State of Nebraska

Game and Parks Commission

Fisheries Division

Federal Aid in Sport Fish Restoration

Dingell-Johnson / Wallop-Breaux Project

F-75-R-22

Performance Report

1 March 2004 through 28 February 2005

August 2005

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Abstract

Annual fish population monitoring of the Missouri River between 1 March 2004 and 28 February 2005 included gill netting for paddlefish in the lower unchannelized reach, trawling for paddlefish in Lewis and Clark Lake, hoop netting for channel catfish in the upper unchannelized and lower channelized reaches and electrofishing for flathead catfish in the lower unchannelized and upper channelized reaches. The mean PSD values for channel catfish collected with 25 and 38 mm mesh hoop nets from the upper unchannelized and lower channelized Missouri River increased since 2002. The PSD values for flathead catfish from the lower unchannelized and upper channelized section increased from 2002 to 2004. Abundance of young-of-year paddlefish from Lewis and Clark Lake was very low (0.04 paddlefish per minute), lower than the long term (1965 - 2004) average of 0.28 paddlefish per minute.

Angler surveys included a roving creel from Bellevue to Camp Creek, a recreational use survey from Gavins Point Dam to the mouth of the Missouri River at St. Louis and postcard surveys for the paddlefish archery and snagging seasons. Paddlefish angers harvested nearly 1,100 paddlefish during the 2004 snagging season.

Keywords: Fishes, rivers, seining, hoop netting, gill netting, trammel netting, benthic trawl, pallid sturgeon, paddlefish, channel catfish, flathead catfish, shovelnose sturgeon, sturgeon chub, sicklefin chub, mitigation, creel, Missouri River.

Performance Report

State: Nebraska Project Number: F-75-R-22

Project Type: Research

Study Title: Missouri River Ecology

The Nebraska Game and Parks Commission has adopted the following management goal for the Missouri River: Restore, protect, and maintain the diversity of historic Missouri River habitats, resources, and ecosystem functions in order that present and future generations may enjoy consumptive and non-consumptive outdoor recreational opportunities (NGPC 1996). To accomplish this goal the Nebraska Game and Parks Commission has identified the following five objectives:

- To restore terrestrial and aquatic floodplain habitat types by 2008. This would include old oxbows, chutes, side channels, sand bars, backwaters, wetlands, and other shallow water habitats.
- To restore flows that reflect the natural hydrograph of the Missouri River by the year 2008.
- To inform and educate the general public and constituency about Missouri River ecosystem functions and management.
- To double the total number of recreational use days by the year 2008.
- To investigate and manage native fish, wildlife, waterfowl, and furbearers on a sustainable basis.

Even though several of these objectives fall outside of NGPC management authority, this project has and will provide the data necessary to plan, implement and evaluate these objectives. Progress towards meeting these objectives has been evaluated and the results presented in the updated NGPC strategic plan.

Job 1 - Missouri River Ecology

a. Objective

Monitor fish populations living in unchannelized and channelized sections of the Missouri River bordering Nebraska. Measure pertinent physical, chemical, and biological parameters (eg. primary and secondary productivity estimates, feeding behavior of organisms at various trophic levels, water temperature, turbidity, conductivity, velocity, and fish yield) annually from the Missouri River ecosystem to

determine factors that may affect changes in these populations.

b. Activity

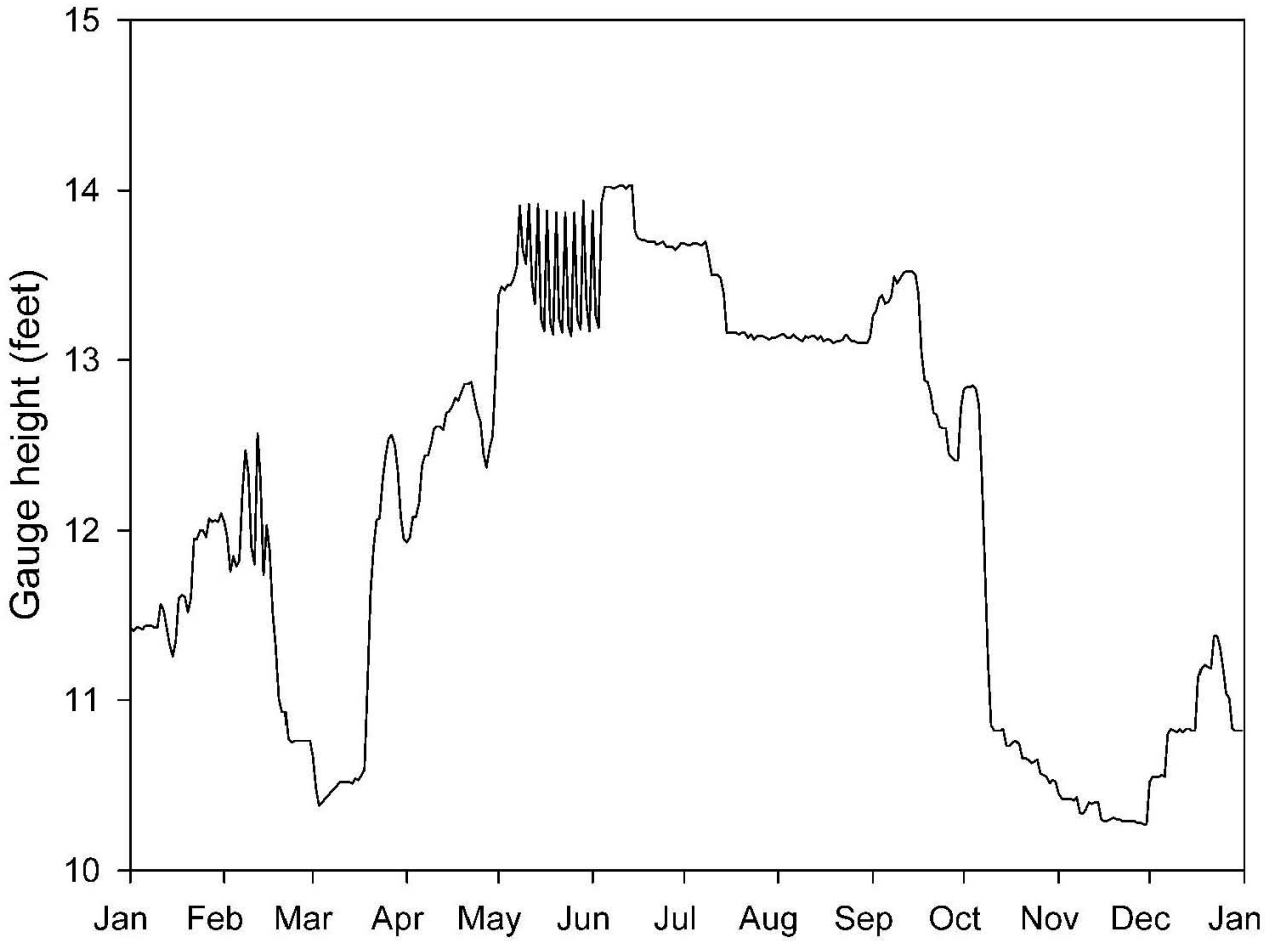
Study site definitions

The NGPC Fisheries Division has divided the Missouri River adjacent to Nebraska into five sections. These sections are based on physical or geomorphological uniqueness. The upper unchannelized section extends from the Fort Randall Dam tailwater (river kilometer (rk) 1,419) down river to the headwaters of Lewis and Clark Lake (rk 1,352). The lower unchannelized section extends from the Gavins Point Dam tailwater (rk 1,308) down river to the mouth of the Big Sioux River (rk 1,184). The upper channelized section extends from the mouth of the Big Sioux River down river to the mouth of the Platte River (rk 960). The lower channelized section extends from the mouth of the Platte River down river to the Nebraska-Kansas border (rk 794). Lewis and Clark Lake (rk 1,352 to rk 1,308) is considered the fifth section. Each section has been subdivided into reaches up to 32 kilometers in length. Codes have been developed and revised for sections and reaches of the Missouri River for use in the Fisheries Division fisheries analysis programs (refer to Appendix I for definitions and descriptions).

Conditions

In Figure 1 we present the stage at Yankton, South Dakota during 2004. River stage increased rapidly starting 19 March and reached the level of navigation support by 26 March. A three day peaking cycle was implemented during May to encourage terns and plovers to establish nests at higher elevations. River stage generally declined throughout the summer through the end of the Navigation season on 5 October. Discharge was very low the rest of the year to conserve water in the system because of basin-wide drought conditions.

Figure 1. Stage (feet) at Yankton, South Dakota, 2004.



Hoop net sampling

Hoop nets were set on 20, 21 and 22 July 2004 to sample channel catfish in the upper unchannelized reach at Upper/Lower Boyd County, Ponca Creek and Niobrara, and on 28, 29 and 30 July 2004 on the lower channelized reach at Plattsmouth, Peru and Brownville. A combination of 0.6 m and 1.2 m diameter hoop nets with 25 mm (1") and 38 mm (1½") mesh were fished. Nets were baited with scrap cheese and set overnight in current using hoop net hooks along vertical underwater bank lines. All fish were measured to the nearest millimeter, weighed to the nearest gram, and spines were removed from channel catfish for age and growth analysis.

A total of 165 fish of 14 species were collected in 48 hoop net nights in the upper unchannelized Missouri River (Tables 1 and 2) and 174 fish of 9 species were taken in 48 hoop net nights on the lower channelized Missouri River (Tables 3 and 4). Catch rates for channel catfish from the 0.6 m diameter 25-mm mesh hoop nets ranged from 0.3 fish per hoop net night at Niobrara to 11.5 fish per hoop net night at Peru (Table 5). Catch rates for channel catfish from the 1.2 m diameter 25-mm mesh hoop nets ranged from 0.5 fish per hoop net night at Ponca Creek to 8.0 fish per hoop net night at Peru. Catch rates for channel catfish from the 0.6 m diameter 38-mm mesh hoop nets ranged from 0.3 fish per hoop net night at Niobrara and Brownville to 3.3 fish per hoop net night at Upper/Lower Boyd County (Table 6). Catch rates for channel catfish from the 1.2 m diameter 38-mm mesh hoop nets ranged from zero fish per hoop net night at Plattsmouth to 1.8 fish per hoop net night at Upper/Lower Boyd County and Brownville.

In 1998 we began a study that will compare catch rates from 0.6 m and 1.2 m diameter hoop nets. We set nearly equal numbers of hoop nets of both mesh sizes and diameters each sampling trip. This effort will continue for several years to examine the relationship between catch rates and net type to determine if we will change the size of our standard hoop nets. Length distributions for channel catfish sampled with hoop nets are presented in Figures 2 - 5.

Table 1. Effort (hoop net nights), number of fish collected and fish per net night using 0.6 m and 1.2 m diameter 25-mm (1") mesh hoop nets from the upper unchannelized Missouri River, Nebraska during 2004.

Species	Upper/Lower Boyd		Ponca Creek		Niobrara		Total
	0.6m	1.2m	0.6m	1.2m	0.6m	1.2m	
Common carp		1	1	1			3
River carpsucker			6	1			7
Northern pike			1				1
Smallmouth buffalo		1					1
Shorthead redhorse		3	1	2	1	2	9
Channel catfish	4	18	12	2	1	7	44
Spotted bass							1
Smallmouth bass	2			2			4
Black crappie				1			1
Total number of fish	5	23	21	9	2	9	70
Effort in Net Nights	4	4	4	4	4	4	24
Fish / Net night	1.5	5.8	5.3	2.3	0.5	2.3	2.9

Table 2. Effort (hoop net nights), number of fish collected and fish per net night using 0.6 m and 1.2 m diameter 38-mm (1 ½") mesh hoop nets from the upper unchannelized Missouri River, Nebraska during 2004.

Species	Upper/Lower Boyd		Ponca Creek		Niobrara		Total
	0.6m	1.2m	0.6m	1.2m	0.6m	1.2m	
Common carp			1	1		1	3
River carpsucker			1			1	2
Northern pike			1		1	1	3
Smallmouth buffalo	1	1	1	6	1	6	16
Shorthead redhorse	3	11	3	3	2	3	25
Channel catfish	13	7	3	5	1	3	32
Flathead catfish						3	3
Bluegill				1			1
Smallmouth bass				3			3
Rock bass	1						1
White bass				1			1
Black crappie						1	1
Blue sucker		1				1	2
Freshwater drum		1		1			2
Total number of fish	18	21	10	21	5	20	95
Effort in Net Nights	4	4	4	4	4	4	24
Fish / Net night	4.5	5.3	2.5	5.3	1.3	5.0	3.9

Table 3. Effort (hoop net nights), number of fish collected and fish per net night using 0.6 m and 1.2 m diameter 25-mm (1") mesh hoop nets from the lower channelized Missouri River, Nebraska during 2004.

Species	Plattsmouth		Peru		Brownville		Total
	0.6m	1.2m	0.6m	1.2m	0.6m	1.2m	
Common carp						1	1
River carpsucker						1	1
Channel catfish	3	12	46	32	4	7	104
Flathead catfish	1	1	1				3
Freshwater drum				1			1
Total number of fish	4	13	47	33	4	9	110
Effort in Net Nights	4	4	4	4	4	3	23
Fish / Net night	1.0	3.3	11.8	8.3	1.0	3.0	4.8

Table 4. Effort (hoop net nights), number of fish collected and fish per net night using 0.6 m and 1.2 m diameter 38-mm (1 ½") mesh hoop nets from the lower channelized Missouri River, Nebraska during 2004.

	Plattsmouth		Peru		Brownville		
Species	0.6m	1.2m	0.6m	1.2m	0.6m	1.2m	Total
Common carp	1			1		2	4
River carpsucker				2		2	4
Shovelnose sturgeon		4		1			5
Blue sucker		17		1			18
Channel catfish	2		5	5	1	9	22
Flathead catfish	1			1		2	4
Goldeye				2			2
Flathead catfish	1					2	3
Freshwater drum			1	1			2
Total number of fish	5	21	6	14	1	17	64
Effort in Net Nights	4	4	4	4	4	5	25
Fish / Net night	1.3	5.3	1.5	3.5	0.3	3.4	2.6

Table 5. Number of channel catfish collected using 0.6 m and 1.2 m, 25-mm (1") mesh hoop nets, number of net nights and catch per net night (CPNN) from the Missouri River, Nebraska during 2004.

Site	0.6 m hoop nets			1.2 m hoop nets		
	Catfish	Effort	CPNN	Catfish	Effort	CPNN
Upper Unchannelized						
Upper/Lower Boyd	4	4	1	18	4	4.5
Ponca Creek	12	4	3	2	4	0.5
Niobrara	1	4	0.3	7	4	1.8
Total	17	12	1.4	27	12	2.3
Lower Channelized						
Plattsmouth	3	4	0.8	12	4	3.0
Peru	46	4	11.5	32	4	8.0
Brownville	4	4	1.0	7	3	1.8
Total	53	12	4.4	51	11	4.6

Table 6. Number of channel catfish collected using 0.6 m and 1.2 m, 38-mm (1 ½") mesh hoop nets, number of net nights and catch per net night (CPNN) from the Missouri River, Nebraska during 2004.

Site	0.6 m hoop nets			1.2 m hoop nets		
	Catfish	Effort	CPNN	Catfish	Effort	CPNN
Upper Unchannelized						
Upper/Lower Boyd	13	4	3.3	7	4	1.8
Ponca Creek	3	4	0.8	5	4	1.3
Niobrara	1	4	0.3	3	4	0.8
Total	17	12	1.4	15	12	1.3
Lower Channelized						
Plattsmouth	2	4	0.5	0	4	0
Peru	5	4	1.3	5	4	1.3
Brownville	1	4	0.3	9	5	1.8
Total	8	12	0.7	14	13	1.1

Figure 2. Length distribution (by 20 mm length groups) of channel catfish sampled using 0.6 m and 1.2 m diameter 25-mm mesh hoop nets on the upper unchannelized Missouri River, 2004.

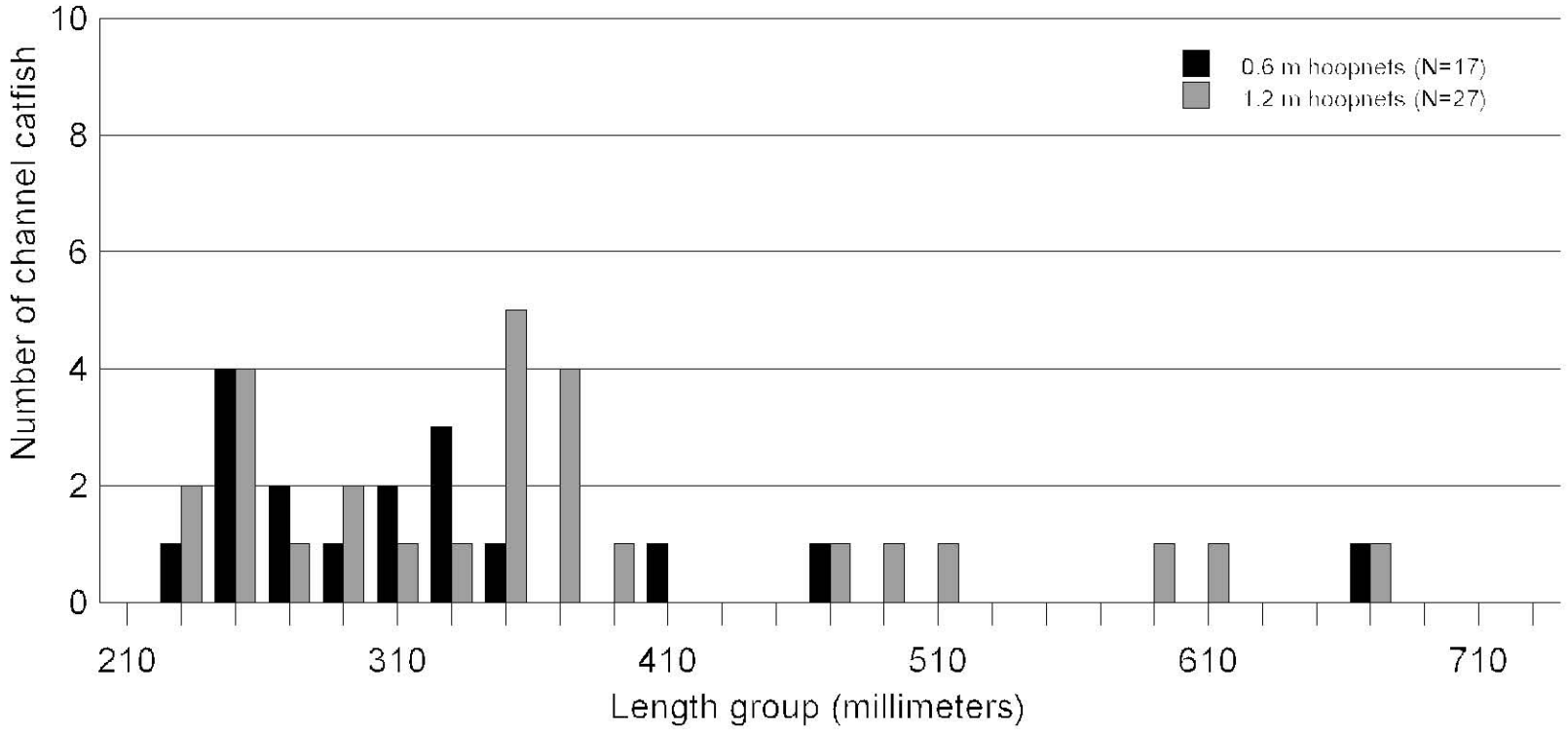


Figure 3. Length distribution (by 20 mm length groups) of channel catfish sampled using 0.6 m and 1.2 m diameter 38-mm mesh hoop nets on the upper unchannelized Missouri River, 2004.

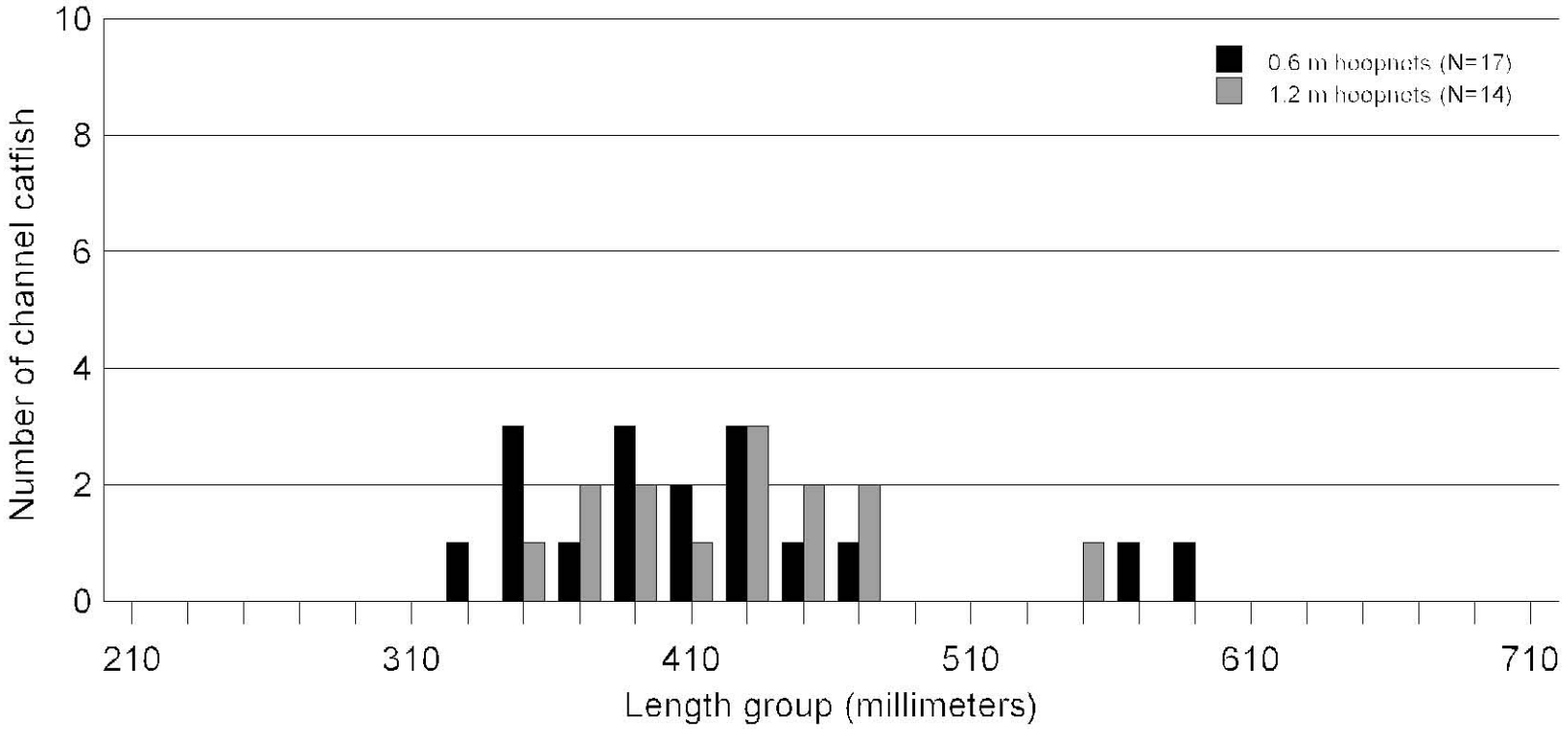


Figure 4. Length distribution (by 20 mm length groups) of channel catfish sampled using 0.6 m and 1.2 m diameter 25-mm mesh hoop nets on the lower channelized Missouri River, 2004.

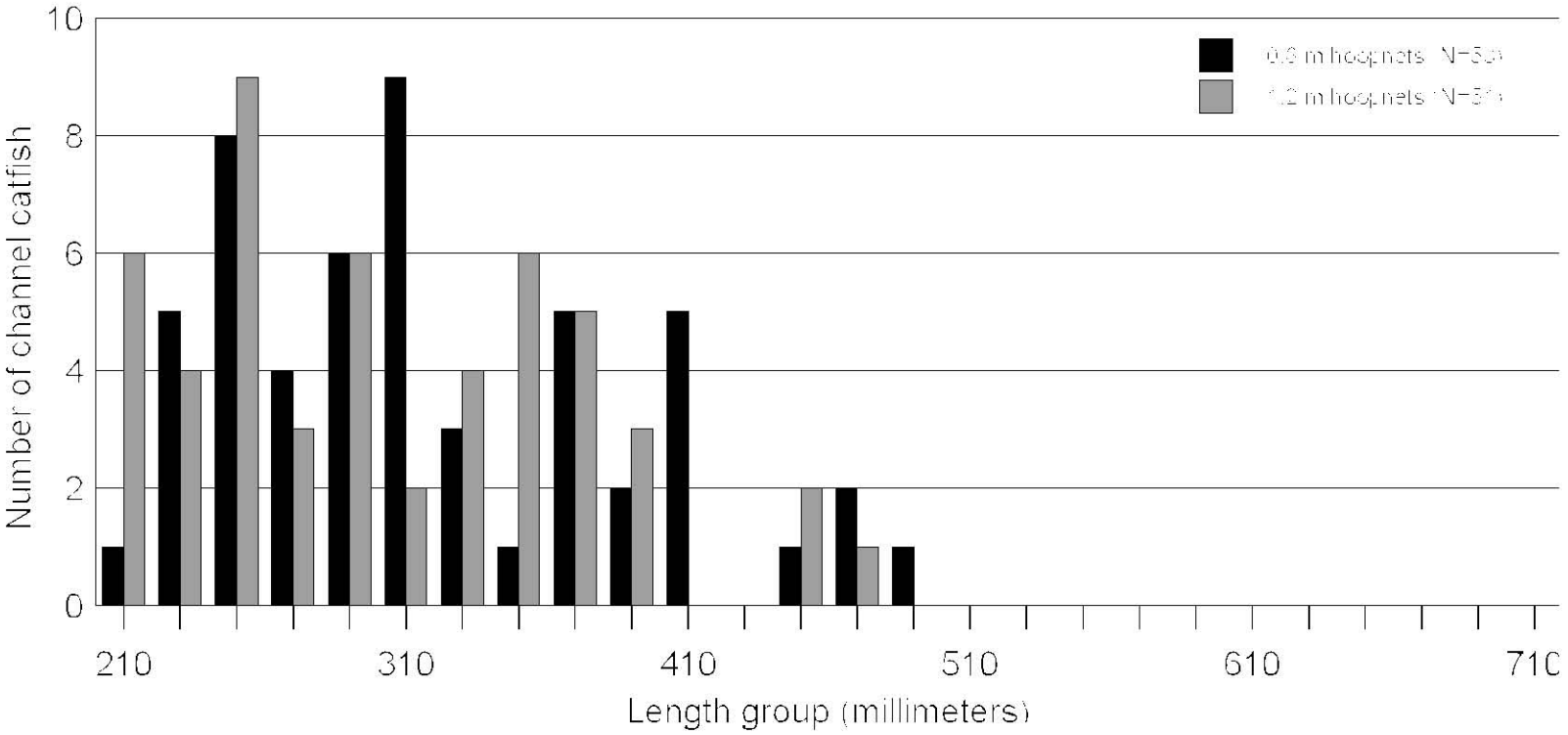
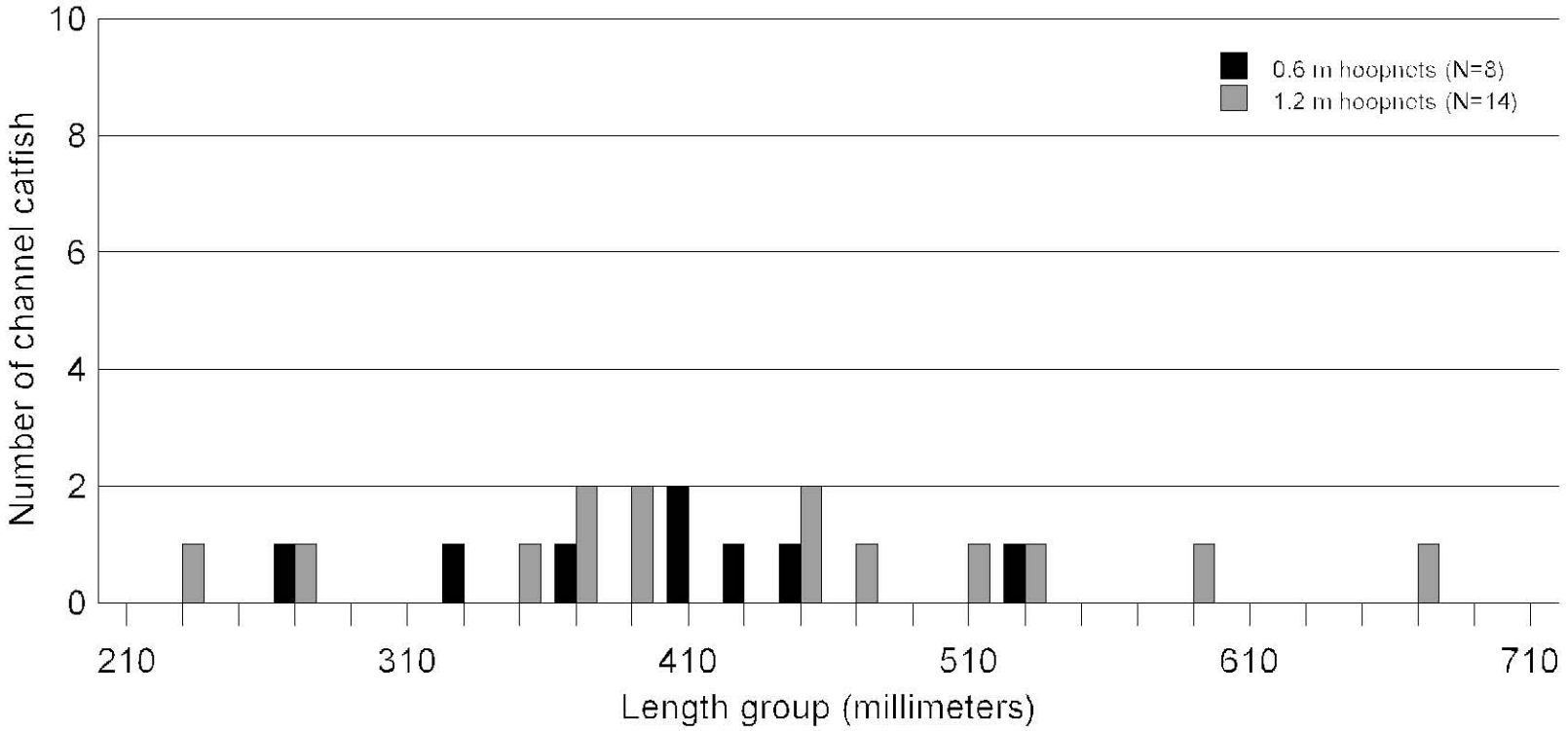


Figure 5. Length distribution (by 20 mm length groups) of channel catfish sampled using 0.6 m and 1.2 m diameter 38-mm mesh hoop nets on the lower channelized Missouri River, 2004.



In 1996 we changed our sampling schedule for channel and flathead catfish so that we would visit each section of river on alternate years. The results of the 1996 and 1997 catfish age analysis were presented in the segment 15 report (Mestl 1998). The results of the 1998 and 1999 catfish age analysis were presented in the segment 17 report (Mestl 2000). The results of the 2000 and 2001 catfish age analysis were presented in the segment 19 report (Mestl 2002). The results of the 2002, 2003 and 2004 age analysis will be presented in the Segment 23 report.

A length-frequency index measures changes in population structure. Gabelhouse (1984) defined minimum lengths for channel catfish as 280 mm for stock, 410 mm for quality, 610 mm for preferred, 710 mm for memorable and 910 mm for trophy sizes. Proportional Stock Density (PSD) is the proportion of fish of quality size in a stock. Relative Stock Density (RSD) is the proportion of fish of a size group in a stock. Proportional stock density (PSD) and relative stock density (RSD) values are presented in Table 7 for channel catfish collected in 25 mm and 38 mm mesh hoop nets during 1996, 1998, 2000 and 2002.

The mean PSD values for channel catfish collected with 25mm mesh hoop nets from the upper unchannelized and lower channelized Missouri River both increased since 2002 (Table 7). There has also been an increase in PSD values for the channel catfish collected in 38 mm hoop nets on the upper unchannelized and lower channelized river since 2002.

Table 7. PSD and RSD values for channel catfish collected with 25-mm and 38-mm mesh hoop nets from the Missouri River, Nebraska during 1996, 1998, 2000, 2002, and 2004.

	25mm					38mm				
	1996	1998	2000	2002	2004	1996	1998	2000	2002	2004
Upper unchannelized										
PSD	39	22	12	10	30	19	21	28	37	48
RSD-P (preferred)	2	<1	<1		7	1	3	6	7	
RSD-M (memorable)					7					
RSD-T (trophy)										
Number of stock size fish	59	351	666	273	30	86	147	238	43	31
Lower channelized										
PSD	19	21	28	15	17	27	45	51	40	53
RSD-P (preferred)	2	2	4	2		2	2	12		5
RSD-M (memorable)										5
RSD-T (trophy)										
Number of stock size fish	94	61	44	119	64	49	47	78	91	19

Flathead catfish sampling

Flathead catfish were sampled on the lower unchannelized Missouri River at St Helena, Mulberry Bend and Kenslers Bend on 12 and 13 July 2004 and on the upper channelized section at South Sioux City, Tekamah and Blair on 17 and 18 August 2004. Flathead catfish were collected with a Smith-Root electrofishing boat using pulsed DC operated on the low range (50-500), percent of range was 18%, output current <1 amp and pulse rate of 15 per second. Only flathead catfish were dipped from the water. All fish were measured to the nearest millimeter, weighed to the nearest gram, and five spines for every 10 mm length group were removed for age and growth analysis.

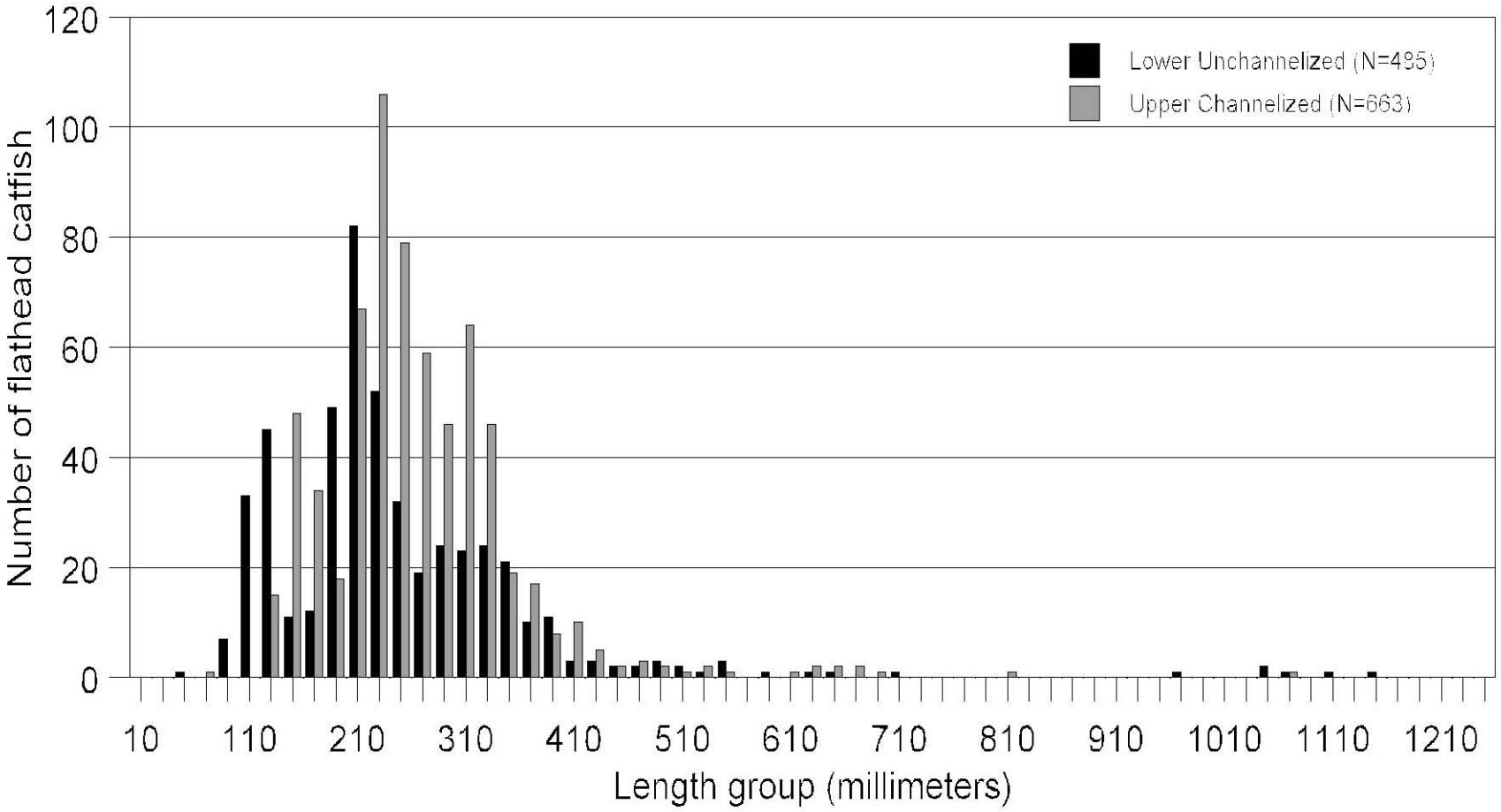
A total of 1,149 flathead catfish were collected in 352 minutes of electrofishing (Table 8). Catch per unit of effort for electrofishing is reported as number of flathead catfish per minute of electrofishing and ranged from 1.4 fish/minute at Mulberry Bend to 4.9 fish/minute at Blair. Catch rates decreased on the upper channelized and lower unchannelized reach from 2002. Length distributions for flathead catfish sampled with electrofishing are presented in Figure 6.

Table 8. Number of flathead catfish collected, effort of electrofishing (minutes), and catch per unit effort (flathead catfish per minute) from the lower unchannelized and upper channelized Missouri during 1996, 1998, 2000, 2002, and 2004.

Site	1996			1998			2000			2002			2004[-1]		
	Fish	Effort	CPUE	Fish	Effort	CPUE	Fish	Effort	CPUE	Fish	Effort	CPUE	Fish	Effort	CPUE
Lower unchannelized															
St. Helena							124	60	2.1	193	81	2.4	159	63	2.5
Mulberry Bend				32	75	0.4	106	59	1.8	140	70	2.0	91	64	1.4
Kenslers Bend	77	85	0.9	211	90	2.3	465	60	7.8	426	66	6.5	235	65	3.6
Total	77	85	0.9	243	165	1.5	733	210	3.5	759	217	3.5	485	192	2.5
Upper channelized															
Dakota City	89	108	0.8	213	90	2.4	369	65	5.7	335	72	4.6	166	52	3.2
Tekamah	109	59	1.9	270	94	2.9	290	60	4.8	279	64	4.4	236	54	4.3
Blair				290	90	3.2	249	60	4.2	411	57	7.2	262	54	4.9
Total	198	167	1.2	773	274	2.8	908	185	4.9	1,025	193	5.3	664	160	4.2

[-1] In 2004 South Sioux City sampled in place of Dakota City

Figure 6. Length distribution (by 20 mm length groups) of flathead catfish sampled using electrofishing on the lower unchannelized and upper channelized Missouri River during 2004.



Gabelhouse (1984) defined minimum lengths for flathead catfish as 280 mm for stock, 410 mm for quality, 610 mm for preferred, 710 mm for memorable and 910 mm for trophy sizes. The PSD and RSD values for flathead catfish collected using electrofishing gear during 1996, 1998, 2000, 2002, 2004 are given in Table 9. The PSD values for the lower unchannelized section increased slighty from 2002 to 2004 while the number of stock size fish decreased by nearly 70%. The PSD value for the upper channelized section in 2004 more then doubled from 2002 while the number of stock sized fish decreased by 45%.

Table 9. PSD and RSD values for flathead catfish collected with electrofishing gear from the Missouri River, Nebraska during 1996, 1998, 2000, 2002 and 2004.

Length category	Lower unchannelized					Upper channelized				
	1996	1998	2000	2002	2004	1996	1998	2000	2002	2004
PSD	3	29	24	18	19	20	9	6	6	13
RSD-P (preferred)		2	3	2	6	1		1	1	4
RSD-M (memorable)		1	2	1	4				1	<1
RSD-T (trophy)		1	<1	<1	4				1	<1
Number of stock size fish	34	157	303	448	142	80	391	379	433	236

Paddlefish sampling

During 1995, the Nebraska Game and Parks Commission signed a cooperative agreement with the Mississippi Interstate Cooperative Resource Association (MICRA) to participate in their Interjurisdictional Paddlefish Tagging Study. Tagging methodologies and data recording procedures conforming with protocol developed for the study have been adopted (Oven 1995). During 2004, paddlefish were collected using floating gill nets in the Gavins Point tailwater. Floating trammel nets set in previous years at St Helena were not deployed. All paddlefish were weighed to the nearest 0.1 kg and measured to the nearest mm from the front of the eye to the fork of the tail. Each paddlefish was examined for tags and external injuries, tagged with sequentially numbered coded wire tags, and released near where they were captured.

Floating multifilament gill nets (182.9 m x 3 m x 76-mm mesh) were used in the Gavins Point Dam stilling basin. Floating gill nets were anchored and paddlefish were removed as they were observed striking the net. Effort is reported as hours and CPUE is expressed as the number of paddlefish per hour.

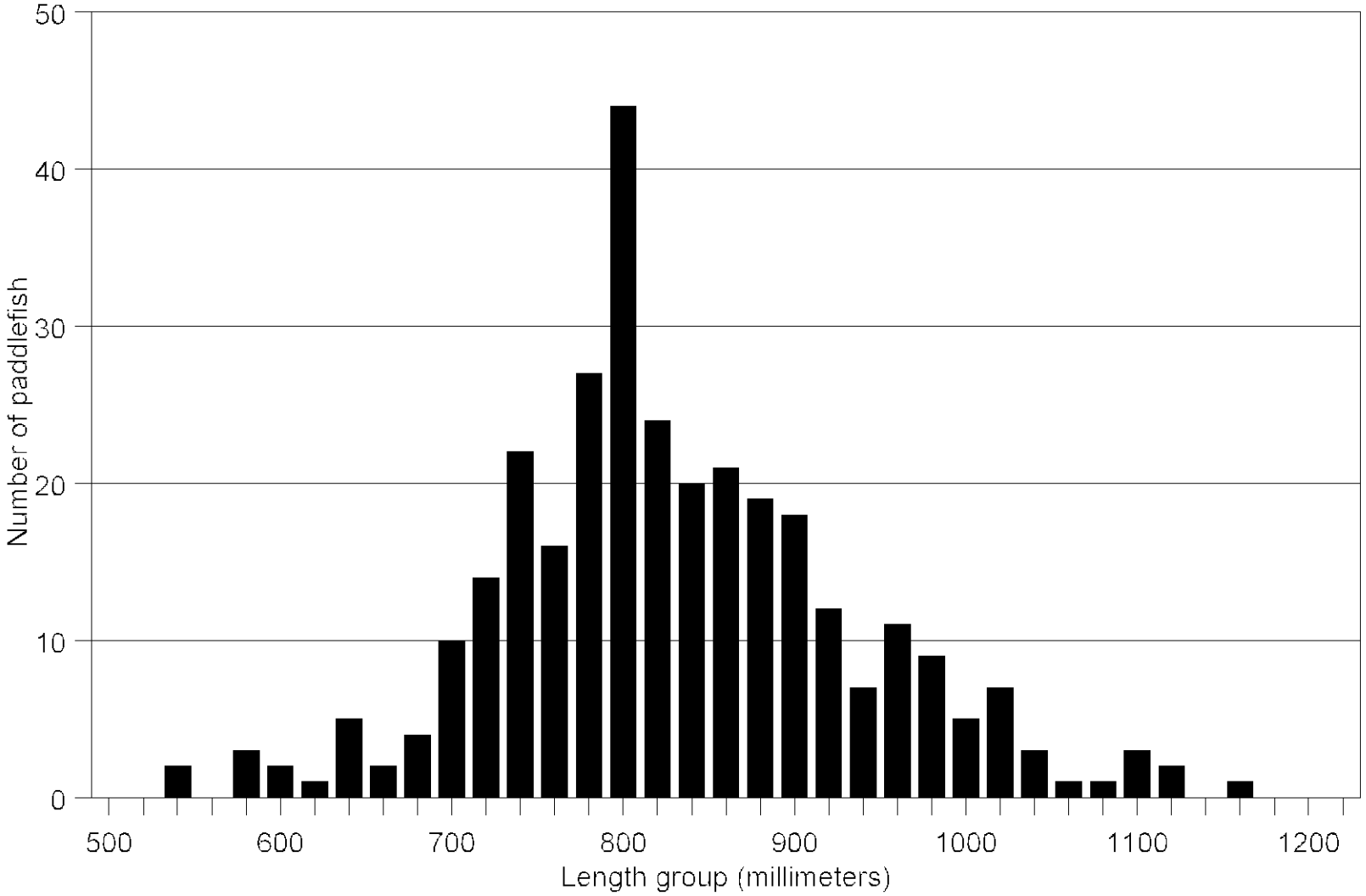
During 2004, 316 paddlefish were netted; of these, 30 were recaptures with previously implanted coded wire tags, either from this study or from previously stocked fish (Table 10). Floating gill nets caught 77.1 paddlefish per hour in the Gavins Point Dam tailwater. A length distribution for paddlefish collected from the Gavins Point Dam tailwater is presented in Figure 7. During 2004 the mean length of paddlefish netted with floating gill nets from the Gavins Point Dam tailwater was 828 mm and the mean weight was 7.1 kg (Table 11).

Table 10. Number of net sets, net type, number of paddlefish, effort (hours), CPUE (paddlefish per hour), and number of tagged paddlefish recaptured by date and location during 2004

Date	# nets	Net type[1]	Paddlefish	Effort	CPUE	# Recap
Gavins Point Dam tailwater						
September 20	5	GIF	114	0.6	180.0	13
September 21	4	GIF	52	0.4	120.0	6
November 1	6	GIF	93	1.2	77.5	7
November 2	6	GIF	57	1.9	29.7	4
Total	21		316	4.1	77.1	30

[1] Net types -GIF- floating gill net

Figure 7. Length distribution of paddlefish (by 20 mm length groups) sampled using 76 mm mesh floating gill nets and 76mm mesh floating trammel nets in the Gavins Point Dam tailwater during 2004 (N=316)..



Gabelhouse (1984) defined minimum lengths for paddlefish as 410 mm for stock, 660 mm for quality, 840 mm for preferred, 1,040 mm for memorable, and 1,300 mm for trophy sizes. The PSD and RSD values for paddlefish collected using trammel and gill nets from 1995 through 2004 are given in Table 12. The PSD, RSD-P and RSD-M values for paddlefish sampled from the Gavins Point Dam tailwater in 2004 was slighty lower then 2003.

In Table 13, we present RSD values for paddlefish netted and snagged from the Gavins Point Dam tailwater with the following length categories: stock - paddlefish greater than 410 mm, slot - paddlefish greater than 889 mm up to 1,143 mm; and above slot - paddlefish greater than 1,143 mm. These length groups correspond with the protected slot regulation (889 mm to 1,143 mm) for the snagging season. Tracking changes in these values over time will allow us to assess changes in the paddlefish population that may have been caused by snagging. The RSD slot value of 25 from netting was the same as the previous year while RSD above slot value dropped slightly. The RSD slot value decreased slightly from 2003 and the RSD above slot value increased slightly.

Table 11. Number, mean length (mm), mean weight (kg), and minimum and maximum length of paddlefish collected with gill and trammel nets from the Missouri River, 1995-2004.

Year	Method	Number	Length	Weight	Min	Max
Fort Randall Dam Tailwater						
1996	Floating trammel net	8	948	13.1	750	1221
Upper unchannelized Missouri River - Niobrara						
1996	Floating trammel net	13	883	10.1	790	1080
Gavins Point Dam Tailwater						
1995	Floating trammel net	45	854	8.9	630	1160
	Floating gill net	198	745	5.9	500	1090
	Sinking gill net	71	693	5.2	460	1090
	Yearly total	314	749	6.2	460	1160
1996	Floating trammel net	370	820	7.5	478	1187
	Floating gill net	57	873	9.5	594	1173
	Sinking gill net	26	687	4.4	490	922
	Yearly total	453	819	7.6	478	1187
1997	Floating trammel net	565	807	7.1	470	1290
1998	Floating trammel net	231	821	7.3	546	1296
	Floating gill net	2	861	9.5	819	903
	Sinking gill net	22	816	6.7	666	1086
	Yearly total	255	821	7.0	546	1296
1999	Floating trammel net	367	820	7.1	428	1310
	Floating gill net	88	803	7.3	562	1208
	Yearly total	455	817	7.1	428	1310
2000	Floating gill net	155	835	8.0	584	1186
2001	Floating trammel net	1	848	5.6		
	Floating gill net	252	838	9.0	590	1199
2002	Floating gill net	290	833	7.6	552	1150
2003	Floating gill net	301	832	7.9	564	1138
2004	Floating gill net	316	828	7.1	542	1150
Lower unchannelized Missouri River - St Helena						
1997	Floating trammel net	19	707	4.6	563	883
1998	Floating trammel net	51	768	6.0	610	1020
2000	Floating trammel net	19	765	6.4	612	995
2002	Floating trammel net	76	810	8.0	652	975
2003	Floating gill net	24	847	7.4	697	1006

Table 12. Number of fish by length category, PSD and RSD values for paddlefish collected with gill and trammel nets from the Missouri River, Nebraska from 1995 through 2004.

Year	Number of paddlefish				PSD	RSD-P	RSD-M
	Stock	Quality	Preferred	Memorable			
Fort Randall Dam Tailwater							
1996	8	8	5	2	100	63	25
Upper unchannelized Missouri River - Niobrara							
1996	20	20	17	2	100	85	10
Gavins Point Dam Tailwater							
1995	372	260	100	22	70	27	6
1996	446	400	172	37	90	39	8
1997	565	499	182	45	88	32	8
1998	255	238	95	19	93	37	7
1999	429	390	152	23	91	35	5
2000	155	148	64	11	95	41	7
2001	253	245	104	16	97	41	6
2002	246	238	108	8	97	44	3
2003	301	291	126	11	97	42	4
2004	316	301	125	8	95	40	3
Lower unchannelized Missouri River - St Helena							
1997	19	11	3	0	58	16	0
1998	51	42	12	0	82	24	0
2000	19	15	5	0	79	26	0
2002	76	74	21	0	97	28	0
2003	24	24	15	0	100	63	0

Table 13. Number of fish and RSD values for paddlefish collected with gill and trammel nets and snagged by anglers from the Gavins Point Dam tailwater from 1995 through 2004.

Year	Collection method	Stock	Slot	Above slot	RSD slot	RSD above slot
1995	Netting	372	73	2	20	1
1996	Netting	446	116	7	26	2
1997	Netting	565	125	6	22	1
	Snagging	3,375	1,255	107	37	3
1998	Netting	255	63	2	25	1
	Snagging	2,275	585	53	26	2
1999	Netting	429	96	10	22	2
	Snagging	4,078	1,377	72	34	2
2000	Netting	155	45	2	29	1
	Snagging	2,262	829	50	37	2
2001	Netting	253	71	6	28	2
	Snagging	1,523	419	22	28	1
2002	Netting	246	60	1	24	<1
	Snagging	697	181	11	26	2
2003	Netting	301	76	0	25	0
	Snagging	1,481	392	20	26	1
2004	Netting	316	80	1	25	<1
	Snagging	3,704	759	87	23	2

Paddlefish tagging

The numbers of paddlefish tagged and coded wire tags recovered in the Missouri River since the MICRA paddlefish tagging project began in 1995 are presented in Table 14.

Table 14. Total number of paddlefish sampled, tagged and the number of tagged paddlefish recovered by year and reach, 1995-2004.

Year	Number sampled	Number tagged	Recaptures	Percent
Upper unchannelized - Fort Randall Dam Tailwater				
1996	8	8	2	25.0
Upper unchannelized - Niobrara				
1996	20	15	0	0
Lower unchannelized - Gavins Point Dam Tailwater				
1995	315	277	20	6.3
1996	446	414	38	8.5
1997	565	542	49	8.7
1998	255	253	35	13.7
1999	455	449	43	9.5
2000	155	154	10	6.5
2001	253	249	30	11.9
2002	290	229	23	10.0
2003	301	297	34	11.4
2004	316	307	30	9.8
Lower unchannelized - St Helena				
1997	19	19	0	0
1998	51	51	1	2.0
2000	19	19	0	0.0
2002	76	73	3	4.1
2003	24	24	1	4.2

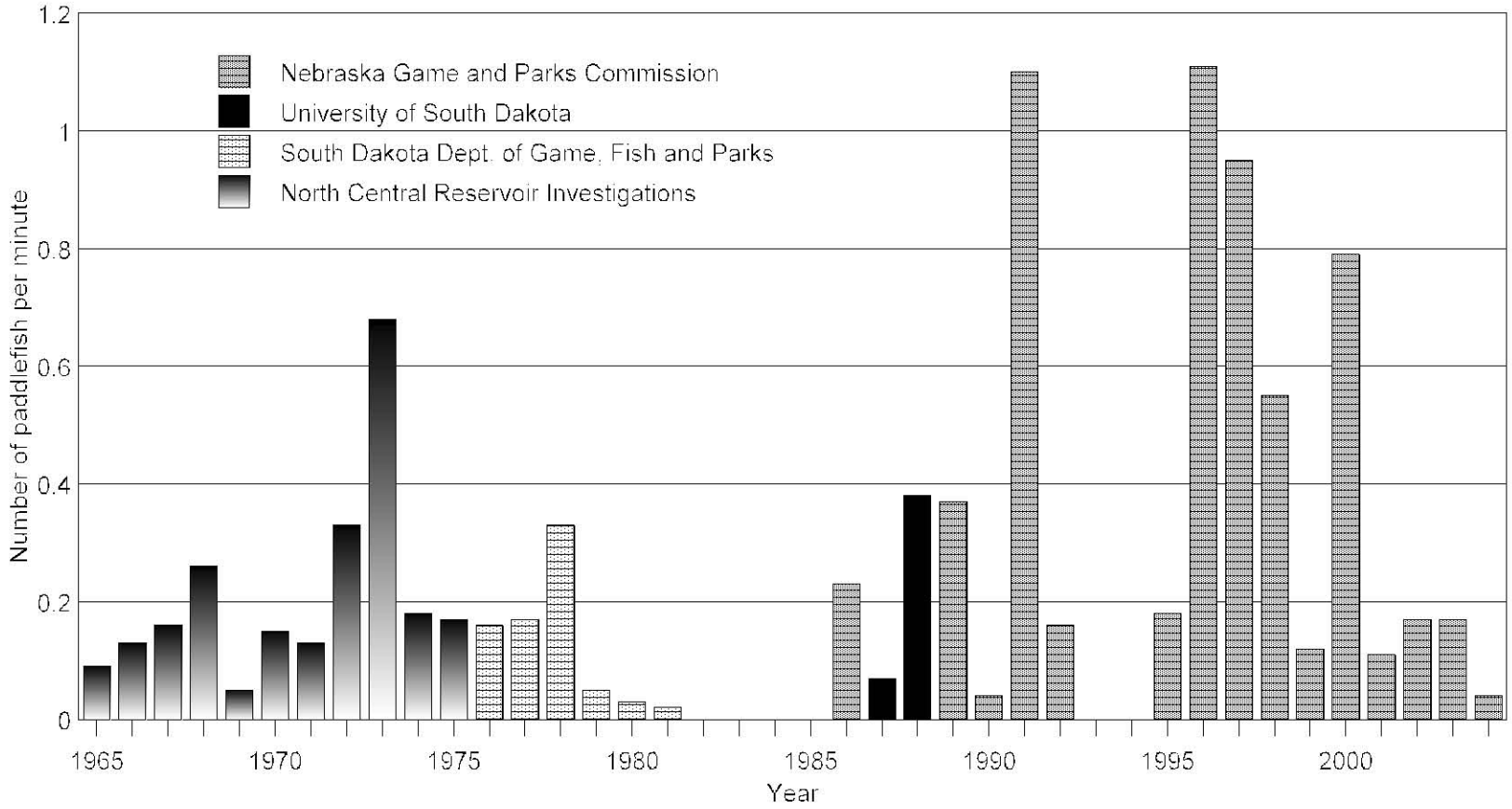
Paddlefish trawling

Young-of-year (YOY) paddlefish were sampled using a 7.9-m (headrope) semi-balloon otter trawl fished on the bottom in the old river channel in Lewis and Clark Lake on eleven days from late June through early August. Effort is reported in minutes and CPUE is reported as number of fish collected per minute of trawling. A total of 12 species were collected with the otter trawl with freshwater drum making up 70.2% of the catch (Table 15). If drum are not considered, gizzard shad made up 47.9% of the catch, followed by white bass and sauger (13.4%). Paddlefish numbers peaked on 15 July. Freshwater drum numbers fluctuated throughout the sample period. No channel catfish were collected. The annual catch rate of 0.04 was one of the lowest catch rates ever reported. The catch rate was down from 0.17 in 2003 and was much lower than the long term average of 0.28 paddlefish per minute (Figure 8) (Lewis and Clark Lake was not sampled from 1982 through 1985 and 1993 through 1994) (Kallemeyn 1975, Unkenholz 1982 and Wessel 1993).

Table 15. Number of fish collected, effort in minutes, fish per minute, and paddlefish per minute by date, using a semi-balloon otter trawl in Lewis and Clark Lake during 2004.

Species	June	July									Aug	Total
	30	1	9	14	15	21	22	23	29	30	4	
Paddlefish	2			2	5	1		1	1			12
Gizzard Shad				3	5	1	4	14	30			57
Sunfish Family				1								1
Emerald shiner					1	5			1	1		8
Common carp			1									1
White crappie											1	1
Flathead catfish								1				1
White bass			1	3		4				2	6	16
Johnny darter			2			1						3
Sauger	8	1	1	3		1	1	1				16
Walleye		1				2						3
Freshwater drum		2	19	73	15	13	96	46	9	7		280
Total number of fish	10	4	24	85	26	28	101	63	41	10	7	399
Effort in minutes	30	30	30	30	30	30	30	30	30	30	30	330
Fish / Minute	0.33	0.13	0.8	2.83	0.87	0.93	3.37	2.10	1.37	0.33	0.23	1.21
Paddlefish / Minute	0.07			0.07	0.17	0.03		0.03	0.03			0.04

Figure 8. Number of young-of-year paddlefish per minute of trawl effort from Lewis and Clark Lake, 1965 though 2004 (no samples during 1982-1985, 1993 and 1994).



c. Target date for achievement

Field sampling was scheduled from March through November, 2004. Samples were to be identified and data analysis concluded by January, 2005.

d. Date of accomplishment

Field work was completed by the end of the segment as scheduled. Aging of catfish spines was not completed in time for this report.

e. Significant deviations

None.

f. Remarks

None.

g. Recommendations

None.

Job 2 - User Surveys

a. Objective

To measure the use of the fishery resource by anglers.

b. Activity

From late March though mid October 2004 a roving creel survey was scheduled for a segment of the unchannelized Missouri River between Bellevue (rk 968) and Camp Creek (rk 885). From January 2004 through January 2005 a recreational use survey was conducted between Gavins Point Dam and the mouth of the Missouri River at St. Louis in conjunction with the Missouri Department of Conservation. Harvest and effort information was collected for the paddlefish archery and snagging seasons through a postcard survey.

Roving creel survey

The results of the roving creel survey on the lower channelized Missouri River in 2004 are presented in Appendix II.

Paddlefish archery and snagging season postcard surveys

Beginning in 1997, Nebraska and South Dakota required all paddlefish anglers to apply for a paddlefish tag to fish during the archery and snagging seasons. Included with their tag was a postage paid postcard survey. Anglers were asked to answer a few simple questions related to their participation and success during the paddlefish season for which they received a tag. All anglers that had not returned their survey cards were sent reminder letters approximately one month after the conclusion of the season. In instances where an angler did not respond to a question, that angler was not included in the analysis and is not reflected by the totals given for each question. Results were adjusted for missing responses by using the results from the post cards returned after the reminder date, and applied to those anglers that did not return cards.

Archery paddlefish postcard survey results:

The percent of respondents in 2004 remained the same as the previous year, which was slighty below the six year average (QA1). The percent of anglers that did not fish increased in 2004 to 17.0% from 13.9% in 2003 (QA1). The number of people that fished but did not harvest a paddlefish was down from 2003 (55.5% to 49.8%) (QA1). The number of paddlefish harvested increased from 84 in 2003 to 91 in 2004 (QA1). The mean number of hours per angler spent fishing during the archery paddlefish season decreased slightly from 15.2 in 2003 to 14.2 in 2004 (QA2). The estimated total hours in 2004 was up almost 300 hours from 2003 (QA2). Over 84% of the anglers fished the river exclusively or at least part of the time (QA3). The mean number of days each angler fished decreased slightly to 2.6 days per angler (QA4). The 714 estimated total archer days was the highest reported (QA4). The mean number of weekend days was the same as 2003 at 1.7 (QA5) and the mean number of weekdays fished per archer decreased slightly (1.0 to 0.8) (QA6). The number of archers that fished opening day was down from 2003 (QA7).

Question A1: Did you harvest a paddlefish during the archery paddlefish season, and if so, what length?

Response	1997	1998	1999	2000	2001	2002	2003	2004			Mean
	Adjusted	Adjusted	Adjusted	Adjusted	Adjusted	Adjusted	Adjusted	Before	After	Adjusted	
Did not fish	25 12.5%	38 15.2%	48 18.9%	38 13.8%	35 12.7%	61 22.2%	38 13.9%	4 5.3%	19 21.6%	47 17.0%	15.8%
No paddlefish	123 61.5%	137 54.8%	156 61.4%	145 52.7%	136 49.5%	164 59.6%	152 55.5%	37 49.3%	44 50.0%	137 49.8%	55.6%
< 35 inches	24 12.0%	43 17.2%	28 10.9%	58 17.1%	51 18.5%	23 8.4%	48 17.5%	16 21.3%	16 18.2%	52 18.9%	15.1%
≥35 inches & ≤ 45 inches	21 10.5%	17 6.8%	16 6.3%	27 12.7%	36 13.1%	22 8.0%	26 9.5%	17 22.7%	7 8.0%	33 12.0%	9.9%
> 45 inches	7 3.5%	14 5.6%	6 2.4%	10 3.6%	17 6.2%	5 1.8%	10 3.6%	1 1.3%	2 2.3%	6 2.2%	3.6%
Total harvested	52	74	50	95	104	50	84			91	75
Total respondents	200	249	254	278	275	275	275	75	88	275	
% responding	71%	73%	61%	58%	66%	56%	56%			56%	62%

Question A2: For archers that fished, how many hours did you fish during the archery paddlefish season?

Hours	1997	1998	1999	2000	2001	2002	2003	2004
1 - 5	24.2%	18.9%	19.2%	17.7%	21.9%	25.6%	20.6%	16.4%
6 - 10	29.8%	28.3%	30.0%	25.0%	29.1%	24.8%	22.8%	30.7%
11-15	18.6%	16.4%	16.9%	19.1%	16.1%	16.0%	19.9%	18.6%
16 - 20	12.9%	20.8%	18.5%	19.1%	12.3%	20.0%	14.0%	13.6%
21 - 25	5.7%	4.4%	6.2%	1.5%	7.8%	2.4%	6.6%	6.4%
26 - 30	4.8%	3.1%	4.6%	6.6%	4.5%	3.2%	5.9%	7.1%
31 - 40	2.4%	5.7%	4.6%	6.6%	3.9%	4.8%	6.6%	5.7%
> 40	1.6%	2.5%		2.9%	4.5%	3.2%	3.7%	1.4%
Total # of respondents	124	159	130	136	155	125	136	140
Total hours reported	1,518	2,222	1,707	1,996	2,228	1,660	2,068	1,991
Mean # of hours per angler	12.2	14.0	13.1	14.7	14.4	13.3	15.2	14.2
Estimated total hours fished	2,135	2,968	2,699	3,484	3,456	2,846	3,602	3,925

Question A3: Where did you fish during the archery paddlefish season?

Location	1997	1998	1999	2000	2001	2002	2003	2004
Tailwater only	13.7%	20.9%	15.4%	16.1%	19.9%	7.0%	16.2%	15.4%
River only	55.7%	44.4%	57.7%	48.9%	53.2%	61.4%	61.5%	62.5%
Both	30.7%	34.6%	21.5%	29.9%	26.9%	31.6%	22.3%	22.1%
Total # of respondents	124	153	123	137	156	114	130	136

Question A4: For archers that fished, how many days did you fish during the archery paddlefish season?

Days	1997	1998	1999	2000	2001	2002	2003	2004
1	29.7%	21.6%	29.1%	26.6%	25.1%	28.2%	23.1%	30.9%
2	37.3%	38.5%	32.3%	36.8%	30.5%	28.2%	30.0%	25.9%
3	14.4%	18.2%	17.3%	16.5%	19.2%	24.8%	24.6%	16.6%
4	8.5%	11.5%	6.3%	8.3%	11.3%	10.3%	10.8%	15.1%
5	3.4%	4.7%	6.3%	6.8%	7.3%	2.6%	4.6%	4.3%
6	6.8%	5.4%	3.9%	5.3%	5.3%	4.3%	3.1%	6.5%
7			1.6%	0.8%	0.7%	1.7%	3.1%	
8			1.6%					0.7%
9			1.6%					
10							0.8%	
12					0.7%			
Total # of respondents	118	148	127	133	151	117	130	139
Total # of days reported	282	378	335	336	407	293	352	360
Mean # of days per archer	2.4	2.6	2.6	2.5	2.7	2.5	2.7	2.6
Estimated total archer days	420	551	536	593	648	535	640	714

Question A5: For archers that fished, how many weekend days did you fish during the archery paddlefish season?

Days	1997	1998	1999	2000	2001	2002	2003	2004
0	22.0%	12.8%	15.8%	19.5%	18.5%	24.8%	30.0%	20.1%
1	27.1%	24.3%	31.5%	24.8%	25.2%	27.4%	18.5%	28.1%
2	33.9%	39.9%	27.6%	36.8%	27.2%	30.8%	27.7%	30.9%
3	8.5%	10.1%	11.8%	6.8%	16.6%	6.8%	11.5%	6.5%
4	4.2%	8.8%	8.7%	3.8%	6.6%	6.0%	6.2%	10.1%
5	0.9%	2.0%	3.2%	3.0%	3.3%		2.3%	1.4%
6	3.4%	2.0%	1.6%	5.3%	2.7%	4.3%	3.9%	2.9%
Total # of respondents	118	148	127	133	151	117	130	139
Total # of weekend days reported	191	284	231	240	284	186	218	242
Mean # of weekend days per archer	1.6	1.9	1.8	1.8	1.9	1.6	1.7	1.7
Estimated total weekend days fished	280	403	371	427	456	342	403	481

Question A6: How many weekdays did you fish during the archery paddlefish season?

Days	1997	1998	1999	2000	2001	2002	2003	2004
0	58.5%	60.1%	48.0%	57.1%	55.6%	42.7%	47.7%	48.2%
1	23.7%	25.7%	32.3%	24.0%	21.9%	33.3%	25.4%	29.5%
2	11.0%	7.4%	15.0%	9.8%	14.6%	16.2%	9.2%	13.7%
3	0.9%	4.7%	2.4%	7.5%	4.6%	5.1%	13.1%	7.2%
4	2.5%	1.4%	1.6%	1.5%	1.3%	2.6%	3.1%	0.7%
5	1.7%	0.7%	0.8%		0.7%		1.5%	0.7%
6 - 10	1.7%				1.3%			
Total # of respondents	118	148	127	133	151	117	130	139
Total # of weekdays reported	91	94	104	96	123	107	134	118
Mean # of weekdays per archer	0.8	0.6	0.8	0.7	0.8	0.9	1.0	0.8
Estimated total weekdays fished	140	127	165	166	192	193	237	234

Question A7: For archers that fished, did you fish the opening day during the archery paddlefish season?

	1997	1998	1999	2000	2001	2002	2003	2004
Yes	54.2%	46.0%	32.3%	54.9%	45.0%	33.3%	40.8%	28.1%
No	45.8%	54.0%	67.7%	45.1%	55.0%	66.7%	59.2%	71.9%
Total # of respondents	118	148	127	133	151	117	130	139

Paddlefish snagging season postcard survey results:

The number of respondents increased from 2003 with 62% of permit holders returning their survey card in 2004 (QS1). The percent of anglers that did not fish decreased to 9.5% from 13.8% in 2003 (QS1). The number of people that fished but did not harvest a paddlefish decreased and was the lowest ever reported (13.6%) (QS1). The 1,078 paddlefish harvested in 2004 was the highest ever reported (QS1). Sixty-four of the paddlefish harvested were over the 1,143 mm protected slot which is the highest reported since 1997 (QS1). The number of paddlefish less than 35 inches that were released in 2004 increased by 41% when compared to 2003, by 62% when compared to 2002 and decreased by 15% when compared to 2001 (QS2). The total number of paddlefish released, increased by over 80% from 2003 and by 163% when compared to 2002 (QS2). The mean number of hours per angler spent snagging during the season decreased from 11.8 in 2003 to 6.9 in 2004, the lowest ever reported (QS3). The estimated total hours fished, 9,624 was the lowest ever reported (QS3). The number of anglers that fished just the tailwater was 53.1% in 2004, up slightly from 2003 (QS4). The mean number of days fished per angler decreased to 1.8 while the estimated number of total angler days also decreased from 2003 to 2004 (QS5). The total number of weekend days fished decreased to 166, the lowest ever reported, while the total number of weekdays fished remained almost the same from 2003 to 2004 (QS6 and QS7). Only 15.5% of the respondents reported that they fished opening day, which was on a Friday (QS8). Only 6.4% of the anglers fished the opening weekend (QS9).

Question S1: Did you harvest a paddlefish during the snagging season, and if so, what length?

Response	1997	1998	1999	2000	2001	2002	2003	2004			Mean
	Total	Total	Total	Total	Total	Adjusted	Adjusted	Before	After	Adjusted	
Did not fish	78 6.5%	130 10.8%	98 8.2%	181 12.8%	175 12.3%	231 16.5%	193 13.8%	16 2.3%	28 16.6%	133 9.5%	11.3%
No Paddlefish	590 49.2%	476 39.7%	380 31.6%	748 52.9%	747 52.3%	835 59.6%	625 44.6%	61 8.8%	31 18.3%	190 13.6%	42.9%
< 35 inches	464 38.7%	561 46.8%	670 55.7%	473 33.5%	490 34.3%	330 23.5%	574 41.0%	593 85.2%	101 59.8%	1014 72.3%	43.2%
> 45 inches	68 5.7%	33 2.8%	53 4.4%	12 0.9%	15 1.1%	6 0.4%	8 0.6%	26 3.7%	9 5.3%	64 4.6%	2.5%
Total harvested	532	594	723	485	505	336	582			1078	604
Total respondents	1,200	1,200	1,201	1,414	1,427	1,402	1,400	696	169	1,401	
% responding	63%	63%	57%	59%	58%	57%	57%			62%	60%

Question S2: How many paddlefish did you release during the snagging season?

	1997			1998			1999			2000		
Number	< 35	35-45	> 45	< 35	35-45	> 45	< 35	35-45	> 45	< 35	35-45	> 45
0	455	434	701	488	512	682	352	397	637	575	563	744
1	93	127	11	86	92	9	105	121	9	78	98	3
2	65	67	5	37	53	2	60	52	1	62	88	4
3	33	27		25	19		34	29		72	42	
4	17	27	1	15	11		29	9		44	32	
5 - 9	37	24		26	4		46	23		150	99	
10 - 14	8	5		10	1		9	4		32	30	
15 - 19	3	5		3			3	5		34	19	16
> 20	7	2		3	1		9	7		112	66	
Estimated total # released	1,549	1,255	39	1,076	585	20	1,959	1,377	19	960	779	38
Total	2,844			1,681			3,355			1,777		

	2001			2002			2003			2004		
Number	< 35	35-45	> 45	< 35	35-45	> 45	< 35	35-45	> 45	< 35	35-45	> 45
0	578	566	743	600	591	682	542	540	708	324	373	807
1	80	109	3	45	58	2	76	90	5	112	138	10
2	40	35	2	21	20		37	43		93	80	2
3	20	14		8	8	1	22	16		55	51	1
4	9	7		3	3		9	5		36	43	
5 - 9	10	11		5	4		21	15	1	102	69	1
10 - 14	5	4		3	1		3	4		32	39	
15 - 19	1						1	1		25	16	
> 20	5	2					3			42	11	
Estimated total # released	991	701	12	318	291	9	495	392	12	844	759	23
Total	1,704			618			899			1,626		

Question S3: For anglers that fished, how many hours did you fish during the paddlefish snagging season?

Hours	1997	1998	1999	2000	2001	2002	2003	2004
1 - 5	33.4%	36.1%	42.4%	29.2%	31.6%	26.6%	27.2%	57.5%
6-10	33.4%	36.8%	30.3%	39.9%	30.2%	28.2%	33.8%	25.0%
11-15	12.7%	11.0%	12.7%	14.5%	13.1%	17.7%	14.4%	8.4%
16-20	8.5%	8.8%	7.6%	11.9%	1.2%	11.4%	12.2%	4.6%
21-25	3.9%	1.7%	2.5%	5.3%	4.6%	3.8%	4.3%	1.3%
26-30	3.3%	2.9%	1.6%	2.8%	3.4%	4.6%	3.2%	1.2%
31-40	3.5%	1.4%	1.7%	3.5%	2.3%	4.3%	1.8%	1.5%
41-50	0.6%	0.4%	0.8%	1.6%	1.1%	2.4%	2.0%	0.1%
>50	0.8%	0.8%	0.6%	1.2%	1.9%	1.2%	1.1%	0.4%
Total # of respondents	718	693	647	750	738	678	714	821
Total # of hours reported	7,769	6,863	5,980	9,156	8,867	8,822	8,431	5,636
Mean # of hours per angler	10.8	9.9	9.2	12.2	12.0	13.0	11.8	6.9
Estimated total hours fished	12,118	10,593	10,157	15,043	15,024	15,223	14,243	9,624

Question S4: For anglers that fished, where did you fish during the paddlefish snagging season?

Location	1997	1998	1999	2000	2001	2002	2003	2004
Tailwater only	47.2%	48.6%	59.8%	47.5%	45.2%	41.3%	49.2%	53.1%
River only	29.0%	29.3%	23.6%	27.2%	31.2%	34.2%	30.1%	33.1%
Both	23.8%	22.1%	16.5%	24.1%	23.6%	20.9%	20.7%	13.8%
Total # of respondents	758	761	647	750	728	685	691	797

Question S5: For anglers that fished, how many days did you fish during the paddlefish snagging season?

Number of days	1997	1998	1999	2000	2001	2002	2003	2004
1	38.0%	43.6%	42.2%	38.1%	36.1%	32.5%	33.9%	60.5%
2	27.9%	28.6%	28.1%	26.6%	26.8%	27.6%	29.2%	23.4%
3	14.7%	13.6%	15.0%	14.6%	15.9%	16.5%	17.7%	8.0%
4	8.6%	4.9%	4.8%	8.8%	9.1%	8.6%	7.8%	4.2%
5	4.8%	4.7%	2.8%	3.9%	4.0%	6.0%	3.4%	1.7%
6 - 10	5.4%	4.1%	6.1%	6.4%	7.0%	8.4%	6.9%	1.8%
> 10	0.6%	0.7%	0.9%	1.5%	1.1%	0.5%	0.8%	0.5%
Total # of respondents	685	677	640	737	728	671	696	788
Total # of days reported	1,679	1,507	1,490	2,274	1,895	1,779	1,768	1,378
Mean # of days per angler	2.5	2.2	2.3	3.1	2.6	2.7	2.5	1.8
Estimated total days fished	2,805	2,354	2,539	3,822	3,255	3,162	3,018	2,452

Question S6: For anglers that fished, how many weekend days did you fish during the paddlefish snagging season?

Days	1997	1998	1999	2000	2001	2002	2003	2004
0	27.0%	28.8%	28.8%	38.1%	34.8%	29.4%	46.7%	84.5%
1	34.5%	36.8%	34.7%	35.3%	35.6%	28.9%	37.2%	11.7%
2	22.9%	22.5%	24.2%	17.9%	20.5%	22.4%	11.9%	2.7%
3	8.6%	4.6%	5.2%	3.3%	5.6%	7.6%	3.2%	1.0%
4	2.8%	4.1%	3.3%	3.1%	2.2%	5.5%	0.6%	
5	1.9%	1.6%	2.0%	1.4%	0.7%	3.1%	0.3%	
6	0.9%	0.7%	1.6%	0.8%	0.4%	1.8%	0.1%	
7	0.7%	0.3%		0.1%	0.1%	0.8%		
8	0.7%	0.6%	0.3%		0.1%	0.6%		0.1%
Total # of respondents	685	677	640	737	728	671	696	788
Total # of weekend days reported	979	889	856	781	802	1,039	523	166
Mean # of weekend days per angler	1.4	1.3	1.3	1.1	1.1	1.5	0.8	0.2
Estimated total weekend days fished	1,571	1,391	1,435	1,356	1,377	1,757	966	295

Question S7: For anglers that fished, how many weekdays did you fish during the paddlefish snagging season?

Days	1997	1998	1999	2000	2001	2002	2003	2004
0	45.0%	45.8%	43.1%	20.4%	24.5%	37.6%	9.9%	6.6%
1	31.8%	34.9%	37.0%	45.3%	40.4%	36.1%	45.1%	58.7%
2	13.0%	10.8%	10.8%	17.9%	17.7%	15.8%	24.9%	21.7%
3	5.1%	4.9%	4.7%	9.1%	9.6%	5.7%	9.6%	7.5%
4	2.0%	1.6%	1.4%	3.1%	3.0%	2.5%	4.7%	2.9%
5	1.0%	1.0%	1.4%	1.9%	2.3%	1.3%	3.2%	1.3%
6 - 10	1.9%	0.7%	1.1%	2.2%	1.8%	0.9%	2.3%	1.3%
> 10	0.2%	0.3%	0.5%	0.1%	0.7%	0.2%	0.3%	0.1%
Total # of respondents	685	677	640	737	728	671	696	788
Total # of weekdays reported	979	889	630	1,093	1,093	740	1,245	1,212
Mean # of weekdays per angler	1.0	0.9	1.0	1.5	1.5	1.1	1.8	1.5
Estimated total weekdays fished	1,122	963	1,104	2,121	1,878	1,288	2,173	2,156

Question S8: For anglers that fished, did you fish the opening day during the paddlefish snagging season?

	1997	1998	1999	2000	2001	2002	2003	2004
Yes	10.4%	5.8%	6.9%	5.7%	6.0%	9.5%	13.2%	15.5%
No	89.6%	94.2%	93.1%	94.3%	94.0%	90.5%	86.8%	84.5%
Total # of respondents	685	677	640	737	728	671	696	788

Question S9: For anglers that fished, did you fish the opening weekend during the paddlefish snagging season?

	1997	1998	1999	2000	2001	2002	2003	2004
Yes	34.3%	25.1%	32.5%	5.7%	11.3%	33.5%	24.7%	6.4%
No	65.7%	74.9%	67.5%	94.3%	88.7%	66.5%	75.3%	93.6%
Total # of respondents	685	677	640	737	728	671	696	788

Discussion

For the 2004 paddlefish seasons, Nebraska and South Dakota had established harvest quotas of 200 paddlefish for the archery season and 1,600 for the snagging season. For the following discussion, the numbers have been adjusted for anglers that did not respond to the post card survey. In 2004 we estimated that the Nebraska archery paddlefish anglers harvested 91 paddlefish, which was slightly higher than the 84 paddlefish harvested in 2003 (Question A1). This number is just less than Nebraska's harvest quota of 100 paddlefish during the archery season. The harvest rate 2.3 paddlefish per 100 angler hours during the archery paddlefish season was the same as in 2003 (Table 16).

During the 2004 paddlefish snagging season we estimated that Nebraska anglers harvested 1,078 paddlefish, which was most paddlefish harvested since the tag system was implemented for the 1997 snagging season (Question S1). In 2004, the mean harvest rate during the snagging season was 11.2 fish per 100 hours, which was the highest catch rate documented since 1997 (Table 16). During the 2004 paddlefish snagging season, 1,401 anglers expended over 9,500 hours (QS3).

Table 16. Harvest, release, and catch rates (paddlefish per 100 hours of angling effort) from the paddlefish archery and snagging seasons on the Missouri River between Nebraska and South Dakota from 1997 to 2004.

	1997	1998	1999	2000	2001	2002	2003	2004	Mean
Paddlefish archery season									
Harvest rate < 35 inches	1.1	1.5	1.0	1.7	1.5	0.8	1.3	1.3	1.3
Harvest rate ≥35 inches and ≤ 45 inches	1.0	0.6	0.6	0.8	1.0	0.8	0.7	0.8	0.8
Harvest rate > 45 inches	0.3	0.5	0.2	0.3	0.5	0.2	0.3	0.2	0.3
Total	2.4	2.5	1.9	2.7	3.0	1.8	2.3	2.3	2.4
Paddlefish snagging season									
Harvest rate < 35 inches	3.8	5.3	6.6	3.1	3.3	2.2	4.0	10.5	4.9
Harvest rate > 45 inches	0.6	0.3	0.5	0.1	0.1	< 0.1	0.1	0.7	0.3
Total	4.4	5.6	7.1	3.2	3.4	2.2	4.1	11.2	5.2
Release rate < 35 inches	12.8	10.2	19.3	6.4	6.6	2.1	3.5	8.8	8.7
Release rate ≥35 inches and ≤ 45 inches	10.4	5.5	13.6	5.2	4.7	1.9	2.8	7.9	6.5
Release rate > 45 inches	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.2	0.2
Total	23.5	15.9	33.0	11.8	11.3	4.1	6.3	16.9	15.4
Catch rate < 35 inches	16.6	15.5	25.9	9.5	9.9	4.3	7.5	19.3	13.6
Catch rate > 45 inches	0.9	0.5	0.7	0.3	0.2	0.1	0.1	0.9	0.5

c. Target date for achievement

The roving creel on the lower channelized river was scheduled from 3 April through 15 October 2004. The recreational use survey was scheduled from January 2004 through January 2005. The the paddlefish postcard surveys were mailed with the permits. Data entry and analysis were scheduled to be completed by January 2004.

d. Date of accomplishment

Work was completed on the recreational user survey as scheduled. Data entry and analysis was completed as scheduled.

e. Significant deviations

The roving creel was started but was terminated after the first two creel periods due to elimination of temporary personnel as part of a temporary budget reduction process with the Nebraska Game ans Parks Commission. We decided to concentrate our limited personnel resources on the recreational use survey when it became apparent that we could not do both.

f. Remarks

We anticipate being able to hire the full complement of temporary staff for Segment 23.

g. Recommendations

None.

Job 3 - Mitigation site monitoring

a. Objective

To evaluate the impact of restoration projects on site-specific fisheries, its contribution to recreational sport fishing and to the river ecosystem.

b. Activity

No activity was scheduled due to elimination of temporary personnel as part of a temporary budget reduction process with the Nebraska Game ans Parks Commission. We decided to concentrate our limited personnel resources on the recreational use survey and our catfish and paddlefish surveys.

c. Target date for achievement

None.

d. Date of accomplishment

None.

e. Significant deviations

None.

f. Remarks

We anticipate being able to hire the full complement of temporary staff for Segment 23.

g. Recommendations

None

Job 4 - To analyze river flow/fish and invertebrate population relationships using the long-term Missouri River Historical Database.

a. Objectives

Objective 1. To supplement and expand sampling of the Missouri River fishery resources in cooperation with the States of Iowa and Missouri and the Mississippi Interstate Cooperative Resource Association.

Objective 2. The project will develop testable hypotheses regarding relationships between biota, habitat, flow and sediment by applying accepted large river ecological principles. It will also develop biophysical models by statistical inference from the integration of selected fields in the Missouri River Historical Database that can be used to test specific management hypotheses. We can then utilize the biophysical models to create discharge targets for Gavins Point Dam that are intended to achieve stable biodiversity and bioproduction.

b. Activity

Objective 1. A description of study sites and methods, results and discussion for 2004 are presented in the “Middle Missouri River Ecosystem Monitoring, 2004 Summary Report” (Hesse 2005).

Objective 2. The NGPC has entered into an agreement with the Missouri River Natural Resources Committee and the Iowa Department of Natural Resources and the Missouri Department of Conservation effective July 1, 2001 through June 30, 2006 (see Cooperative Agreement No. IADNR/NGPC/MDC 01-1) to fund a contract to conduct data analysis, assessment and biophysical modeling on the Missouri River Historical Database. These analysis and models will be developed with the assistance of the Statistical Analysis System (SAS), the statistical package NCSS, Microsoft Access, Microsoft Excel and reports will be prepared in Microsoft Word (Hesse 2001).

c. Target date for achievement

Objective 1. Field sampling was scheduled from March through November, 2004 with laboratory analysis and a final report scheduled to be completed by February 2005.

d. Date of accomplishment

Objective 1. Field work, lab work and the final report were completed on schedule.

e. Significant deviations

None.

f. Remarks

None.

g. Recommendations

None.

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Appendix I - Sections and Reaches of the Missouri River in Nebraska

Code	Section or Reach	From	To	Upper rk	Lower rk	County
8000	Missouri River, Nebraska	South Dakota Border	Kansas Border	1,411	794	
8100	Upper Unchannelized	Fort Randall Dam	Lewis and Clark Lake	1419	1,352	
8110	Fort Randall	Fort Randall Dam	South Dakota Border	1,419	1,411	Charles Mix
8120	Upper Boyd County	South Dakota Border	Boyd County Ramp	1,411	1,397	Boyd
8130	Lower Boyd County	Boyd County Ramp	Boyd / Knox Co Line	1,397	1,389	Boyd
8140	Verdel	Boyd / Knox Co Line	Verdel Landing	1,389	1,373	Knox
8150	Ponca Creek	Verdel Landing	Mouth of Niobrara	1,373	1,361	Knox
8160	Niobrara	Mouth of Niobrara	Bazile Creek	1,361	1,352	Knox
8200	Lower Unchannelized	Gavins Point Dam	Big Sioux River	1,308	1,184	
8210	Gavins Point Tailwater	Gavins Point Dam	Start of Revetment	1,308	1,306	Cedar
8220	Yankton	Start of Revetment	Above James River Island	1,306	1,292	Cedar
8230	St Helena	Above James River Island	Red Rocks	1,292	1,282	Cedar
8240	Myron Grove	Red Rocks	Myron Grove	1,282	1,271	Cedar
8250	Brooky Bottom	Myron Grove	Clay County Park	1,271	1,258	Cedar
8260	Mulberry Bend	Clay County Park	Vermillion River	1,258	1,245	Dixon
8270	Kate Sweeney Bend	Vermillion River	Bolton GPA	1,245	1,232	Dixon
8280	Ponca	Bolton GPA	Lower Ponca Bend	1,232	1,215	Dixon
8290	Kenslers Bend	Lower Ponca Bend	Big Sioux River	1,215	1,184	Dakota
8300	Upper Channelized	Big Sioux River	Platte River	1,184	960	
8310	South Sioux City	Big Sioux River	Dakota City	1,184	1,171	Dakota
8320	Dakota City	Dakota City	Iowa Power Plant	1,171	1,158	Dakota
8330	Winnebago	Iowa Power Plant	Black Bird Creek	1,158	1,126	Thurston
8340	Decatur	Black Bird Creek	Lower Blackbird Bend	1,126	1,106	Burt
8342	Middle Decatur Oxbow			1,108		
8343	Tieville Bend Oxbow			1,116		
8350	Tekamah	Lower Blackbird Bend	Soldier River	1,106	1,071	Burt
8352	Louisville Bend Oxbow			1,102		
8360	Blair	Soldier River	Wilson Island	1,071	1,034	Washington
8361	California Bend Oxbow			1,047		
8362	Soldiers Bend Oxbow			1,065		

Code	Section or Reach	From	To	Upper rk	Lower rk	County
8366	Tyson Bend WMA			1,053		
8370	Fort Calhoun	Wilson Island	Dodge Park	1,034	1,011	Washington
8380	Omaha	Dodge Park	275 Bridge	1,011	987	Douglas
8390	Bellevue	Highway 275 Bridge	Platte River	987	960	Sarpy
8400	Lower Channelized	Platte River	Kansas State Line	960	794	
8410	Plattsmouth	Platte River	Rock Bluff	960	942	Cass
8411	Tobacco Island Mitigation			950	945	
8420	Goose Island	Rock Bluff	Weeping Water Creek	942	918	Cass
8421	Goose Island Control			939	934	
8430	Nebraska City	Weeping Water Creek	O.P.P.D. Ne City Plant	918	879	Otoe
8440	Hamburg Bend	O.P.P.D. Ne City Plant	Camp Creek	897	885	Otoe
8441	Hamburg Bend Mitigation			892		
8443	Hamburg Bend Mitigation			895	892	
8444	Lower Hamburg Bend			892	887	
8450	Peru	Camp Creek	Nishnabotna River	885	874	Nemaha
8460	Brownville	Nishnabotna River	Little Nemaha River	874	852	Nemaha
8461	Langon Bend Mitigation			858	853	
8463	Langdon Bend Mitigation			853		
8470	Indian Cave	Little Nemaha River	Big Tarkio Ditch	852	819	Richardson
8473	Lincoln Bend Control Site			842	839	
8480	Rulo	Big Tarkio Ditch	Kansas State Line	819	794	Richardson
8500	Lewis and Clark Lake	Bazile Creek	Gavins Point Dam	1,352	1,308	
8510	Santee	Bazile Creek	Santee Landing	1,352	1,338	Knox
8520	Devil's Nest	Santee Landing	Miller Creek	1,338	1,323	Knox
8530	Weigand	Miller Creek Area	Gavins Point Dam	1,323	1,308	Knox

Appendix II - Missouri River Creel Survey

Bellevue Bridge to Camp Creek

3 April through 29 May 2004