Implementation of the Whooping Crane Monitoring Protocol

Final Report Submitted by

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For

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Final Report

AIM Environmental Consulting 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 *Whooping Crane Monitoring Protocol* developed by the Technical Committee. Our study was conducted according to the methodology and study plan described therein in the Draft dated 23 February 2001. We present the results of this pilot study pursuant to the Work Order Agreement dated 6 March 2001.

Study Area and Methods

The study area consisted of 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 Platte River. We hired and trained seven technicians and were prepared to begin field work on 10 March 2001. Personnel from the U.S. Fish & Wildlife Service office in Grand Island assisted with the training.

Two air services were contracted and aerial surveys were conducted near sunrise from 18 March through 30 April 2001 as weather permitted. Cessna 172's were used and were marked with observation bands affixed to the windows and struts with the assistance of personnel from the Executive Director of the Governance Committee's Office. This was done in order to estimate the distance of an object from the aircraft. For the purposes of the aerial census, the study area was divided into two segments in order to increase the likelihood of encountering Whooping Cranes before they departed from their roost. The East Crew surveyed the reach between Chapman and the Highway 10 (Minden) Bridge and the West Crew surveyed from Highway 10 to Highway 283. Censuses were initiated no earlier than 30 minutes before sunrise and typically were completed within 1.5 hours. The west bound portion surveyed the main river channel, alternating between the north and south side each day. The east bound portion alternated on one of 6 possible transects located 1, 2, and 3 miles north and south of the river respectively (Appendix A). A Garmin 1500 GPS unit was deployed in each aircraft with the waypoints for each transect programmed beforehand (Appendix A). Two observers were present in each aircraft in order to survey both sides of the airplane.

A ground observer was stationed at the midpoint of both aerial census routes. The east station was at the I-80 Wood River Exit and the west station was at the Odessa Exit. In order to provide communication between the air crew and the ground crew, four hand-held two-way radios were rented, one for each aircraft and one for each ground contact. In the event of a whooping crane sighting by the air crew, the ground person was contacted and dispatched to the location. Each air crew had a set of aerial photos of the river (Appendix B). The photos were inserted in polypropylene sheet protectors that enabled the observer to accurately mark the spot on the photo with a grease pencil for later reference.

Once a Whooping Crane was located on the ground, habitat use and activity monitoring commenced. These observations were continuous until the bird was either lost or went to roost. It was not unusual for a number of other vehicles to pull up next to an observer and inquire as to the whereabouts of the Whooping Crane. Although this was distracting at times, the overall public relations benefit seemed to be worthwhile.

Efforts were made to photograph Whooping Crane roost sites from the air. Digital cameras were provided for each aircraft. Channel profiles were measured at each riverine roost site and stream flow data was recorded from U.S. Geological Survey gauging stations. Personnel from the U.S. Fish & Wildlife Service in Grand Island assisted with the first profile that served as on-the-job training for our technicians. Leica laser rangefinders were used to assist in this effort. Whooping Crane movements, behavior, and diurnal habitat use of was recorded when possible. All monitoring activities followed U.S. Fish & Wildlife Service guidelines (Appendix A) and were recorded on datasheets provided by the Executive Director's Office. Wally Jobman, the Whooping Crane Migration Coordinator for the U.S. Fish and Wildlife Service, kept our team appraised of the latest sighting reports and census results from the wintering grounds on a regular basis. Landowner permission was obtained prior to accessing any site. All original datasheets are attached (Appendix C).

As specified by the protocol, Sandhill Crane use of Program Lands (i.e. Cottonwood Ranch) was documented during the aerial surveys. Also, observations of Whooping Crane decoys were recorded as well.

Results

Aerial Survey.--

Of a possible 44 morning flights, the West Crew flew 27 (61%) missions while the East Crew flew 31 (70%). Fog, low ceiling, precipitation, and high winds were factors in cancellations. We recorded 5 riverine sightings of a single Whooping Crane out of a possible 10 opportunities (Appendix D). Although a single Whooping Crane was known to be in the area for 17 days (March 23-April 8), we were able to fly on only 10 of those mornings. On the morning of March 25, a photographer located at Audubon's Rowe Sanctuary witnessed the departure of the Whooping Crane from its riverine roost about 10 minutes before the East Air Crew arrived. No Whooping Cranes were detected along the return (eastbound) transects.

We recorded 6 possible Whooping Crane sightings as follows: March 24- 1 individual in flight east of Trust's bunker blind on Mormon Island Crane Meadows; March 25- 1 individual same as March 24; April 2- 2 individuals on river near NE border of Wyoming Land; April 12- 2 individuals seen in flight 1.5 mi east of Overton Bridge; April 13- 2 individuals seen in flight SE of Elm Creek bridge; April 17- 1 individual seen roosting near Sandhill Cranes on Shoemaker Island. A follow-up of the first 5 sightings by the ground crew could not confirm the presence of Whooping Cranes. A follow-up was not immediately conducted on the April 17 sighting reported by Terry Medjo and Shay Howlin; however, a search at mid-day did not result in a confirmation of a Whooping Crane (Appendix D). In addition, we conducted several on ground

follow-ups of reports by the air crew and confirmed the presence of Great Egrets, Snow Geese, albino Sandhill Cranes, and white trashbags but no Whooping Cranes.

Whooping Crane decoys were placed at a number of locations from April 17-30. The air crews recorded decoys on 9 mornings at 17 locations (Appendices C and D). Great Egrets and White Pelicans were attracted to the decoys as reported by the air crew.

Although an effort was made to record Sandhill Crane use of Cottonwood Ranch, none were detected by the West Air Crew. Two factors may have been responsible for the paucity of sightings. One is the fact that this area was near the west end of the river transect such that by the time the aircraft arrived, the cranes had left their roost. Cranes were detected in flight above the property, but not on the ground. The other problem was that during the 25 days from census initiation through April 11 (a time of peak crane numbers), only 14 (56%) flights occurred. A mass exodus of Sandhill Cranes was observed on April 8. It also took the crew a few flights to be able to identify where the Cottonwood Ranch was. Consequently, we were unable to document crane use at this site.

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

We collected riverine roost channel profile data at 6 locations (Appendix C). Four were documented by our air crew, the other 2 were reported by the public. Photographs depicting the habitat used were taken at each roost site and are attached. We deviated from the U.S. Fish & Wildlife Service guidelines in that we collected river profile data prior to the migration of the Whooping Crane from the area. Approval was granted by the U.S. Fish & Wildlife Service upon consultation with them after it was determined that our activities would not likely create any potential disturbance to the bird if it was done during mid-day. We deviated from the protocol with respect to upland habitat use after discussion with the Technical Committee and the Project Officer at their March 14 meeting in Kearney. The committee agreed that diurnal habitat measurements would be taken only if surface water was present in the field being used. It was determined that detailed information in croplands such as sediment type and distances to disturbances would provide little useful information and that distance measurements could be obtained from aerial photography at a later date if it was deemed necessary. Therefore, we collected vegetation information, management practices, and specific location information along with a sketch of the use area at upland sites (Appendix C).

Diurnal movements and activity was collected when possible (Appendices B and C). We followed a single Whooping Crane on 10 days. The first probable sighting of the season occurred on March 21 southeast of Grand Island. It was not reported again. The first confirmed Whooping Crane sighting was an unbanded adult seen southeast of Kearney on March 23 by Nebraska Game & Parks Commission personnel. We coded this individual 2001-SP-01 (hereinafter 01). We followed this bird to its roost that evening located about 0.5 mi east of the Minden Bridge on the main channel. 01 was observed the following morning by both air crews and 02 was reported by the East Crew on Trust property 5 mi east of their headquarters. However; 02 was never confirmed. 01 was last observed by U.S. Fish & Wildlife Service personnel the evening of March 25. 03 was reported by U.S. Geological Survey researchers on March 27 SE of Denman in Hall County. The East Crew spotted 03 from the air at the

Woodman Roost on March 29. Whooper #03 was an unbanded adult and may be the same individual as #01. Our last visual contact of 03 was on April 5 although it was reported in the area by the public the morning of April 8. Soon afterwards we believe it migrated from the area.

The other probable/confirmed Whooping Crane sighting was reported on April 11 by Larry Rogers of the National Wildlife Federation's Operation Whooper Watch. He saw a group of 3 individuals around 1430 h CDT 2 miles east of the Gibbon Road in Kearney County. They flew to the north and were not located again.

The number of reported Whooping Crane sightings throughout the flyway was minimal this spring relative to other spring migrations (Wally Jobman, personal communication). A preliminary tally revealed only 4 other confirmed sightings in Nebraska beyond those reported herein. The general migration phenology of Sandhill Cranes and waterfowl was much later than normal due to the cold winter and spring. Likewise, the Whooping Crane migration seemed to be compressed as breeding pairs rapidly moved through the migration corridor enroute to their nesting grounds.

Discussion and Recommendations

The Technical Committee agreed that implementation of the *Whooping Crane Protocol* should occur in the spring 2001 season "for the purposes of testing, verifying, and modifying the eventual protocol for use during the remaining Cooperative Agreement period and Program. All parties recognize that the protocol may change after this initial season." Accordingly, our team members were directed to critique methodologies, data sheets, etc. for the purposes of offering suggestions to the Technical Committee in order to facilitate an adaptive management approach to future protocol revisions. The following comments, observations, and suggestions are offered in this spirit of cooperation and are the collective result of this initial year's experience.

Decoys

- Decoy placement should be done earlier in the season. This could serve as a proving ground for the aerial crew and would minimize distractions during the peak migration period when attention would be better spent looking for the real thing. Much time was spent circling decoys which increased the possibility of birds leaving the roost before the aircraft arrived.

- Placement should be at sites where Whooping Cranes would logically be expected to occur i.e. not along I-80 or in the forest

- If future detectability trails are warranted, conduct them during the off-season of Whooping Crane migration.

Aerial Census

- Accuracy of distance bands placed on the aircraft brings the entire effort into question. Although great care was taken in precisely marking the planes, inherent errors within the

aircraft's altimeter rendered this effort as meaningless. The altimeters onboard work off barometric pressure rather than laser. Since barometric pressure deviates considerably from one end of the transect to the other, the readings are at best within + or – 200 feet. Consequently, the best geometric projections are suspect. Furthermore, this technique works well in a featureless landscape censusing big game, but the Platte Valley has a grid system of roads that makes visual estimates at least as accurate as the marker technique. Also, we are only looking for a very small number of Whooping Cranes, not large numbers of Pronghorn.

- GPS pilot/crew education should be more thorough.

- Fly at a lower elevation (perhaps 500 feet) especially along the river. A lot of time was spent circling non-target objects at 1000 feet.

- Alternate starting points between east to west and west to east to reduce the chances of missing cranes that leave the roost before the plane arrives.

- Define specific objective/priority of flight crew. Staying with a potential Whooping Crane until the ground crew arrives or simply notifying the ground crew of a potential sighting then continuing the census involves very different strategies.

- Return transect should be on the opposite side that the river channel was covered i.e. if the north bank was flown then fly back on a south transect and vice versa. This would eliminate double coverage of the area near the river.

- Are the transects 3 miles north and south of the river necessary? Often they were over towns, canyons, airport runways, or major highways. More coverage closer to the river may result in increased opportunities for encountering a Whooping Crane.

- If flights are cancelled due to bad weather, especially fog, would it be worthwhile to go later in the morning if the weather clears?

- Coordinate more with volunteers/crane-watchers on the ground (Operation Whooper Watch, Crane Meadows Nature Center, Rowe Sanctuary, Ft. Kearny State Park, Platte River Whooping Crane Trust, etc.). Improve lines of communication between various groups.

Site Evaluations

- Place a limit on distances to visual obstructions e.g. >0.5 miles.

- Define what constitutes a visual obstruction more precisely. Does a telephone pole constitute a visual obstruction since it is >1.5m in height or does the obstruction have to occlude a larger field of view such as 30^{o} or 90^{o} or some other angle?

- Determine the necessity of measuring 3 profiles at each roost site after examining the data collected this year.

Data Sheets

- Streamline the data sheets in order to reduce redundancy. Provide space for vital information on every sheet e.g. date, location, observer, etc.

- Transfer any data marked on the aerial photos immediately. Use Mr. Sids to obtain accurate UTM measurements in addition to the GPS unit.

- Record legal descriptions of use-sites in the field.

Ground Observers/Volunteers

- Since school bus drivers and mail carriers drive most of the county roads on a regular basis, it may be worthwhile to target them to aid in reporting possible Whooping Cranes.

- If a Whooping Crane is lost either by the ground or air crew, personnel should be dispatched to the last location and begin searching all of the county roads within a 3 mile radius. This recommendation is based on the daily movement patterns observed this year and would provide the greatest opportunity to relocate the bird.

Photos

- Download and label daily if a digital camera is used. If not, keep a photo log. Labeling can become an enormous task if it is not completed until the end of the season. Also, memory lapses reduce the accuracy of the information obtained from a photo if it is not done as soon as possible.

Conclusions

With the pilot year of this study behind us, the experience gained and baseline information collected should help in formulating and refining a future plan of study. This effort should continue for at least another 2 spring migrations in order to account for variation between migration seasons. Although this year's results did not lead to any additional confirmed Whooping Crane sightings, the number of possible sightings attests to the contention that some birds slip through without being detected or reported. The flights proved valuable in obtaining information on roost locations and in detecting possible Whooping Cranes that would not have happened otherwise. We also discovered that trying to monitor a Whooping Crane from dawn to dusk can be very difficult to do even when a bird is known to be in the area. This was especially apparent when peak numbers of Sandhill Cranes were in the area since our target bird often became lost in the masses. One last comment would be to solicit for proposals earlier. We essentially had a little more than a week after receiving the notification to proceed to locate and

hire technicians and less than 4 days to train them in order to be ready for a March 10 startup date.

To conclude, we were satisfied that this pilot year was successful to the extent that methodologies were put to test and data on Whooping Cranes were collected.

List of Appendices

Appendix A. Miscellaneous sheets, maps, lists, schedules, data sheet revisions

Appendix B. Color-Infrared Aerial photos of Blocks and Use Sites

Appendix C. Original Data Sheets

Appendix D. Photographs

APPENDIX A

Equipment Checklist for Whooping Crane Roost Measurement

- ❑ 100m Tape Measure OR Laser Rangefinder
- ❑ Survey Flags (to mark transect endpoints)
- ❑ Target (if using Laser Rangefinder)
- ❑ Digital Camera
- ❑ GPS Unit
- ❑ Stage Gauge
- ❑ Depth Measurement Rod
- ❑ Chest Waders
- ❑ Scope and Tripod or Binoculars (to maintain a straight line across the river)
- ❑ Aerial Photo
- ❑ Cell Phone
- ❑ Two-way Radio (Optional)
- ❑ Plate Book and Telephone Directory to obtain land owner permission
- ❑ Data Sheets and clipboard

Obtain streamflow data from the following website: http://www-ne.cr.usgs.gov/rt-cgi/gen_tbl_pg

SCHEDULE FOR WHOOPING CRANE MONITORING--2001

		EASTERN FLIGHT						WESTERN FLIGHT				
DATE	DAY	FLIGHT	ground observers 0-5 hrs	ground observers 5-10 hrs	radio	daylight Kearney*	Transect on return	FLIGHT	ground observers 0-5 hrs.	ground observers 5-19 hrs.	RADIO	SURVEY
18-Mar	SU	tm,bh	tm,bh	tm,bh	jk	6:43	1s	as,bp	bd,bp	bp,as	jz	
19-Mar	M	tm,,bh	tm,bh	tm,bh	jk	6:41	1n	bd,as	bd,as	bd,as	jz	
20-Mar	TU	jk,as	tm,bh	tm,bh	bh	6:39	2s	bd,bp	bd,bp	bd,bp	jz	
21-Mar	W	tm,bh	tm,bh	tm,bh	jk	6:38	2n	bd,as	bd,bp	bd,as	jz	
22-Mar	TH	tm,bh	tm,bh	jz,jk	jk	6:36	3s	bd,bp	bd,bp	bd,bp	jz	
23-Mar	F	tm,bh	tm,bh	jz,jk	jk	6:34	3n	bd,as	bd,as	bd,bp	jz	
24-Mar	SA	tm,jk	tm,jk	jk,jz	bh	6:33	1s	as,bp	as,bp	as,bp	jz	
25-Mar	SU	bh,tm	tm,jk	jk,jz	hn	6:31	1n	as,bd	bd,as	as,bp BD	hn(Minden)	
26-Mar	M	tm,bh	tm,bh	tm,bh	hn	6:29	2s	bd,as	bd,as	bd,as	hn(Minden)	
27-Mar	TU	gl,bh	tm,bh	tm,bh	tm	6:28	2n	bd,as	bd,bp AS	bd,bp AS	hn(Minden)	
28-Mar	W	tm.bh	tm,bh	tm,bh	jk	6:26	3s	bd,bp AS	bd,bp AS	bd,as	jz	
29-Mar	TH	tm,bh	tm,bh	jk,jz	jk	6:25	3n	bd,as	bd,as	bd,bp	jz	
30-Mar	F	tm,bh	tm,bh	jk,jz	jk	6:23	1s	bd,bp	bf,bp	bd,as	jz	
31-Mar	SA	tm,jz	tm,jz	jz,jk	bh	6:21	1n	bp,as	bp,as	bp,as	bd	
1-Apr	SU	tm,jz	tm,jz	jz,jk	bh	7:20**	2s	bp,as	as,bp	as,bp	bd	
2-Apr	M	tm,bh	tm,bh	tm,bh	jk	7:18	2n	bd,as	bd,as	bd,as	jz	
3-Apr	TU	gl,bp	tm,gh	tm,bh	jk	7:16	3s	bd,as	bd,bp	bd,bp	jz	
4-Apr	W	tm,bh	tm,bh	tm,bh	jk	7:15	3n	bd,bp	bd,bp	bd,bp	jz	
5-Apr	TH	tm,bh	tm,bh	bh,jk	jk	7:13	1s	bd,bp	bd,as	bd,bp	jz	
6-Apr	F	tm,bh	tm,bh	bh,jz	jk	7:11	1n	bd,as	bd,as	bd,bp	jz	
7-Apr	SA	jk,jz	jk,jz	jk,jz	bh	7:10	2s	bp,as	bp,as	bp,as	bd	
8-Apr	SU	jk,jz	jz,jk	jz,jk	bh	7:08	2n	as,bp	bp,as	bp,as	bd	
8-Apr	M	tm,bh	tm,bh	tm,bh	jjk	7:07	3s	bd,bp	bd,as	bd,as	jz	
10-Apr	TU	tm,bh	tm,bh	tm,bh	jk	7:05	3n	bd,as	bd,bp	bd,bp	jz	
11-Apr	W	tm,bh	tm,bh	tm,bh	jk	7:04	1s	bd,bp	bd,as	bd,as	jz	
12-Apr	TH	tm,bh	tm,bh	bh,jz	jk	7:02	1n	bd,as	bd,bp	bd,bp	jz	
13-Apr	F	tm,bh	tm,bh	tm,jz	jk	7:00	2s	bd,bp	bd,as	bd,as	jz	
14-Apr	SA	jk.jz	jk,jz	jk,jz	bd	6:59	2n	as,bp	bp,as	bp,as	bd(Minden)	
15-Apr	SU	jk,jz	jk,jz	jk,jz	bd	6:57	3s	as,bp	as,bp	as,bp	bd(Minden)	
16-Apr	M	tm,bh	tm,bh	tm,bh	jk	6:56	3n	bd,bp	bd,as	bd,as	as	
17-Apr	TU	tm,bh	tn,bh	tm,bh	jk	6:54	1s	bd,as	bd,bp	bd,bp	jz	
18-Apr	W	tm,bh	tm,bh	bh,tm	jk	6:53	1n	bd,bp	bd,as	bd,as	jz	

19-Apr	TH	tm,bh	tm,bh	bh,jk	jk	6:51	2s	bd,as	bd,bp	bd,bp	jz
20-Apr	F	tm,bh	tm,bh	bh,jk	jk	6:50	2n	bd,bp	bd,as	bd,as	jz
21-Apr	SA	jk,jz	jz,jk	jk,jz	bh	6:48	3s	bp,as	bp,as	bp,as	bh(Minden)
22-Apr	SU	jk,jz	jk,jz	jz,jk	bh	6:47	3n	as,bp	bp,as	bp,as	bd
23-Apr	M	tm,bh	tm,bh	tm,bh	jk	6:44	1s	bd,bp	bd,as	bd,as	as
24-Apr	TU	tm,bh	tm,bh	tm,bh	jk	6:43	1n	bd,as	bd,bp	bd,bp	jz
25-Apr	W	tm,bh	tm,bh	tm,bh	jk	6:41	2s	bd,bp	bd,as	bd,as	jz
26-Apr	TH	tm,bh	tm,bh	tm,jz	jk	6:40	2n	bd,as	bd,as	bd,bp	jz
27-Apr	F	tm,bh	tm,bh	tm,jz	jk	6:39	3s	bd,bp	bd,bp	bd,as	jz
28-Apr	SA	jk,jz	jk,jz	jk,jz	bh	6:37	3n	bp,as	bp,as	bp,as	bh(Minden)
29-Apr	SU	jk,jz	jk,jz	jk,jz	bh	6:37	1s	as,bp	as,bp	as,bp	bd
30-Apr	M	tm,bh	tm,bh	tm,bh	jk	6:36	1n	bd,as	bd,as	bd,bp	jk(Minden)

*Subtract 3 minutes for Grand Island. **Daylight sav. Time

NAME	HOURS/WK.	WHEN CAN'T WORK
Andy Simpso	30	Tues PM 2-5 Wed >5 PM
Brian Peterso	30	Mon 12 to midnight Night class M, W
Justin Krahuli	15	M9on, Wed 9AM class to 9:55, 22:30-5 Tues PM, M,T,W nite
Jesse Ziems	15	Mon,Wed 11 AM,T,W nights, Tu PM lab > 5:00.
Bill Dunn	40	
Terry Medjo	40	
Bob Hatfield	40	
	210	

Transect ID: River

SurveyRoutes

East To West (Chapman-Lexington)

	Easting	Northing	
0RE1	575357.5	4541419.24	Chapman
0RE2	556501.64	4520103.92	
0RE3	551884.76	4516954.08	
0RE4	533330.94	4510136.63	
0RE5	518185.84	4505606.05	
0RE6	513051.18	4503534.92	Minden
0RW1	513051.18	4503534.92	Minden
0RW2	503601.67	4501334.35	
0RW3	489362.69	4501201.91	
0RW4	478230.4	4502024.73	
0RW5	470808.87	4503621.22	
0RW6	453851.54	4503966.41	
0RW7	443452.77	4506210.12	
0RW8	432406.77	4510913.3	Lexington

Transect ID:

SurveyRoutes

	Easting	Northing	
1SW1	431846	4509360	Lexington
1SW2	445696	4503664	
1SW3	455707	4502154	
1SW4	470723	4501895	
1SW5	480733	4499954	
1SW6	498985	4499436	
1SW7	508305	4500385	
1SW8	513008	4501723	Minden
1SE1	513008	4501723	Minden
1SE2	521940	4505304	
1SE3	528326	4506771	
1SE4	551238	4514883	
1SE5	557149	4518464	
1SE6	576609	4540470	Chapman
2SW1	431285	4507893	Lexington
2SW2	445092	4502197	
2SW3	455880	4500515	
2SW4	471240	4500299	
2SW5	480474	4498400	
2SW6	497345	4497753	
2SW7	505759	4498357	
2SW8	513051	4500040	Minden
2SE1	513051	4500040	Minden
2SE2	523105	4503923	
2SE3	531174	4505951	
2SE4	553136	4513977	
2SE5	558228	4517299	
2SE6	577644	4539132	Chapman
3SW1	430681	4506426	Lexington
3SW2	444402	4500817	
3SW3	453981	4499091	
3SW4	470981	4498659	
3SW5	480431	4496761	
3SW6	497259	4496157	
3SW7	506449	4496847	
3SW8	513008	4498314	Minden
3SE1	513008	4498314	Minden
3SE2	522069	4501982	
3SE3	527808	4503405	
3SE4	548951	4510525	
3SE5	557235	4514408	
3SE6	561636	4518464	
3SE7	579068	4538313	Chapman

Transect ID:

SurveyRoutes

3NW1	434133	4515401
3NW2	477207	4509964
3NW3	452341	4508972
3NW4	455146	4508626
3NW5	470938	4508368
3NW6	474433	4507850
3NW7	481596	4506426
3NW8	489578	4506038
3NW9	498853	4505908
3NW10	506665	4506685
3NW11	512965	4508670
3NE1	512965	4508670
3NE2	521206	4511733
3NE3	526212	4512941
3NE4	551540	4522434
3NE5	554560	4524893
3NE6	552187	4522952
3NE7	550461	4521744
3NE8	552920	4523642
3NE9	557408	4528690
3NE10	571690	4544569
2NW1	433572	4513977
2NW2	445136	4508928
2NW3	449882	4507720
2NW4	455275	4507116
2NW5	570507	4506814
2NW6	481984	4504786
2NW7	491736	4504225
2NW8	499330	4504312
2NW9	513008	4506900
2NE1	513008	4506900
2NE2	520947	4510050
2NE3	527722	4511647
2NE4	551712	4520579
2NE5	554776	4523038
2NE6	572898	4543534
1NW1	433054	4512424
1NW2	446085	4506771
1NW3	446128	4506728
1NW4	455017	4505433
1NW5	472707	4504959
1NW6	481553	4503103
1NW7	494713	4502499
1NW8	508477	4503794

Transect ID:

1NW9	512965	4505175
1NE1	512965	4505175
1NE2	513051	4505002
1NE3	521810	4508583
1NE4	533740	4519845
1NE5	554449	4520449

Field Study Requirements for Avoiding Disturbance to Migrating Whooping Cranes

The following guidelines for avoiding disturbance to migrating whooping cranes were developed by the Fish and Wildlife Service and Nebraska Game and Parks Commission, as necessary precautions in implementing monitoring protocols of the Cooperative Agreement. Adherence to the guidelines is mandatory, i.e., any personnel involved in field work monitoring whooping cranes in Nebraska must abide by these rules to avoid possible harassment of the cranes.

Harassment, harm, and pursuit of whooping cranes is prohibited by the Endangered Species Act of 1973 (as amended), and Nebraska's Nongame and Endangered Species Conservation Act, and may include any intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns.

1. Observers must remain in their vehicle(s) when observing whooping cranes.

2. Cranes may be observed from public roads only, and from a distance of greater than or equal to 2000 feet (approximately 0.4 miles).

3. Real time information on location(s) of whooping cranes will be relayed to the designated whooping crane sighting coordinator, and may not be given to the media or to the public.

4. Intrusions into use sites for the purpose of measuring habitat parameters, or for any other purpose, may not be made until after the observed crane(s) have migrated out of the Platte River valley, as confirmed by Wally Jobman, FWS, Grand Island.

5. Airplanes may not approach whooping cranes within 500 feet.

6. All field observers must meet with personnel of the Fish and Wildlife Service in Grand Island for training prior to start of the monitoring study.

7. Any whooping crane injuries or deaths that are observed will be reported immediately according to the 2000-2001 Contingency Plan: Federal-State Cooperative Protection of Whooping Cranes (see attached for contacts).

8. The scope and the procedures of the field activities will be reviewed on a periodic basis by the Fish and Wildlife Service.

Nebraska contacts for reporting dead or injured whooping cranes:

Wally Jobman (Key)
U.S. Fish and Wildlife Service
Federal Bldg., Second Floor
203 West Second Street
Grand Island, NE 68801

Work: (308) 382-6468, ext.16
Home: (308) 381-2391

Gene Mack (Alternate)
Rainwater Basin Wetland Mgmnt Dist.
P.O. Box 1686
Kearney, NE 68848

Work: (308) 236-5015, ext. 27

John Dinan (Key)
Nebraska Game and Parks Commission
2200 North 33rd Street
Lincoln, NE 68503

Work: (402) 471- 5440
Home: (402) 665- 6361

Mike Fritz (Alternate)
Nebraska Game and Parks Commission
2200 North 33rd Street
Lincoln, NE 68503

Work: (402) 471-5421
Home: (402) 488-3105

In addition to the above, one of the following must be contacted:

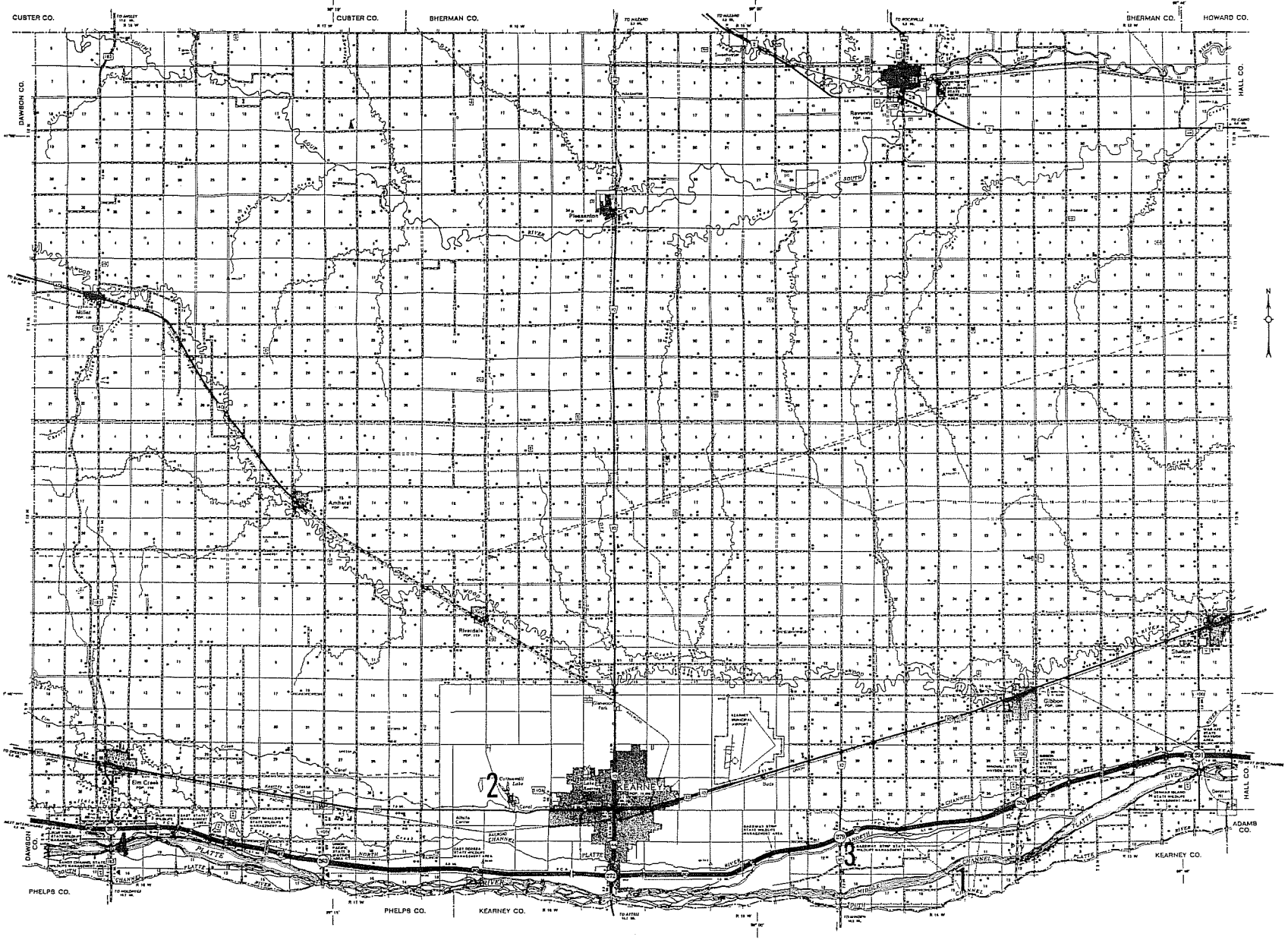
Mark Webb, Special Agent
U.S. Fish and Wildlife Service
320 Federal Building
100 Centennial Mall North
Lincoln, NE 68506

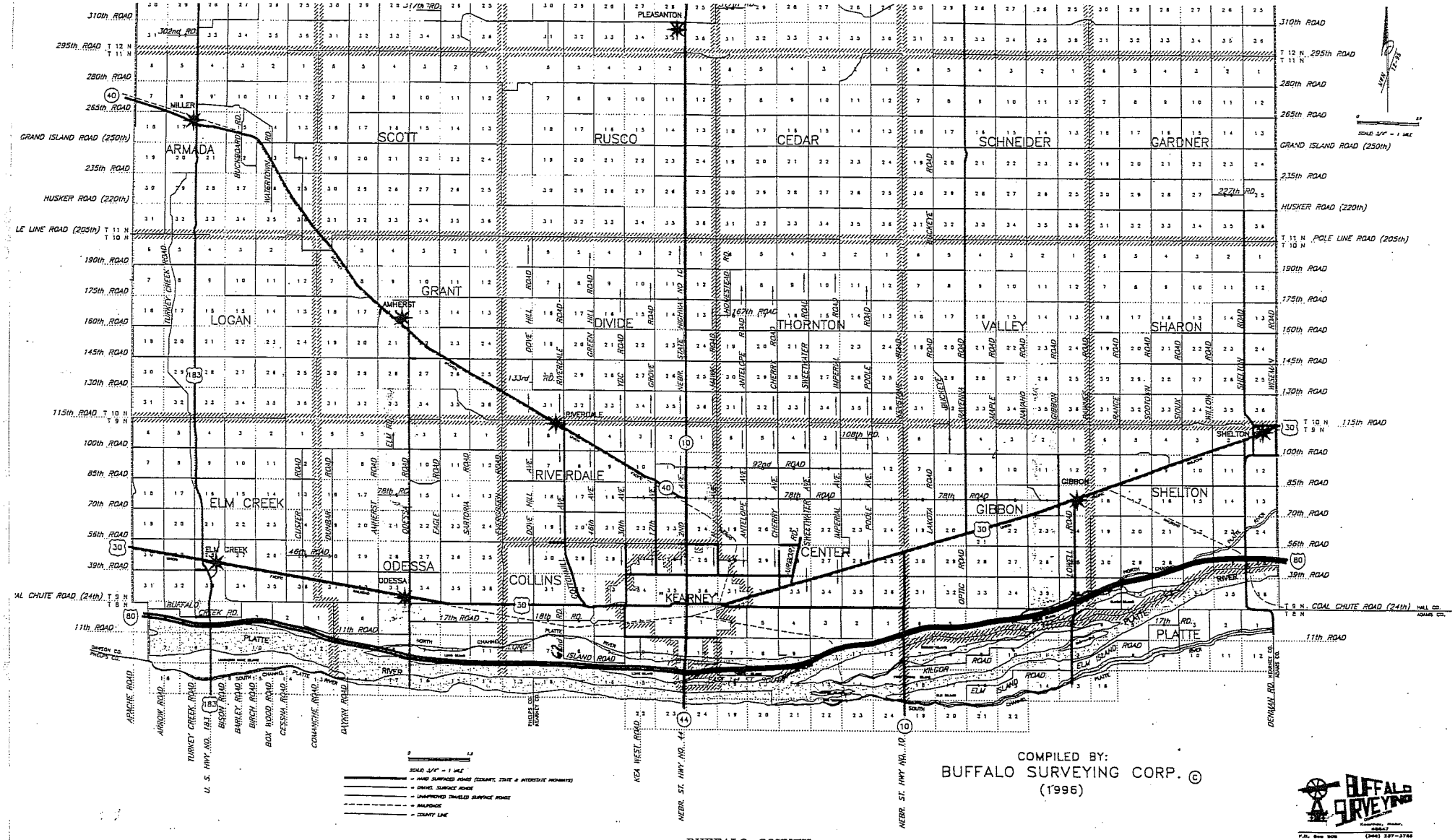
Work: (402) 221-4037

Mike Damico, Special Agent
U.S. Fish and Wildlife Service
P.O. Box 1086
North Platte, NE 69103

Work: (308) 534-0925

BUFFALO COUNTY





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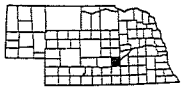
Kearney, Nebr.
68847
P.O. Box 906
(308) 237-3785

HALL COUNTY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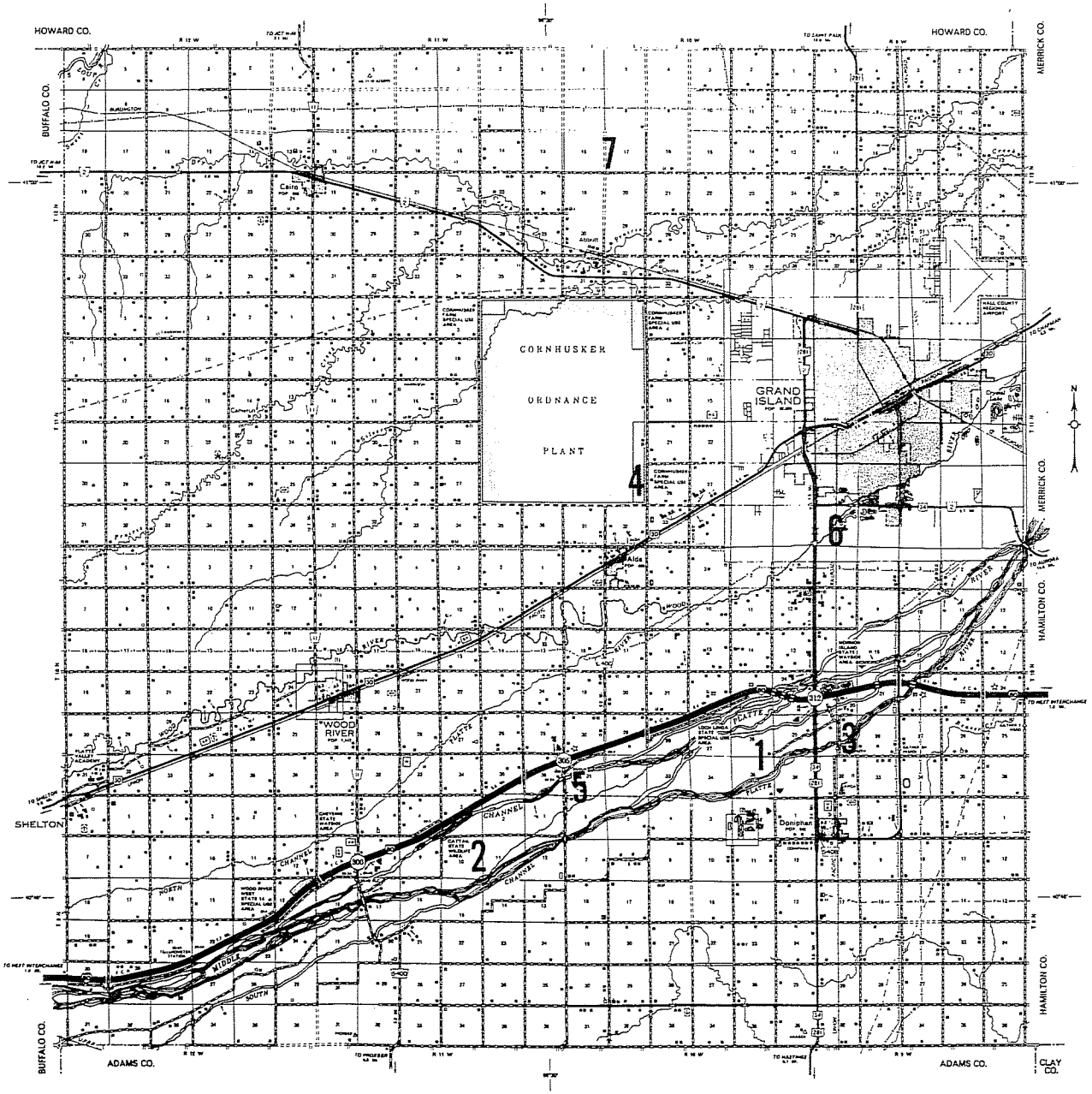
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ADAMS CO.
CLAY CO.
CORNHUSKER ORDNANCE PLANT
GRAND ISLAND
Alda
WOOD RIVER
SHELTON
Doniphan
Cairo
PLATTE
CHANNEL
MIDDLE
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NORTH
1
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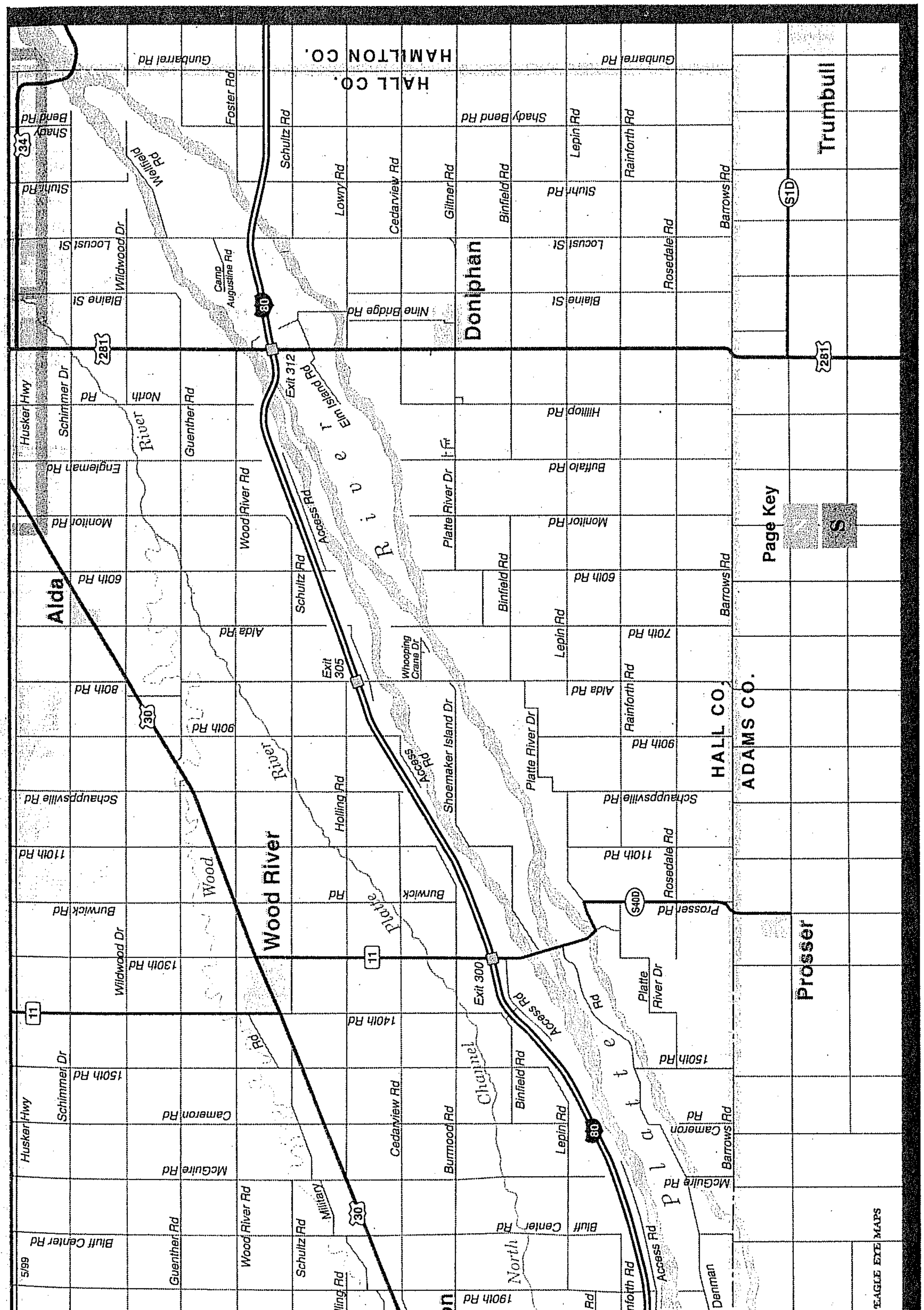
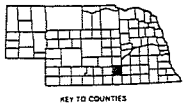
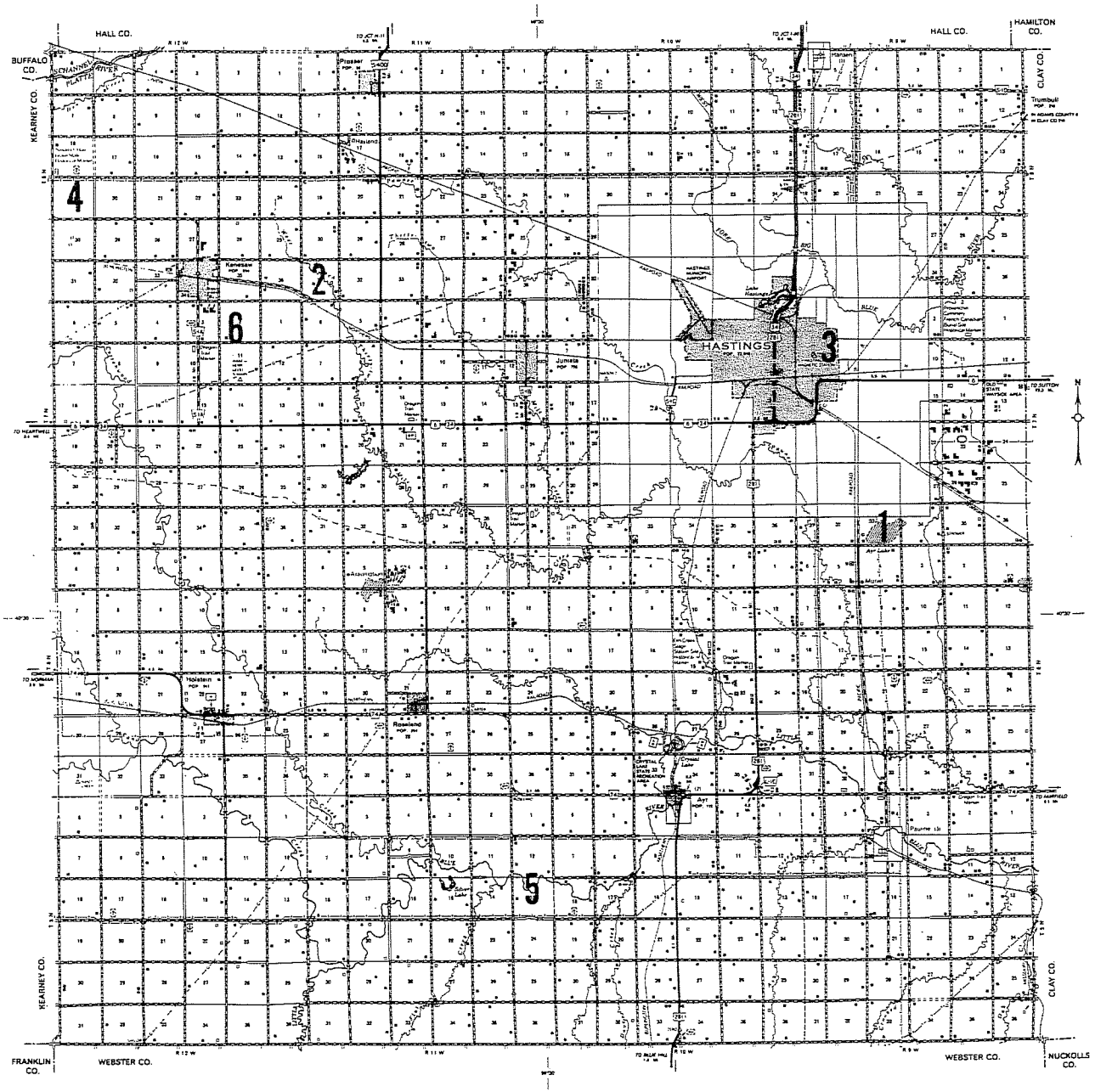
Grand Island South Vicinity Map



HALL COUNTY

ADAMS COUNTY





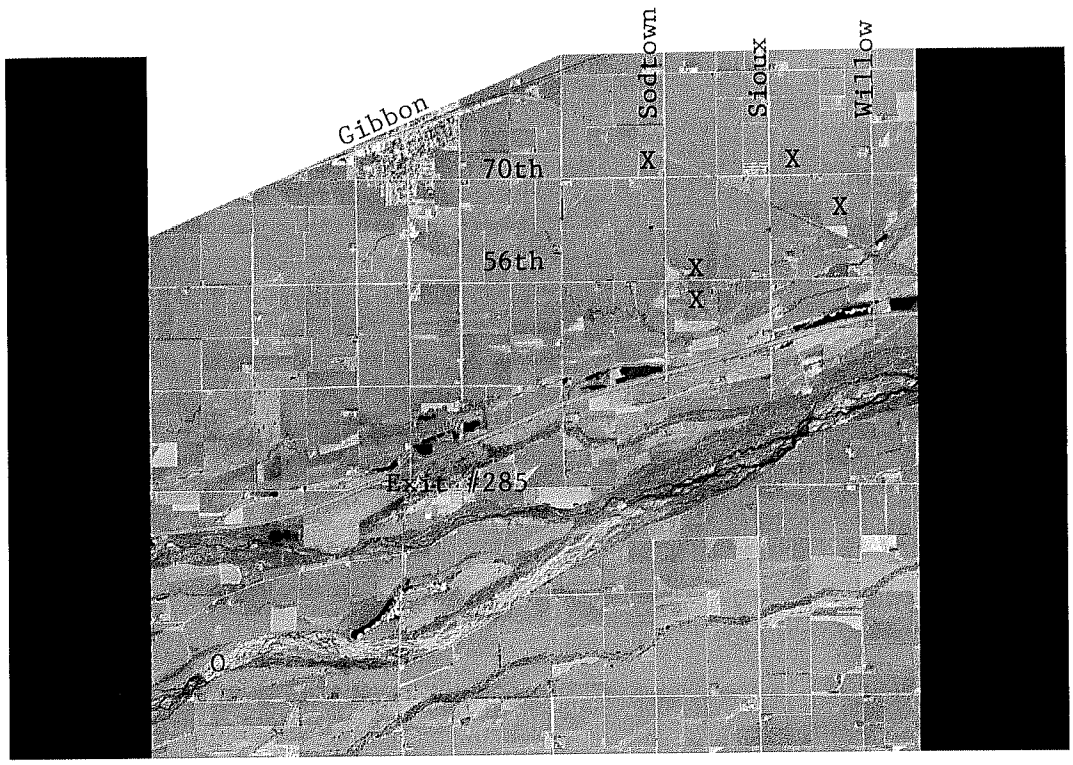
APPENDIX B

WHOOPING CRANE USE SITES

O= Roost Site

X= Field Site

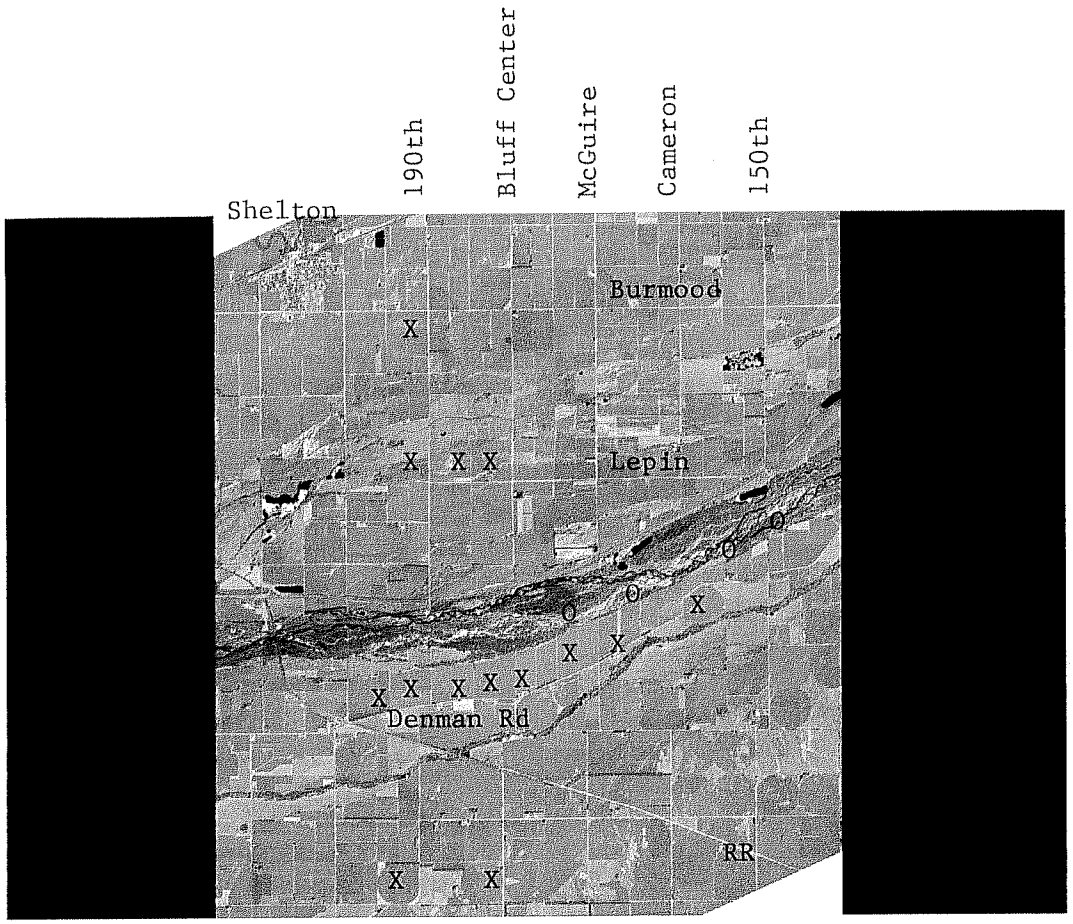
WHOOPING CRANE USE SITES



O= Roost Site

X= Field Site

WHOOPING CRANE USE SITES



O= Roost Sites

X= Field Sites

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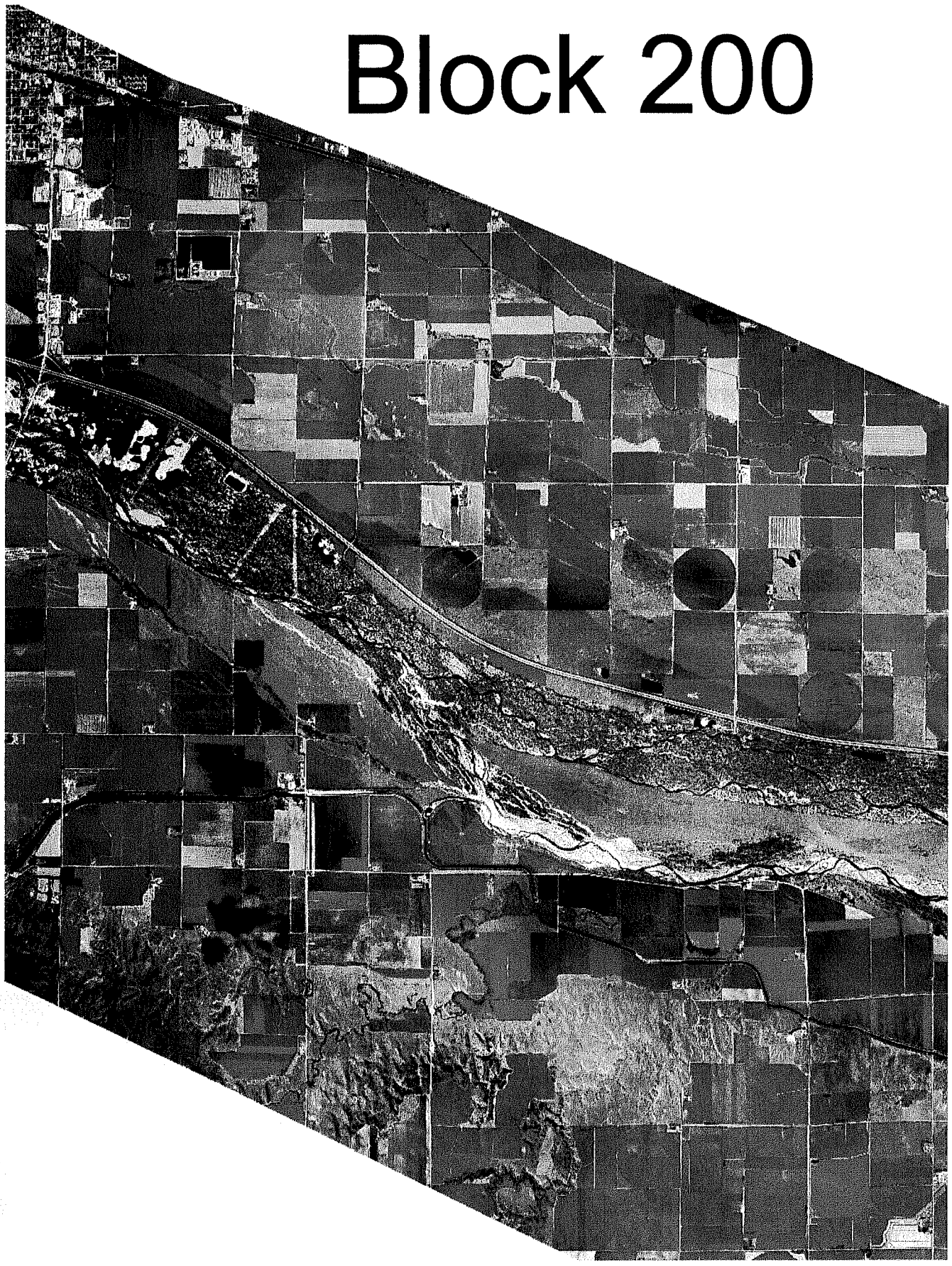

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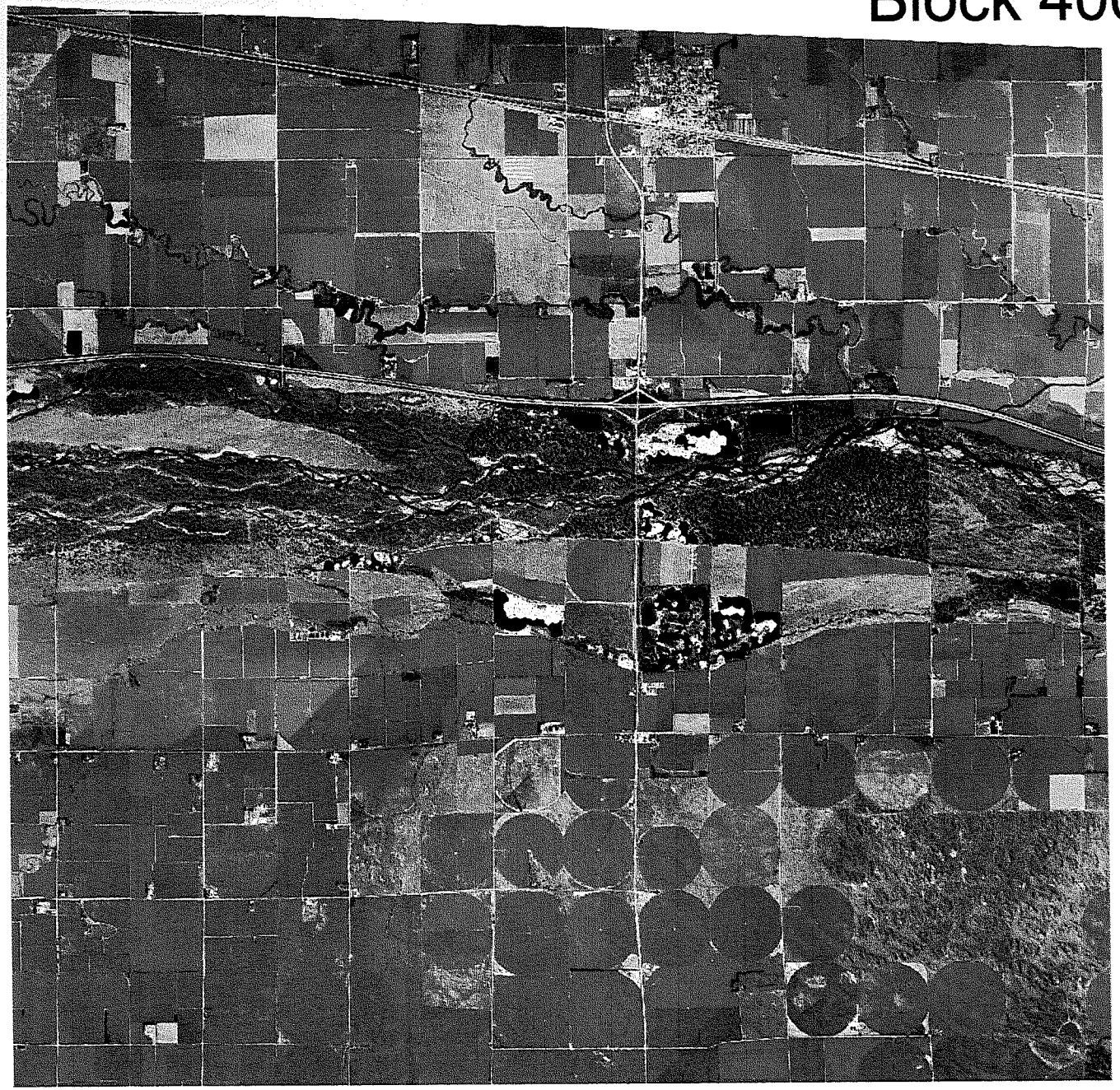

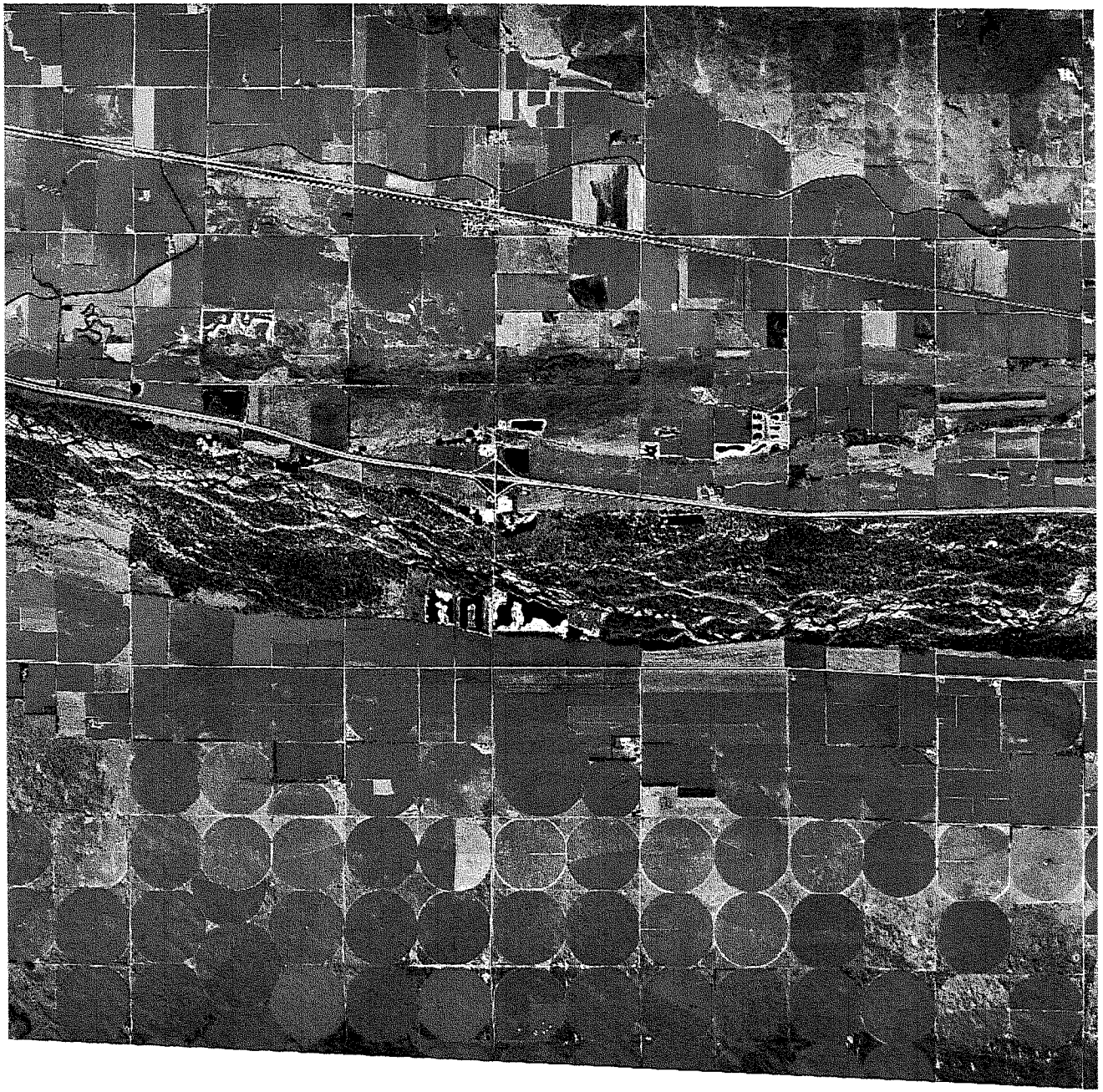

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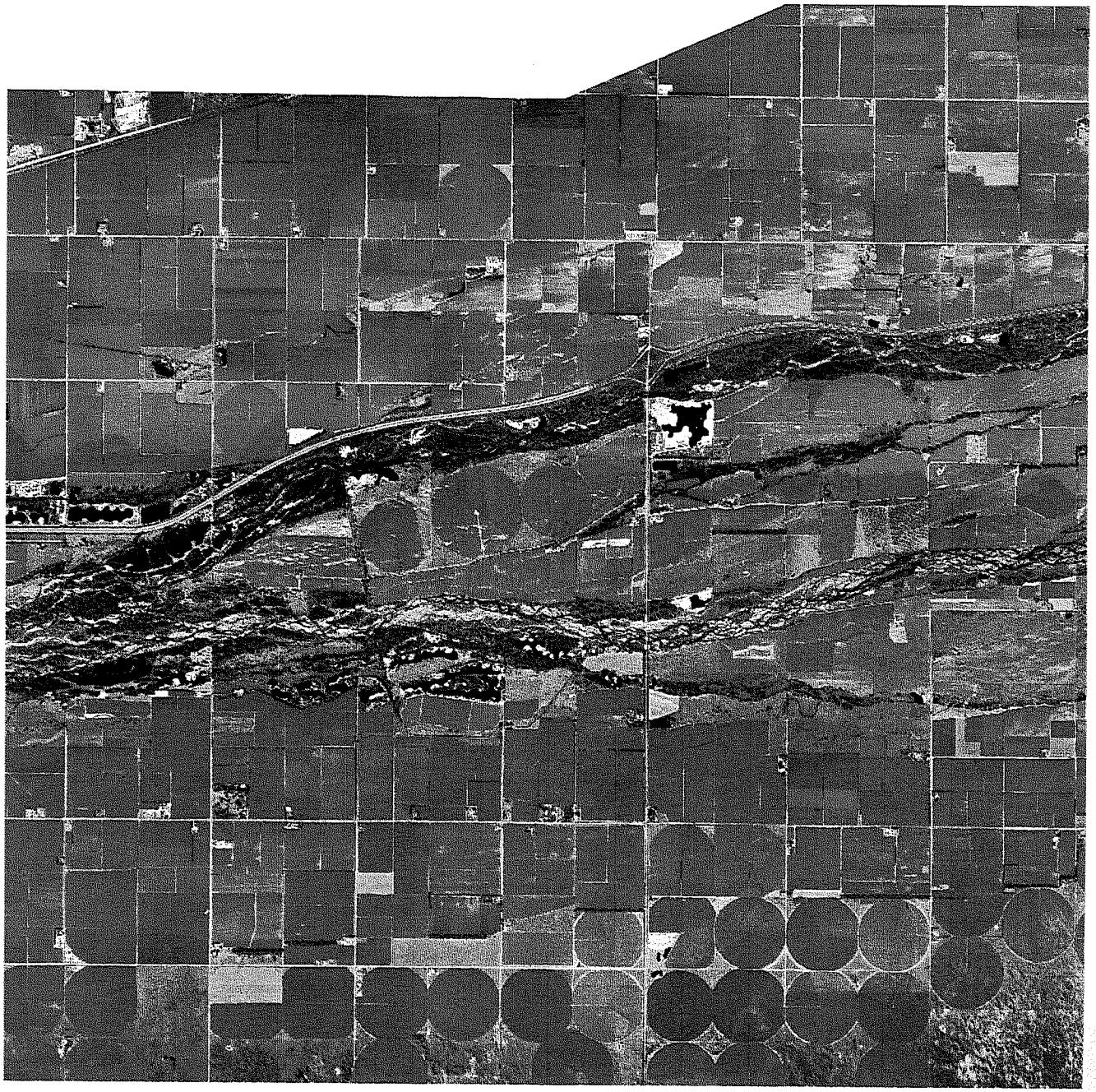

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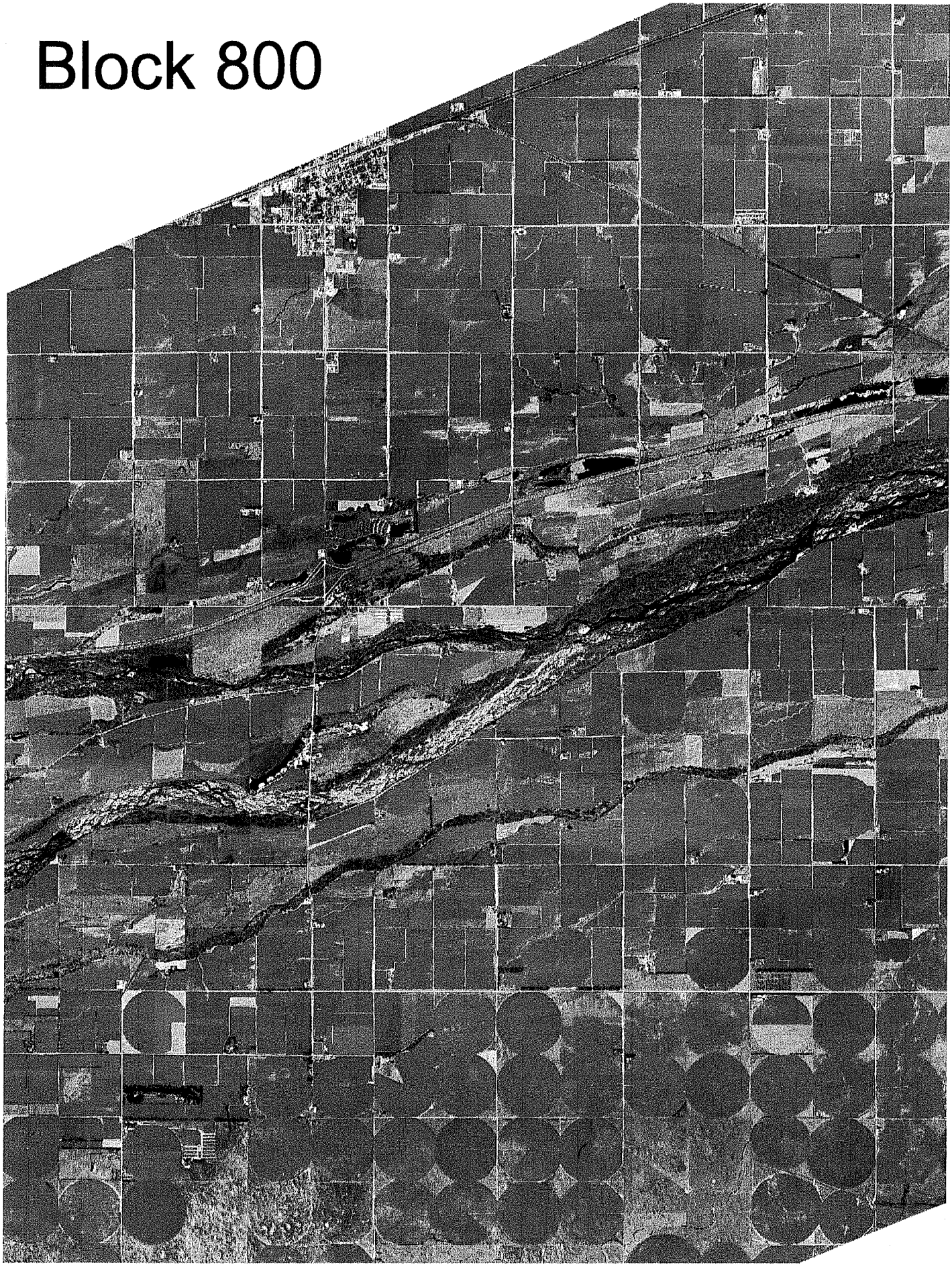

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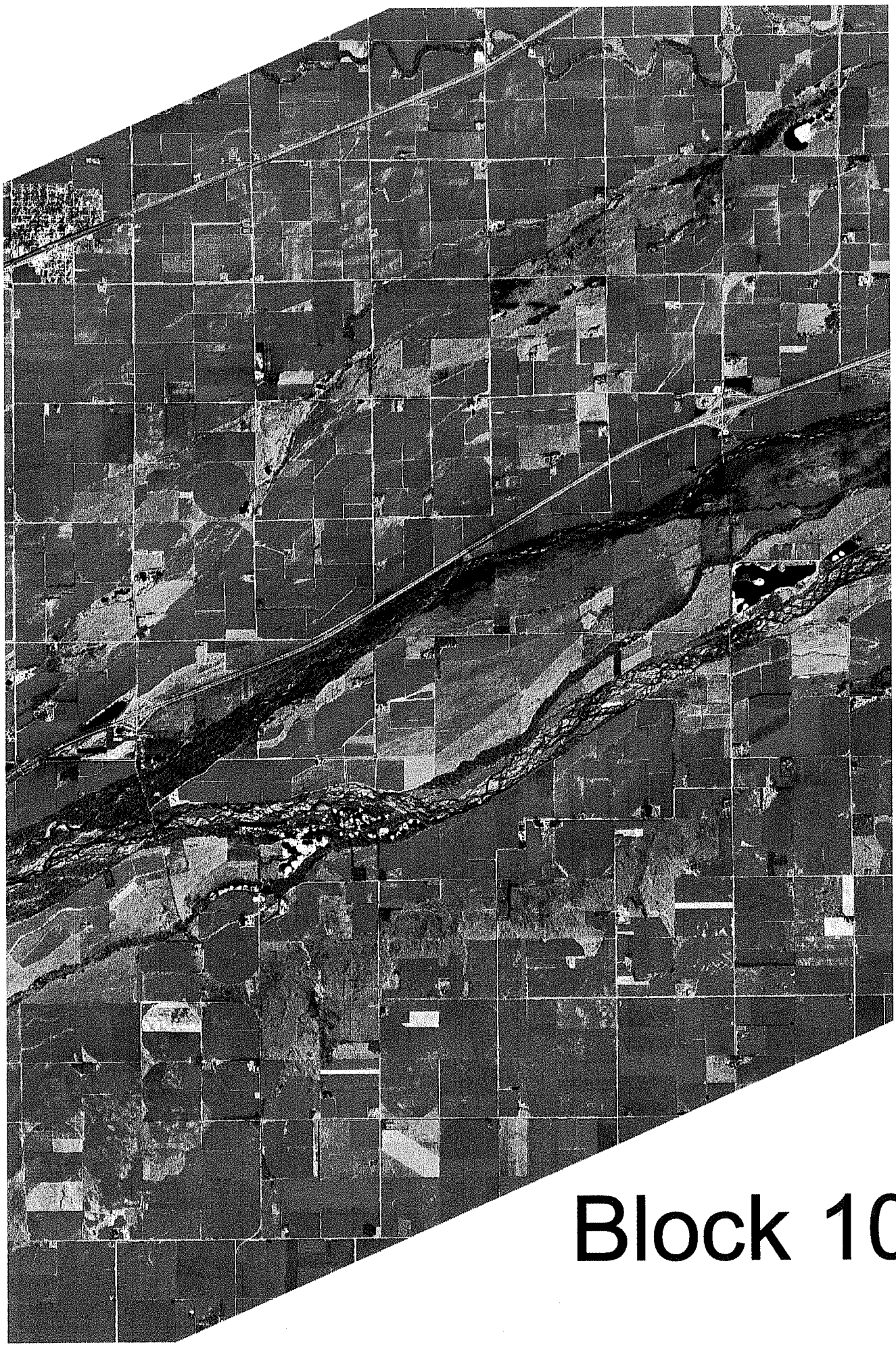

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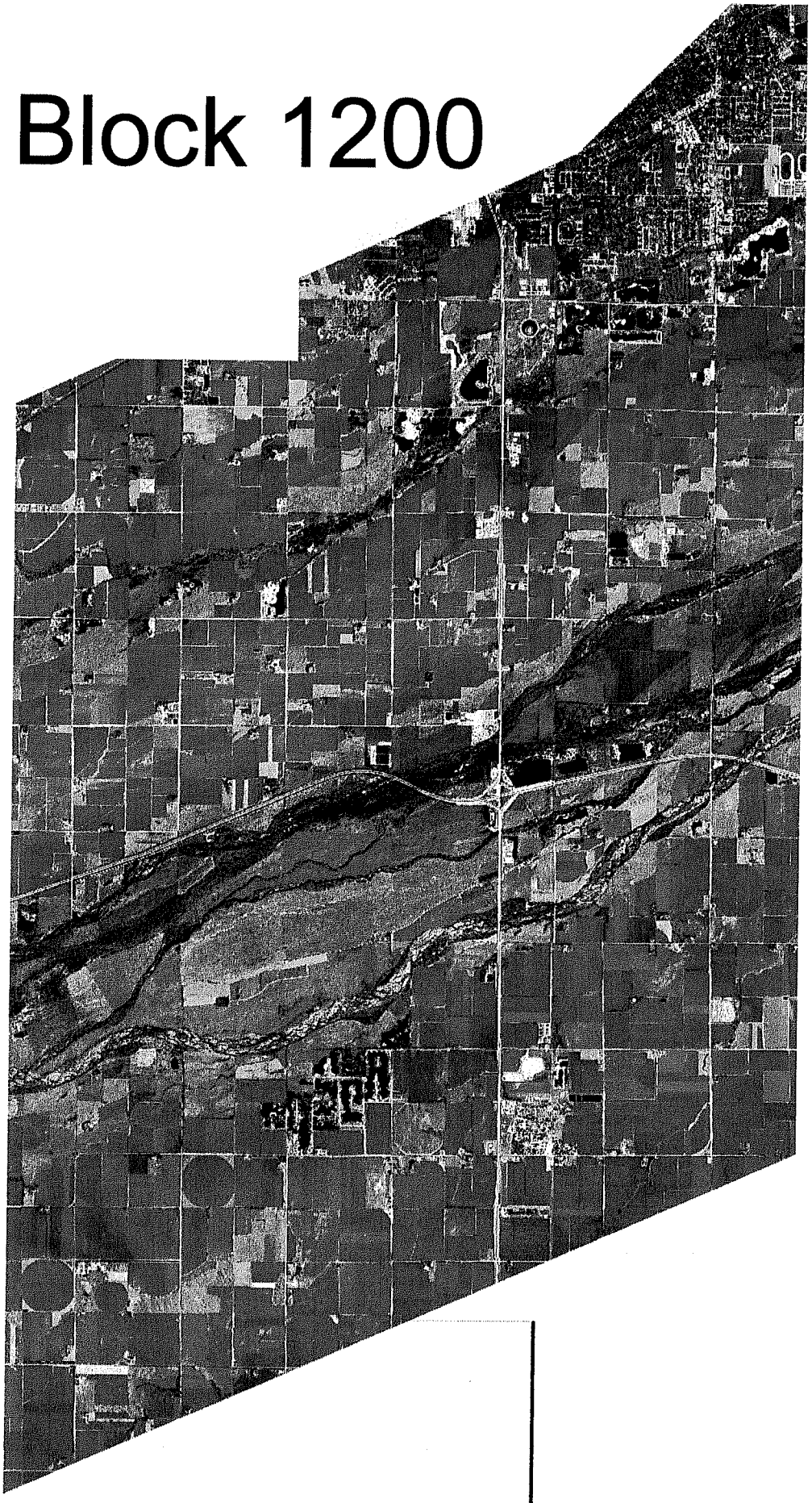

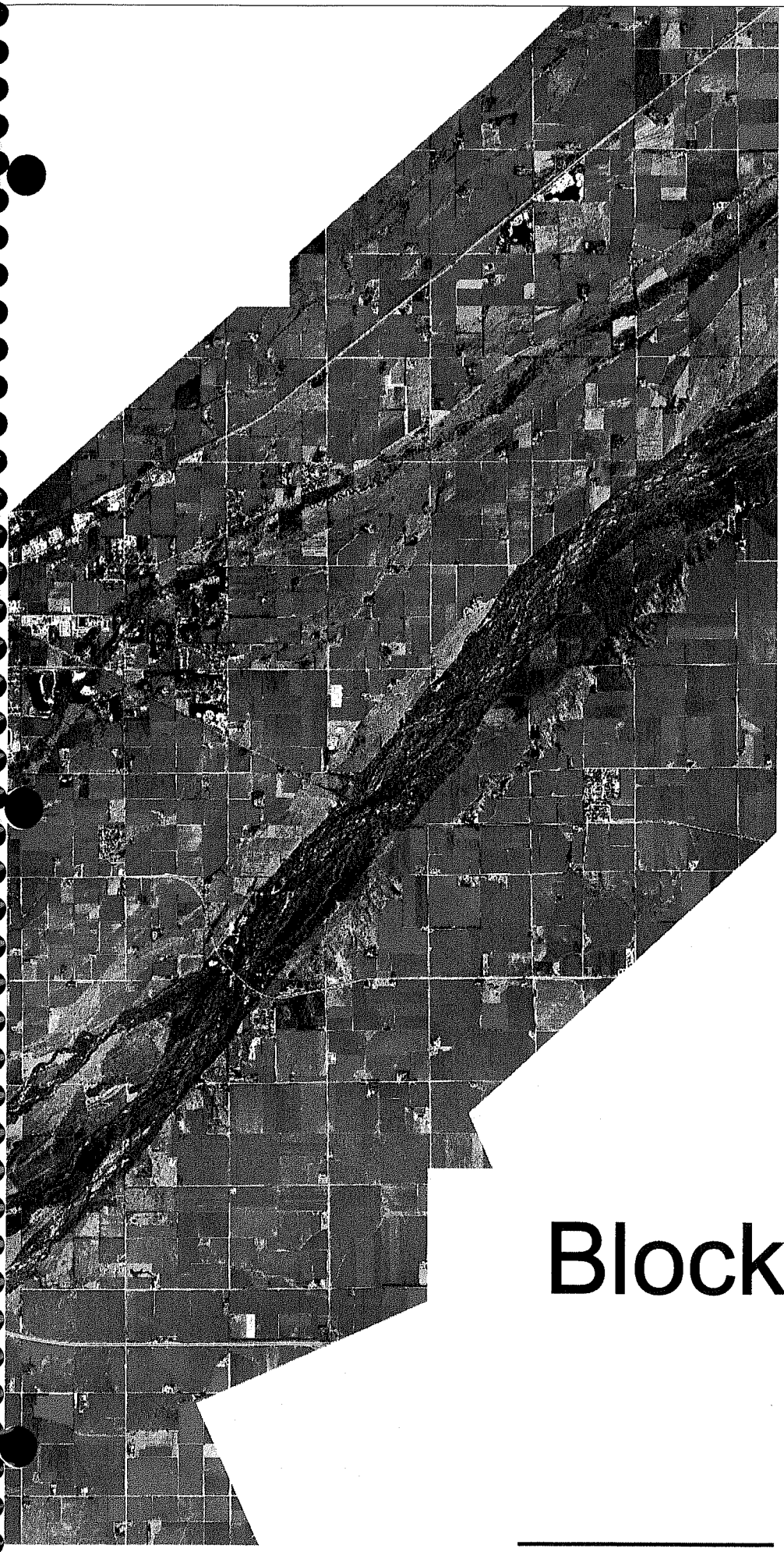

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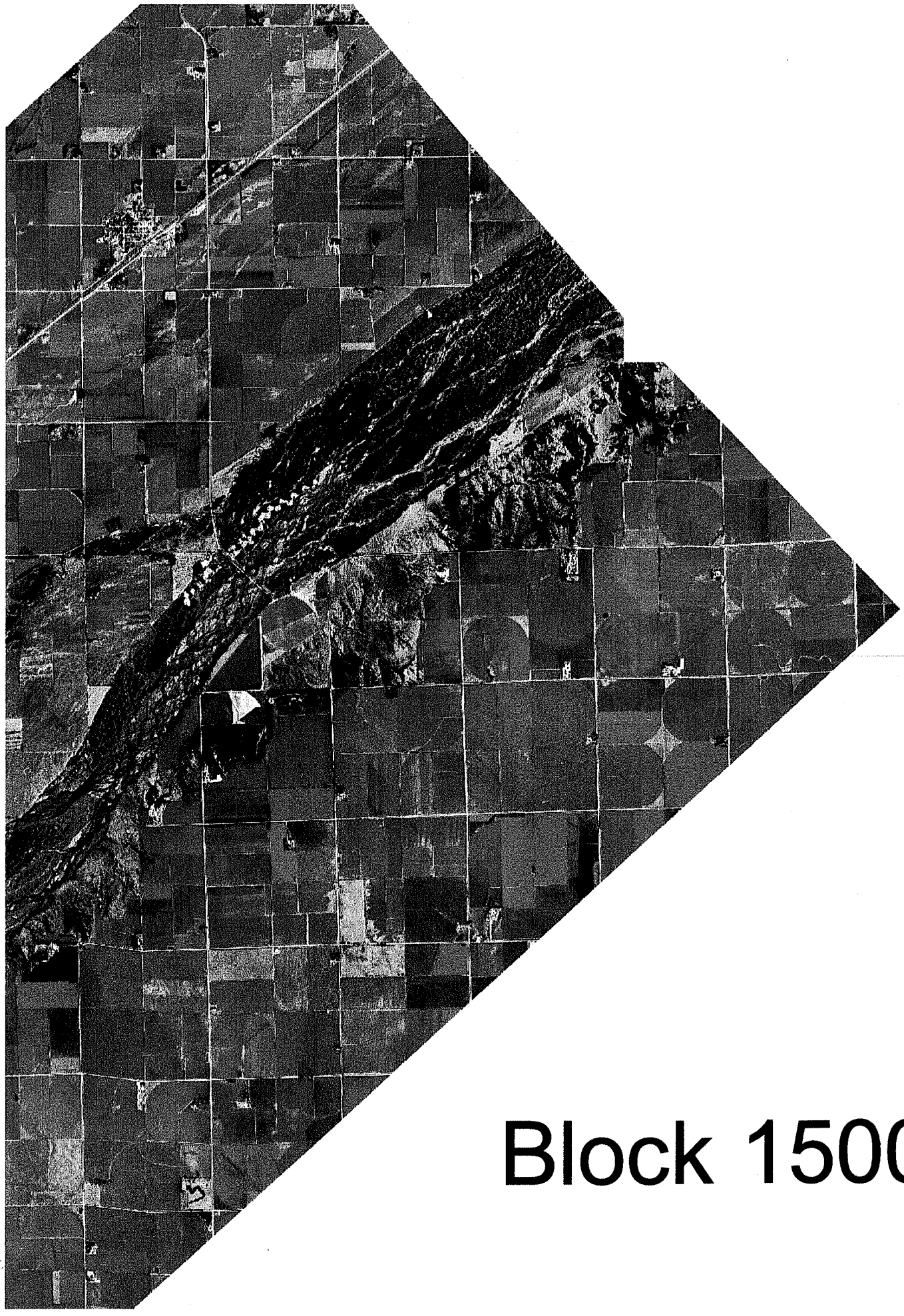

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