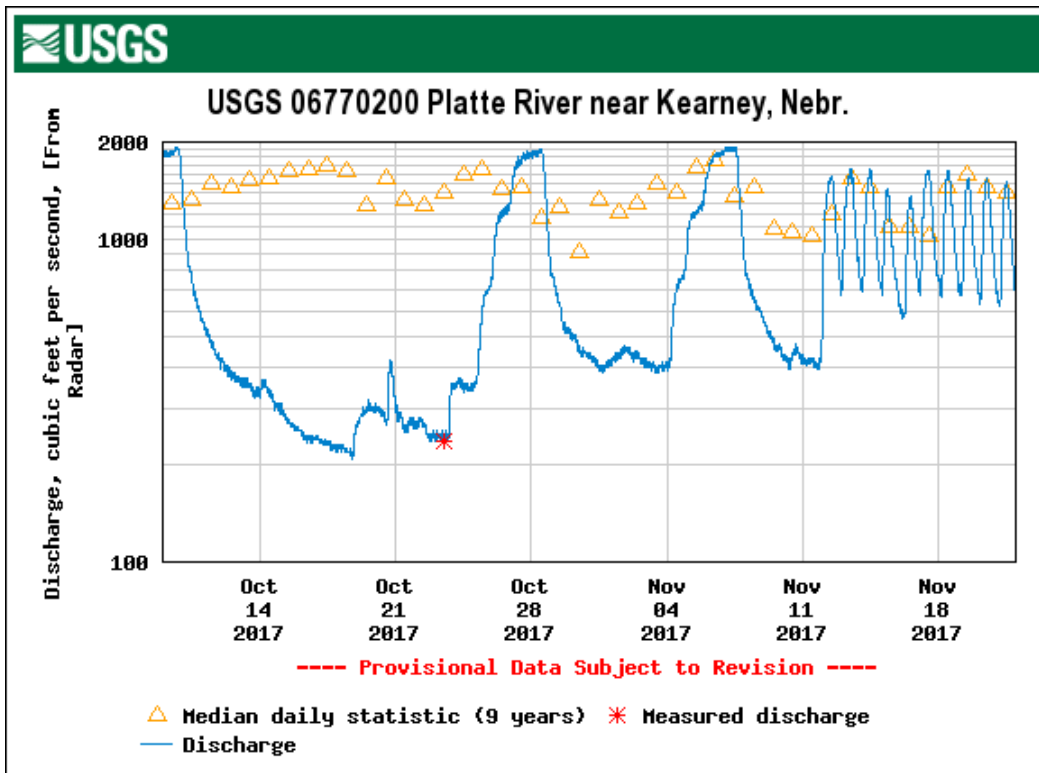
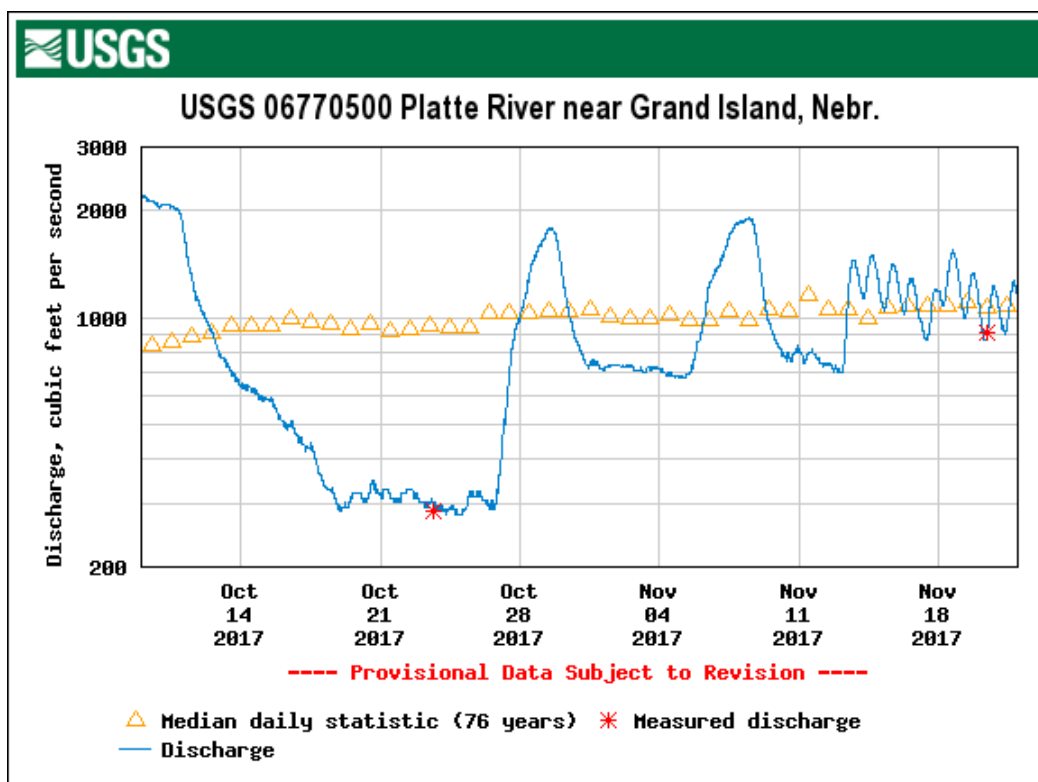


Figure 5



USFWS/PRRIP Data Comparison

Table 4 compares the USFWS WC sighting data (provided by Matt Rabbe – USFWS whooping crane lead) to the PRRIP WC survey effort. Included are the date(s) the group was observed, the number of individuals in the group and each agency’s identification numbers assigned to the respective groups.

There is a difference in dates in Table 4 compared to Table 1 due to the USFWS data which operates on a “initial sighting” basis of identification, whereas PRRIP assigns a new crane group identification number each day observed. There were 3 crane groups that were not observed by ES or EDO staff on some of the dates within the time period the USFWS data indicates they were present. On these dates, they were either reported directly to USFWS from other sources or assumed to be the same group seen on previous date/s and are as follows: USFWS group 17B-52 on 11/11 & 17; 17B-55 on 11/12; and 17B-58 on 11/10, 11, & 13.

The assumption that USFWS groups 17B-55, 17B-56 & 17B-57 joined on varying dates is reflected in the repetition of PRRIP ID #'s assigned to those USFWS groups. To highlight these, on 11/11 USFWS groups 17B-56 & 17B-57 joined forming PRRIP group 2017FA08 and on the same date joined with USFWS group 17B-55 forming PRRIP group 2017FA09. Then on 11/12 only USFWS groups 17B-56 & 17B-57 were observed together and assigned PRRIP ID # 2017FA12. Thereafter, all three aforementioned USFWS groups were observed together and were assigned the corresponding PRRIP ID #'s noted in Table 4 until their respective departures.

TABLE 4

USFWS/PRRIP Data Comparison			
Date	# of WC Ad:Juv	USFWS ID #	PRRIP Group ID #s
11/2	2:0	17B-32	2017FA01
11/8 – 11/18	4:2	17B-52	2017FA02, 03, 06, 10, 13, 15, 18 & 2017WI01, 04
11/10 – 11/21	7:0	17B-55	2017FA07, 09, 14, 17, 20 & 2017WI02, 03, 05-08
11/10 – 11/15	2:0	17B-56	2017FA04, 08, 12, 14, 17, 20
11/10 – 11/21	1:0	17B-57	2017FA05, 08, 12, 14, 17, 20 & 2017WI02, 03, 05-08
11/10 – 11/15	5:0	17B-58	2017FA11, 16, 19

Ground Search Effort and Opportunistic Observations

There were 23 instances where ground crews either independently observed a WC group or they conducted a search to verify either a public sighting or a white object spotted by aerial crews within the survey area during the 45-day monitoring effort. In Table 5, the “miles driven” column indicates the total miles driven in the effort to locate the crane group, starting from the location of the last reported sighting or known location based on previous days’ observations, then continuing until the crane group or white object is located and identified or a reasonable amount of effort has been put forth. Twenty of these were opportunistic ground observations resulting in crane groups 2017FA03, 2017FA06 – 09, 2017FA13 – 20, 2017WI01 - 03, 2017WI05, 2017WI06, & 2017WI08. Nineteen unique crane groups were observed and 2017FA07 was independently observed on the same date by two ground crews, bringing the total observations to twenty. On 11/11 the 3:0 crane group was initially observed by the ground crew then we received a report from the public on a 10:0 crane group in the same area, which was confirmed by the ground crew. It was assumed the 7:0 crane group joined the 3:0 crane group, as they were observed together on 11/13 & 11/15 and no other 3:0 crane groups were reported in the valley following the first sighting. The remaining three ground searches resulted in no whooping crane observations.

TABLE 5

GROUND SEARCH EFFORT/OPP. SIGHTINGS				
Date	Source	WC Confirmed Ad:Juv	Miles Driven	Aerial, Ground Effort
11/09	Air crew	4:2	3	Both
11/10	Known	4:2	0	Both
11/10	Public	7:0	10	Ground
11/10	Public	7:0	0	Ground
11/11	Known	3:0	0	Ground
11/11	Public	10:0	0	Ground
11/13	Known	4:2	3	Ground
11/13	Known	10:0	0	Ground
11/13	Known	None	17	Ground
11/13	Known	None	10	Ground
11/14	Known	4:2	3	Ground
11/14	Known	5:0	5	Ground
11/15	Known	4:2	3	Both
11/15	Known	10:0	0	Both
11/15	Known	5:0	0	Both
11/16	Known	4:2	1	Ground
11/16	Known	8:0	0	Both
11/17	Known	8:0	0	Ground
11/18	Known	8:0	0	Both
11/19	Known	8:0	0	Both
11/21	Known	8:0	0	Ground
11/22	Known	None	10	Both

Incidental Take

The USFWS requests information and documentation of any human activity that occurred in the proximity of Whooping Cranes that could constitute “take” as defined by the Endangered Species Act i.e. “...to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or attempt to engage in any such conduct”. Because harassment interrupts essential feeding or sheltering behaviors, the definition includes disturbance of Whooping Cranes sufficient to result in cranes taking flight.

LETHAL OR CRIPPLING TAKE

There were no observations of crippling or lethal take of Whooping Cranes this season as a result of the monitoring conducted by ES.

HARASSMENT

Ecological Solutions staff did not observe or engage in any activity that could be construed as harassment as defined by USFWS.

PUBLIC DISTURBANCE

Ecological Solutions staff did not observe any incident of public disturbance of whooping cranes.

Observation Efficiency Trials

Twenty-five whooping crane decoys were randomly placed by PRRIP personnel along the aerial transects. Flight crews spotted 9 in the wetted channel (90.0%), 1 in the corn/ag (20.0%), 0 in lowland grassland (0.0%), and 2 in the open water pit/pond/lake (60.0%), for an overall spotting efficiency of 48.0% (Table 6).

TABLE 6

Decoys

Decoy	Date Placed	Date Tested	UTMx	UTMy	Type	Detected
1	10/06/17	10/09/17	496787	4500569	Wetted channel	YES
2	10/11/17	10/12/17	534413	4510578	Wetted channel	YES
3	10/11/17	10/12/17	550391	4515874	Wetted channel	YES
4	10/11/17	10/12/17	463087	4503392	Wetted channel	YES
5	10/12/17	10/13/17	509582	4502260	Wetted channel	YES
6	10/16/17	10/17/17	496152	4501181	Wetted channel	YES
7	10/17/17	10/18/17	502302	4501302	Wetted channel	YES
8	10/19/17	10/20/17	534645	4510980	Wetted channel	YES
9	10/19/17	10/20/17	499232	4501016	Wetted channel	YES
10	11/01/17	11/02/17	535170	4511807	Wetted channel	NO
11	11/02/17	11/03/17	456162	4505727	Ag - corn	NO
12	11/02/16	11/03/16	442317	4502787	Ag - corn	NO
13	11/08/17	11/09/17	522793	4506256	Ag - corn	NO
14	11/10/17	11/12/17	571191	4534596	Ag - corn	YES
15	11/13/17	11/15/17	452337	4501841	Ag - corn	NO
16	10/17/17	10/18/17	539086	4512492	Grassland-lowland	NO
17	11/01/17	11/02/17	459523	4502681	Grassland-lowland	NO
18	11/02/17	11/03/17	476689	4503353	Grassland-lowland	NO
19	11/08/17	11/09/17	550729	4516975	Grassland-lowland	NO
20	11/01/17	11/02/17	522167	4506720	Grassland-lowland	NO
21	10/24/17	10/25/17	559307	4515882	Open water pit/pond/lake	NO
22	10/07/17	10/08/17	472331	4502117	Open water pit/pond/lake	YES
23	11/08/17	11/09/17	458994	4501071	Open water pit/pond/lake	YES
24	11/09/17	11/10/17	566814	4530981	Open water pit/pond/lake	NO
25	11/09/17	11/10/17	546933	4511387	Open water pit/pond/lake	NO

Flight Statistics and Sighting Frequency

There was a total of 86 flights (45 West, 41 East), of which 61 were completed, which resulted in an overall completion of 70.9% (Table 7). Twenty-five flights were cancelled or incomplete due to inclement weather.

TABLE 7

	EAST			WEST			OVERALL TOTAL
	FALL	WINTER	TOTAL	FALL	WINTER	TOTAL	
COMPLETED	26	2	28	28	5	33	61
CANCELLED/INCOMP.	12	1	13	10	2	12	25
SEASON TOTAL	38	3	41	38	7	45	86
% COMPLETED	68.4%	66.6%	68.3%	73.7%	71.4%	73.3%	70.9%

FLIGHT RESULTS

A total of 235 individual systematic transects were flown throughout the survey period. During this time, 17 whooping crane groups were observed from the air while conducting systematic flights for an overall sighting per transect frequency of 7.2% (Table 8). Of note, crane groups 2017FA07 – 09, 2017FA13 – 17, 2017WI01, 2017WI03, & 2017WI08 were observed by ground crews only, so were not included on this chart. No crane groups were observed during opportunistic flights.

TABLE 8**SIGHTING FREQUENCY/TRANSECT**

	TRANSECTS			# WC Groups ¹	FREQUENCY	
	COMPLETED	CANCELLED	TOTAL			
FALL	OSE, OSW ²	57	19	76	11	14.4%
	PWRTE, PWRTW ³	57	19	76	1	1.3%
	WSRT/CSRT, ESRT ⁴	38	19	57	0	0.0%
WINTER	OSE/OSW	7	3	10	4	40%
	PWRTE/PWRTW	7	3	10	1	10%
	WSRT/CSRT, ESRT	3	3	6	0	0.0%
OVERALL	OSE, OSW	64	22	86	15	17.4%
	PWRTE, PWRTW	64	22	86	2	2.3%
	WSRT/CSRT, ESRT	41	22	63	0	0.0%
TOTALS		169	66	235	17	7.2%

¹These groups may or may not consist of crane(s) observed on previous days. See crane group ID designation on page 4 under “Confirmed Whooping Crane Sightings”.

²Primary Transect (Riverine), (East – OSE, West – OSW)

³Primary Return transect, (East – PWRTE, West – PWRTW)

⁴Secondary Return transect, (East – WSRT and CSRT, West – ESRT)

Supplements

QA/QC of database was performed by ES

Original datasheets – Retained at PRRIP

FIGURE 6. Observed whooping crane locations. 1 of 3 collective crane group maps. See Table 1 for color coding and details. Round icons indicate roost sites and pin drops indicate off-channel locations.



FIGURE 7. Observed whooping crane locations. 2 of 3 collective crane group maps. See Table 1 for color coding and details. Round icons indicate roost sites and pin drops indicate off-channel locations.

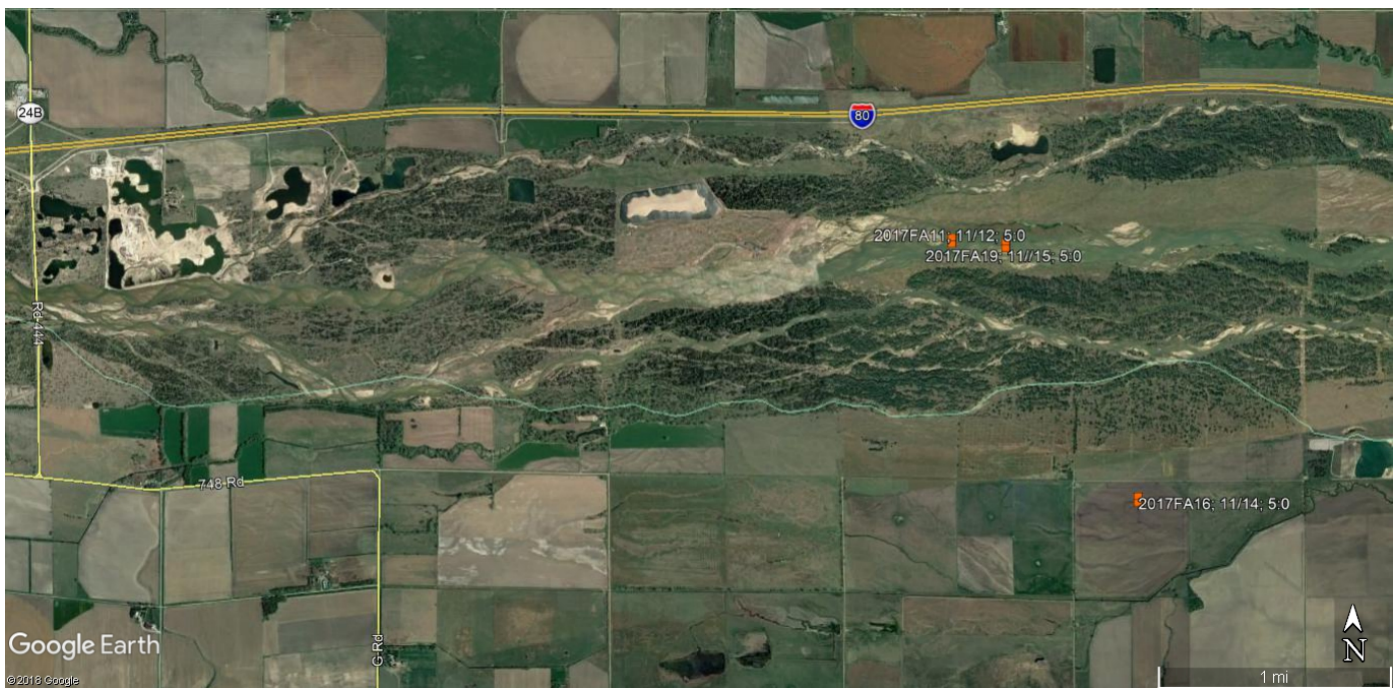


FIGURE 8. Observed whooping crane locations. 3 of 3 collective crane group maps. See Table 1 for color coding and details. Round icons indicate roost sites and pin drops indicate off-channel locations.



FIGURE 9. Locations of the 2:0 crane group 2017FA 01 observed on 11/2/17:



FIGURE 10. This photo was taken during a systematic observation of the 2:0 crane group 2017FA01 at Use Site 1 on 11/2 in the main channel of the Platte River.



FIGURE 11. Locations of the 4:2 crane group: 2017FA02 on 11/8, 2017FA03 on 11/9, 2017FA06 on 11/10, 2017FA10 on 11/12, 2017FA13 on 11/13, 2017FA15 on 11/14, 2017FA18 on 11/18, 2017WI01 on 11/16, & 2017WI04 on 11/18. Round icons indicate roost sites and pin drops indicate off-channel locations.



FIGURE 12. This photo was taken during a systematic observation of the 4:2 crane group 2017FA02 on 11/8 at use site 2 in the main channel of the Platte River.



FIGURE 13. Location of the 2:0 crane group 2017FA04 observed on 11/10.



FIGURE 14. This photo was taken during a systematic observation of the 2:0 crane group 2017FA04 at use site 3 on 11/10 in the main channel of the Platte River.



FIGURE 15. Location of the 1:0 crane group 2017FA05 observed on 11/10.



FIGURE 16. This photo was taken during the systematic observation of the 1:0 crane group 2017FA05 on 11/10 at use site 5 in the main channel of the Platte River.



FIGURE 17. Location of the 7:0 crane group 2017FA07 observed on 11/10. The pin drop icon indicates an off-channel location.

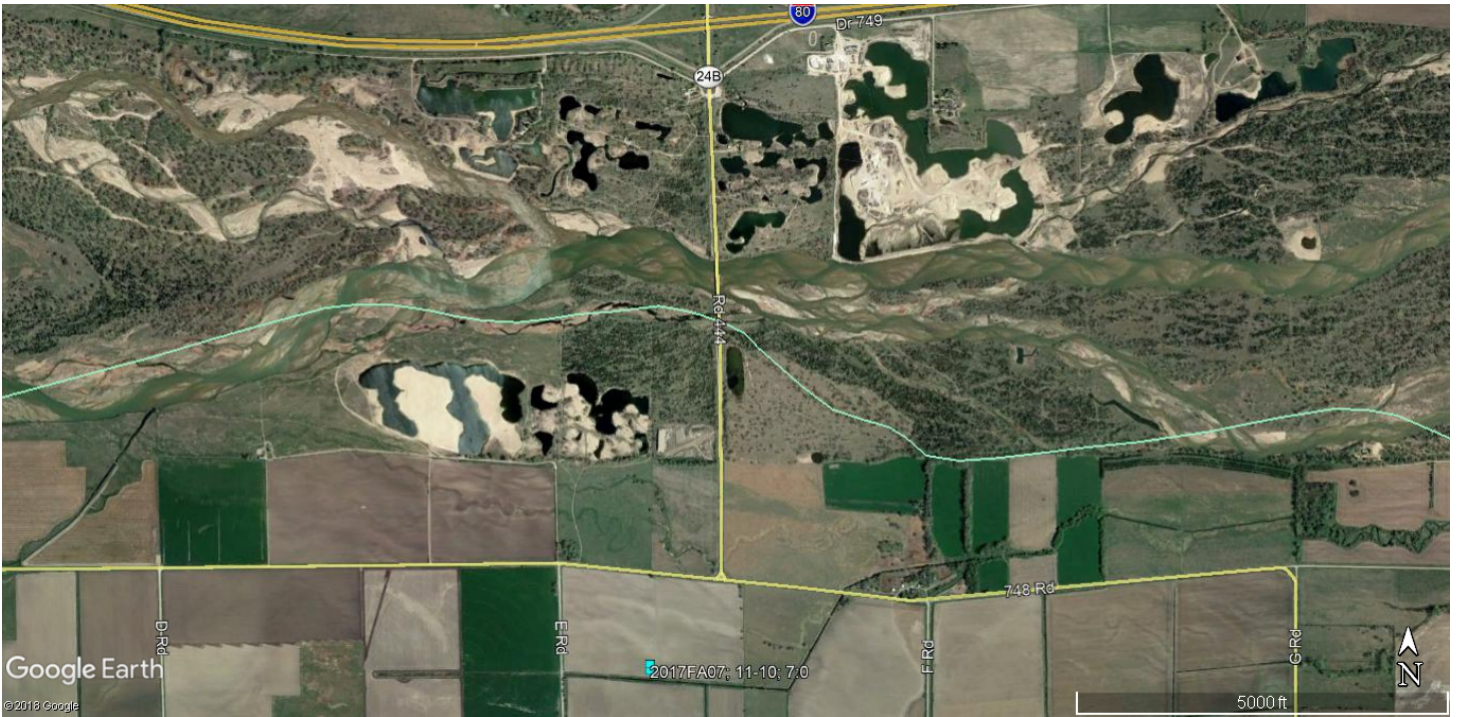


FIGURE 18. A photo taken during a ground observation of the 7:0 crane group 2017FA07 on 11/10 in a corn field south of the Overton bridge on the Platte River.



By Colleen Childers

FIGURE 19. Location of the 3:0 crane group: 2017FA08 on 11/11 & 2017FA12 on 11/12. This crane group is comprised of the 2017FA04 & 05 groups. Round icons indicate roost sites and pin drops indicate off-channel locations.



FIGURE 20. This photo was taken during a systematic observation of the 3:0 crane group 2017FA12 on 11/12 at use site 8 in the main channel of the Platte River.



FIGURE 21. Locations of the 10:0 crane group: 2017FA09 on 11/11, 2017FA14 on 11/13, 2017FA17 on 11/14, and 2017FA20 on 11/15. This crane group is comprised of the 2017FA04, 05, & 07 groups. Round icons indicate roost sites and pin drops indicate off-channel locations.



FIGURE 22. This photo was taken during a systematic observation of the 10:0 crane group 2017FA20 on 11/15 at use site 11 in the main channel of the Platte River.



FIGURE 23. Locations of the 5:0 crane group: 2017FA11 on 11/12, 2017FA16 on 11/14, & 2017FA19 on 11/15. Round icons indicate roost sites and pin drops indicate off-channel locations.



FIGURE 24. This photo was taken during a systematic observation of the 5:0 crane group 2017FA11 on 11/12 at use site 7 in the main channel of the Platte River.



FIGURE 25. Locations of the 8:0 crane group: 2017WI02 on 11/16, 2017WI03 on 11/17, 2017FA05 on 11/18, 2017WI06 on 11/19, 2017WI07 on 11/20, & 2017WI08 on 11/21. This crane group is comprised of groups 2017FA05 & 07. Round icons indicate roost sites and pin drops indicate off-channel locations.



FIGURE 26. This photo was taken during a systematic observation of the 8:0 crane group 2017WI02 on 11/16 at use site 1 (winter season) in the main channel of the Platte River.

