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Ecology of the Missouri River: Missouri River Creel Survey, Bellevue Bridge to Camp Creek, 3 April through 29 May 2004

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Ecology of the Missouri River

Missouri River Creel Survey
Bellevue Bridge to Camp Creek
3 April through 29 May 2004

Federal Aid in Sport Fish Restoration
Dingell-Johnson / Wallop-Breaux Project
F-75-R-22
1 March 2004 through 28 February 2005

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Nebraska Game and Parks Commission
August, 2005

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Abstract

This report describes Missouri River activities and results related to a channelized Missouri River creel survey conducted from 3 April through 29 May 2004. This is the fifth of a planned annual creel survey to be conducted on alternating sections of the channelized Missouri River to measure changes in recreational fishing activity, especially those changes due to large scale habitat restoration efforts. Future reports will contain additional analyses of these data. Due to budget reductions we were only able to complete the first two survey periods.

Anglers spent almost 6,500 hours fishing the Missouri River from Bellevue (rkm 967.7) to Camp Creek (rkm 883.5) during the survey period. Effort remained steady during the two periods. Bellevue and Plattsmouth accounted for over 66% of the effort. Anglers only targeted channel and flathead catfish.

Anglers caught and harvest over 1,000 fish from 3 April through 29 May 2004 while fishing the Missouri River. Catch was spread out through this period but anglers fishing the Bellevue and Plattsmouth reaches caught over 58% of the fish. Total catch rates were 0.25 fish per hour during the first (4/3 - 5/1) creel period to 0.09 fish per hour during the last creel period (5/2 - 5/29). Channel catfish were the most abundant species in the creel followed by shorthead redhorse, river carpsucker, shovel sturgeon, and flathead catfish.

Keywords: Missouri River, rivers, creel, survey, fish, fishing, anglers, recreation, shovelnose sturgeon, common carp, channel catfish, flathead catfish, freshwater drum, macrohabitat, microhabitat and bait.

Performance Report

State: Nebraska

Project Number: F-75-R-22

Project Type: Research

Study Title: Missouri River Ecology

The Nebraska Game and Parks Commission's strategic plan has stated 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 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 number of total recreational use days by the year 2008.
- To investigate and manage native fish, wildlife, waterfowl, and fur bearers 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 them. This strategic plan is currently being reviewed and updated.

Introduction

Creel surveys on large rivers with numerous public and private access points are difficult and expensive to design and conduct. The first creel survey conducted on the channelized Missouri River in Nebraska was a roving creel during 1972 to 1973 (Groen 1973). Segments of the channelized river covered included, Sioux City to Blair, Blair to Nebraska City and Nebraska City to Rulo. These same segments were surveyed again in 1978 and 1979 (Hesse 1980). The Missouri Department of Conservation conducted a recreational use survey on the channelized Missouri River from the mouth to the Iowa-Missouri state line in four segments over a four year period from 1983 through 1987 (Fleener 1989). The segment adjacent to Nebraska was sampled in 1985 and 1986 and extended from the Iowa-Missouri state line downstream to St Joseph, Missouri. The present project examining several reaches of the channelized Missouri River had several objectives:

- Develop a creel survey design that when repeated over time would measure changes in recreational fishing activity and success and allow us to estimate the effects of large scale restoration efforts on recreational fishing.
- Estimate recreational fishing use.
- Estimate the number and species of fish harvested and released by recreational anglers.
- Estimate recreational fishing effort on public and private lands and by boating anglers using public and private boat ramps
- Correlate fishing effort and success with a combination of season, physical habitat variables (location, macrohabitat, microhabitat, water temperature and secchi disk transparency) and fishing methods (bait)
- Develop recreational fishing educational information based on survey results

Study Site

A roving creel was conducted on a 84.2 kilometer reach of the channelized Missouri River from the Bellevue Bridge (river kilometer (rkm) 967.7) downstream to Camp Creek (rkm 883.5) during 2004 (Figure 1). This reach was divided into five segments; Bellevue, Plattsmouth, Goose Island, Nebraska

City, and Hamburg.

The Bellevue segment started at the Bellevue Bridge and ended above the mouth of the Platte River (rkm 957.2). This 10.5 km segment consists of four river bends: Upper Bellevue, Lower Bellevue, St. Mary's Cut-off, and Papillion. One tributary, Papio Creek, drains into this segment of the Missouri at rkm 960.2. Two private cabin developments are in this segment at rkm 964.6 - 963.7 and rkm 960.0 - 958.8. There is one public boat ramp, Hayworth Park, in Bellevue (rkm 967).

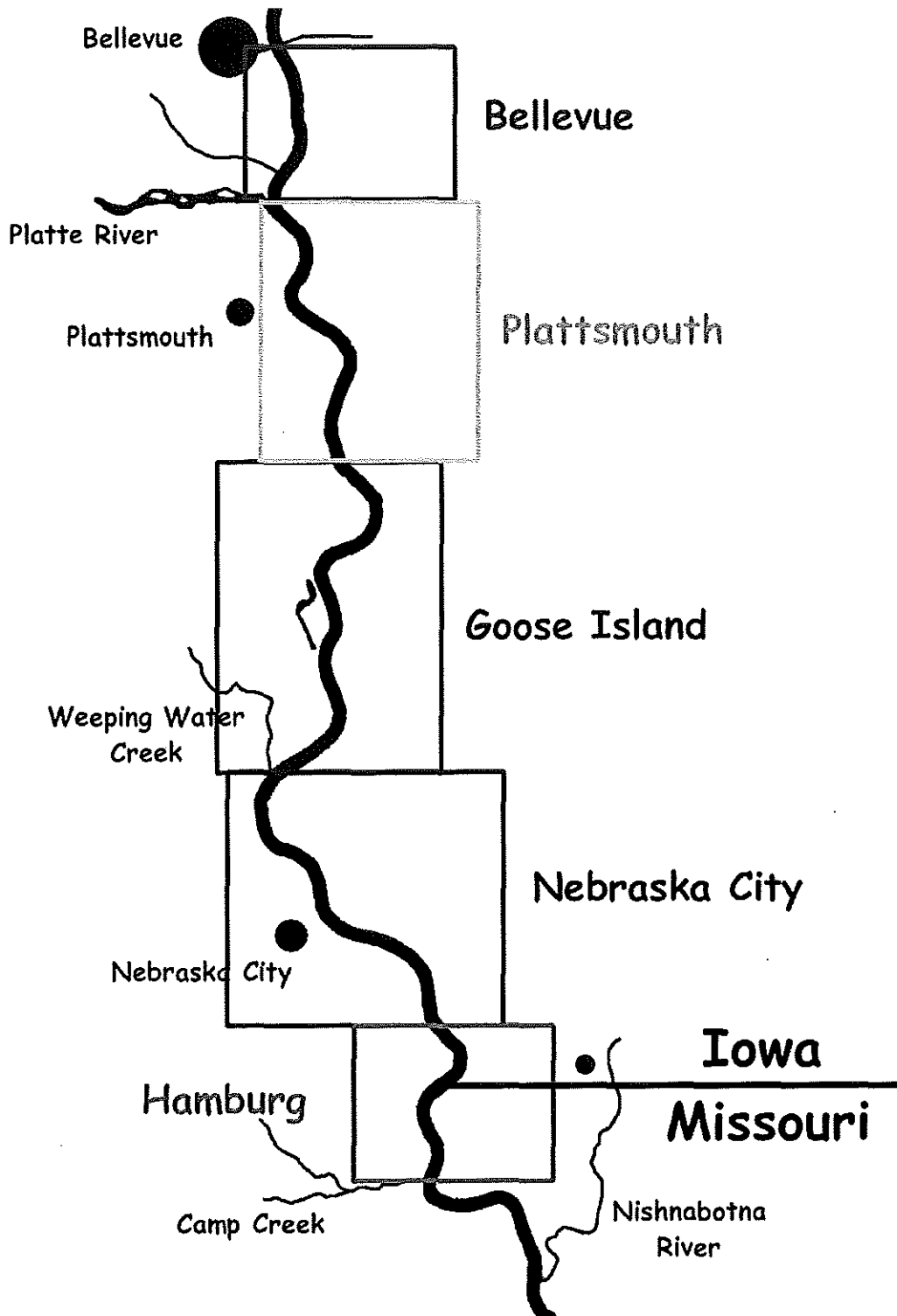
The Plattsmouth segment begins above the mouth of the Platte River and ends at the Rock Bluff elevators (rkm 940.7). This 16.5 kilometer segment consists of four bends: Upper Plattsmouth, Lower Plattsmouth, Tobacco and Rock Bluff. The Platte River (rkm 957.2) and Keg Creek (rkm 945.7) are the only tributaries in this segment. There is a public boat ramp near the city of Plattsmouth (rkm 951.9). This segment contains the Schilling Wildlife Management Area (WMA), 3.8 kilometers of publicly accessible river bank. Three private cabin developments occur at rkm 945.6 - 944.7, 949.8 - 949.0 and between the boat ramp and Schilling WMA at rkm 953.4 - 952.7.

The Goose Island segment begins at the Rock Bluff elevators and ends at the mouth of Weeping Water Creek (rkm 915.2). This 25.5 kilometer segment consists of five bends: Calumet-Barlett, Pin Hook, Van Horns, Lower Civil and Upper Civil. It has five tributaries: Rock Creek (rkm 940.2), Fremont Ditch (rkm 935.4), Waubonsie Ditch (rkm 933.4), Rakes Creek (rkm 929.7), and Plum Creek (rkm 922.3); plus one private cabin development and one public boat ramp (rkm 934.7).

The Nebraska City segment starts at the mouth of Weeping Water and ends at the O.P.P.D. Power Plant north of Hamburg Bend (rkm 895.1). This 20.1 kilometer segment consists of five bends: Upper Copeland, Lower Copeland, Nebraska, Frazers, and Otoe. There are three tributaries: Walnut Creek (rkm 908.9), North Table Creek (rkm 905.1), and South Table Creek (rkm 904.8); plus one private cabin development and one public boat ramp, Riverside Marina at Nebraska City (rkm 906.4).

The Hamburg segment starts at the O.P.P.D. Power Plant and ends at the mouth of Camp Creek (rkm 883.5). This 11.6 kilometer segment consists of three bends: Upper Hamburg, Lower Hamburg and Upper Barney and has one tributary, Camp Creek in Otoe County. There are no private cabin developments and one public boat ramp, Hamburg Bend Access at Hamburg, Iowa (rkm 892.4). There is also a restored chute, Hamburg Bend WMA, chute entrance rkm 894.3 and exit rkm 888.7.

Figure 1. Map showing sampling segments used during the creel survey on the Missouri River from the Bellevue Bridge to Camp Creek from 3 April through 29 May 2004.



Creel Survey Design

We used a roving creel design because of the large number of potential access points. An “instantaneous count” (2 hours downstream and 2.5 hours upstream) was obtained using a boat. Four weekend creel surveys and six weekday surveys were conducted during each four-week period. For each creel day a random count time and direction (either upriver or downriver) were chosen. One of four starting count times (0900, 1200, 1500 or 1800) was chosen randomly without replacement for a weekend count and one of six starting count times (0800, 1000, 1200, 1400, 1600 or 1800) was chosen at random without replacement for a weekday count. An example of a creel schedule for a creel period is presented in Table 1.

Creel clerks recorded the number of active boat and bank anglers and the number of boats involved in various recreational activities by segment (examples of the data forms used are presented in Appendix I). In addition, the clerks recorded information on air and water temperature, wind speed (categories), weather (categories), navigation conditions (categories) and the secchi disk transparency (cm).

During angler interviews all harvested fish were identified to species and measured to the nearest millimeter. Anglers were asked to identify released fish and estimate their length to the nearest inch. In addition, if an angler was fishing from the bank we identified whether they were fishing on public or private property or if fishing from a boat whether they used a public or private boat ramp. Trip information included the time the angler started fishing, the time of the interview, and if the fishing trip was complete or incomplete. Fishing information included the species the angler was seeking, fishing method, bait and if each angler had run setlines during the year. Additional information collected from each angler included gender, anglers state of residence and age.

Information was collected on the actual fishing location of each angler including segment, latitude and longitude, macrohabitat, microhabitat and structure. The river was divided into six macrohabitats some of which were further subdivided by location: inside bends (upper, middle and lower), outside bends (upper, middle and lower), secondary channel connected (upper, middle and lower), secondary channel non-connected and channel crossover (inside, middle and outside). The tributary macrohabitat included river and creek mouths and drainage ditches emptying into the river. Each of these six macrohabitats

were further divided into microhabitats (see figures in Appendix II) that identified where the angler was actually fishing.

Data Analysis

Data were entered into three tables in a Microsoft ACCESS database. The tables were exported from the database as ASCII text files. All data summarization and analysis was done with SAS statistical analysis software (Version 6.12 for Windows) (SAS Institute 1989).

Calculations of effort and catch, effort and catch variances and standard errors followed Pollock et al. 1994, pages 245 through 252. Hours and catch were both calculated by survey period, segment, and day type (weekend or weekday). Catch rate is the number of fish caught divided by the number of hours spent fishing.

A length-frequency index measures changes in population structure. Proportional Stock Density (PSD) is the proportion of fish of quality size in a stock (Gabelhouse 1984). Relative Stock Density (RSD) is the proportion of fish of a size group in a stock.

Table 1. An example of the creel schedule for the 20 July through 16 August survey period for the Missouri River during 2002.

Count Time	Creel clerk	Date	Direction	Boat ramp
Weekends				
0642	Ken	7/20/02	Up	Hamburg
1028	Clint	7/28/02	Up	Plattsmouth
1408	Austin	7/27/02	Up	Nebr City
1723	Benda	8/10/02	Up	Bellevue
Weekdays				
0659	Ken	8/7/02	Down	Bellevue
0858	Austin	7/24/02	Up	Nebr City
1112	Clint	7/29/02	Up	Nebr City
1323	Austin	7/30/02	Down	Plattsmouth
1529	Brenda	8/8/02	Down	Nebr City
1727	Ken	8/14/02	Up	Bellevue

Results

The 2004 creel year was marked by low water throughout the year, with flows lower on average due to an ongoing basin-wide drought. Due to budget reductions we were only able to complete the first two survey periods from 3 April through 29 May 2004. Because we only completed two survey periods we are only presenting a limited set of results for 2004.

Fishing Effort

Anglers spent almost 6500 hours fishing the Missouri River from Bellevue downstream to Camp Creek from 3 April through 29 May 2004 (Table 2). The Bellevue segment was the most heavily fished with over 33% of the total effort, followed by the Plattsmouth segment with over 32% of the effort. Hamburg Bend was the least fished segment with approximately 3% of the effort. Just over 55% of the fishing occurred on weekends, although this varied by creel period and segment (Table 3).

Table 4 presents fishing effort by species being sought and creel period. Channel catfish accounted for 79% and flathead catfish for 21% of the angler effort. Only channel catfish were sought by anglers during the first creel period (4/3 - 5/1). Table 5 presents fishing effort by species sought and river segment.

Table 2. Angler effort (hours) and standard errors by segment and creel period by anglers fishing the Missouri River during 2004.

Segment	Period		Segment totals	Percent
	4/3 - 5/1	5/2 - 5/29		
Bellevue	1208 ± 252	980 ± 490	2188 ± 551	33.7
Plattsmouth	881 ± 0	1222 ± 396	2103 ± 396	32.4
Goose Island	340 ± 205	399 ± 201	739 ± 287	11.4
Nebraska City	617 ± 396	640 ± 171	1257 ± 431	19.3
Hamburg	0 ± 0	212 ± 151	212 ± 151	3.3
Period totals	3046 ± 512	3453 ± 699	6499 ± 867	
Percent	46.9	53.1		

Table 3. Angler effort (hours) and standard errors by day type by creel period and segment by anglers fishing the Missouri River during 2004.

Period	Day Type		Period totals
	Weekend	Weekday	
4/3 - 5/1	1542	1504 ± 512	3046 ± 512
5/2 - 5/29	2038 ± 533	1415 ± 453	3453 ± 699
Total	3580	2919	6499
	± 533	± 683	± 867
Segment	Weekend	Weekday	Segment totals
Bellevue	1358 ± 462	830 ± 300	2188 ± 551
Plattsmouth	1349 ± 120	754 ± 377	2103 ± 396
Goose Island	116 ± 116	623 ± 263	739 ± 287
Nebraska City	640 ± 171	617 ± 396	1257 ± 431
Hamburg	117 ± 117	95 ± 95	212 ± 151
Total	3580	2919	6499
	± 533	± 683	± 867

Table 4. Angler effort (hours) by species sought and creel period by anglers fishing the Missouri during 2004.

Species	Period		Species totals	Percent
	4/3 - 5/1	5/2 - 5/29		
Channel catfish	1498	2117	3615	79.4
Flathead catfish		937	937	20.6
Total	1498	3054	4552	

Table 5. Angler effort (hours) by species sought and segment by anglers fishing the Missouri River during 2004.

Species	Segment					Species totals	Percent
	Bellevue	Plattsmouth	Goose Island	Nebraska City	Hamburg		
Channel catfish	653	1492		1257	212	3614	79.4
Flathead catfish	327	611				938	20.6
Total	980	2103		1257	212	4552	

Catch

Anglers caught 1,074 fish while fishing the Missouri River between 3 April and 29 May of 2004 (Table 6). The catch per period was 760 fish caught from 3 April to 1 May and 314 fish caught from 2 May through 29 May. Over 58% of the catch occurred in the Bellevue and the Plattsmouth segments. Anglers harvested 1,049 fish during 2004 (Table 7), representing almost 98% of all fish caught. Over 72% of the harvest occurred in the first creel period. Anglers only released 26 fish during 2004 (Table 8) and these fish were all released during the second creel period.

Catch, harvest and release rates by period and segment are presented in Table 9. Total catch rates were 0.29 fish/hr from 3 April through 1 May and 0.13 fish/hr from 2 May through 29 May. Harvest rates by time period were 0.29 and 0.11 fish/hr and release rates were 0 and 0.01 fish/hr. Catch rates by segment were derived by dividing the total number of fish caught in that segment by the number of hours of effort by time period. Catch rates by segment ranged from 0.11 fish/hr at Plattsmouth and Hamburg to 0.22 fish/hr at Goose Island.

Table 6. Estimated total catch (number of fish) and standard deviation by segment and period by anglers on the Missouri River during 2004.

Segment	Period		Segment totals	Percent
	4/3 - 5/1	5/2 - 5/29		
Bellevue	307 ± 93	96 ± 49	403 ± 105	37.5
Plattsmouth	141 ± 0	81 ± 37	222 ± 37	20.7
Goose Island	147 ± 86	15 ± 15	162 ± 88	15.1
Nebraska City	165 ± 165	98 ± 4	263 ± 165	24.5
Hamburg	0 ± 0	24 ± 24	24 ± 24	2.2
Period totals	760 ± 208	314 ± 68	1074 ± 219	
Percent	70.8	29.2		

Table 7. Estimated number of harvested fish and standard deviation by segment and period by anglers on the Missouri River during 2004.

Segment	Period		Segment totals	Percent	Percent of total catch harvested
	4/3 - 5/1	5/2 - 5/29			
Bellevue	307 ± 93	93 ± 53	400 ± 107	38.1	99.3
Plattsmouth	141 ± 0	71 ± 28	212 ± 28	20.2	95.5
Goose Island	147 ± 86	15 ± 15	162 ± 88	15.4	100.0
Nebraska City	165 ± 165	90 ± 11	255 ± 165	24.3	97.0
Hamburg	0 ± 0	20 ± 20	20 ± 20	1.9	83.3
Period totals	760 ± 208	289 ± 66	1049 ± 218		
Percent	72.4	27.6			
Percent of total catch harvested	100.0	92.0	97.7		

Table 8. Estimated number of released fish and standard deviation by segment and period by anglers on the Missouri River during 2004.

Segment	Period		Segment totals	Percent	Percent of total catch released
	4/3 - 5/1	5/2 - 5/29			
Bellevue		4 ± 4	4 ± 4	15.4	1.0
Plattsmouth		10 ± 10	10 ± 10	38.5	4.5
Goose Island		0	0.		
Nebraska City		8 ± 8	8 ± 8	30.8	3.0
Hamburg		4 ± 4	4 ± 4	15.4	16.7
Period totals		25 ± 14	25 ± 14		
Percent		100.0			
Percent of total catch released		8.3	2.4		

Table 9. Catch, harvest and release rates (number of fish per angler-hour) by creel period and segment by anglers fishing the Missouri River during 2004.

	Harvest Rate	Released Rate	Total Catch Rate
Period			
4/3 - 5/1	0.29		0.29
5/2 - 5/29	0.11	0.02	0.13
Total	0.17	0.01	0.18
Segment			
Bellevue	0.18	< 0.01	0.18
Plattsmouth	0.10	< 0.01	0.11
Goose Island	0.22		0.22
Nebraska City	0.20	0.01	0.21
Hamburg	0.09	< 0.01	0.11

Species catch

Shovelnose sturgeon

Shovelnose sturgeon were not a sought species by any of the anglers interviewed (Table 10). Anglers caught an estimated 13 shovelnose sturgeon, fourth most abundant species caught during the 2004 creel season (Table 11). All of the shovelnose sturgeon (100.0%) caught were harvested. Shovelnose sturgeon were caught in all segments except Goose Island, with over 38% of the total catch coming from the Plattsburgh segment (Table 13). All of the shovelnose sturgeon were caught during the second creel period (4/3 - 5/29).

River carpsucker

River carpsucker were the third most abundant species caught even though they were not sought by any of the anglers interviewed. Anglers caught an estimated 26 river carpsucker from 3 April through 29 May 2004, of which 100.0% were released. River carpsucker were only caught in the second creel period (5/1 - 5/29), with more than 38% of the catch occurring in the Plattsburgh segment (Table 14). No shorthead redhorse were caught in the Goose Island segment.

Shorthead redhorse

Shorthead redhorse were not sought by any of the anglers interviewed, however they were the second most abundant species caught. Anglers caught an estimated 225 shorthead redhorse from 3 April through 29 May 2004, of which 100.0% were released. Shorthead redhorse were caught in all segments except Hamburg during the first creel period (4/3 - 5/1). More than 37% of the catch came from the Bellevue segment (Table 15). Shorthead redhorse were caught throughout the survey period with over 70% of the total catch occurring between 3 April and 29 May.

Channel catfish

Channel catfish were specifically identified as being sought by 88.6% of the anglers that were interviewed, and was the most abundant fish caught. Anglers caught an estimated 802 channel catfish from 3 April

through 29 May 2004, of which 100.0% were harvested. Total catch rate and harvest rate for channel catfish was 0.22 fish/hr (Table 12). Channel catfish were caught in all segments, except during the first period in Hamburg, with almost 39% coming from the Bellevue segment (Table 16). Channel catfish were caught throughout the survey period with 75.0% of the total catch occurring during the first creel period (4/3 - 5/1).

Flathead catfish

Flathead catfish were sought specifically by 11.4% of the anglers interviewed and were the fifth most abundant species caught. Anglers caught an estimated 10 flathead catfish from 3 April through 29 May 2004, of which 100.0% were harvested. Total catch rate and harvest rate for flathead catfish was 0.01 fish/hr. Flathead catfish were only caught in the second creel period (5/2 - 5/29), with the highest overall percentage of total catch coming from the Plattsmouth segment (40.0%) (Table 17). No flathead catfish were caught at Goose Island.

Table 10. Number and percent of anglers who indicated that they were seeking a particular species while fishing the Missouri River during 2004.

Species	Number	Percent
Channel catfish	31	88.6
Flathead catfish	4	11.4
Total	35	

Table 11. Estimated total number of fish harvested, released and caught and the standard error by species by anglers fishing the Missouri River during 2004.

Species	Harvested		Released		Total	
	Catch	SE	Catch	SE	Catch	SE
Shovelnose sturgeon	13	7			13	7
River carpsucker			25	14	25	14
Shorthead redhorse	225	56			225	56
Channel catfish	801	166			801	166
Flathead catfish	10	5			10	5
Total	1074	219	26	14	1074	219

Table 12. Total catch, harvest and release rates by species by anglers fishing the Missouri River during 2004.

Species	Harvest (fish/hour)	Release (fish/hour)	Catch (fish/hour)
Shovelnose	< 0.01		< 0.01
Channel catfish	0.12		0.22
Flathead catfish	< 0.01		0.01
River carpsucker	< 0.01		< 0.01
Shorthead redhorse		0.03	0.03
Total	0.14	0.03	0.17

Table 13. Estimated total catch (harvested fish) of shovelnose sturgeon by segment and period and totals with standard deviations for anglers fishing the Missouri River during 2004.

Segment	Period		Harvested	Released	Total	Percent
	4/3 - 5/1	5/2 - 5/29				
Bellevue		2 ± 2	2 ± 2		2 ± 2	15.4
Plattsmouth		5 ± 5	5 ± 5		5 ± 5	38.5
Goose Island						
Nebraska City		4 ± 4	4 ± 4		4 ± 4	30.8
Hamburg		2 ± 2	2 ± 2		2 ± 2	15.4
Harvested		13 ± 7	13 ± 7			100.0
Released						
Total		13 ± 7			13 ± 7	
Percent		100.00	100.00			

Table 14. Estimated total catch (harvested fish) of river carpsucker by segment and period and totals with standard deviations by anglers fishing the Missouri River during 2004.

Segment	Period		Harvested	Released	Total	Percent
	4/3 - 5/1	5/2 - 5/29				
Bellevue				4 ± 4	4 ± 4	15.4
Plattsmouth				10 ± 10	10 ± 10	38.5
Goose Island						
Nebraska City				8 ± 8	8 ± 8	30.8
Hamburg				4 ± 4	4 ± 4	15.4
Harvested				26 ± 14		100.0
Released						
Total					26 ± 14	
Percent				100.0		

Table 15. Estimated total catch (harvested fish) of shorthead redhorse by segment and period and totals with standard deviations by anglers fishing the Missouri River during 2004.

Segment	Period		Harvested	Released	Total	Percent
	4/3 - 5/1	5/2 - 5/29				
Bellevue	62 ± 26	23 ± 16	85 ± 31		85 ± 31	37.8
Plattsmouth	35 ± 0	15 ± 3	50 ± 3		50 ± 3	22.2
Goose Island	21 ± 21	4 ± 4	25 ± 21		25 ± 21	11.1
Nebraska City	41 ± 41	21 ± 7	62 ± 42		62 ± 42	27.6
Hamburg		3 ± 3	3 ± 3		3 ± 3	1.3
Harvested	159 ± 53	66 ± 19	225 ± 56		225 ± 56	100.0
Released						
Total	159 ± 53	66 ± 19	225 ± 56		225 ± 56	
Percent	70.7	29.3	100.0			

Table 16. Estimated total catch (harvested fish) of channel catfish by segment and period and totals with standard deviations by anglers fishing the Missouri River during 2004.

Segment	Period		Harvested	Released	Total	Percent
	4/3 - 5/1	5/2 - 5/29				
Bellevue	245 ± 69	66 ± 40	311 ± 80		311 ± 80	38.8
Plattsmouth	106 ± 0	48 ± 16	154 ± 16		154 ± 16	19.2
Goose Island	127 ± 73	10 ± 10	137 ± 74		137 ± 74	17.1
Nebraska City	124 ± 124	63 ± 11	187 ± 124		187 ± 124	23.3
Hamburg		13 ± 13	13 ± 13		13 ± 13	1.6
Harvested	601 ± 159	200 ± 48	801 ± 166			100.0
Released						
Total	601 ± 159	200 ± 48			801 ± 166	
Percent	75.0	25.0	100.0			

Table 17. Estimated total catch (harvested fish) of flathead catfish by segment and period and totals with standard deviations by anglers fishing the Missouri River during 2004.

Segment	Period		Harvested	Released	Total	Percent
	4/3 - 5/1	5/2 -5/29				
Bellevue		2 ± 2	2 ± 2		2 ± 2	20
Plattsmouth		4 ± 4	4 ± 4		4 ± 4	40
Goose Island						
Nebraska City		3 ± 3	3 ± 3		3 ± 3	30
Hamburg		1 ± 1	1 ± 1		1 ± 1	10
Harvested		10 ± 5	10 ± 5		10 ± 5	100.0
Released						
Total		10 ± 5			10 ± 5	
Percent		100.0	100.0			

Angling

A long-term goal of conducting annual creel surveys on the Missouri River is to develop educational materials for recreational fishing on the Missouri River, based upon survey results. Due to only two survey periods being completed we are not including this analysis in this report.

Discussion

No changes were made in the design of the creel survey used during 2004

In Table 18 we compare selected parameters from the 2000, 2002, 2004 creel surveys of the Missouri River from Bellevue to Camp Creek and the 2001 and 2003 creel surveys from Camp Creek to Kansas State line. The number of days in the creel period in 2004 was nearly 75% less than the in 2002. Total effort in 2004 was down over 85% compared to 2002 and down over 29% when compared to 2001.

The percent of weekend hours fished in the Bellevue to Camp Creek segment increased in 2004 to 55.1%, the highest reported for this segment.

Table 18. Comparison of selected parameters between the 2000 - 2005 Missouri River creel surveys.

Parameter	Bellevue to Camp Creek			Camp Creek to Kansas State Line	
	2000	2002	2004	2001	2003
Number of creel periods (days)	6 (168)	7 (196)	2 (56)	7 (196)	7 (196)
Effort (hours)	55,047	42,367	6,499	22,131	30,187
Effort (hours) creel periods 1 - 3	36,857	17,634	6,499	5,137	12,455
Effort (hours) creel periods 4 - 6	18,190	19,969	0	15,706	17,731
Percent weekend hours	53.5%	53.8%	55.1%	69.0%	62.8%
Percent of total effort fishing for					
Shovelnose sturgeon	3.1%	2.4%	0%	0%	0%
Common carp	2.2%	3.4	0%	1.4%	1.2%
Channel catfish	9.1%	23.7%	88.6%	9.2%	21.2%
Flathead catfish	15.0%	21.7%	11.4%	24.1%	21.4%
All "catfish"	53.7%	46.4%	100%	77.8%	70.9%
Freshwater drum	1.7%	0%	0%	0%	0%
Any species	39.2%	47.3%	0%	20.9%	27.8%
Total catch	23,853	18,636	1,074	8,151	12,778
Harvested fish	9,139	7,812	1,049	4,022	6,088
Released fish	14,714	10,824	26	4,129	6,689
Percent released fish	61.7%	58.1%	2.4%	51%	52.3
Catch rate	0.44	0.39	0.18	0.37	0.38
Harvest rate	0.17	0.17	0.17	0.18	0.18
Release rate	0.27	0.22	0.01	0.19	0.20
Percent of total catch					
Shovelnose sturgeon	12.4%	14.7%	1.2%	9.1%	0.7%
Common carp	21.3%	19.4%	0%	9.7%	9.8%
Channel catfish	25.9%	38.6%	74.6%	38.8%	67.9%
Flathead catfish	9.0%	4.7%	0.9%	26.1%	9.3%
Freshwater drum	21.0%	14.7%	0%	3.4%	6.3%

Table 18. Continued.

Parameter	Bellevue to Camp Creek			Camp Creek to Kansas State Line	
	2000	2002	2004	2001	2003
Catch rate (fish / hour)					
Shovelnose sturgeon	0.05	0.07	< 0.01	0.03	< 0.01
Common carp	0.09	0.05	0	0.04	0.03
Channel catfish	0.11	0.15	0.13	0.14	0.24
Flathead catfish	0.04	0.02	< 0.01	0.10	0.05
Freshwater drum	0.09	0.06	0	0.01	0.03
RSD-preferred					
RSD-preferred channel catfish	4	2	0	3	0
RSD-preferred flathead catfish	10	23	0	1	0
Percent of Nebraska residents	71.5%	78.2%	85.7%	44.1%	48.4
Percent of anglers that ran setlines	8.5%	2.5%	0%	16.0%	8.7

Acknowledgment

This work could not have been done without the dedication and assistance of David Tsoodle, Blake Smith and Betsy Glaesemann. These individuals conducted the creel, assisted with data entry, data verification creating tables and editing this report.

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Appendix I - Missouri River Creel Survey Forms

Nebraska Game and Parks Commission
Fisheries Division

Missouri River Creel Survey - Count Form

(33-000 / REV 3-02)

Enter the segment code and the time you finish counting that segment.

Direction
1 - Upriver
2 - Downriver

MONTH

DAY

YEAR
2 0 0 2

CLERK

ANGLER - RECREATIONAL COUNT

BOAT COUNT

	SEGMENT				COUNT				END TIME		DIR
1	1	1	1	1							
2											
3											
4											
5											
6											
7	9	9	9	9							

BANK-NE		BANK-IA/MO		BOAT		OTHER	

FISHING		REC		JET SKI	
					1
					2
					3
					4
					5
					6
					7

TEMPERATURE (C), WEATHER AND RIVER CONDITONS

	AIR	WATER		WIND	WEATHER	NAVIGATION		SECCHI (cm)	
1									
2									
3									
4									
5									
6									
7									

Wind
 00 - Calm <1
 01 - Light air 1-3
 02 - Light breeze 4-7
 03 - Gentle breeze 8-12
 04 - Mod breeze 13-18
 05 - Fresh breeze 19-24
 06 - Strong breeze 25-31
 07 - Mod gale 32-38
 08 - Fresh gale 39-46

Weather
 01 - No effect
 02 - Lightning
 03 - Precipitation

Navigation
 01 - No debris
 02 - Some debris
 03 - Heavy debris
 04 - Ice

Segments

8390 - Bellevue Br - Platte River
601.3 - 595

8410 - Platte River - Rock Bluff
595 - 584.5

8420 - Rock Bluff - Weeping Water Cr
584.5 - 568.6

8430 - Weeping Water Cr - OPPD
568.6 - 556.3

8440 - OPPD - Camp Cr
556.3 - 549

COMMENTS _____

RAW DAILY COUNTS

Bank Anglers -
Nebraska Bank -
persons actively fishing

Bank Anglers - Iowa -
persons actively fishing

Boat Anglers - persons
actively fishing

Recreational Activity -
sunbathers, boaters
birdwatchers, picnics

Fishing
Boats

Recreational
Boats

Jet Skis

	SEGMENT	PARTY #	ANGLER #	FISHING LICENSE #	STATE	AGE	SEX	START TIME	INTERVIEW TIME	TRIP
11										11
12										12
13										13
14										14
15										15
16										16
17										17
18										18
19										19
20										20

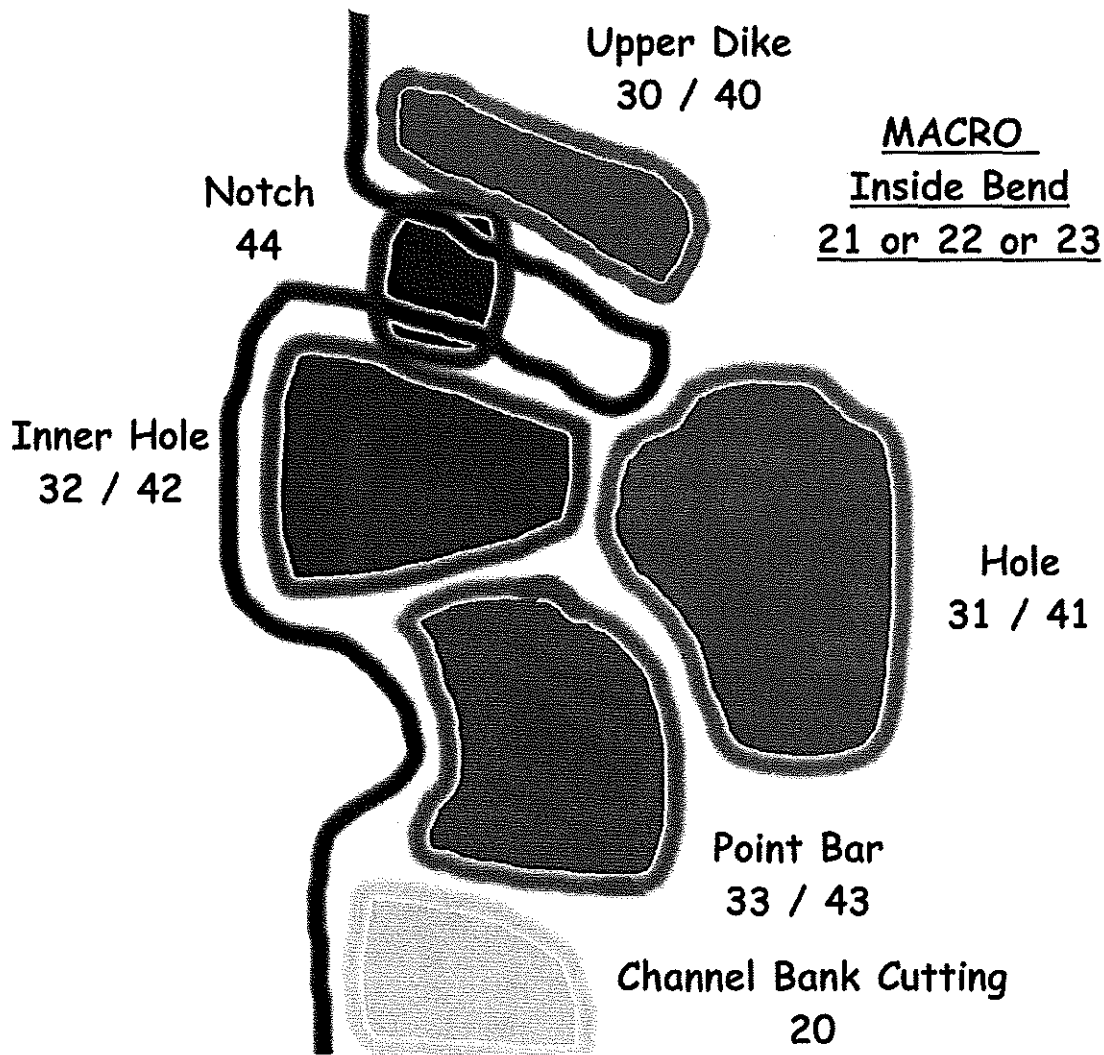
	SPECIES SOUGHT						METHOD	BAIT	MACRO	MICRO	Structure	Latitude "40"	Longitude "95"	BANK	ACCESS CODE (where fishing?)	BOAT RAMP Launched	SETLINE
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

COMMENTS _____

ANGLER #	SPECIES	HARVEST					RELEASE					TAG
		LENGTH (mm)	WEIGHT (g)	GROUP (Inches)	COUNT							
1												1
2												2
3												3
4												4
5												5
6												6
7												7
8												8
9												9
10												10
11												11
12												12
13												13
14												14
15												15
16												16
17												17
18												18
19												19
20												20
21												21
22												22
23												23
24												24
25												25
26												26
27												27
28												28
29												29
30												30

TAG	TAG NUMBER	COMMENTS
1		
2		
3		
4		
5		

Appendix II - Diagrams of Macrohabitats and Microhabitats Used During the Creel Survey

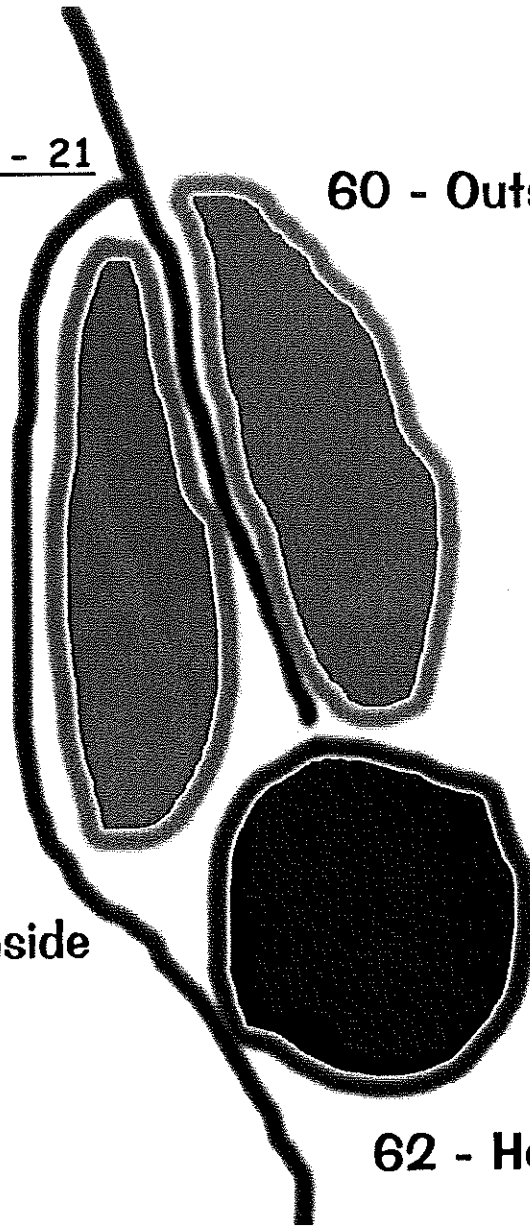


Wing dike / notched dike Fishing Location Codes

MACRO

Upper Inside Bend - 21

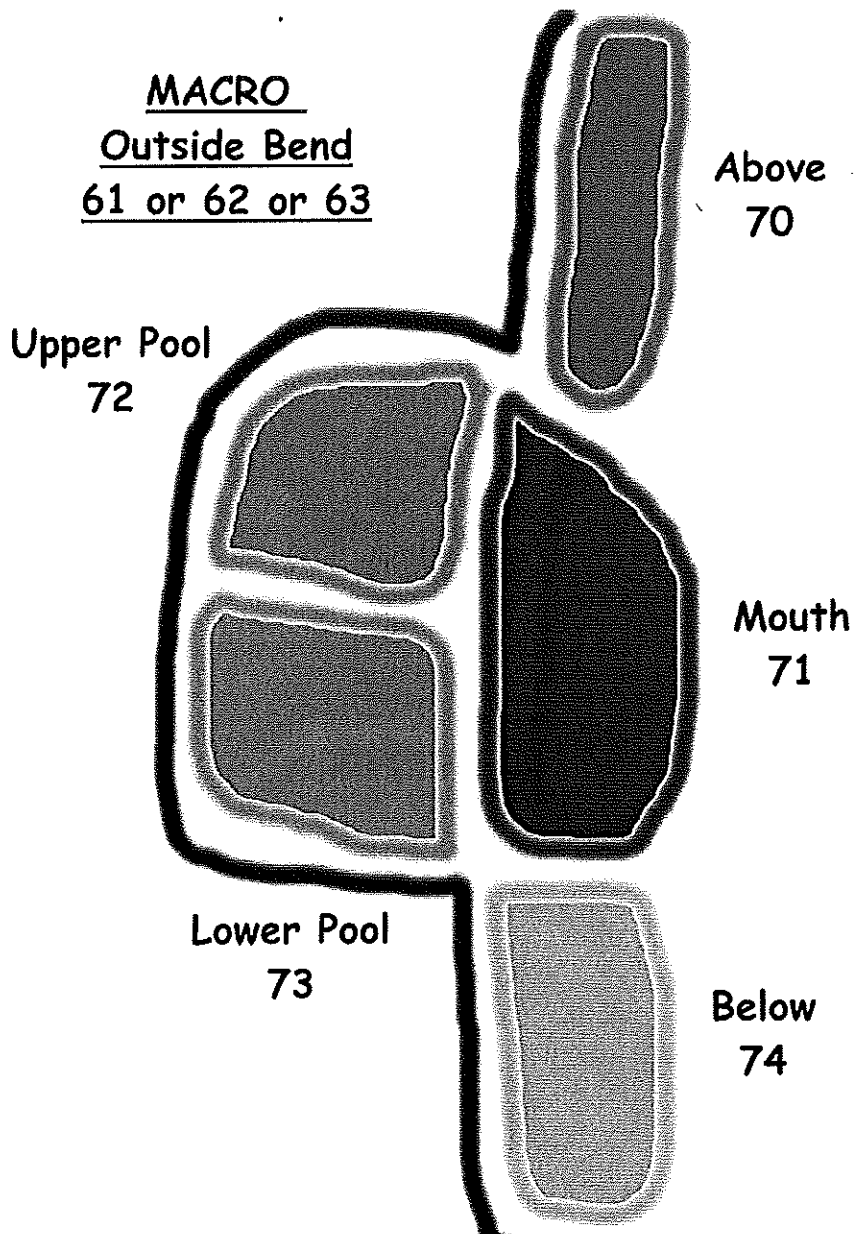
60 - Outside



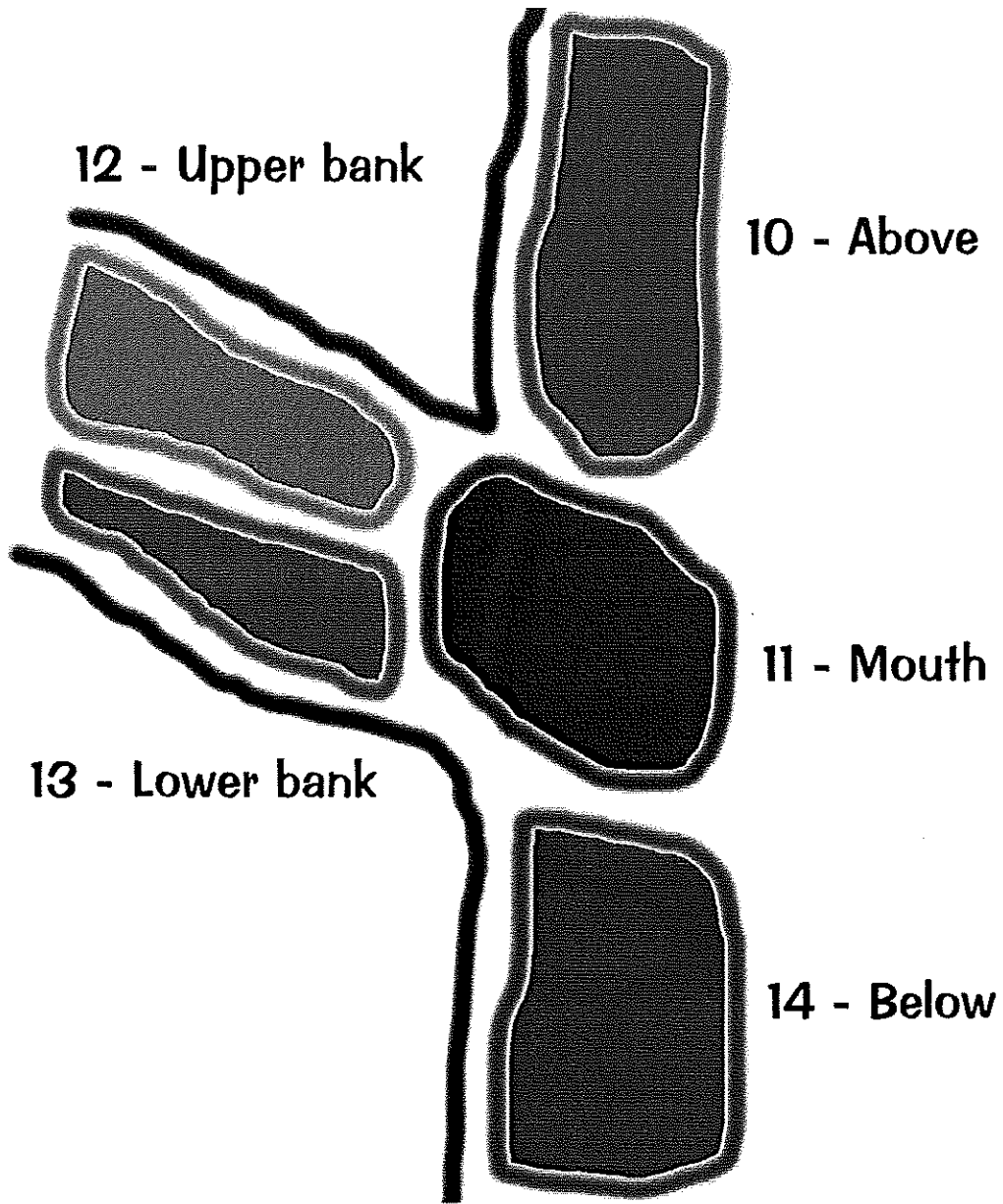
62 - Inside

62 - Hole

Kicker (I-head) Revetment Fishing Location Codes



Revetment Scallop Fishing Location Codes



Tributary / Ditch Mouth Fishing Location Codes